

Executive Summary



Introduction

Management of municipal solid waste (MSW) is one of the most important and challenging environmental issues we face today. The change to more sustainable waste management systems and long term global environmental protection is now backed by substantial legislation and guided by detailed policies at European, national and regional level.

In response to these new drivers, the GMWDA and its partner Authorities¹ have formulated a Municipal Waste Management Strategy (MWMS) based on joint working and an integrated waste management system; driven by a fundamental desire to change waste into useable resources, to minimise the generation of waste and to maximise recycling and composting.

Through introducing this strategy there will be economic benefits through the creation of jobs in kerbside collection services, development of new and emerging environmental technology and the reprocessing of the recyclates and compostables extracted from the waste stream. The environmental benefits would reduce the current levels of carbon emissions, the need for virgin materials and the requirement for future landfill sites.

The strategy is designed to meet all known and anticipated duties of the Authorities and is an overall approach based on the aim of managing Greater Manchester's waste high in the waste management hierarchy. Recycling and composting targets exceed current statutory requirements and national performance targets.

The MWMS takes into account the types and quantities that make up municipal solid waste and the policy and guidance, statutory targets and objectives. Implementation of the strategy is based on assessments of the available waste management methods and options together with performance and cost modeling of integrated scenarios designed to achieve the MWMS targets and objectives. Implementation of the strategy will require land use planning issues to be addressed.

Municipal Waste Growth

The municipal waste stream in Greater Manchester originates from a range of sources; WCA collected household waste (weekly, bulky, hazardous) and other waste (e.g. street cleansing, parks and gardens, Council office waste); WCA collected commercial waste; waste from civic amenity sites; waste collected for recycling; and difficult waste.

¹ Throughout this document, references made to Greater Manchester refer to the area covered by the nine District Councils which participate in the GMWDA

In the last five years (1998 to 2003) MSW has grown by an average of over 2% per year to **1,483,323 tonnes**. The annual increase was 3% in the year ending April 2003. Subject to continued economic growth in the UK as a whole it would not be unreasonable to conclude that MSW arisings will continue to grow at a rate of at least 2% unless action is taken.

It is recognised to reduce waste growth to 2% and below and the high levels of recycling and composting of 50% will involve joint working by the partnership of collection and disposal authorities.

Greater Manchester MWMS – Targets and Objectives

The strategy is designed to meet all known and anticipated duties of the Authorities based on the aim of managing Greater Manchester's waste high in the waste management hierarchy. Key elements of the strategy are;

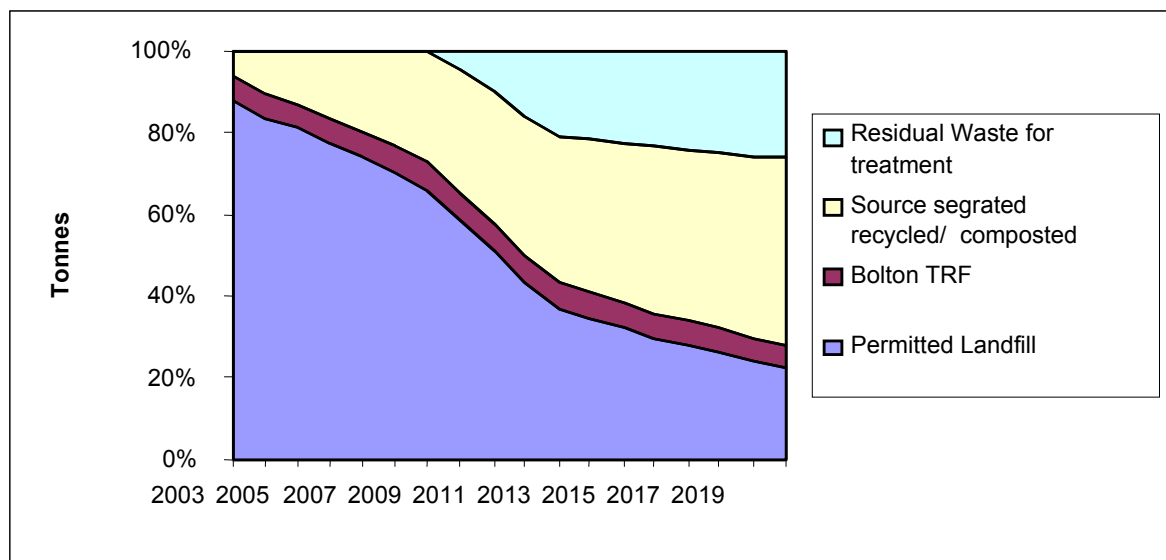
- Waste reduction and minimisation has the highest priority. The target is to arrest the increases in MSW arisings to no more than 2% per annum by 2010 and zero by 2020
- Reduce non-household waste by 50% in proportion to current MSW arisings, which will reduce total tonnage by 10%
- A commitment to adopting a recycling and composting led approach to waste management with no restriction to the development of recycling and composting
- Targets of recycling and composting 50% of household waste for 2020. The target for 2005/6 is recycling and composting 20% of household waste and 33% for 2010
- Develop an approach that takes account of new and emerging technologies
- Meeting landfill permit allowances and bio-diversion targets through implementation of residual waste treatment processes with use of refuse derived fuels (RDF)
- Collect adequate and reliable data on individual waste streams and management methods to provide the basis for strategy and financial planning
- Adoption of partnership waste management working arrangements at a strategic and operational level between the GMWDA and other partners
- Develop and integrate waste collection, processing, treatment and disposal systems to ensure "Best Value" is delivered from WCA and WDA services
- Working with external agencies and partner authorities to develop and provide facilities and markets for waste derived materials in accordance

with the Best Practicable Environmental Option for Greater Manchester and the region as a whole

- Building on synergies of dealing with commercial and industrial waste where these will assist in the delivery of the waste management strategy as a whole
- Retain and optimise the use of Bolton Thermal Recovery Facility (TRF) throughout the life of the strategy

Waste Strategy Summary

Figure 1 - this illustrates the level of treatment and source separation required to meet future permitted landfill targets



Waste Strategy Implementation

Options that move waste management as far up the waste hierarchy as practicable

GMWDA preference is to move waste management as far up the waste hierarchy as practicable. This means that waste reduction and minimisation heads the hierarchy and will have priority in the strategy followed by source segregation, waste recycling and composting.

After removal of materials for recycling and composting, residual material will remain that cannot be easily and effectively recycled or composted. Achievement of the challenging targets for recycling and composting targets **will not avoid** the need for a significant amount of **residual waste** to be dealt with.

Residual waste treatment considered includes Mechanical and Biological Treatments (MBT) and a number of closely related technologies such as high

pressure steam sterilisation. Scenarios that combine available technical options into practical integrated systems for managing Greater Manchester's MSW have been modelled for performance in meeting the MWMS targets and for costs. Full details of the options and are contained within the content of the strategy report.

Costs Summary for the Greater Manchester MWMS

Table 1 – This table sets out the costs of implementation of the waste management strategy as outlined in the targets and objectives. Costs modelled are benchmark costs derived from current industry standard estimates. The models are therefore illustrative on the basis of the best known information and assumptions. Full details of the basis of costs and assumptions are contained within the content of the strategy report.

Scenario		Annual Cost £m @ 2003 values				
		2002/3	2005/6	2009/10	2012/13	2019/20
Strategy targets achieved 50% reduction in non Household waste	WCA Costs	£26	£48	£60	£63	£65
Early introduction of residual waste treatment and MRF Recyclables sorting	WDA Costs	£72	£78	£99	£101	£107
	Integrated Costs	£98	£126	£147	£162	£171

Table 2 – This table sets out the cost of continuing with the 2002/03 activities without adopting the targets and objectives and illustrates the projected cost taking into account increased landfill tax, landfill costs and penalties. Full details of the basis of costs and assumptions are contained within the content of the strategy report.

Scenario		Annual Cost £m @ 2003 values				
		2002/3	2005/6	2009/10	2012/13	2019/20
Do nothing 6.1% diversion from Landfill no non HH waste reduction, current waste management arrangements	WCA Costs	£26	£28	£30	£32	£33
	WDA Costs	£72	£88	£140	£148	£167
	WET Fines		(£19)	£49	£91	£126
	Total Costs (Inc fines)	£98	£116 (£135)	£170 (£219)	£180 (£271)	£200 (£326)

Performance and Cost Modelling Conclusions

- Do nothing is not an option. By 2005/6 this will only transfer costs from collection to disposal and from thereon increasing landfill disposal costs and penalties rapidly escalate costs beyond more sustainable waste management options
- Waste collection costs show the most significant increases and demonstrate a need for early investment in increased source segregated collection capacity if early targets are to be met
- Early investment and improvement in recycling and composting from Civic Amenity sites is both productive and cost effective
- Early investment in increased composting capacity is required
- MRF sorting of mixed dry recyclable collection in the long term will assist in maximising the separation of recyclates and reduces overall integrated costs. Early decisions on investment in new facilities are required to maximise this benefit
- Early implementation of residual waste treatment will reduce costs since rises in landfill tax and gate fee costs can be expected to exceed treatment costs by 2010. Introduction of residual waste treatment will also increase the amount of recyclate removed from the waste stream
- In-vessel composting of source segregated waste including kitchen waste may be needed by 2020 if the challenging target of 50% recycling and composting is to be achieved
- The Authority continues to operate with the nine constituent district councils and costs models are based on obtaining best value through a partnership approach
- Current assets are used enabling residual treatment and the integration of waste disposal facilities to be introduced within the required timescales and where required planning approval obtained for new facilities

Key Action plan

- Secure reduction of 50% in non household municipal waste, principally collected commercial waste, Council waste and unauthorised deposits at Civic Amenity sites

- Investment in reduction and minimisation of all MSW waste streams including promotion and education on minimisation to households
- Investment in increased composting capacity
- Early decision on investment in new MRF sorting facilities is required to maximise long term dry recyclable collection and reduce overall integrated costs
- Early investment in increased source segregated collection capacity
- Early decision on implementation of residual waste treatment to reduce costs and increase the amount of recyclate removed from the waste stream
- Undertake a study of current capacity in the region of fossil fuelled power plants/high energy consumers that can either be converted or increase their capacity for RDF
- Investigate and secure landfill capacity as required post 2008 for the strategy

Cross cutting Actions

- Collecting adequate and reliable data on individual waste streams and management methods
- Review of the role of the community sector involvement and the provision of waste and recycling services
- Develop best practice in kerbside collection infrastructures at a district level
- Examine potential for maximising recyclates diversion from the bulky waste stream
- Review the policies for charging for waste collection services across the partnership including charges for commercial waste
- Adoption of partnership waste management working arrangements at a strategic and operational level between the GMWDA and other partners
- Review existing assets and future needs and where possible seek planning approval for new facilities
- Review the equity and provision of facilities for waste treatment and civic amenity sites for the partnership
- Address the future role of the LAWDC

- Establishing a procurement strategy for the provision of the GMWDA's main waste disposal services post the expiry of existing contracts on 31 March 2006
- Develop integrated disposal services for recyclates and joint bulking and composting facilities for materials
- Review the available markets and processing capacity for recyclates and compostables locally, regionally and nationally and develop opportunities for processing of waste locally



1.0 Introduction

- 1.1 Management of municipal solid waste (MSW) is one of the most important and challenging environmental issues we face today. The change to more sustainable waste management systems and long term global environmental protection is now backed by substantial legislation and guided by detailed policies at European, national and regional level.
- 1.2 This legislation sets constraints and limitations on the way that MSW can be managed and targets that must be achieved. At a national level the UK government faces heavy fines if targets are not complied with. The government has deployed a number of levers and incentives together with guidance to Waste Disposal and Collection Authorities to ensure that this does not happen.
- 1.3 In response to these new drivers, the GMWDA and its partner Authorities² have formulated a Municipal Waste Management Strategy (MWMS) based on joint working and a integrated waste management system; driven by a fundamental desire to change waste into useable resources, to minimise the generation of waste and to maximise recycling and composting.
- 1.4 Through introducing this strategy there will be economic benefits through the creation of jobs in kerbside collection services, development of new and emerging environmental technology and the reprocessing of the recyclates and compostables extracted from the waste stream. The environmental benefits would reduce the current levels of carbon emissions, the need for virgin materials and the requirement for future landfill sites.
- 1.5 A draft “Strategy Discussion Document” was issued in December 2002 indicating an overall strategic direction based upon a waste minimisation, recycling and composting led approach. However, the discussion document raised a number of issues and questions that would have to be addressed to take this strategy forward. Drawing on the background of this draft strategy a consultation paper was produced in January 2003 including seventeen key questions and a public consultation undertaken through Waste Collection Authority (WCA) civic newspapers and leaflets distributed to all households in the WCA areas. This strategy takes the responses to this consultation into account.
- 1.6 The legislative and policy background within which waste strategy must be developed has also seen important new developments since the consultation was undertaken. These will have major implications for how

² Throughout this document, references made to Greater Manchester refer to the area covered by the nine District Councils which participate in the GMWDA

waste can be managed in the future. A summary of key legislation and statutory targets including the Waste and Emissions Trading Bill consultation and Animal-By-Products Regulations is given at Appendix A.

- 1.7 The strategy is designed to meet all known and anticipated duties of the Authorities and is an overall approach based on the aim of managing Greater Manchester's waste high in the waste management hierarchy. Recycling and composting targets set in the MWMS exceed current statutory requirements and national performance targets.
- 1.8 This document gives background information on the types and quantities that make up municipal solid waste and sets out the framework of policy and guidance within which the strategy has been developed. The targets and objectives are clearly stated followed by chapters setting out how the strategy will be implemented. These include assessments of the available waste management methods and options together with performance and cost modelling of integrated scenarios designed to achieve the MWMS targets and objectives. Land use planning issues that will be important to strategy implementation also need to be addressed.

2.0 How much MSW is produced and what happens to the waste now?

- 2.1 The municipal waste stream in Greater Manchester originates from a range of sources;
 - Waste Collection Authority collected household waste (weekly, bulky, hazardous) and other waste (e.g. street cleansing, parks and gardens, Council generated waste);
 - Waste Collection Authority collected commercial waste;
 - waste from civic amenity sites (Household Waste and Recycling Centres);
 - material collected for recycling; and
 - difficult waste.
- 2.2 Historically data collected by GMWDA was based on the requirements of a disposal orientated system (recently supplemented by those of Government BVPI recycling targets) rather than the requirements of a new waste strategy based on minimising waste arisings whilst maximising recycling and composting and reducing residual waste for treatment or disposal.
- 2.3 Figures for street sweepings, special collections, fly tipping, and dedicated trade waste were not separated, so that it is not possible to track or project trends in each of these waste streams or indeed to project the impact of particular policies and plans upon them.
- 2.4 The quantity of trade and commercial waste collected is probably the greatest uncertainty. **Whilst commercial waste is reported as making up less than 7% of the total of MSW arisings there are strong**

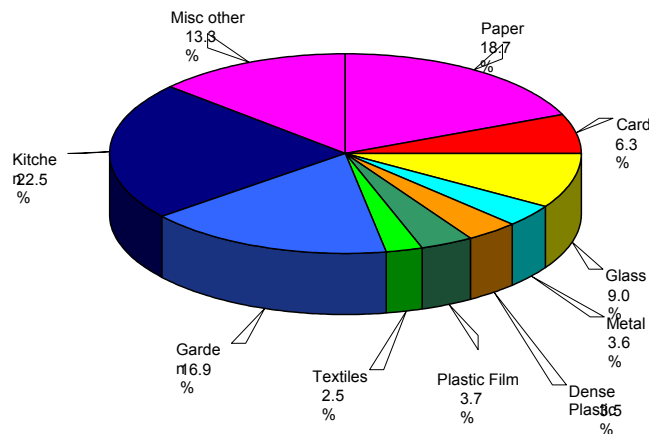
indications that this quantity could be in the order of or exceed 20%.

Table 1 - The Municipal Waste Stream in 2002/03

Waste Stream	2002/3	%
Household Collections		
Total Household Collected	805,623	54
Total Recycled from Households	56,633	4
Bulky& Trade Waste		
Bulky & Clinical Waste	293,338	20
Commercial Waste (est; inc in hsehld/blky/clncl)	(98,167)	(7)
Civic Amenity Sites		
Total Disposed	293510	19
Total Recycled	34,219	2
Total Waste	1,483,323	100

- 2.5 The municipal waste collected by the WCAs is managed on behalf of the GMWDA by Greater Manchester Waste Ltd (GM Waste Ltd), the Authority's Local Authority Waste Disposal Company (LAWDC).
- 2.6 GM Waste Ltd operates a range of waste management facilities, (including material recovery facilities (x4), transfer stations (x3), a thermal recovery facility and civic amenity sites (x25)), prior to landfill disposal outside the conurbation. Almost 90% of Greater Manchester's waste, through contracts with Biffa Waste Services Ltd, are sent to landfill, principally to sites in Warrington and on Humberside.
- 2.7 The following Figure 1 shows an estimate of the composition of Greater Manchester's kerbside collected household waste, provided to the GMWDA by Ecologika (December 2001) and adopted by Enviros in their work on the strategy (spring 2002).

Figure 1 - Composition of Greater Manchester Kerbside Collected Household Waste



2.8 A number of key challenges face Greater Manchester. Current collection infrastructure is inadequate to capture more than a small proportion of the *theoretically* recyclable or compostable household waste. Even when such infrastructure is in place, public participation rates will have to be improved significantly over those achieved by current schemes for it to have a major impact. Markets for collected recycle and compost must be developed for many materials.

3.0 Future projections of waste growth

3.1 Whilst the total for municipal waste arisings was 1,483,323 tonnes for year 2002/3 future planning for the management of MSW must take into account changes in the quantities and composition of the municipal waste streams. In particular historic data has shown a relentless growth in the quantities of MSW generated.

3.2 This growth approximates, if imprecisely, to overall levels of economic growth although Government statistics on municipal waste show that the quantity of waste managed by local authorities is growing at a rapid pace. A generally accepted estimate is that municipal waste is growing by an average of 3% per year in the UK, a significant majority of which is attributed to growth in CA site arisings; this is equivalent to municipal waste doubling every 25 years.

3.3 In the last five years (1998 to 2003) MSW in Greater Manchester has grown by an average of over 2% per year. The annual increase was 3% in the year ending April 2003. Subject to continued economic growth in the UK as a whole it would not be unreasonable to conclude that MSW arisings will continue to grow at a rate of at least 2% unless action is taken.



4. Policy and Guidance

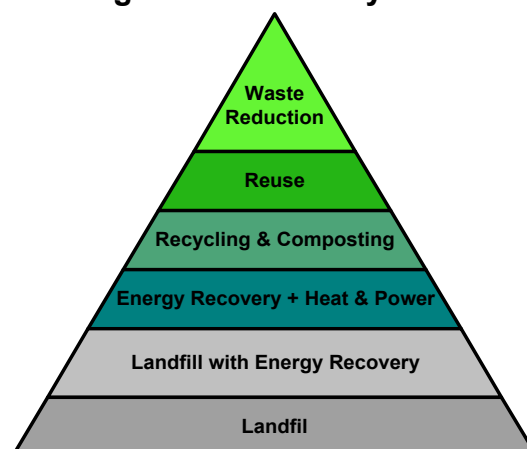
4.1 The European Commission (EC), the Executive of the EU, have adopted through the Council of Ministers the following guiding principles on which they base all aspects of their Environmental Policy. These principles are highlighted below:

- **The Precautionary Principle** - Potential problems must be anticipated.
- **The Polluter Pays Principle** - Those who cause pollution must pay to clean it up.
- **The Prevention Principle** - Waste production must be minimised where possible.
- **The Proximity Principle** - Waste should be disposed of as closely as possible to where it is produced.

4.2 Government policy also embraces the concept of Best Practicable Environmental Option (BPEO). BPEO is “the option that provides the most benefits or least damage to the environment as a whole, at an acceptable cost in the long and short term.” The principle is based upon broad consultation between stakeholders, i.e. the waste industry, waste collection and disposal authorities, the Environment Agency and community groups. Different waste streams will have different BPEO waste management options.

4.3 The Government’s policies and guidance on waste management strategy have been set out in their Waste Strategy 2000, its Guidance on Municipal Waste Management Strategies and in its response to the report to the Cabinet Office document “Waste Not, Want Not” (December 2002). The key principles of the Government’s vision for sustainable waste management are based on moving waste up the adopted Waste Hierarchy, (see Figure 2 below) the higher levels of which reflect more sustainable waste and resource management.

Figure 2 - The Waste Management Hierarchy³



³ ‘Waste Not, Want Not’, Cabinet Office Strategy Unit, November 2002

- 4.4 At a regional level the North West Regional Waste Strategy sets out a strategic direction over a number of issues most of which reflect national policies or are already encompassed in Greater Manchester's waste strategy development. The adoption of the proximity principle is perhaps the most significant for Greater Manchester given the essentially urban character of the conurbation and the fact that most of the MSW arisings are disposed of at landfill sites outside of the Greater Manchester area.

5.0 GMWDA Policy, Aims and Objectives



- 5.1 The GMWDA has undertaken policy and strategy development and since 1996 has been working in partnership with its' key stakeholders. Agreed corporate aims of the Authority have been set out as follows;
- To provide quality services
 - To establish sustainable waste management services
 - To optimise the provision of integrated waste management services

The Strategic Objectives of the Authority are:

- To continue to reduce the amount of waste that is currently landfilled, principally at sites outside the Authority's area
 - To manage the municipal waste stream higher up the waste hierarchy, based on the descending options of waste reduction, re-use, recovery and disposal
 - To seek to maximise environmental benefits from its services at a cost which is affordable
 - To achieve the objectives and targets of the integrated waste management strategy
 - To derive best value through its contractual arrangements
 - To ensure that completed landfill sites under the control of the Authority do not cause harm to human health or pollution of the environment
- 5.2 The Authority intends to achieve its corporate aims and strategic objectives by working in partnership with others;
- To fulfill all of its statutory obligations in accordance with the principles of sustainability and Best Value
 - To consult with and be responsive to service users
 - To recognise the need for the conservation of natural resources and the protection of the natural environment

- To provide encouragement and opportunity for community involvement
 - To ensure equality of access for all service users
 - To invest in and promote the training and development of its' employees
 - To review and seek to continuously improve its' performance
- 5.3 Joint working between the Authority and the nine constituent WCAs of Greater Manchester is a crucial factor in the establishment of a MWMS for the conurbation. Consequently, in September 2001 the Authority invited the District Councils and other organisations to participate in the Greater Manchester Waste Forum (Waste Forum) under a formalised structure that would consider a recycling and composting led strategy in the context of a wider reassessment of waste management options.
- 5.4 In July 2002 the Authority and Waste Forum came to an initial view of the short-term objectives of the MWMS. In broad-terms it was agreed that the MWMS should be led by maximising amounts of recycling and composting and by adopting national and international best practice.
- 5.5 As part of the continuing process of development of a municipal waste management strategy for Greater Manchester, assurances were given to the Association of Greater Manchester Authorities Council (AGMA) at the end of December 2002 which reaffirmed the Authority's wish to consult each District Council on the preferred way forward.
- 5.6 The Consultation Paper set out the key issues facing Greater Manchester in developing a MWMS that offered a realistic route for compliance with the legislation. These included;
- arresting the increases in the quantities of municipal waste arisings;
 - dealing with the issues of commercial waste both collected and at CA sites
 - collecting adequate and reliable data on individual waste streams and management methods
 - a commitment to adopting a recycling and composting led approach to waste management;
 - a desire for integrated waste collection, treatment and disposal services;
 - implementing a residual waste treatment process consistent with meeting landfill allowances and bio-diversion targets

- adoption of partnership waste management working arrangements at a strategic and operational level between the GMWDA and other partners;
 - adoption of a method of apportionment of the waste disposal levy on a basis that is acceptable to the District Councils;
 - addressing the issue of existing GMWDA contractor costs to ensure that value for money can be attributed to provision of these services when compared with other service providers; and,
 - establishing a procurement strategy for the provision of the GMWDA's main waste disposal services post the expiry of existing contracts on 31 March 2006
- 5.7 The Consultation Paper was circulated to Members of the Authority and to all other elected Members and selected Officers of the constituent District Councils during December 2002 and January 2003.
- 5.8 In general terms, the WCAs supported the aims of establishing vertically integrated services, based upon partnership working, but commitment to these principles would mainly be dependant upon, for example, Best Value and levy apportionment considerations.
- 5.9 All of the WCAs supported the principles of the waste hierarchy and the need to develop a strategy, which recognises the primacy of waste reduction and reuse. There was also general support for the recycling and composting led approach, which has been the foundation for the work that has been completed to date.
- 5.10 It was also accepted that the pursuit of a more sustainable approach to the management of municipal waste would continue to need to be realistic and achievable and, at the same time, remain flexible. In particular, the future strategy must take account of the known barriers to recycling and composting, as well as the emerging technologies alongside those that are established in the UK and elsewhere.

6.0 The Greater Manchester MWMS – Targets and Objectives

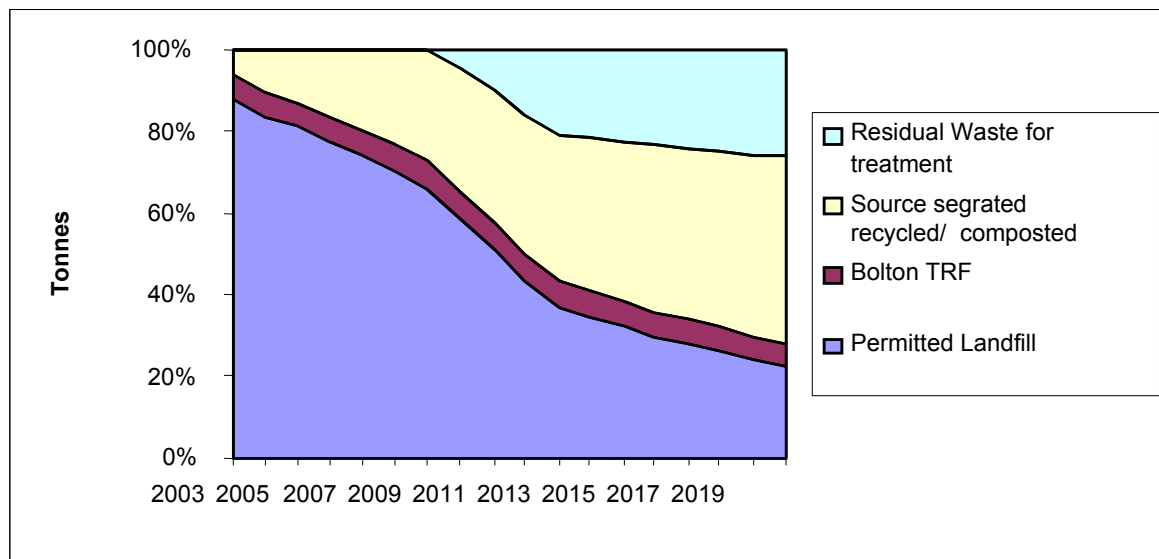


- 6.1 The strategy is designed to meet all known and anticipated duties of the Authorities based on the aim of managing Greater Manchester's waste high in the waste management hierarchy. Key elements of the strategy are;
- Waste reduction and minimisation has the highest priority. The target is to arrest the increases in MSW arisings to no more than 2% per annum by 2010 and zero by 2020

- Reduce non-household waste by 50% in proportion to current MSW arisings, which will reduce total tonnage by 10%
- A commitment to adopting a recycling and composting led approach to waste management with no restriction to the development of recycling and composting
- Targets of recycling and composting 50% of household waste for 2020. The target for 2005/6 is recycling and composting 20% of household waste and 33% for 2010
- Develop an approach that takes account of new and emerging technologies
- Meeting landfill permit allowances and bio-diversion targets through implementation of residual waste treatment processes with use of refuse derived fuels (RDF)
- Collect adequate and reliable data on individual waste streams and management methods to provide the basis for strategy and financial planning
- Adoption of partnership waste management working arrangements at a strategic and operational level between the GMWDA and other partners
- Develop and integrate waste collection, processing, treatment and disposal systems to ensure “Best Value” is delivered from WCA and WDA services
- Working with external agencies and partner authorities to develop and provide facilities and markets for waste derived materials in accordance with the Best Practicable Environmental Option for Greater Manchester and the region as a whole
- Building on synergies of dealing with commercial and industrial waste where these will assist in the delivery of the waste management strategy as a whole
 - Retain and optimise the use of Bolton Thermal Recovery Facility (TRF) throughout the life of the strategy

Waste Strategy Summary

Figure 1 – this illustrates the level of treatment and source separation required to meet future permitted landfill targets



7.0 Waste Strategy Implementation



Options that move waste management as far up the waste hierarchy as practicable

- 7.1 GMWDA preference is to move waste management as far up the waste hierarchy as practicable. This means that waste reduction and minimisation heads the hierarchy and will have priority in the strategy followed by source segregation, waste recycling and composting.
- 7.2 After removal of materials for recycling and composting residual material will remain that cannot be easily or effectively be recycled or composted. Achievement of the challenging targets for recycling and composting targets **will not avoid** the need for a significant amount of **residual waste** to be dealt with. Residual waste treatments include Mechanical and Biological Treatments (MBT) and a number of closely related technologies such as high pressure steam sterilisation. Scenarios that combine available technical options into practical integrated systems for managing the Greater Manchester's MSW are set out in the tables below.
- 7.3 Technical options that rely on traditional mixed waste collections, without source separation, include mass burn Energy from Waste and Dirty MRFs. Mass burn EfW plants are able to accept mixed waste from household waste collection but bulky, difficult and hazardous waste must be screened and processed or excluded from the process. The role for Dirty MRFs will probably diminish or be eliminated as the products fall short of meeting recycling and landfill bio-diversion targets. Existing

plants may possibly be converted to various forms of MBT plant and may be used to manage and bio-stabilise residual mixed MSW streams.

7.4 There are also some new technologies that in principle can process mixed collected household waste. However, most of these new technologies present only a theoretical ability to deal with unsegregated MSW. A review of these options shows that most of these technologies are not fully developed or evaluated and have technical issues that have to be overcome or the outputs from the processes may not meet statutory and strategic targets.

7.5 Whilst collected household waste is the largest component of Greater Manchester's MSW and has the highest focus of attention, other waste streams must be considered in any integrated scenario. These "other" waste arisings make up almost 42% of the total MSW. These waste arisings include:

- Street sweepings and litter
- Site clearance & fly tipping
- Highways waste
- Parks and gardens waste
- Waste from schools
- Commercial waste
- Hazardous Household Waste
- Civic Amenity waste
- Domestic refrigerators and freezers
- Tyres
- Automotive vehicles

8.0 Integrated Waste Management Models

8.1 Scenarios that move waste management as far up the waste hierarchy as practicable are achieved by the integration of three main components. These are:

- *Waste reduction and minimisation;*
- *Source segregation for waste recycling and composting;*
- *Treatment and disposal of the residual waste including energy recovery.*

The role that these components play in integrated scenarios is set out below.

9.0 Waste Reduction and Minimisation



9.1 Investment in waste reduction can be made independently of other model components. Decisions on the options are essentially about which initiative will prove most effective in local circumstances and what level of investment can be afforded.

9.2 MSW falls into two main categories as household waste and non-household waste.

Household waste is defined as waste from:-

- Regular household collection - waste collected by refuse collection vehicles;
- Other household sources - e.g. separate waste collections from households of bulky wastes, clinical waste, street sweepings, litter collections, etc;
- Waste brought to civic amenity sites; and
- Household waste collected for recycling and composting.

Non-household municipal waste may include:-

- Construction and do-it-yourself (DIY) waste collected as rubble at civic amenity sites;
- Waste collected from municipal parks and gardens;
- Waste that the local authority collects from industrial and commercial premises; and
- Waste resulting from the clearance of fly-tipped material from private land and Council land (other than the highway)

To be successful in reducing the overall amount of municipal waste the strategy addresses both of these main categories.

10.0 Minimising household waste

10.1 Minimising household waste could make an important contribution to curbing the growth in municipal waste. However this will require a widespread willingness of householders to participate and a significant cultural shift in household waste practices.

10.2 Preventing waste production will include:

- Changes in public attitudes and behaviour to change the "out of sight, out of mind culture."
- Education campaigns to reinforce cultural shift changes
- Home composting is probably the single most effective way of minimising municipal waste
- Development of clean production technologies more sparing in their use and wastage of natural resources.

- Developing and marketing products designed to make no or little environmental impact from their manufacture, use or disposal (e.g. so that they last longer before they become waste, or they are capable of refurbishment)
- Reduction and minimisation of waste production and hazardousness
- Ensure efficient use of resources within existing processes through tighter management control (e.g. within an Environmental Management System);

10.3 Options for Action on Waste Reduction and Minimisation include:

- Relying on national/UK initiatives – such as the Waste Awareness Initiative, Encams and WRAP etc
- Participating in regional or national educational and promotional campaigns
- Undertaking ‘market research’ to establish how the local communities will be best persuaded to change behaviour
- Promoting waste minimisation and recycling in schools and colleges, e.g. through ‘All Schools Can Recycle’, ‘Schools Recycling Network’ and ‘Eco Schools’;
- Providing incentives for public participation in minimisation and composting
- Promoting waste minimisation and recycling to the wider community, especially those able to initiate changes, such as shoppers. This will include using the procurement practices of the local authority as examples of how to promote waste minimisation and recycling;
- Developing home and community composting
- Working with business and commercial organisations to reduce and minimise waste
- Working with major local retail outlets by providing information to shoppers that will assist them to purchase their requirements in a manner that minimises waste.

10.4 In attempting to plan for the types of waste management techniques that will be required in Greater Manchester up until 2020, the assumptions made about the quantity and nature of waste to be managed are critical. However, these assumptions are made against a background of data and information that does not reflect strategic business needs.

- 10.5 Minimising non-household waste
- 10.6 Perhaps the most significant uncertainty lies between the quantification of household and non-household waste within the total amount of MSW. Comparative analysis and practical observations indicate that the quantities of commercial non household waste are significantly higher than shown in the recorded estimates.
- 10.7 There is considerable uncertainty surrounding the prediction of waste arisings in future. Across England, there is a perhaps surprising variation in per capita waste arisings between local authorities. Waste collection authority arisings of household waste (i.e. excluding CA site waste) varied between 250 and 1,000 Kg per capita in 2000/01, and waste disposal authority household waste from 400 to 1,300 Kg.

Table 2 Greater Manchester authorities waste arisings compared with English averages.

Household Waste Kg. per Head of Population	
Bolton	416
Bury	450
Manchester	627
Oldham	414
Rochdale	405
Salford	448
Stockport	407
Tameside	478
Trafford	556
GM WCA Average (household & commercial)	467
<i>English WCA Average</i>	397
GMWDA (Total Collected and Civic Amenity)	592
<i>English WDA Average</i>	528

- 10.8 As can be observed from Table 2, all of the Greater Manchester authorities have waste arisings per capita above the national average and in some cases considerably so. The average for the GMWDA waste collection authorities is 467 Kg/capita, which is 18% above the national average. Taken as a whole including civic amenity waste the GMWDA household waste arisings per capita are 12% above the national average – equivalent to 140,000 additional tonnes when extrapolated across the conurbation.

10.9 Research over recent years has established a clear link between affluence and waste production and given the fact that Greater Manchester has relatively high average indices of multiple deprivation score, it would be logical to assume that Greater Manchester's waste arisings would fall below the national average.

10.10 A number of factors may be involved. Urban areas in the north of England tend to have slightly higher waste arisings than their rural counterparts, which may have a distorting effect on the national average. Also, it has been shown by various research projects that the use of wheeled bins for refuse collection can cause waste arisings to increase, in some cases dramatically. As most households in Greater Manchester have wheeled bins, this may be a contributory factor, but is not likely to be that significant as a large proportion of English councils now also use wheeled bins.

There are some local authorities that have robust waste collection statistics where commercial waste has been excluded or is known with good precision. Chester CC and Halton BC, both within the NW Region, are examples of such authorities. These examples from different ends of the socio-economic spectrum show significant consistency in waste arisings.

Chester is an example where trade waste is not collected by the City Council. There is source segregated collection with residual waste collected in black bags. Here collected waste was recorded at 381 Kg/capita and 851kg per household in year 2000/1 (inclusive of street sweepings). A further example is Halton BC where the figure for collected household waste arisings was 391 Kg/capita and 946kg per household (2000/1 inclusive of street sweepings). Halton BC has very limited source separated collection and wheeled bins are used throughout the borough. Comparative analysis with average household waste collection arisings for GMWCAs (467 Kg/capita) indicates a level **over 20% higher** than would be expected if commercial waste were not included.

This analysis is consistent with the most likely explanation of the high levels of waste arisings i.e. higher than average levels of non-household waste are entering the Greater Manchester household waste stream, both on CA sites and at WCA level.

10.11 Given the imperative of reducing total MSW arisings, the option to reduce or even cease to collect and dispose of commercial waste presents an opportunity to make a significant contribution to meeting statutory and legal limits for the management of MSW in Greater Manchester.

10.12 Significant reductions in commercial waste collection cannot be achieved without considering the social and economic factors involved and without ensuring that adequate and more sustainable arrangements are in place to service the commercial sector that currently relies on municipal waste disposal.

- 10.13 The changing costs of commercial waste collection should also be borne in mind. WCA commercial waste collection services may become uncompetitive, if charges for commercial waste are set at a level that reflects the true costs of municipal waste disposal in future years. Private waste contractors will not be constrained by municipal waste landfill allowances and may be able to offer cheaper collection and disposal.
- 10.14 Food retail, restaurants and any commercial or institutional waste that includes catering waste will be banned from landfill from the end of 2005 and will have to be treated by specified means. Therefore this waste will have to be subject to separate collection and treatment with substantial additional costs.
- 10.15 Consideration can also be given to developing recycling and perhaps composting of commercial waste either through source segregated collection or through commercial equivalents to civic amenity facilities.

11.0 Reuse Recycling and Composting



- 11.1 We can make better use of the waste by recycling and composting. However, there are limits on the types and amounts of materials that can be readily and economically recycled, whilst the waste producer has to make more effort to keep waste clean and separated. Materials that can be recycled include metals, paper, cardboard, plastics, textiles and glass.
 - .1 Options for waste recycling and composting through source segregation turn essentially on choices of systems of waste collection (collected household waste) and delivery (“bring sites” and civic amenity facilities etc.) as well as the types of materials segregated as recycle
 - .2 Another main consideration is the balance between “collection” and “bring facilities” as the means of delivery of the recyclable and compostable materials. Experience with high performing recycling authorities is that investment is needed in both collect and bring systems in order to maximise recycling performance
 - .3 Choices of options for composting have been significantly constrained by the Animal By-Products Order, which reflects environmental and health concerns over biological contamination. This limits the range of suitable waste types and promotes higher technology in-vessel composting. Costs for windrow and in-vessel composting are given in the section on modelling assumptions although it is recognised that windrow technology may only be permitted for green garden waste compostable materials.
 - .4 The choices for recycling and composting cannot wholly be divorced from the choices for treating and disposing of the residual wastes. The extent to which the waste stream is source segregated by the removal of green waste and dry recyclates will alter the character of the residual waste and therefore impact on the products of any further treatment. However, in practice the viable choices for residual treatment will have to

be able to deal with a wide range of residual waste reflecting variable performance on source segregation that can be expected from differing socio-economic localities.

Finding markets for recycled materials and compost will also be a key factor in the success of the strategy. If the target of 33% of recycling and composting by 2010 is to be achieved, markets will have to be found for an eight fold increase in the amounts of material processed.

For the purposes of building up the cost and performance model scenarios for evaluation, source segregation with recycling and composting is included in all scenarios.

12.0 Household Collected Waste

12.1 The two principle variants for collected household waste are kerbside sorting of pre-segregated dry recyclable materials or sorting and packaging for transportation at a clean "MRF". Analysis given below illustrates significant differences in costs for these methods. Actual collection methods, specification of material types, container use and frequency of collections represent a significant number of variables and are modelled in detail. However, it must be noted that high levels of recycling performance will dictate that the widest range of materials are source segregated. This together with the need to secure high levels of participation across all areas of Greater Manchester including those with high levels of socio-economic deprivation, will have a significant impact on costs.

12.2 The collection system assumed can be summarized over time as follows;

- develop recycling infrastructure and management systems on CA sites;
- focus on improving participation in existing kerbside collection schemes;
- implement multi-material kerbside collection programmes for dry recyclables;
- introduce 'high density bring' and other schemes for multi-occupancy dwellings;
- introduce collection services for source separated garden "green" waste and eventually kitchen waste; and,
- introduce systems for capturing bulky waste, street sweepings and schools waste for recycling and composting

12.3 Modelling a number of systems shows that by collecting most recyclable materials mixed together and sorting them at central Materials

Reclamation Facilities (MRFs) would have a lower net cost per tonne than sorting material at the kerbside. It has therefore been assumed that up to 2010, waste is sorted at the kerbside (in line with WCA plans and the successful bid to DEFRA for kerbside collection infrastructure) and that after 2010 a co-mingled collection takes over. This is not intended to suggest that all WCAs will necessarily be using similar systems for collection. Whilst MRF based systems have a lower overall cost, they are reliant on the development of waste treatment facilities which will require a significant timescale in planning and introduction, in advance of commissioning.

- 12.4 The basic collection systems will be supported by policies and investments to allow cost optimisation and maximised use of 'source separation' services by the public. These measures will include major, ongoing and cross media programmes of public education and awareness-raising. It is estimated that a budget of between £1 and £2 per household per annum will be required in order to achieve the target recycling and composting rates. Alternating recycling and residual waste collections may be introduced both in order to maximise participation and optimise cost at the discretion of the district authority.

13.0 Civic Amenity Sites

- 13.1 Civic amenity sites, now re-badged as household waste recycling centres, can prove to be very efficient in the rates of recovery of recyclate and green waste. Diversion from landfill to recycling and composting of over 50% are now reported by many authorities, whilst diversion rates of up to 80% have also been reported. Exclusion of commercial wastes from civic amenity sites and a high standard of operation have been key factors in high performing sites.

- 13.2 The GMWDA receives in excess of 300,000 tonnes per annum of wastes and materials delivered by members of the public to 25 sites across Greater Manchester (at least two in each District). Maximising recycling and composting from this waste stream is a key feature of the strategy. The recycling rate achieved in 2002/03 was 11.0%. With the full support of the partnership and DEFRA funding the sites will be transformed into major recycling centres and specific objectives have been set to improve performance to;

- 2005/6 – 20% recyclate, 20% compostable green waste
- 2009/10 – 25% recyclate, 20% compostable green waste,
- 2019/20 – 35% recyclate, 20% compostable green waste,
- 5% soils and rubble (non counting for performance outputs at all years)

- 13.3 Recycling on CA Sites is, by definition, cost effective when compared to other means of increasing the capture of household recyclables (e.g. kerbside collection). As part of a proposal to pool statutory performance

targets for 2003/04, the GMWDA and the WCAs agreed to fund radical improvements to the CA site network described below.

14.0 Investment Proposals

14.1 Investment is planned in a number of key areas, all of which are intended to either facilitate recycling and composting, or to prevent waste arising in the first place.

- **Fabric and layout of sites;** almost all sites are in need of basic investment in recycling facilities and associated infrastructure. Those sites have been redesigned to change the layout and image to make source separation as convenient as possible compared to disposal
- **Site staffing levels;** it has been shown on the best performing UK sites that high diversion is about a combination of having the right facilities and 'customer services'. The staff complement is to be increased from the current average of 3 operatives per site to 5.5 (i.e. 62.5 additional staff during 2003/04 to 2005/06). All site operatives will receive customer services and sustainable waste management training in order to "meet and greet" site users and assist them to divert materials for reuse, recycling and composting.
- **Incentives;** clear responsibility to maximise recycling will be set out in the contractual arrangements. Best practice elsewhere has demonstrated the effectiveness of providing performance related incentives such as attainment of specific recycling/composting targets and target reductions in waste.
- **Trade Waste Prevention;** with the exception of a site in Tameside, the CA sites are confined to the deposit of household sourced materials. It is recognised that illegal deposits of trade waste take place at a number of sites. A package of measures will be deployed based on an analysis of best practice in the UK, and involving physical deterrents and a potential combination of commercial vehicles bans, a system of permits, limits on trailer sizes and the vigorous prosecution of offenders who demonstrate obstructive and violent behaviour. Trade waste prevention will be supported by increased staffing levels and the incentives under the contractual arrangements.
- **Customer awareness;** it is recognised that a major factor behind Greater Manchester's low performance in recycling is a lack of participation of the public where good services are offered. In order that the investments outlined above prove effective, it is planned to place two education officers permanently on CA sites, allowing each site to benefit from a dedicated awareness raiser for one month per year.

- **Community/voluntary sector involvement;** the GMWDA intends to work in partnership with a number of furniture/white goods projects on a major reuse initiative, linked to identified market outlets.

- **Development of markets for recycled materials and compost**

Significant increases in the markets for recycled materials and compost will have to be achieved in order to make effective use of the recovered materials. This will be important to:

- ensure that fit for purpose standards are developed for recycled materials and compost;
- develop local markets for recycled materials
- develop new business opportunities and innovation
- reduce the environmental damage caused by transporting recyclable materials;
- procurement in the public sector to prefer recycled products and materials

14.2 In addition to the initiatives emerging from the nationally based WRAP programme, the GMWDA is exploring a recyclables market development programme in Greater Manchester. The programme will build upon a consolidated database of sources (quantities of materials being collected and potential end users) that can be linked and developed to generate local market demand. This project will need financial support.

15.0 Residual Waste Management

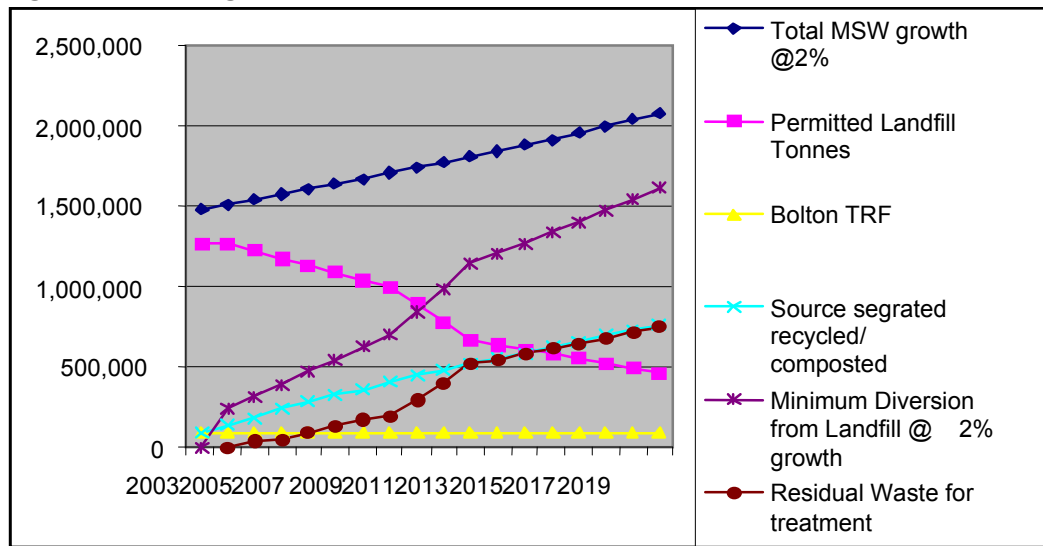


15.1 By focusing heavily on collection/sorting systems and driving forward separation at source, considerable inroads can be made into reducing the volume of residual waste generated. However, it is likely that for the lifetime of this strategy, plans will need to be considered for at least a significant minority of municipal waste to be managed as residual waste.

15.2 Figure 4 shows a projection in which recycling and composting targets for household waste 2006/2010/2020 are achieved (20%, 33% and 50% respectively). In this scenario the permitted landfill allocation has been taken as the tonnage of waste landfilled in 2002/3 and a straight line projection from 2004 to 2010. This is based as an equivalent proportion of the total waste landfilled in England (the proportion of biodegradable waste is taken at 68% as provisionally indicated by Government). The actual landfill allocations may vary from this estimate as the relevant scheme is currently at consultation.

15.3 The figure shows that even if projected recycling and composting rates are achieved excess residual waste that cannot be landfilled could be generated as early as 2005/6 if additional measures are not taken.

Figure 4 - Biodegradable Waste to be excluded from landfill

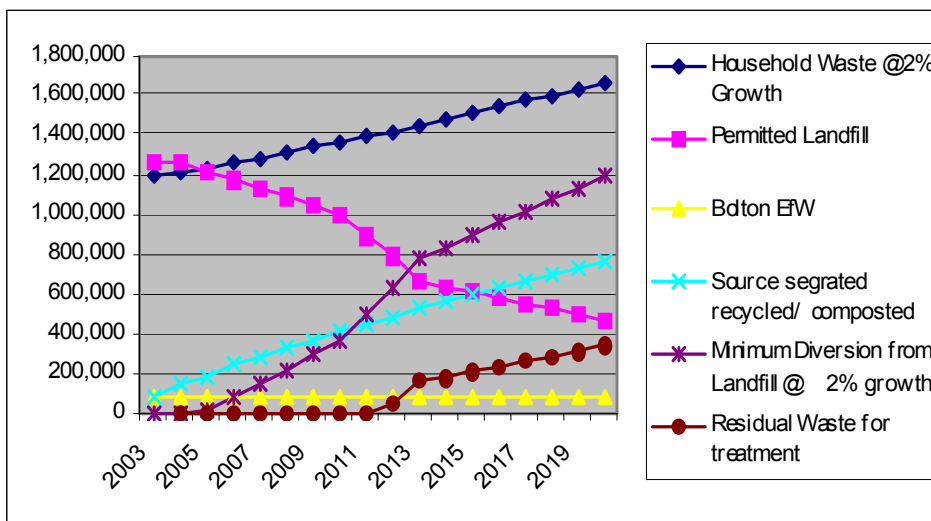


16.0 Landfill Allowances and Biodegradable Municipal Waste Diversion

- 16.1 The Waste and Emissions Trading Act, when implemented will limit the proportion of biodegradable municipal waste that will be permitted to be disposed of by landfill. The proportion will be restricted progressively between 2004 and 2020. Introduction of finite limits on the amount of biodegradable MSW that can be disposed of to landfill places an increased focus on the need to reduce the rate of growth in waste arisings and to develop alternative waste management solutions. Actual landfill allocations have not yet been published by Government although provisional indicators have been given on the basis for the calculation.
- 16.2 In terms of bio-diversion targets the introduction of allocated landfill allowances places a significant shift of focus of targets from percentages of waste arisings to specific tonnages. This arises because the allocated allowance will be a fixed tonnage in each year from 2004. The target for bio-diversion will be the remaining tonnage of MSW arisings, i.e. the total waste arisings in the year minus the permitted quantity for landfill.
- 16.3 The biodegradable element of MSW in England has been estimated at 68% for those purposes of the allowance scheme. The estimate may be amended following further research by the Environment Agency. The calculation used in the projections given below use 68% as the percentage of bio-degradable material. Any rise in the percentage estimate used could have a significant impact on the achievement of projected targets.
- 16.4 Since the baseline for calculating reductions in biodegradable waste sent to landfill is 1995, the interim and continued growth in waste arisings is a major consideration. Figure 5, illustrates the scale of the problem in showing the quantity of biodegradable waste which will have to be excluded from landfill, assuming that waste arisings continue to grow at the (5 year historic) rate of 2%.

- 16.5 Residual waste in excess of the landfill quota may not arise so early in the projection if the Government decide not to use a straight line regression in the permitted landfill quantities and allow high rates of landfill disposal in the early years. It may also be possible to borrow permit quantities by up to 5% from subsequent years but this would mean early full implementation of residual waste treatment.
- 16.6 Alternative options for dealing with this issue include the option of reducing or ceasing trade and commercial waste collection and disposal at CA sites. Whilst the permitted landfill allowance will be based on the amount of waste landfilled up to 2002/3, the need for landfill is reduced by the reduction in non household waste, which currently all goes to landfill. If there is a 50% reduction in non household MSW, the projection is that it will be possible to meet all recycling and composting targets whilst excess residual waste does not arise before 2011.
- 16.7 The need for residual waste treatment may be delayed if the allowance scheme provides more flexibility than indicated in the consultation and or there is a significant reduction in commercial waste or early implementation of recycling and composting targets.

Figure 5 Biodegradable Waste Diversion – Excluding Commercial waste



17.0 Residual Waste Treatment Options

- 17.1 There has been a considerable lack of confidence in alternatives to landfill such as anaerobic digestion and composting often perpetuated by mistakes that have been made in the past elsewhere. For example, previous attempts to produce compost have often been based on using mixed waste as input to mechanical separation, resulting in contaminated output (plastic pieces and glass shards being the troublesome contaminants).
- 17.2 However, the technologies for dealing with residual waste are constantly evolving. Organic and biodegradable waste can be used to produce

energy in the form of heat or electricity. Processes such as Anaerobic Digestion, Autoclave and Mechanical and Biological Treatment (MBT) may be used to treat residual wastes (after separation of recyclable and compostable waste) to produce solid and gaseous fuels for energy production. New technologies such as gasification and conversion of waste to pellets or briquettes for use as fuel in power generation and cement kilns, offer options alongside more conventional energy from waste plants.

- 17.3 The primary aims of residual treatments are to reduce weight, volume and toxicity/pollution potential of residual waste. These ends are broadly achieved through either breaking down the residual waste materials biologically ('composting'), thermally and mechanically or combusting it (or converting it into more combustible compounds) or in various combinations.
- 17.4 Residual waste treatment processes considered in the scenarios are MBT with Refuse Derived Fuel (RDF) used for energy recovery, Steam Sterilisation and Mechanical Treatment (SSMT) with RDF used for energy recovery and traditional Energy from Waste (EFW). Landfilling of residual waste is included as a scenario in the residual options for comparison as it is the current method of disposal.
- 17.5 Technologies such as anaerobic digestion or pyrolysis are not considered in the detailed modelling analysis as these technologies remain unproven with regard to treatment of mixed residual waste. However, the procurement policy for residual waste treatment will eventually be based on an output specification. This leaves the opportunities open for new and emerging technologies to be used should they be able to maximise recycling and energy recovery whilst minimising landfill and environmentally damaging by-products.

18.0 Mechanical-Biological Treatment (MBT)ⁱ

- 18.1 MBT is a generic name for a range of processes. In its simplest form waste is bio-stabilised followed by landfill. More complex plants provide bio-stabilisation followed by recyclate recovery, aerobic treatment of the organic fraction and energy recovery, followed by landfilling of the residues. Available data is from European plants treating mixed MSW.
- **Technology status:** technology proven in mainland Europe with 70 plants in operation.
 - **Implementation timescales:** The status of Refuse Derived Fuel and whether this is burnt for energy recovery or landfilled could have a major impact on overall timescales, in particular if some form of energy recovery plant is co-located with the MBT plant
 - **Economies of scale:** Considerable economies envisaged on larger plants on account of automation. Technology maturation also expected to lead to considerable economies on specialised buildings

Advantages:

- Suitable for treatment of residual MSW stream after targeted level of source segregated recycling and composting.
- Acts to bio-stabilise residual waste fraction and promotes bulk reduction through degradation and evaporation
- Potential for significantly reduced landfill gas and leachate production due to bio-stabilisation.
- RDF produced is a cleaner and more consistent feedstock for energy recovery (e.g. by gasification) than mixed MSW in traditional EfW plants
- The quantity of residual waste disposed of to landfill is reduced, particularly where RDF is beneficially utilised
- The need for landfill should be substantially reduced
- RDF use could help displace virgin fossil-fuel use and assist in reducing long distance transport/import of coal

Disadvantages and Concerns:

- Uncertainty of the contribution towards BVPIs for secondary recyclates
- Little operational experience in the UK. Plants operating similar processes at Doncaster and Byker have had mixed success though the latter remains operational
- Represents a significant investment that may only help comply with the Landfill Directive through volume reduction
- Residue disposal requirements to landfill may exceed permitted landfill limitations
- Limited landfill if resulting RDF is used for energy recovery.
- Some concerns that if waste is not sufficiently bio-stabilised, methane production could still result in landfill.
- RDF combustion plants will have to meet Waste Incineration Directive controls
- Has significant emissions and requires emission controls
- Bio-aerosols/odours may form
- Spent emission control residues may be hazardous waste

- 18.2 There are a number of different MBT systems available quoting different outputs. Output data is only available for mixed MSW inputs. Source segregation of recyclables and composts may be predicted to significantly affect MBT outputs and may reduce outputs of recycle. Outputs are typically in the following ranges.

Table 3 MBT systems outputs

Range of outputs	Outputs modelled in Scenarios
Loss to air and sewer 20-30%	25%
Organic Fuel/RDF 45-55%	50%
Recyclables 3-12%	5%
Residual Waste 0-25%	20% residual and inert
Residual Inert 15%	

- 18.3 The higher figures for recycling include glass and plastics whilst the lower figures are for metals only. Recovery of plastics and glass may require additional hand picking of the wastes and/or may produce low value recycle with limited end use or may require significant additional processing of separated fractions. For the purposes of developing viable scenarios and reflecting source segregation within the proposed scenarios, recycle recovery from MBT is considered for metals only.
- 18.4 Performance with respect to landfill bio-diversion targets will be highly dependent on the extent to which the residual output if landfilled, can be described as biologically stabilised. Systems with more intensive biological processes would increase the potential for disposal of residues to landfill and/ or may produce “cleaner” RDF but increased retention times and processing will have consequences for the physical size of a plant and operational costs.
- 18.5 Treatment of MSW by MBT could reduce the environmental impact of the waste, with respect to landfill gas emissions and leachate, by more than 90 % but still not achieve the EU landfill threshold values. If organic material separated as RDF were landfilled and not used for energy recovery, it is very likely that this organic material would be classified as biodegradable and thus fail EU Landfill Directive obligations.
- 18.6 A number of studies about waste management alternatives show that from a system specific point of view, landfill is the least favourable option in terms of environmental impacts and efficient use of resources and that for each waste type; no net benefit can be obtained from the final disposal of that waste. As long as any kind of well managed recovery – ranging from recycling to energy recovery even reclamation of energy in a municipal incinerator – deliver environmental benefits, the lack of benefit from the landfill option clearly devalues the landfill alternative. In particular, this type of assessment shows that high calorific value wastes are literally wasted when landfilled. Applying the landfill option for a

possible RDF waste stream should only be considered for waste material for which the energy recovery might cause a high environmental impact.

19.0 Higher performance residual waste treatment

- 19.1 Residual waste treatment processes consist essentially of a process that breaks down the organic components of the waste, which then allows different material types such as fibres, metals, plastic, glass and inert residues to be separated mechanically. The more complete the breakdown of the organic material, the easier it is to separate the principal components.
- 19.2 The use of biological processes in conventional MBT systems limits the degree of separation that is possible to some extent. Other processes use techniques such as sterilisation, followed by mechanical treatment which involves heating or “cooking” the waste in a rotating vessel using high temperature and pressure steam. Paper and non woody organic materials are reduced to a fibre. The sterile product of this process is treated mechanically to separate recyclables from fibres and residues (trials indicate about 10%residual waste). The fibres produce a consistent and homogeneous RDF that may be use for energy recovery by gasification. The recovered fibres may have a number of potential uses other than RDF, including fibre board production.

Table 4 High performance residual waste treatment outputs

Range of outputs	Outputs modelled in Scenarios
Organic Fuel/RDF 55-65%	60%
Recyclables 15-20%	18%
Aggregate10-15%	12%
Residual non bio-degradable 10%	10% residual and inert

19.3 Technology Status

An operational scale plant (combined with gasification of RDF) is currently under evaluation in South Wales. Similar type processes are also under development in the USA.

Implementation timescales

Subject to successful evaluation, implementation timescales should be similar to those projected for MBT projects.

Economies of Scale

The thermal processing vessels are batch process and thus modular but mechanical processing plant and Advanced Thermal Treatment (ATT) (gasification) elements will benefit from economies of scale.

Advantages:

- Can process both mixed MSW and residual waste after source separation
- Relatively efficient in both recovery of recyclate and energy
- Minimal residuals for disposal by landfill
- Process products sterile and more efficiently separated than from crude or biologically treated processes
- TS plus ATT could in theory be used as a 'one stop shop' approach to MSW waste target delivery under the Landfill Directive
- Produces homogeneous RDF which may enhance the viability of ATT technologies, in particular for gasification.
- Competitive quoted costs

Disadvantages:

- New technology not yet routinely operational in the UK
- Lack of available independent evaluation and assessment
- Mechanical treatment may require further development
- Markets for recyclate materials will require substantial development in order to make use of quantities and types of recyclate generated
- Limited landfill still required for residues and ash, flue gas/gas scrubbing residues
- Aesthetics are of industrial-style plants with chimney stack, but significantly smaller-scale than for mass-burn incineration

20.0 Energy Recovery from RDF

20.1 A number of studies about waste management alternatives show that from a system specific point of view, landfill is the least favourable option in terms of environmental impacts and efficient use of resources and that for each waste type, no net benefit can be obtained from the final disposal of that waste. As long as any kind of well managed recovery – ranging from recycling to energy recovery via incineration – delivers environmental benefits, the lack of benefit from the landfill option clearly devalues the landfill alternative. In particular, this type of assessment shows that high calorific value wastes are literally wasted when

landfilled. Applying the landfill option for a possible RDF waste stream should only be considered for waste material for which the energy recovery might cause a high environmental impact.

- 20.2 The MBT and Steam Sterilisation and Mechanical Treatment (SSMT) processes can both produce RDF for energy recovery. Process technology for utilising the RDF can vary from advance thermal treatment (ATT) processes such as gasification and pyrolysis to conventional heat and power generation plant. Different MBT and related treatment processes such as SSMT will produce a significant range of variety in the physical and chemical nature of the RDF and thus, the suitability of any RDF to a specific energy recovery process will vary accordingly.
- 20.3 At the lower end of the scale, energy recovery processes may require emission control similar to that for incineration, whilst more refined RDF may be used as conventional fuel. Processes that produce a very “clean” RDF will have wider applications and higher value. Cost or revenues from RDF production remain problematic to predict thus projections used in this scenario are neutral with respect to the costs of RDF disposal. However it must be recognised that there could be significant additional capital and operational costs involved in the development and running of plant disposing of relatively unrefined RDF.
- 20.4 MBT or related treatment processes may be considered as a more flexible solution than mass-burn incineration. Not only can the biological treatment aspect of the process be made modular (to allow switching away from treatment of mixed waste to composting of source separated waste) but also the use of RDF in co-incineration plants removes the need to invest in capital intense, dedicated incineration (or thermal treatment) facilities.
- 20.5 RDF from MSW can be utilised in other processes than incineration and combustion.
- 20.6 Gasification and pyrolysis processes are generally promoted as “greener” alternatives to incineration or energy-from-waste. Via gasification, the energy content of the waste is transformed into a syn-gas, which can be re-used as chemical feedstock or to produce power.
- 20.7 Pyrolysis produces from waste a bio-fuel and syn-gas, which again can be used as chemical feedstock and/or for power production. However, the major negative factor about adopting gasification and pyrolysis for waste treatment is that they are less proven in operation than mass burn incineration and can be just as inflexible as mass burn incineration. In contrast to mass burn incineration, which is optimised around large-scale single site implementation, many gasification and pyrolysis processes lend themselves to economic implementation at smaller scale.
- 20.8 Use of RDF in industrial processes offers more flexibility than incineration. It leaves more opportunity for future recycling programmes.

It does not need to be fed with a constant amount of waste and it does not require investment in capital intensive dedicated incineration facilities.

- 20.9 RDF used in coal power plants and cement works, due to the effective substitution of primary fossil fuels, shows a large number of ecological advantages when they are compared with the alternative combustion in a MSWI as long as the plants comply with the new Waste Incineration Directive 2000/76.

21.0 Energy from Waste (EfW) Mass-Burn incineration

- 21.1 Energy from Waste (EfW) Mass-Burn incineration is the combustion of unsorted MSW under strictly controlled operating conditions, converting input material into energy (for power and/or heat recovery) and ash. The process results in bulk reduction and stabilisation of MSW. EfW is not a substitute for recycling. Plants should be sized for residual waste streams after targeted levels of source segregated material recycling and/or composting have been achieved.

Technology status:

This is the most developed waste treatment and processing technology and is used extensively in mainland Europe.

Implementation timescales: Unpopularity results in long lead-times. As a result, plants at design stage today are unlikely to meet 2010 commissioning. Smaller plant capacities may aid progress on grounds of proximity (design to commissioning 1 to 5 years).

Economies of scale: There are significant economies with large plant sizes.

Advantages:

- EfW could in theory be used as a 'one stop shop' approach to MSW waste target delivery under the Landfill Directive, but this approach is neither politically deliverable nor advantageous for nutrient and wider materials recovery.
- Produces a stable residual
- Allows secondary recycling from (non-)ferrous metals and bottom ash (used as a secondary aggregate), displacing virgin raw resources
- Energy recovery – in the form of heat and/or power – can help to reduce fossil-fuel dependency and renewable CO₂
- Beneficial outlets exist for bottom ash as a secondary aggregate

- Risks to public health of exposure to pollutant releases regarded as insignificant in recent NSCA report (NSCA 2000) whilst Waste Incineration Directive requires stringent EU control of releases to air and water.
- Releases from combustion of the biogenic fraction of MSW are conducive with Climate Change policy

Disadvantages and Concerns:

- This technology suffers from poor public perception with public concern over dioxins and deterioration of local air quality, however
- Poor aesthetics as large-scale industrial-style plant require use with chimney stack
- May discourage recycling and composting if oversized in capacity
- High capital and operating costs
- Lack of flexibility once the commitment to EfW is made

22.0 Performance Models for Integrated Waste Management Scenarios



- 22.1 This section sets out the viable scenarios for integrating the available waste management methods and options that will meet the Greater Manchester strategy objectives and targets. Performance models have been developed for the selected scenarios for specified target years 2005/6, 2009/10, 2012/13 and 2019/20.
- 22.2 Options can be considered in which the components of minimisation, recycling and composting and residual waste treatment described above can be used to develop an integrated scenario that will be practical and effectively deliver strategic objectives. Scenarios take into account projected increases in waste arisings in accordance with the specified waste strategy targets.

Technical Scenarios Modelled

- 1. Do nothing with 6.1% diversion from landfill, no non HH waste reduction and current waste management arrangements**

This scenario is considered for comparative purposes as this reflects the status quo for disposal of residual waste. However, this scenario is not viable as a long-term strategy as it will fail to meet permitted quantities under the Waste and Emissions Trading

legislation and Landfill Directive requirements. Costs can be predicted to increase significantly.

2. Source segregated recycling and composting only as a means of meeting the waste strategy targets

This scenario, which relies on source segregated recycling and composting to meet the strategy targets is viable for target year 2005/6 and has the potential to satisfy strategic performance targets until year 2010/11 if waste reduction and minimisation targets are met.

3. Source segregated recycling and composting, treating residual waste by MBT or related processes with similar output specification with energy recovery from RDF

This scenario (assessment) is based on MBT or related processes, with similar output specification, producing RDF which is used for energy recovery and recycle together with some treated residues disposed of to landfill that are classified as biologically degradable.

4. Source segregated recycling and composting, treating residual waste by SSMT (MBT/BMT/ and related processes) with higher output specification with energy recovery from RDF

This scenario (assessment) is based on SSMT (MBT/BMT/ and related processes or related processes which are currently under development and may be able to achieve better separation of materials from the residual waste thus producing more and higher quality recycle and a more consistent quality of RDF, whilst reducing the quantities of residues for landfill to non biodegradable status.

5. Source segregated recycling and composting, treating residual waste by Energy for Waste through a traditional Thermal Recovery Facility

Under this scenario recycling and composting targets are achieved almost entirely through source segregated collection whilst thermal treatment ensures that landfill bio-diversion targets are met.

22.3 It is recognised in this evaluation that assumptions must be made which are generic in nature and by no means precise. What can be predicted is continuing improvement in technical capacity and performance specification, particularly for waste treatment technology, ongoing change in the areas of legislation and policy, and variations in costs.

Therefore assumptions about unproven technologies and environmental or sustainability performance levels must be taken as indicative and not clear cut predictions. The methodology used recognises these difficulties and addresses the practicality of potential scenarios and technical options, the environmental considerations and sustainability and the risks involved in forward planning based on the assumptions made.

23.0 Evaluation of Models – The Tests

23.1 Development of conclusions about the choice of preferred scenario is influenced by a number of factors. These factors have been considered both with respect to relevant individual technical options or approaches and the scenario as a whole.

- proven performance levels and overall delivery of strategy targets for recycling, composting, recovery and bio-diversion
- participation rates,
- operational criteria, reliability and technical suitability to local circumstances
- Capital costs (operational with short, medium and long term projections)
- Cost and practicality of change
- Capital and revenue funding options
- Procurement and contract policy implications e.g. analyse market stability for recyclables, and make recommendations to reduce risks and secure long-term contracts with reprocessors
- Consideration of securing waste management sites and infrastructure, including land-use planning
- Key stakeholders and partnerships and any additional players in the delivery of new waste management options, together with their roles and responsibilities
- Consultation including the public as well as key stakeholders
- Best Practicable Environmental Option analysis
- Risk management analysis
- Business needs analysis

- 23.2 Output performance scenarios are modelled in Appendix A. Options and scenarios that fail to meet the long term targets have not been modelled or considered in detail beyond the point where it can be reasonably concluded that the scenario/option will fail to meet the long term GMWDA waste strategy targets
- 23.3 Of the five scenarios considered above, Scenario 1 “do nothing” represents the status quo in waste management techniques and will undoubtedly fail to meet the targets. Costs are modelled through to 2020 to illustrate that “do nothing” is in fact a high cost option. Scenario 2 – “Source separated recycling and composting with residual waste disposed of to landfill without further treatment” also fails to comply with long term GWWDA targets and Landfill Directive legislation and is therefore not given detailed consideration as a long term option.
- 23.4 Scenarios 3 and 4 can be judged as representing two ends of a spectrum of residual waste treatment processes that rely on a range of biological and thermal treatments (including “cooking under pressure”) to effectively eliminate pathogens by biological activity or sterilisation and break down of the organic components of the residual waste so that these can be separated from inert material, glass and metals. Depending on the nature of the process and the nature of material produced, various mechanical processes can also be used to separate materials such as plastics, textiles, organic fibres, compost etc. Product materials may be variously suitable as raw material for manufacture from recycle, compost/soil substitute manufacture or for use as refuse derived fuel. In some cases, treatments offered by branded manufacturers may be tuned to meet different output specifications for recycle, compost type materials or RDF. Therefore whilst scenarios 3 and 4 have some fundamental differences ie in scenario 3, the treatment is essentially a biological process with an element of bio-stabilised waste disposed of to landfill, it may be the case that any specific branded technology could be tuned to produce a different mix of outputs.

Table 5 Assessment of Scenario in Compliance with Strategy Targets

(R/C = Recycling and Composting Targets)

Scenario	Compliance with targets			
	2006	2010	2013	2020
1. "Do nothing" with 6.1% diversion from Landfill no non HH waste reduction and current waste management arrangements	Meets R/C Fails Landfill Permit	Fails R/C Landfill Permit/Directive	Fails Landfill Permit/Directive	Fails Landfill Permit/Directive
2. Source segregated recycling and composting only as a means of meeting the waste strategy targets	Meets R/C Meets Landfill Permit	Meets R/C Meets Landfill Permit	Fails Landfill Permit/Directive	Fails Landfill Permit/Directive
3. Source segregated recycling and composting, treating residual waste by MBT or related processes with similar output specification with energy recovery from RDF	Meets R/C Meets Landfill Permit	Meets Landfill Permit/Directive	Meets Landfill Permit/Directive	Just Meets Landfill Permit/Directive
4. Source segregated recycling and composting, treating residual waste by SSMT (MBT/BMT/ and related processes) with higher output specification similar output specification with energy recovery from RDF	Meets R/C Meets Landfill Permit	Meets Landfill Permit/Directive	Meets Landfill Permit/Directive	Meets Landfill Permit/Directive

41.0 BPEO, Sustainability Ranking Assessment

24.1 BPEO, sustainability and risks assessments are set out in Appendix C.

- 1 Source segregated recycling and composting, treating residual waste by SSMT (MBT/BMT/ and related processes) with higher output specification with energy recovery from RDF (Ranking points 33).
This scenario achieves the highest rank on the basis of the highest level of potential recyclate recovery and lowest levels of emissions of the three scenarios considered.
- 2 Source segregated recycling and composting and in-vessel composting plus residual waste treatment by Mechanical Biological Treatment and advanced thermal treatment of Refuse Derived Fuel, with some residual treated waste to landfill. (Ranking points 28)
Potential air emissions and spent emission control residues, together with residual landfill, reduce option ranking.
- 3 Source segregated recycling and composting plus Energy recovery from Waste from mass burn incineration. (Ranking points 21).
This scenario produces the lowest ranking through its low recyclate recovery rates and poor public perception and acceptability together with high capital costs

42.0 Development of the Preferred Waste Management Options

- 25.1 The conclusion of the evaluation of scenarios is that Scenario 4 (based on source segregated recycling and composting and high performance residual waste treatment by Steam Sterilisation or Mechanical Biological Treatment and related advanced treatments with Refuse Derived Fuel) is the preferred option, with Scenario 3 ranking closely in second place. Scenario 5, based on EfW, is evaluated as the least favoured option.
- 25.2 This methodology for assessment, including sustainability, business needs, risk assessment and consultation, has essentially been based on evaluation of technologies within projected scenarios. This assessment has essentially informed and brought into focus the key issues that separated the scenarios considered and that must underpin the decision making process.
- 25.3 The key issues that separated the scenarios in the overall assessment were essentially the process outputs, in terms of maximising recycling and recovery, together with costs. (Public acceptability was also a significant factor in the scenario based on EfW as well as cost).
- 25.4 Assessments for Scenarios 3 and 4 produced a close score on ranking points. This is because the technical options identified for treating residual waste represented two ends of a spectrum of residual waste treatment processes. Scenario 4 essentially ranks higher because of its process outputs (potential for maximising (the production of) recycling and recovery), whilst it may also produce the lowest levels of process emissions. However, specific branded processes within the range of processes commercially available (and under development) may also be able to meet similar output specifications to those assumed for Scenario 4, whilst remaining within the envelope of technical assumptions that underpinned the assessment process and outcome.
- 25.5 The primary technical options within Scenarios 3 and 4 are technologies that have only been recently developed or are currently still under development. Whilst these options produced the highest overall ranking, it must be recognised that these rankings are achieved on the basis of performance assumptions that cannot yet be tested against the proven performance of current operation at plant in the UK. The risk assessment clearly identifies some significant risks concerning the assumptions underpinning these technologies. In adopting a strategy and implementation plan, this will include specific risk management actions to ensure that these risks are fully addressed.
- 25.7 **Development and implementation of this strategy will therefore be based on prescribing the type of outputs required from the treatment process (maximising recycling and recovery from residual waste) rather than a specific prescription of the process technology. These outputs from the residual waste treatment process will be consistent with those projected within Scenario 4.**

The solutions do not exclude the potential to utilise new and emerging technologies.



26.0 Cost Models for Integrated of Waste Management Options

26.1 This section sets out the costs of implementation of the waste management strategy. Costs modelled are benchmark costs derived from current industry standard estimates. The models are therefore illustrative on the basis of the best known information and assumptions.

27.0 Assumptions made in the Scenarios for Performance and Cost Modelling

27.1 Precise modelling of quantitative requirements and costs are limited by the quality of information and data currently available. It must be noted that there is continuing development in the detailed implementation of legislation in which apparently small and detailed variances in statute and interpretation can have significant impacts in terms of changes to required management techniques and costs.

28.0 Waste Arisings and quantities

- Baseline waste arisings figures are the actual for year ending April 2003.

- Waste streams are classified as:

Collected Household waste (inclusive of door step collections, recycling and composting, including any bring recycling by WCAs)	863,000 tonnes
Civic Amenity Waste (inclusive of recycling and composting)	328,000 tonnes
Bulky and non household waste (Includes commercial waste collected by WCAs) (20% of total MSW arisings)	292,000 tonnes
Recycled and composted 6.1%	(91,000) tonnes
Total MSW arisings year ending April 2003	<u>1483,000 tonnes</u>

- Waste growth projections are taken as the same growth rate for each waste stream with the exception of -
- Bulky and non-household waste which is reduced by 50% reflecting a reduction in the collection of commercial waste
- A growth in waste arisings is projected at **2% up to 2010**. It should be noted that a growth rate of 2% is less than the current national average and its achievement is in line with Cabinet Office Strategy Unit recommendations on waste growth limitation.

- From 2010 waste growth is projected to fall at a linear year on year rate until growth is stabilised at **nil growth by 2020**

Table 6 Waste Growth Projections @ 2% until 2009/10 and Zero by 2020

Waste Arisings - tonnes Year ending April	2003	2006	2010	2013	2020
Collected Household Waste	863,000	919,000	994,000	1,046,000	1,091,000
Civic Amenity Waste	328,000	345,000	374,000	402,000	420,000
Non Household Waste including commercial waste	292,000	141,000	154,000	163,000	168,000
Total MSW arisings	1,483,000	1,419,000	1,535,000	1,610,000	1,679,000

41.0 Targets

- The assumption is made that all targets for recycling and composting are met
- Recycling and composting targets (these exceed published BVPI targets) are
 - 20% for 2005/6
 - 33% for 2009/10
 - 50% for 2020
- Waste and Emissions Trading (WET) landfill allowances have been calculated using the published national target figures and making the presumption that GMWDA will have an equivalent proportion of the national allowances to that of its current (2002/3) share (6.1%) of the total quantity of waste landfilled in England at key target dates and extrapolating linear projections for intermediate years. Allowances have been made in the calculations such that the figures shown represent the total waste quantity as it arises, not just the bio-degradable fraction (given as 68%) in the DEFRA consultation.

Table 7 **Estimated Waste and Emissions Trading Allowances**

Target Years	2004	2006	2010	2013	2020
Estimated WET Landfill Allowances (MSW with 68% biodegradable content)	1,266,000	1,177,000	1,000,000	669,000	465,000

- The value of tradable WET landfill allowances is estimated at a nominal £20 per tonne. Income from WET trading at a nominal £20 per tonne is included in the projected costs.
- Penalties for failure to meet WET targets are estimated at £100 per tonne

30.0 **Waste Management Methods and Performance**

- Performance of source segregated **waste collection** will be that required by the target dates
- 2005/6 – 10% recyclate, 10% compostable green waste, 110k tonnes per annum treatment by TRF, remaining waste is residual
- 2009/10 – 18% recyclate, 15% compostable green waste, 110k tonnes per annum treatment by TRF, remaining waste is residual
- 2019/20 – 30% recyclate, 15% compostable green waste, 5% in-vessel compostable bio-waste, 110k tonnes per annum treatment by TRF, remaining waste is residual
- Recycling and composting performance at **Civic Amenity sites** is projected as
 - 2005/6 – 20% recyclate, 20% compostable green waste
 - 2009/10 – 25% recyclate, 20% compostable green waste,
 - 2019/20 – 35% recyclate, 20% compostable green waste,
 - 5% soils and rubble (non counting for performance outputs at all years)
- Performance of residual waste treatment process outputs are based primarily on government's Cabinet Office Strategy Unit report studies, published studies and industry provided performance data (Set out in separate table)

- Scenarios that model the performance of integrated waste management methods which will implement the requirements of the strategy have been completed for each target year. These models take into account waste growth and required performance in accordance with the strategy targets. These performance models are given in Appendix B.

31.0 Cost Modelling

- Input and output tonnages from the performance models in Appendix B have been used to estimate costs in each of the target years.
- The cost estimates per tonne are **benchmark costs** derived from current industry standard estimates. Actual implementation costs may vary according to local factors and the capabilities of specific service providers. Current cost estimates - GMWDA costs estimates are used for year 2003/4.

32.0 Waste Collection Costs

- Current cost assumption for kerbside waste collection at current recycling rates is taken as an indicative £30 per tonne.
- Cost for kerbside sorted collection is taken as an indicative £75 per tonne (2.5 times current indicative cost). For year 2019/20 the multiple is taken as 2.75 giving an average cost of £82.50 to take into account the high levels of recyclate diversion required and additional collection of kitchen waste. The estimated figures are net of costs and income from recyclate and include all WCA costs of delivery of materials and residual waste to WDA designated facilities. It should be noted that actual costs may vary for individual waste collection authorities. It should also be noted that kerbside sorting is labour intensive and it may be difficult to secure long term cost efficiencies. Securing high source segregated recycling rates under difficult socio economic conditions may introduce additional cost pressures as high recycling levels are achieved.
- Cost for comingled recyclate with MRF is taken as an indicative £60 per tonne (doubling the current indicative cost). This is consistent with national waste industry estimates and empirical data from pilots and implemented collection schemes. The figure is net of costs and income from recyclate and includes all WCA costs of delivery of materials and residuals waste to WDA designated facilities. This costs estimate is also consistent with that given for long term costs in the report by Enviro. Actual costs may vary for individual waste collection authorities. Whilst it should be possible to gain long term cost efficiencies securing high source segregated recycling rates under difficult socio economic conditions will introduce additional cost pressures.

- For year 2005/6 it is assumed that full source segregated collection services will apply to 50% of households
- From year 2009/10 full source segregated collection services are assumed for all households

33.0 Waste processing and disposal

- Transfer costs currently add £20 per tonne to collection and disposal costs. Whilst some waste transfer costs will still apply to waste taken to landfill outside of Greater Manchester, these costs will be eliminated when wastes are removed for recycling and composting or processed by residual waste treatment. Waste transfer costs are therefore only retained within the model for those waste streams disposed of to landfill outside of Greater Manchester. The model assumes that WCA waste processing facilities are within Greater Manchester and that WCAs will deliver waste directly to these facilities where this is the case.
- MRF costs are estimated at £40 per tonne based on Cabinet Office Strategy Unit report studies and supplementary investigation reports.
- TRF costs have been estimated on basis of Bolton fixed costs plus Bolton adjustment – this gives £47.25 as an operational cost. TRF costs are projected to rise by 50% from 2013 to take into account the capital costs of refurbishment
- Long term landfill costs from 2010 are based on £65 per tonne - £35 tax plus £30 gate fee. This tax level is taken as the minimum and could be increased. Gate fees are predicted to at least double through increased landfill specification and environmental controls required by the Landfill Directive and scarcity of landfill provision due to difficulty in securing new long term landfill site developments.
- MRF costs are estimated at £40 per tonne and green waste composting costs are estimated at £23 per tonne. In-vessel composting costs are estimated at £45 per tonne. These costs are estimated as net of income from recyclate and compost which are taken as essentially neutral with respect to process costs. There are significant uncertainties on long term market stability, costs and income that cannot be accurately factored into cost projection models since markets for recyclates must increase by more than 5 fold to accommodate the increased levels of recyclate extracted from source segregated waste.
- Residual waste treatment costs at £48 are based on industry quotes and the government's Cabinet Office Strategy Unit report studies in line with industry standard estimates. Costs are modelled on the basis of a nominal average MBT performance taken from Cabinet Office Strategy Unit report studies and industry published material.

Gate fee costs for higher performance specification technologies have been quoted within similar estimates to those for more established MBT processes. Costs modelling therefore does not differentiate between these processes, despite some differences in output performance other than for residual landfill costs, which are taken as additional to process costs. Higher performance residual waste treatment processes may reduce costs.

- However, most of these processes have not yet progressed beyond demonstrator projects and reliance on such high performance levels would represent a significant risk. Costs and values associated with RDF are included as net within the residual waste treatment gate fee price.
- Other waste costs as at 2003 costs. These may increase with WEEE requirements but these should not be highly significant when compared with main cost elements and long term uncertainties in cost projections. Other WDA costs are based on the current GWWDA cost model.

34.0 Commissioning of MRF residual waste treatment technologies

- 34.1 A considerable amount of time must be allowed for between the point of decision making on the implementation of residual waste treatment and the date when the process can become operational.
- 34.2 The models assume that any new MRF facilities will not be completed in time to meet 2005/6 target year commissioning.
- 34.3 Given issues such as finding sites, obtaining planning permissions and licences as well as tendering, contract design, building and commissioning, it may be expected that these processes may take a period in the order of 5 years or so, dependent on any issues emerging out of this wide range of variables. In considering the scenarios below, it is assumed that residual waste treatment technologies can be implemented by year 2009/10.

Table 8 Costs Summary for Greater Manchester MWMS Implementation

Scenario		Annual Cost £m @ 2003 values				
		2002/3	2005/6	2009/10	2012/13	2019/20
Do nothing 6.1% diversion from Landfill no non HH waste reduction, current waste management arrangements	WDA Costs	£72	£88	£140	£148	£167
	WET Fines		(£19)	£49	£91	£126
	WCA Costs	£26	£28	£30	£32	£33
	Total Costs (Inc fines)	£98	£116 (£135)	£170 (£219)	£180 (£271)	£200 (£326)
Strategy targets achieved 50% reduction in non Household waste No Residual waste treatment Kerbside Sorting	WDA Costs		£78	£105	FAILS TARGETS	FAILS TARGETS
	WCA Costs		£48	£75	FAILS TARGETS	FAILS TARGETS
	Integrated Costs		£126	£180	FAILS TARGETS	FAILS TARGETS
Strategy targets achieved 50% reduction in non Household waste No Residual waste treatment MRF Recyclables Sorting	WDA Costs			£112	FAILS TARGETS	FAILS TARGETS
	WCA Costs			£60	FAILS TARGETS	FAILS TARGETS
	Integrated Costs			£172	FAILS TARGETS	FAILS TARGETS
Strategy targets achieved 50% reduction in non Household waste Early introduction of residual waste treatment Kerbside Sorting	WDA Costs			£81	£92	£93
	WCA Costs			£75	£78	£90
	Integrated Costs			£155	£170	£183
Strategy targets achieved 50% reduction in non Household waste Early introduction of residual waste treatment MRF Recyclables sorting	WDA Costs			£99	£101	£107
	WCA Costs			£60	£63	£65
	Integrated Costs			£147	£162	£171

Cost of meeting full strategy Implementation (2020 targets) based on Nil growth (2003 Waste Arisings) Kerb side sort collection	WDA Costs	£66
	WCA Costs	£72
	Integrated Costs	£138
Cost of meeting full strategy Implementation (2020 targets) based on Nil growth (2003 MSW Arisings) MRF Recyclables sorting	WDA Costs	£74
	WCA Costs	£52
	Integrated Costs	£126

35.0 Performance and Cost Modelling Conclusions

- Do nothing is not an option. By 2005/6 this will only transfer costs from collection to disposal and from there on increasing landfill disposal costs and penalties rapidly escalate costs beyond more sustainable waste management options
- Waste collection costs show the most significant increases and demonstrate a need for early investment in increased source segregated collection capacity if early targets are to be met
- Early investment and improvement in recycling and composting from Civic Amenity sites is both productive and cost effective
- Early investment in increased composting capacity is required
- MRF sorting of mixed dry recyclable collection in the long term will assist in maximising the separation of recyclates and reduces overall integrated costs. Early decisions on investment in new facilities are required to maximise this benefit
- Early implementation of residual waste treatment will reduce costs since rises in landfill tax and gate fee costs can be expected to exceed treatment costs by 2010. Introduction of residual waste treatment will also increase the amount of recyclate removed from the waste stream
- In-vessel composting of source segregated waste including kitchen waste may be needed by 2020 if the challenging target of 50% recycling and composting is to be achieved

- The Authority continues to operate with the nine constituent district councils and cost models are based on obtaining best value through a partnership approach
- Current assets are used enabling residual treatment and the integration of waste disposal facilities to be introduced within the required timescales and where required planning approval obtained for new facilities



36.0 Disposal, Land Use and Transportation of Waste

- 36.1 The Town and Country and Country Planning system regulates the development and use of land in the public interest, and has an important role to play in achieving sustainable waste management. Through national and regional planning guidance and policies contained within development plans, the planning system must be ready to evaluate and implement, where acceptable, the new facilities that will be required to meet national and local waste management requirements. There is no doubt that the number of new waste management facilities will increase significantly as waste handling and treatment processes become more complex and sophisticated.
- 36.2 The role of Local Plans will be critical to the delivery of the overall waste management strategy for Greater Manchester. It will important that these plans reflect the need to develop adequate local waste management infrastructure reflecting principles of proximity and long term sustainability. The facilities that are needed will include waste handling, processing and treatment but landfill will also continue to be required for treated residues and inert materials.
- 36.3 The Authority is currently working (in conjunction with the AGMA Planning Group) towards the development of a Strategic Waste Local Plan for Greater Manchester in order to facilitate the identification of key strategic sites within the conurbation that could be utilised for future waste management facilities. This document is currently being prepared in direct consultation with the district council planners by the consultant ENTEC who are working as part of a consortium of advisers assisting the Authority in the procurement of its future waste management services (i.e. post 31 March 2006). The completed Plan will be approved by the AGMA Planning Group in May / June 2004 and form the basis from which future strategic waste planning will derive policy and site identification so as to provide a clear perspective for prospective new waste management service providers to base their proposals on.
- 36.4 **The North West Regional Assembly draft regional waste strategy**
The North West Regional Assembly is developing a North West regional waste management strategy. The regional strategy informs revised regional planning guidance on waste management, as well as presenting

a regional, cross boundary framework within which waste management needs can be considered.

- 36.5 The North West Regional Assembly regional waste strategy states that local authorities should review development plans in order to specifically identify sites that they consider are suitable for waste management facilities. This will be either through the review of existing Waste Local Plans or through local development documents covering individual or combined unitary authority areas.
- 36.6 It is supported that waste local plans should be developed to identify the strategic placement of facilities for waste management. It is considered that facilities for bulking of recyclables from kerbside collections and neighbourhood/household recycling centres need to be included. Within Greater Manchester the bulky/civic waste arisings account at present for forty two percent of waste arisings and facilities for the recovery of materials will be required.
- 36.7 The strategy proposes that WDAs in the region should take responsibility for the management and disposal of their municipal waste arisings wherever possible in their own administrative areas. However, partnership working between neighbouring WDAs will be an important consideration to work towards wider sub-regional self-sufficiency and in providing practical implementation of the proximity principle across traditional local boundaries.
- 36.8 Whilst it is acknowledged that the proximity principle should generally prevail, the markets for recyclables and waste derived products e.g. compost and RDF will be subject to market forces. The market for recyclables in particular is national, if not international, and it will be just as important to obtain long-term sustainable outlets to enable the introduction of new facilities to go ahead. Increased working on a regional basis with North West Development Agency to attract industry will be needed to cater for the high volumes of recyclables forecast. Government should be encouraged to provide support to industries using recyclables and provide taxation benefits for products to encourage the market. The use of RDF requires a study to be undertaken of current capacity in the region of fossil fuelled power plants that can either be converted or increase their capacity for RDF.
- 36.9 It is recognised that a key regional issue affecting the Greater Manchester MWMS is regional landfill capacity for final disposal of non-recovered municipal waste. However effective Greater Manchester becomes in diverting waste from landfill, there is likely to be a considerable reliance on landfilling of residual waste for the lifetime of the proposed Strategy. In 1999 the Environment Agency estimated that the region only had five years capacity left. It is this shortage of landfill that is ultimately the primary driver for European and National progress towards sustainable waste management.

Table 9 - Regional Landfill Capacity

Capacity available in open-gate sites				Inputs 000s tonnes		Life expectancy (years)
Sub-region	Void- space at 1/4/99	Capacity 1998-99				
		Cap/cover 000s m2	Waste 000s m3	All	Degradable	
Cheshire	7,907	3,163	4,744	904	811	4.9
Cumbria	8,631	3,452	5,179	819	524	8.2
GMWDA	12,111	4,844	7,267	1,593	1,316	4.2
Lancashire	13,155	5,262	7,893	2,598	1,513	4.3
Merseyside	3,757	1,503	2,254	583	427	4.4
Mid Mersey	18,554	7,422	11,132	1,916	1,846	5.0
TOTAL	64,115	25,646	38,469	8,413	6,437	5.0

36.10 The GMWDA supports the Government's wishes to manage municipal waste in a sustainable way within the geographic region from which it originates. The GMWDA arranges for the initial reception, intermediate handling and treatment of municipal wastes within the Greater Manchester boundaries. In accordance with the "Proximity Principle", the impact of transporting waste on the environment should be reduced through the location of waste management facilities close to existing transport infrastructure such as canals, railways and major roads. However, it has to be recognised that an urban conurbation like Greater Manchester is faced with practical difficulties in securing sufficient landfill capacity to meet its needs within its boundaries. In order to offset this, wherever possible, road movements have been reduced by the use of bulk haulage and long distance haulage has been carried out by rail.

36.11 The regional waste strategy recognises the need to develop recycle processing industries and markets for recycled materials and includes recommendations that support further research into and development of the integrated waste/reprocessing park concept through engagement with local authorities, the North West Development Agency, private landowners and other regional partners.

36.12 The Strategy promotes the use of recycled construction and demolition waste in construction projects and encourages developers and contractors to specify these materials wherever possible in the construction process. Contractors are also encouraged to minimise the amount of waste that occurs on construction sites through over ordering and to separate waste materials of different types to facilitate recycling and reuse.



37.0. Greater Manchester MWMS Implementation **Action Plans**

- Secure reduction of 50% in non household municipal waste, principally collected commercial waste, Council waste and unauthorised deposits at Civic Amenity sites
- Investment in reduction and minimisation of all MSW waste streams including promotion and education on minimisation to households
- Investment in increased composting capacity
- Early decision on investment in new MRF sorting facilities is required to maximise long term dry recyclable collection and reduce overall integrated costs
- Early investment in increased source segregated collection capacity
- Early decision on implementation of residual waste treatment to reduce costs and increase the amount of recyclate removed from the waste stream
- Undertake a study of current capacity in the region of fossil fuelled power plants/high energy consumers that can either be converted or increase their capacity for RDF
- Investigate and secure landfill capacity as required post 2008 for the strategy

Cross cutting Actions

- Collecting adequate and reliable data on individual waste streams and management methods
- Review of the role of the community sector involvement and the provision of waste and recycling services
- Develop best practice in kerbside collection infrastructures at a district level
- Examine potential for maximising recyclates diversion from the bulky waste stream
- Review the policies for charging for waste collection services across the partnership including charges for commercial waste
- Adoption of partnership waste management working arrangements at a strategic and operational level between the GMWDA and other partners

- Review existing assets and future needs and where possible seek planning approval for new facilities
- Review the equity and provision of facilities for waste treatment and civic amenity sites for the partnership
- Address the future role of the LAWDC
- Establishing a procurement strategy for the provision of the GMWDA's main waste disposal services post the expiry of existing contracts on 31 March 2006
- Develop integrated disposal services for recyclates and joint bulking and composting facilities for materials
- Review the available markets and processing capacity for recyclates and compostables locally, regionally and nationally and develop opportunities for processing of waste locally

38.0 Monitoring and evaluating the progress of MWMS implementation

38.1 The MWMS represents the GMWDA's vision and objectives for municipal waste management in Greater Manchester and focuses upon the time period up to the year 2020. As such, it will be essential that the MWMS is adaptable and flexible so that European and national waste policy is kept abreast of, implementation progress is monitored, outcomes of implementation are recorded and feedback to stakeholders for analysis and any necessary refinement of policies, practices or contractual arrangement are made.

38.2 The MWMS is a living document and review of progress against its objectives will need to take place against pre-determined actions (and un-planned events) over the Strategy time-span. It is envisaged that as the Strategy implementation occurs continuous review of the document will take place against the required Strategy actions to ensure that it retains its status as document that is up-to-date, deliverable and in line with stakeholder ambitions. This method of review will be adopted by the Authority following receipt of new guidance from DEFRA on MWMS preparation and review that is expected to be issued during late summer 2004. Until this time it is proposed that the review of the MWMS will take place on the following basis.

First review to take place in April – June 2006

38.3 Primary focus of the first review will take place following the completion of the initial stages of the MWMS that are aimed at maximising levels of recycling and composting during 2004/05 and 2005/06. Following this period, the GMWDA will assess the success of MWMS implementation against scrutiny of completion of the following key areas of work.

- 41.0 Establishment of reliable and auditable measures to ensure that waste is correctly classified and measured so as to provide accurate data for performance monitoring thus enabling measurement of waste growth and more effective waste management and planning for future facilities required under the MWMS;
 - 42.0 Establishment of a performance reporting regime for recycling and composting performance (from both GMWDA and WCA activities) on a monthly basis;
 - 43.0 expanded kerbside recycling services;
 - 44.0 development of household waste and recycling centres;
 - 45.0 establishment of new bulking facilities for collected commodities for recycling and composting;
 - 46.0 continuing public awareness raising through the Communications Strategy that supports the MWMS; and,
 - 47.0 full review (operational, financial and public participation) of recycling operations and implementation of recommended improvements;
 - 48.0 review of outlet markets for collected commodities and securing Best Value contracts with such outlets;
 - 49.0 Partnership working between the GMWDA and it's constituent WCAs;
 - 50.0 Achievement of statutory recycling and composting standards in 2005/06; and,
 - 51.0 Procurement of the GMWDA's future municipal waste management services that will be introduced at 1 April 2006.
- .1 The Review Cycle highlighted overleaf shows the work that will be undertaken over the next two years and how these items will be fed into a review of the MWMS in early 2006/07. This review will take into account the experience gained in working towards short-term objectives and the new contracts that will be in place for delivery of medium to long-term objectives.

Insert – review Cycle from excel

Second review to take place early 2011/12 (subject to anticipated DEFRA guidance)

38.5 It is proposed that the subsequent MWMS review will take place during 2011/12 and will consider the following factors;

41.0 Performance of GMWDA municipal waste management contracts let at 1 April 2006;

42.0 Achievement of MWMS stated targets of nil waste growth by 2010 and a 33% recycling and composting rate by this year;

43.0 Analysis of the continued use of kerbside recycling operations as the optimum method of collecting material for recycling from households and the role of material recovery facilities; and,

44.0 Review of the initial stages of the construction and use of residual waste treatment facilities.

Subsequent review 2016 (subject to anticipated DEFRA guidance)

.1.1 Subsequent MWMS reviews will take place on a five-year basis. Therefore in 2016/17 a further review will be planned to take place focusing upon waste growth, the full commissioning of all planned new facilities and the preparation of a new MWMS potentially covering the period 2020 to 2040.

39.0 The development of a Communications Strategy to support the MWMS.

39.1 The Greater Manchester Waste Disposal Authority (GMWDA) in partnership with its constituent Waste Collection Authorities (WCAs) (the Partnership) have developed a Communications Strategy that will support the initial stages of implementation of the Greater Manchester MWMS (via the delivery of new public recycling services funded by DEFRA in 2004/05 and 2005/06).

39.2 The Communications Strategy for the next two years focuses upon the engagement of the public in recycling their household waste (incorporating waste minimisation, re-use, recycling and recovery). This underpins the key theme of the Municipal Waste Management Strategy to minimise household waste production and maximise recycling, a challenging task for a large conurbation of diverse ethnic backgrounds and environments. The Communications Strategy will enable a consistent of approach across the conurbation to be allied to all public waste awareness initiatives whilst allowing the flexibility necessary to implement further campaigns and apply specific approaches to the wide variety of communities. The Communications Strategy can be viewed on www.sort-it.net.

- 39.3 The Partnership has worked successfully on awareness raising initiatives as a result of receiving funding from the DEFRA Waste Minimisation and Recycling Fund Rounds one and two (2002/03 and 2003/04) and plans to build upon this work over the next two years as reported in the BV Performance Plan 2003/04.
- 39.4 The Communications Strategy and activities proposed supports the Partnership's successful bid to the DEFRA Challenge Fund 2004/05 and 2005/06 for new recycling services/infrastructure and will build on the capability and capacity engendered as a result of local authority partnership work over the last three years largely based around the implementation of DEFRA funded initiatives, the pooling of statutory performance standards and MWMS development / implementation.
- 39.5 Strong emphasis will be placed on ensuring a clear link between past, current and future campaigns to reinforce previous messages given to the householders of Greater Manchester whilst retaining an innovative approach to the promotion of new infrastructure developments delivered as a result of Greater Manchester's successful DEFRA Challenge Fund bid.

The Vision, Objectives and Targets of the Communications Strategy

- 39.6 The overall vision of the Greater Manchester Communications Strategy is to move the public of Greater Manchester from a position of awareness regarding household waste management to a position where they participate in the recycling services provided by the Partnership as part of their routine. It is essential that recycling is normalised and becomes a fact of everyday Greater Manchester life.
- 39.7 In striving to achieve such a change in public behaviour the Communication Strategy is intended to ensure the delivery of the initial strategic objectives of the MWMS through raising the awareness of people living, working and visiting the Greater Manchester area to household waste management issues and facilitating public use of existing and new recycling services.
- 39.8 The Communication Strategy has been developed to support the investment in Greater Manchester's recycling infrastructure from DEFRA's Waste Minimisation and Recycling Challenge Fund for 2004/05 and 2005/06 and therefore will run for this time span.
- 39.9 The objectives of the Communication Strategy are outlined below.
- 41.0 Minimise the amount of household waste produced.
- 42.0 Maximise the amount of household waste recycled and composted.

- 43.0 Lift the public perception of recycling so that it is regarded as easy, clean, worthwhile and a service that is well managed by the responsible local authorities.
- 44.0 Engender the public from all sectors of Greater Manchester's communities to participate in recycling (with specific focus upon areas that have been identified as having poor recycling performance) so that they accept it as part of their everyday life.
- 45.0 Maximise sustained public participation in the existing and new kerbside recycling services that are managed by the Partnership and therefore ensure that new bulking facilities for collected recyclable material are utilised to their full potential.
- 46.0 Supplement and enhance public awareness of household waste management, and the range of local authority recycling services available for their use, through the use of existing promotional material e.g. the Greater Manchester "Sort-it" brand, the provision of generic Greater Manchester "instructional" public information, and strong links to the new WRAP national branding to be launched this summer.
- 47.0 The use of targeted communications campaigns to specific minority Greater Manchester communities.
- 48.0 Ensure that waste arisings do not increase as a result of additional containers at households for waste storage. Whilst the messages will predominantly be instructional the waste minimisation message will also be incorporated into our designs in an attempt to ensure that waste arisings do not increase because of the provision of additional containers, particularly relating to the new provision of green waste containers.
- 49.0 Establishment of a Media Awareness Group that will be responsible for ensuring that public awareness raising and recycling service promotion is managed in an effective, innovative and timely manner.
- 39.10 Targets have been used to measure achievement of the objectives referred to above. These targets are SMART i.e. specific, measurable, attainable, realistic and time-specific and have been divided into hard and soft categories. Their achievement will be monitored by the Greater Manchester Waste Forum's Joint Officer Group, results will be reported to the GMWDA, WCAs and the DEFRA Project Board.

The key elements of the Communications Strategy

- 39.11 The Communications Strategy is based upon two principles that will facilitate public participation in recycling;
- 39.12 Making recycling matter so that the public take the issue seriously when comparing it against other factors that householders have to deal with in

their day-to-day life. People need to start talking about recycling and then taking part.

39.13 Making recycling simple so that the public receive a clear and consistent message about what they need to do, with the associated environmental benefits explained in lay-persons terms, and have sustained, reliable and easy to access recycling services available to them.

39.14 These principles will be incorporated into a number of key messages for delivery to the public under the brand “Sort-it”;

41.0 You can recycle more than you think;

42.0 You can recycle more paper and more glass (e.g. letters, magazines, envelopes, glass jars etc.);

43.0 You can recycle more than just paper and glass (e.g. tins, cans, textiles, green waste).

44.0 There are regular and reliable local recycling services for you to use;

45.0 Recycling is easier than you think.

39.15 The Communications Strategy will target specific parts of the Greater Manchester population so that financial and human resources are used to maximum benefit. The key areas of focus will be upon the following audiences.

41.0 Primary focus will be placed upon engaging members of the public that have already received a level of engagement from the Partnership on household waste management and have a range of recycling services available to them. There is considerable opportunity to encourage this audience to recycle more in terms of quantity and range of materials and the Partnership is of the view that through the encouragement that the Communication Strategy plans to provide such people will recycle as part of their daily routine and play a fundamental role in achieving the MWMS objectives.

42.0 As a secondary audience those households that are not recycling in any great quantity at present will be targeted. It is the view of the Partnership that these people may only be at a low rate of recycling as a consequence of “barriers to action” such as living in terraced houses or flats (that have little storage space) and possibly do not own a car (so don’t have easy access to bring recycling sites and household recycling centres). To overcome these problems the Partnership proposes that additional help will be provided to these people through direct local contact and ongoing dialogue possibly through the use of community groups. The Partnership will seek examples of best practice from elsewhere in the UK on how to establish recycling within this audience.

43.0 Specific focus will be paid to the hard to reach communities of Greater Manchester. Similar attention to that planned for the low recycling areas will be instigated with support and links to existing local authority contacts with such groups and the use of specific communication media e.g. multi-lingual translation, Braille, and minicom.

39.16 The following campaigning tools will be utilised to deliver the recycling message to Greater Manchester homes and motivate people to take the subject seriously, recycle more and subsequently over the long –term recycle as an everyday activity without thinking about it being an effort. Such work will be co-ordinated by the Media Awareness Group and will be Greater Manchester wide and also area specific.

41.0 PR - Recognised by the Partnership as an extremely effective and credible technique for elevating the recycling message on the local news agenda and therefore influencing public opinion.

42.0 Advertising – specific events to promote new services and poster campaigns.

43.0 Householder direct contact through a planned door-knocking programme undertaken by trained canvassers.

38.0 Special and Hazardous Waste

38.1 Many Households use materials such as paint, paint thinners and strippers, medicines and pet care products, garden chemicals, some types of batteries and motor products such as engine oil and brake fluid. All these materials are commonly known as special or hazardous waste. After use or at the end of their life they need to be safely disposed of. Incorrect handling or disposal presents risks to health and/or the environment.

38.2 European legislation and a review of the Special Waste Regulations has resulted in some waste streams previously defined as non-hazardous (or non-special) will be classified as hazardous. As we increase the amount of waste that is recycled and separated at source, it is essential that all hazardous materials are separated from other household waste and dealt with through separate collection arrangements. Because operational waste staff, engaged in waste collection, recycling and disposal operations are in close proximity to waste, if hazardous waste is mixed in with normal waste this will increase the to their personal health and safety. In addition the toxicity and combustibility of some items of waste prevent their inclusion in waste collection and disposal streams and need to be separated.

38.3 The collection of these types of waste using a kerbside collection based scheme would be financially and operationally prohibitive to the waste collection authorities and may not assist in the diversion of hazardous

waste from the general waste stream as they would, by nature of the irregular need to dispose of them, be based on a collection by request.

38.4 The chosen route of disposal adopted by the Authority is through Household Waste Recycling Centres (HWRC's), which provide facilities for the disposal of items of hazardous waste produce by households.

38.5 The following paragraphs describe the various methods of collection and disposal.

Paint

38.6 The general public delivers paint to the HWRC's. Water based paint is collected and sent to landfill with the residual waste. There are currently pilot schemes being trailed where members of the public place their unwanted paint into a sealed container and the paint is then re-used by people who want it. (Community Re-Paint runs the scheme.)

38.7 Lead based paint is segregated and placed in the on site chemical store for collection and disposal by a specialist contractor.

Waste Oil

38.8 Each HWRC's has a freestanding receptacle where householders can deposit the oil. A specialist contractor who processes the oil for recycling again collects this.

Tyres

38.9 Tyres are dealt with in two ways, by a process similar to the above where residents take the used tyres to the HWRC's for collection/delivery to a specialist contractor who again processes the tyres for recycling. In addition WCA's collect tyres and then deliver them direct to the contractor for processing. Tyres have to be detached from rims prior to processing.

Chemicals

38.8 Chemicals are taken to HWRC's, where they are identified and placed into the secure chemical store. A note of the size of the container and the contents is made and attached to the container for subsequent identification. The disposal contractor keeps a register of the chemicals stored at each location, This information is communicated to the specialist contractor to ensure the correct and safe transportation of the chemicals to the point of processing. Consignment notes are retained by the disposal contractor. In the event of a highly hazardous chemical arriving at one of the facilities procedures are in place for the immediate removal of the substance by the appointed specialist.

Batteries

38.9 Batteries fall into two categories, Lead Acid Batteries (of the type used in motor vehicles) and dry cell batteries (IT equipment, phones etc.)

Lead Acid Batteries

38.10 Batteries are deposited in bunded storage boxes by members of the public. The deposited batteries are collected by a licensed contractor who then removes them from site for processing and recycling. The

removal, processing is carried out under licence from the Environment Agency.

Dry Cell Batteries.

- 38.11 At present there is no specified source for the disposal of batteries, Batteries received at the facilities are disposed of as special/non-conforming waste. The assumption is that small batteries are disposed of via the weekly household collections carried out by the districts.
- 38.12 Recycling is inhibited due to the relatively low cost of landfill for NiCad batteries and the like compared with the high cost of collection, transport/shipping and recycling in Europe due to the lack of licenced facilities in the UK.
- 38.13 The Authority (via the Company) must provide collection and disposal facilities at HWRC's for members of the public to deposit used batteries.
- 38.14 Comparison with two other WDA's indicate that there are contractors who will collect and dispose of these materials. Contractual procedures and costs will need to be negotiated through specialist contractors.

White Cement Bonded Asbestos

- 38.15 Small amounts of WCBA can be taken to HWRC's by members of the public for disposal. The items are placed in a special 35 cu. yd. closed container. The containers are collected from the sites and the contents disposed of under licence from the Environment Agency. Disposal is currently at the landfill site at Risley IV.

LPG Gas Cylinders

- 38.16 Facilities are provided on all sites for the reception of LPG cylinders from members of the public. Waste management licences require cylinders to be stored in lockable, vented compounds pending collection.
- 38.17 Collection of LPG cylinders is undertaken by specialist contractors on behalf of the cylinder owners eg. Calor, BOC etc.

39.0 The Role of the Community Sector

39.1

40.0 Background Documents and Sources

41.0 Glossary of Terms

Advanced conversion technologies are defined in the Renewables Obligation Order 2002 as meaning gasification, pyrolysis or anaerobic digestion, or any combination thereof.

Aggregates granular material used in construction. Aggregates may be natural, artificial or recycled.

Anaerobic Digestion this is the biological degradation of organics in the absence of oxygen, producing biogas (typical composition of 65 per cent methane and 35 per cent CO₂) and residue (digestate) suitable for use as a soil improver.

Best Practicable Environmental Option (BPEO) a BPEO is the outcome of a systematic and consultative decision making procedure that emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable costs, in the long term as well as in the short term.

Best Value Government programme to seek continuous improvement in service quality in the way in which authorities exercise their functions.

Biodegradable waste is defined in Council Directive 1999/31/EC on the landfill of waste as meaning any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.

Biodiversity the diversity, or variety, of plants, animals and other living things in a particular area or region. It encompasses habitat diversity, species diversity and genetic diversity. Biodiversity has value in its own right and has social and economic value for human society.

Biomass is defined in the Renewables Obligation Order 2002 as meaning fuel used in a generating station of which at least 98 per cent of the energy content (measured over a period of one month) is derived from plant or animal matter or substances derived directly or indirectly therefrom (whether or not such matter or substances are waste) and includes agricultural, forestry or wood wastes or residues, sewage and energy crops (provided that such plant or animal matter is not or is not derived directly or indirectly from fossil fuel).

Bottom Ash burnt out residues from the bottom grate of waste incinerators, which represents between 20 and 25 percent of the processed waste by weight. Ferrous metals can be removed by magnetic separation for recycling and bottom ash itself is being increasingly used in the manufacture of masonry blocks and in road construction.

Bring Recycling refers to a recycling site, see recycling site. Known as such, as the recycler has to 'bring' their materials to the site.

Brownfield any land or premises which has previously been used or developed and is not currently fully in use, although it may be partially occupied or utilised. The land may also be vacant, derelict or contaminated but excludes parks, recreation grounds, allotments and land where the remains of previous use have blended into the landscape, or have been overtaken by nature conservation value or amenity use.

Central Composting large-scale schemes which handle kitchen and garden waste from households and which may also accept suitable waste from parks and gardens.

Certificate of Technical Competence (COTC) a certificate awarded by the Waste Management Industry Training and Advisory Board. The Environment Agency must be satisfied, when considering an application for a waste management licence under Part II of the Environmental Protection Act 1990, that the management of the activity will be in the hands of a technically competent person. In most cases, the person holding a Certificate of Technical Competence demonstrates this.

Civic Amenity Sites sites operated by either the Waste Disposal Authority (under the Environmental Protection Act 1990) or the local waste authority (under the Refuse Disposal (Amenity) Act 1978) where residents within a specified area can dispose of their household waste, in particular bulky waste, free of charge. The focus of these sites is due to change to concentrate on reuse and recycling. Also see Reuse and Recycling Centre.

Civic Amenity Waste a sub-group of household waste, normally delivered by the public direct to sites provided by the local authority. Consists generally of bulky items such as beds, cookers and garden waste as well as recyclables.

Clinical Waste waste which consists of human or animal tissue, bodily fluids, pharmaceuticals, sharps etc. and any waste arising from medical, dental veterinary or similar practices etc.

Combined Heat and Power the combined production of electricity and usable heat. Steam or hot water, which would otherwise be rejected when electricity alone is produced, is used for space or process heating.

Commercial Waste waste arising from premises which are wholly or mainly for trade, business, sport, recreation or entertainment as defined in Schedule 4 of the Controlled Waste Regulations 1992.

Community Sector including charities, campaign organisations and not-for-profit companies.

Composting this is the biological degradation of organic materials, such as garden and kitchen waste, in the presence of oxygen producing gas and residue suitable for use as a soil improver (see anaerobic digestion, central composting and home composting).

Contaminated Land land that appears to the local authority (in whose area it is situated) to be in a condition, which is causing or may cause harm (to human health or the environment) or is likely to cause the pollution of controlled waters.

Controlled Waste household, industrial or commercial waste as set out in the Controlled Waste Regulations 1992.

Construction and Demolition Waste waste arising from the construction, repair, maintenance and demolition of buildings and structures, including roads. It consists mostly of brick, concrete, hardcore, subsoil and topsoil, but it can contain quantities of timber, metal, plastics and occasionally special (hazardous) waste materials.

Conventional incineration is the controlled burning of waste in the presence of sufficient air to achieve complete combustion. Unsorted waste is fed onto a, usually inclined, grate and burnt as a red-hot mass as it moves through the furnace. For this reason the process is also sometimes referred to as 'mass burn'. Plants are generally large-scale, having an annual capacity of 100,000 tonnes or more. The term 'conventional incineration' is used in this Strategy to refer specifically to this type of processes as distinct from other thermal treatment processes such as pyrolysis, where air is absent, or gasification processes.

Dioxins polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are generally referred to as dioxins and furans. They are a group of over 200 related chemicals, a small number of which are highly toxic. They are by products of chemical and combustion processes including

waste incineration. Emissions from waste incineration fell by 82 per cent between 1990 and 2000 but this is still the largest source in the UK, accounting for 29 per cent of emissions in 2000.

Duty of Care the Duty of Care (Section 34 of the Environmental Protection Act 1990) places a general duty on waste producers (or anyone else with responsibility for waste) to take all reasonable steps to keep their waste safe. If they transfer their waste to someone else, they must ensure that that person is authorised to take it and can transport (See Registration of Waste Carriers), recycle or disposed of it safely. The duty of care does not apply to waste produced by householders in their own homes.

Energy Recovery from Waste (EfW) includes a number of established and emerging technologies, though most energy recovery is through incineration technologies. Many wastes are combustible, with relatively high calorific values – this energy can be recovered through (for instance) incineration with electricity generation.

Energy Recovery the recovery of useful energy in the form of heat and/or electric power from waste. Includes combined heat and power, combustion of landfill gas and gas produced during anaerobic digestion.

Environment Agency (England and Wales) The Environment Agency for England and Wales was formed by the Environment Act 1995. It took over the functions and responsibilities of its predecessor organisations, the National Rivers Authority, Her Majesty's Inspectorate of Pollution, the 83 Waste Regulators of England and Wales and a number of smaller Waste Technical Departments from the (former) Department for the Environment, Transport and the Regions.

Amongst other things the Agency's functions and duties include the management of radioactive waste, other forms of waste and industrial pollution control.

The Agency has been given a key role in implementing the National Waste Strategy and undertook the National Commercial and Industrial survey of Waste Arisings. It also regulates the waste industry through, amongst other things, the waste management licensing regime.

Environmental Impact Assessment the process whereby information about the environmental effects of a project is collected, assessed and taken into account in reaching a decision on whether the project should go ahead or not (DETR November 2000). See also Environmental Statement.

Environmental Protection Act 1990 (EPA 90) a new regulatory regime that came into force in 1990. It is designed to implement an approach to prevent harm to human health and the environment by ensuring an integrated (air, land and water) approach to environmental regulation and protection.

Environmental Technology Best Practice Programme (ETBPP) aims to demonstrate the benefits of managing resource use and reducing environmental impact to companies across the whole of the UK.

Exemptions from Licensing certain waste reclamation and recycling activities (which are not seen as a threat to human health or the environment) are exempt from waste management licensing requirements. This includes the storage of certain materials for recovery or reuse – although limits on quantities of material apply. These activities must however register with the Environment Agency.

Fly-tipping the illegal deposit of waste on land.

Fuel Cell acts like a constantly recharging battery, electrochemically combining hydrogen and oxygen to generate power. For hydrogen fuel cells, water and heat are the only by-products and there are no direct air pollution or noise emissions. They are suitable for a range of applications, including vehicles and buildings.

Gasification is defined in the Renewables Obligation Order 2002 as meaning the substoichiometric oxidation or steam reformation of a substance to produce a gaseous mixture containing two or all of the following: oxides of carbon, methane and hydrogen;

Green Industries the business sector that produces goods or services, which compared to other, generally more commonly used goods and services, are less harmful to the environment.

Gross Domestic Product (GDP) a measure of the total flow of goods and services produced over a specified time period. It is obtained by valuing outputs of goods and services at market prices.

Household Waste all waste collected by Waste Collection Authorities under section 45(1) of the Environmental Protection Act 1990, plus all waste arisings from Civic Amenity sites and waste collected by third parties for which collection or disposal credits are paid under Section 52 of the Environmental Protection Act 1990. Household waste includes waste from collection rounds of domestic properties (including separate rounds for the collection of recyclables), street cleansing and litter collection, beach cleansing, bulky household waste collections, hazardous household waste collections, household clinical waste

collections, garden waste collections, Civic Amenity wastes, drop-off/'bring' systems, clearance of fly-tipped wastes, weekend skip services and any other household waste collected by the waste authorities. Household waste accounts for approximately four-fifths of London's municipal waste.

Home Composting compost can be made at home using a traditional compost heap, a purpose designed container, or a wormery.

Incineration normally refers to the controlled burning of waste in the presence of sufficient air to achieve complete combustion. Energy is usually recovered in the form of electric power and/or heat. The emissions are controlled under EU Directive 2000/76/EC. This Directive also applies to other thermal treatment processes such as pyrolysis and gasification, so the term incineration may be applied to a wider range of thermal waste treatment processes. See also separate definitions of conventional incineration, pyrolysis, and gasification.

Industrial Waste waste from any factory and any premises occupied by industry (excluding mines and quarries) as defined in Schedule 3 of the Controlled Waste Regulations 1992.

Inert waste is defined in Council Directive 1999/31/EC on the landfill of waste as waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

Integrated Waste Management involves a number of key elements, including: recognising each step in the waste management process as part of a whole; involving all key players in the decision-making process and utilising a mixture of waste management options within the locally determined sustainable waste management system.

Integrated Pollution Prevention and Control (IPPC) the Integrated Pollution Prevention and Control Directive (96/61/EC Directive), as implemented in the Pollution Prevention and Control Regulations 2000, is designed to prevent or, where that is not possible, to reduce pollution from a range of industrial and other installations, including some waste management facilities, by means of integrated permitting processes based on the application of best available techniques.

Kerbside Collection any regular collection of recyclable from premises, which can include collections from commercial or industrial premises as well as

households. Excludes collection services delivered on demand. Also see recycling collections from homes

Land Use Planning the Town and Country Planning system regulates the development and use of land in the public interest, and has an important role to play in achieving sustainable waste management.

Landfill Sites are areas of land in which waste is deposited. Landfill sites are often located in disused quarries or mines. In areas where there are limited, or no ready-made voids, the practice of landraising is sometimes carried out, where some or all of the waste is deposited above ground, and the landscape is contoured.

Landfill Tax landfill operators are liable for tax on all consignments of waste disposed at landfill, except for certain exempt categories of waste. The rate of tax for 2002/03 is £2 per tonne for inert waste and £13 per tonne for non-inert waste (and set to rise to £1 per year to £15 per tonne by 2005).

Landfill Tax Credit Scheme the tax is paid quarterly to the Inland Revenue. The Landfill Tax Credit scheme allows up to 20 per cent of the funds generated by the tax to be channelled into bodies with environmental objectives. The aim of the scheme mirrors those of the tax, in that it aims to help projects which benefit communities in the vicinity of landfill sites, therefore helping to compensate for the local environmental impacts of landfilling. The system of registering Environmental Bodies and approving projects is overseen by ENTRUST.

Landspreading is the spreading of certain types of waste onto agricultural land for soil conditioning purposes. Sewage sludge and wastes from the food, brewery and paper pulp industries can be used for this purpose.

Licensed Site a waste disposal or treatment facility, which is licensed under the Environmental Protection Act for that function.

Life Cycle Analysis/Assessment (LCA) the systematic identification and evaluation of all of the benefits and disbenefits associated with a product or function through its entire life ('cradle to grave'). This can provide a basis for making strategic decisions on the ways in which particular waste in a given set of circumstances can be most effectively managed, in line with the principles of Best Practicable Environmental Option, the waste hierarchy and the proximity principle. See WISARD.

Local Authority Waste Disposal Company (LAWDC) – s32. of the Environmental Protection Act 1990 required that waste disposal functions be discharged through waste disposal contractors. This could be either a private

business or arms length companies formed by the Waste Disposal Authority. LAWDCs are the arms length companies formed from WDA's.

Multi-Material Kerbside Collection (MMKC) the collection from homes of more than one type of material for recycling. The collection can be made using a box, or boxes, from which materials are sorted into separate containers on a collection vehicle or could be mixed together in a bag and sorted later at a MRF.

Municipal Solid Waste (MSW) this includes all waste under the control of local authorities or agents acting on their behalf. It includes all household waste, street litter, waste delivered to council recycling points, municipal parks and gardens wastes, council office waste, Civic Amenity waste, and some commercial waste from shops and smaller trading estates where local authorities have waste collection agreements in place. It can also include industrial waste collected by a waste collection authority with authorisation of the waste disposal authority.

Planning Policy Guidance Notes (PPGs) and Mineral Planning Guidance Notes (MPGs) Government Policy Statements on a variety of planning issues, including waste planning issues, to be taken as material considerations, where relevant, in deciding planning applications.

Precautionary Principle where significant environmental damage may occur, but knowledge on the matter is incomplete, decisions made and measures implemented should err on the side of caution.

Producer Responsibility is about producers and others involved in the distribution and sale of goods taking greater responsibility for those goods at the end of the products life.

Proximity Principle dealing with waste as near as practicable to its place of production.

Pyrolysis is defined in the Renewables Obligation Order 2002 as meaning the thermal degradation of a substance in the absence of any oxidising agent (other than that which forms part of the substance itself) to produce char and one or both of gas and liquid;

Recovery is defined in Waste Strategy 2000 as meaning as meaning obtaining value from waste through reuse; recycling; composting; other means of material recovery (such as anaerobic digestion); or energy recovery (combustion with

direct or indirect use of the energy produced, manufacture of refuse derived fuel, gasification, pyrolysis and other technologies). In addition, certain operations are defined as recovery operations in Annex IIB of Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste.

Recycling involves the reprocessing of waste, either into the same product or a different one. Many non-hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in-house equipment.

Recycling collections from homes refers to any regular collection of recyclables from households, often using a bag, separate wheeled bin or a box. Excludes collection services delivered on demand. Commonly referred to a 'kerbside' or 'door to door' collections.

Recycling Plans under Section 55. of the EPA 90, WCA's must also draw up a plan for the recycling of waste. This should include details of the amounts and types of (controlled) waste to be recycled, arrangements for dealing with it and the associated costs.

Recycling Site a group of containers for the collection of a variety of materials for recycling. Often located in supermarket or public building car parks or on street corners. Commonly referred to as 'bottle banks' but usually collecting a variety of materials. Also see bring site.

Registration of Waste Carriers any person who carries (controlled) waste in the course of any business with a view to profit, is required to be registered with the Environment Agency.

Renewables Obligation Certificates are certificates issued when electricity is generated from renewable sources. The Electricity Act 1989 requires electricity suppliers to meet a certain percentage of their total sales from renewable sources. Under the Renewables Obligation Order 2002, only plants that generate electricity from biomass will be eligible although the biomass may be a waste. Plants processing wastes must, however, use advanced conversion technologies in order to be eligible, and it is only the biomass component of the waste that will earn Renewables Obligation Certificates or ROCs. Advanced conversion technologies are defined in the Order as anaerobic digestion, gasification and pyrolysis. Electricity generated through the conventional incineration of mixed waste is not eligible. See also separate definitions of conventional incineration, gasification, incineration and pyrolysis.

Residual waste is that portion of the waste stream collected by local authorities which is not re-used, recycled or composted and remains to be treated through the recovery of energy and/or materials or through disposal to landfill.

Residues are secondary waste materials requiring further treatment or disposal following a waste recycling, composting or treatment process. For example, bottom ash following the incineration of waste or contaminated recyclable material from Material Reclamation Facility.

Reuse can be practised by the commercial sector with the use of products designed to be used a number of times, such as reusable packaging. Householders can purchase products that use refillable containers, or reuse plastic bags. The processes contribute to sustainable development and can save raw materials, energy and transport costs.

Reuse and Recycling Centres are Civic Amenity sites which have changed their emphasis in operation from disposal towards reuse and recycling. Also see Civic Amenity sites.

Separate Collection recycling collection schemes from homes where materials for recycling are collected either by different vehicle or at a different time to the ordinary household waste collection.

Section 106 Agreements planning obligations on persons with an interest in land in order to achieve the implementation of relevant planning policies as authorised by Section 106 of the Town and Country Planning Act 1990.

Self-sufficiency in relation to waste this means dealing with wastes within the administrative region where they are produced.

Social Exclusion a shorthand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime environments, bad health and family breakdown.

South East Region the South East Region runs in an arc around London from Kent at the South East extremity along the coast to Hampshire, Southampton and Portsmouth in the South West, and then to Milton Keynes and Buckinghamshire in the North. In total it encompasses 19 counties and unitary authorities and 55 district authorities.

Spatial Development Strategy one of the eight strategies for London that the Mayor is required by law to produce (the Greater London Authority Act 1999). It will replace existing Strategic Planning Guidance for London (RPG3). The Mayor has chosen to call it the London Plan.

Special Waste waste which because of the risks posed to human health and the environment (is dangerous to life, has a combustion flashpoint of 210C or less, or is a medical product) are subject to additional controls under the Special Waste Regulations 1996. Before such waste can be collected, the waste producer must notify the Environment Agency of the waste's final destination through a Consignment Note system. All those party to the waste transfer must retain copies of the completed note on a register for at least three years.

Sustainable Development development that is sustainable is that which can meet the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Waste Management means using material resources efficiently, to cut down on the amount of waste we produce. And where waste is generated, dealing with it in a way that actively contributes to the economic, social and environmental goals of sustainable development.

Treatment involves the chemical or biological processing of certain types of waste for the purposes of rendering them harmless, reducing volumes before landfilling, or recycling certain wastes.

Unitary Authority a local authority, which has the responsibilities of both Waste Collection and Waste Disposal Authorities.

Unitary Development Plans (UDPs) statutory plans produced by each borough that integrate strategic and local planning responsibilities through policies and proposals for development and use of land in their area.

Virgin Aggregates granular material used in construction. Virgin aggregates are natural and have not previously been used.

Waste the strict legal definition of waste is extremely complex but it encompasses most unwanted material which has fallen out of the commercial cycle or chain of utility, which the holder discards, or intends to, or is required to discard.

Waste Arising the amount of waste generated in a given locality over a given period of time.

Waste Collection Authority (WCA) the authority responsible for arranging the collection of household waste in their area (in London this is on a boroughwide

basis) and commercial or industrial waste on request. They must also produce a 'Recycling Plan'. (See recycling plans)

Waste Disposal this is defined by the list of operations that constitute disposal (for under Part III of Schedule 4 of the Waste Management Licensing Regulations). This includes landfill, land raising, incineration, permanent storage etc.

Waste Disposal Authority (WDA) the Authority responsible for arranging for the disposal of waste collected in their area by the Waste Collection Authority. They also provide sites where householders can deposit waste free of charge (Civic Amenity sites).

Waste Disposal Authorities are the county councils in non-metropolitan areas. Special arrangements apply in some metropolitan areas and unitary councils, including London and in other metropolitan areas the District Councils are the WDA's. See Local Authority Waste Disposal Company (LAWDC).

Waste Hierarchy suggests that: the most effective environmental solution may often be to reduce the amount of waste generated – reduction; where further reduction is not practicable, products and materials can sometimes be used again, either for the same or a different purpose – reuse; failing that, value should be recovered from waste, through recycling, composting or energy recovery from waste; only if none of the above offer an appropriate solution should waste be disposed.

Waste Management Industry the businesses (and not-for-profit organisations) involved in the collection, management and disposal of waste.

Waste Management Licensing a waste management licence (operated and enforced by the Environment Agency) authorises the treatment, keeping or disposal of waste. These are separate but complimentary to the Land Use Planning System. See Exemptions from Licensing.

Waste Recycling Credits payments have to be made by a Waste Disposal Authority to a Waste Collection Authority who retains waste for recycling. This amount is intended to represent the net saving of expenditure on the disposal should it have been disposed of. There is also provision to pass savings in both collection and disposal costs to voluntary bodies or other who organise recycling schemes.

Waste Transfer Station a site to which waste is delivered for sorting prior to transfer to another place for recycling, treatment or disposal.

WISARD (Waste Integrated Systems Assessment for Recovery and Disposal) a tool developed by the Environment Agency to assist in assessing the LCA of waste management systems.

BPEO	Best Practicable Environmental Option
BVPI	Best Value Performance Indicator
CA	Civic Amenity
CEN	The European Committee for Standardisation
CFC	Chlorofluorocarbons
CHP	Combined Heat and Power
CIPFA	Chartered Institute of Public Finance
CPRE	Council for the Preservation of Rural England
DEFRA	Department for Environment, Food and Rural Affairs
DSO	Direct Service Organisation
DTI	Department of Trade and Industry
DVLA	Driver and Vehicle Licensing Agency
EA	Environment Agency
EfW	Energy from Waste
ELV	End of Life Vehicle
EPA	Environmental Protection Act 1990
EU	European Union
IDeA	Improvement and Development Agency
LAWDC	Local Authority Waste Disposal Company
MME	Mechanised Metal Extraction
MRF	Materials Reclamation Facility
MSW	Municipal Solid Waste
NFFO	Non-Fossil Fuel Obligation
NGO	Non Governmental Organisation
NWAI	National Waste Awareness Initiative
ODS	Ozone Depleting Substance
OECD	Organisation for Economic Co-operation and Development
Ofgem	The Office of Gas and Electrical Markets
PET	Polyethylene terephthalate
PCB	Polychlorinated biphenyls
PFI	Private Finance Initiative
PPG	Planning Policy Guidance

PVC	Polyvinyl chloride
ROC	Renewables Obligation Certificates
RPG	Regional Planning Guidance
RTAB	Regional Technical Advisory Body
SDS	Spatial Development Strategy
SRB	Single Regeneration Budget
SRDF	Sub Regional Development Framework
UA	Unitary Authority
UDP	Unitary Development Plan
UK	United Kingdom
UN	United Nations
WCA	Waste Collection Authority
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment
WRAP	Waste Resources Action Programme

1.0 Legislation and Statutory Targets

- 1.1 The primary statutory drivers for change have come through European Directives. Whilst there are a number of directives that will have a significant influence on the development of MSW strategies, it is the Landfill Directive that is currently the primary driver of change.
- 1.2 The aim of this Directive is to prevent, or reduce as far as possible, the negative effects of landfill waste disposal on human health and the environment. As well as being the least sustainable waste disposal option available, landfilling biodegradable waste is also a major source of the greenhouse gas methane.
- 1.3 The EU Landfill Directive places a legal responsibility on member states to reduce the amount of biodegradable waste that is disposed of by landfill. Article 5 of the Directive poses the greatest challenge in the UK. It specifies quantities of biodegradable municipal waste (BMW) that must be diverted away from landfill by target dates as part of a wider strategy to combat global climate change.
- 1.4 The Directive requires the UK to meet and maintain the relevant BMW reduction targets by 16 July in 2010, 2013 and 2020. If the UK fails reduce its BMW landfill levels to meet these requirements in target years, or if it increases its level of BMW landfill above the required targets in subsequent scheme years, the UK as a whole would be liable to incur EU penalties of up to £0.5 million per day. The Government is committed to meeting these targets for reducing the UK's dependence on landfill. The reduction targets set by the Directive are:
- By 2010 to reduce the amount of BMW going to landfill to 75% of that produced in 1995;
 - By 2013 to reduce the amount of BMW going to landfill to 50% of that produced in 1995;
 - By 2020 to reduce the amount of BMW going to landfill to 35% of that produced in 1995.
- 1.5 The Waste and Emissions Trading Bill introduces a landfill allowance trading scheme in which the total quantity (by weight) of BMW that local authorities will be allowed to landfill in each year between 2004 and 2020 will be limited to set quantities. The Bill is currently the subject of UK wide consultation by DEFRA. Landfill allowances will be allocated to each Waste Disposal Authority (WDA).
- 1.6 The allocation of allowances to WDA's in the first year would be based on current BMW landfilled. Each WDA will be able to determine how to use its allocation of allowances in the most effective way for them. They will be able to save unused allowances for use in later years (banking), or use a proportion of their future allocation of allowances in advance (borrowing). This will allow individual WDAs to use their allowances in accordance with their investment strategy. The Government intends to

launch the scheme at the earliest opportunity, and the Waste and Emissions Trading Bill provides for the scheme to start in 2004.

- 1.7 The implications of the Waste and Emissions Trading Bill are that whilst the landfill allowance will commence in 2004 the permitted quantity will then reduce in each subsequent year. This means that only a finite tonnage of residual waste can be disposed of to landfill and a change in the focus of the MWMS from the BVPI percentage targets to achievement of a specific tonnage of MSW residues. Whilst the BVPI targets will remain they will undoubtedly be achieved if the landfill allowances are met. An accelerated implementation of the MWMS will be needed if these limits are to be met.
- 1.8 Other directives that will impact on local authorities include Directives on End-of-life Vehicle, Batteries, Hazardous Household Waste and on Waste Electrical and Electronic Equipment (WEEE) and Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (ROHS) These directives affect household appliances, IT and telecoms equipment, audiovisual equipment (TV, video, hi-fi), lighting, electrical and electronic tools, toys, leisure and sports equipment all of which will require specific recycling and disposal outlets when separately collected.
- 1.9 Other significant new legislation includes the new EU Animal By-Products Regulation (EC 1774/2002) that will be coming into force in April 2003. The EU Regulation is directly applicable in Member States. Under this legislation catering waste containing meat and low-risk animal by-products will only be permitted to be composted subject to permit and stringent specified composting conditions and will be banned from landfill. Exceptions from this ban are cooked meat from retail outlets (until 2006) and domestic kitchen waste.
- 1.10 The Animal By-Products Regulations have significant implications for commercial waste collection from food retail, restaurants and any commercial or institutional waste that includes catering waste. These wastes will be banned from landfill disposal from the end of 2005 and therefore will have to be subject to separate collection and treatment in accordance with the ABP Regulations. Street litter including waste from food retail appears to be included in this provision and therefore excluded from landfill and thus subject to the same treatment requirements.
- 1.11 The general direction of Government policy in recent years has been to impose an increasing number of statutory duties and fiscal drivers on municipal waste managers and it is highly likely that this trend will continue. Statutory levers deployed by the UK government include the raising of Landfill tax by at least £3 per tonne per annum until it reaches a level of at least £35 per tonne⁴ and the requirement for WDAs and

⁴ The Chancellor's Pre-Budget Report, 27 November 2002

WCAs to meet BVPI performance standards for recycling and composting of Household Waste.

Table 1 – BVPI Performance Standards for Recycling & Composting

Authority	2001/2 Recycling & Composting Rate (%)	2003/4 Recycling & Composting Target (%)	2005/6 Recycling & Composting Target (%)
Bolton	5.76	8	20
Bury	5.6	8	20
Manchester	3.09	7	20
Oldham	4.54	8	20
Rochdale	2.93	7	20
Salford	5.45	8	20
Stockport	11.09	20	36
Tameside	7.46	8	20
Trafford	5.9	8	20
GMWDA	6.62	11.5	20

2.0 The North West Regional Assembly draft Regional Waste Strategy

2.1 The Strategy sets an initial target for reducing growth in municipal waste across the North West to 2% by the end of 2006 in line with the recommendation of the Strategy Unit. Whilst this target is a realistic aspiration additional early reductions may be less easy to achieve in the light of ongoing economic development. However, progressive reduction from 2010 to zero by 2020 is considered to be a realistic if challenging target within the GMMWS.

2.2 The regional strategy targets in respect of recovering value from municipal waste are the same as those promoted nationally:

- recover value from 40% of MSW by 2005/6 (including recycling targets)
- recover value from 45% of MSW by 2010
- recover value from 67% of MSW by 2015

2.3 The Greater Manchester MWMS targets will not reach the recovery of value from 40% of MSW by 2005/6, however the regional targets will be exceeded in years 2010 and 2015.

2.4 The Strategy sets the following recycling/composting targets for household waste across the North West:

- recycle and/or compost 25% of household waste by 2005 (WS2000)
- recycle and/or compost 35% of household waste by 2010
- recycle and/or compost 45% of household waste by 2015 (SU)
- recycle and/or compost 55% of household waste by 2020

- 2.5 The increased level of recycling from kerbside collection combined with development of household waste recycling centres will enable achievement of the 2005/6 target. Regional targets for 1010 and 2015 will be achieved with early implementation of high performance residual waste treatment. The target for Greater Manchester is 50% by 2020 and it is considered that this level is in excess of present Government targets.
- 2.6 All local authorities in the North West are advised that they should now be planning and implementing changes to waste management practices under their control in order to work towards achieving national statutory targets. This will include engaging the public, local businesses and the waste management industry in all aspects of change, from behavioural change to the development of new infrastructure. It will also include reviewing plans and strategies to take into account the importance of waste management in local areas.

Waste arisings 2005/6 @ 2% growth – 50% Non Household waste reduction

	Waste Management options			
Waste Arisings Tonnes	Recycling Tonnes	Composting Tonnes	Residual waste Bolton TRF	Residual waste Landfill treatment
Collected Household waste (HHW) 919,000 tonnes	Separate source collection 10% 92,000 tonnes	Separate source collection and composting 10% 92,000 tonnes	Residual waste for energy recovery 7.4% 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	Collected household waste produces 625,000 tonnes residual collected plus 33,000 tonnes TRF residues Residual waste for landfill is 71% of collected HHW 658,000 tonnes
Civic Amenity 345,000 tonnes	Soil rubble and hardcore 5% (non counting) 18,000 327,000 tonnes Recyclables 20% 65,000 tonnes	Green Waste Composting 20% 65,000 tonnes		Residual waste for landfill 197,000 tonnes
Non Household and Bulk Waste 155,000 tonnes (50% reduction)				Residual waste for landfill 100% 155,000 tonnes
Totals 1,419,000 tonnes	Recyclables 157,000 tonnes	Compost 157,000 tonnes	Energy Recovery 77,000 tonnes	Biodegradable landfill 977,000 tonnes (1m. tonnes permitted) Total Landfill 1010,000 tonnes
Total Recycled and Composted 314,000 = 22.1% of MSW (24.8% of Household waste) Total Recovery (Gross 110,000) = 7.3% Total Landfill 1,075,000 = 71% Biodegradable landfill 977,000 tonnes - WET permitted amount 1,177,000				

2010 Waste arisings @ 2% growth - 33% source segregated recycling & composting - 50% Non Household waste reduction

[Maximising residual landfill]

Waste Arisings	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by MBT & use of RDF (tonnes)	Residual waste Landfill
1,535,000 Tonnes					
Collected Household waste (HHW) 994,000 tonnes 33% recycled & composted	Separate source collection 18% 179,000 tonnes	Separate source collection and composting 15% 149,000 tonnes	Residual waste for energy recovery - 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	nil	Untreated residual collected 556,000 tonnes plus 33,000 tonnes TRF residues Total 589,000 tonnes
Civic Amenity 374,000 tonnes	Soil rubble and hardcore 5% (non counting) 19,000 tonnes 355,000 tonnes Recyclables 35% 124,000 tonnes	Green Waste Composting 20% 71,000 tonnes			Residual waste for landfill 160,000 tonnes
Bulky Waste 167,000 tonnes (50)% reduction)					Residual waste for landfill 100% 166,000 tonnes
Totals 1,535,000 tonnes	Recyclables 303,000 tonnes	Compost 220,000 tonnes	Energy Recovery 436,000 tonnes		Biodegradable landfill 882,000 tonnes (1m. tonnes permitted) Total Landfill

					915,000 tonnes
<p>Total Recycled and Composted 523,000 = 34% of MSW (38.2% of Household Waste)</p> <p>Total Recovery (Gross 110,000) = 7.1% of MSW</p> <p>Total Landfill (inc TRF residues) 915,000 tonnes</p> <p>Biodegradable landfill 882,000 tonnes - WET permitted amount 1,000,000</p>					

2010 Waste arisings @2% growth 33% source segregated recycling and composting, 50% Non Household waste reduction

Maximising residual waste treatment by MBT

Waste Arisings 1,535,000 Tonnes	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by MBT & use of RDF (tonnes)	Residual waste Landfill
Collected Household waste (HHW) 994,000 tonnes 33% recycled & composted	Separate source collection 18% 179,000 tonnes	Separate source collection and composting 15% 149,000 tonnes	Residual waste for energy recovery - 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	556,000 tonnes residual collected household waste produces loss to air & sewer 25% - 139,000 RD Fuel 50% - 278,000 Recyclables 5% - 28,000 Residual waste for landfill 20% - 111,000	MBT residues 111,000 tonnes residual collected plus 33,000 tonnes TRF residues 144,000 tonnes
Civic Amenity 374,000 tonnes	Soil rubble and hardcore 5% (non counting) 19,000 tonnes 355,000 tonnes Recyclables 35% 124,000 tonnes	Green Waste Composting 20% 71,000 tonnes		Assumes waste capable of treatment by MBT 25% of residual Civic Amenity waste 40,000 tonnes loss to air and sewer 25% - 10,000 RD Fuel 50% - 20,000 Recyclables 5% - 2,000 MBT residues for landfill 20%- 8,000	Residual waste for landfill 128,000 tonnes
Bulky Waste 167,000 tonnes (50)% reduction)					Residual waste for landfill 100% 166,000 tonnes
Totals 1,535,000 tonnes	Recyclables 333,000 tonnes	Compost 220,000 tonnes	Energy Recovery 408,000 tonnes		Biodegradable landfill 405,000 tonnes (1m. tonnes permitted) Total Landfill 438,000 tonnes
Total Recycled and Composted 553,000 = 36% of MSW (40% of Household Waste) Total Recovery (Gross 408,000) = 26.5% of MSW Total Landfill (inc TRF residues) 438,000 Biodegradable landfill 405,000 tonnes - WET permitted amount 1,000,000					

2010 Waste arisings @2% growth 33% source segregated recycling and composting, 50% Non Household waste reduction

Maximising residual waste treatment by High performance residual waste treatment

Waste Arisings 1,535,000 Tonnes	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by steam sterilisation (SSMT) and mechanical treatment producing RDF	Residual waste Landfill
Collected Household waste (HHW) 994,000 tonnes 33% recycled & composted	Separate source collection 18% 179,000 tonnes	Separate source collection and composting 15% 149,000 tonnes	Residual waste for energy recovery - 12.0% of collected HHW, (7.0% of MSW) 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	556,000 tonnes residual collected household waste produces RD Fuel 60% - 333,000 Recyclables 18% - 100,000 Aggregate 12% - 66,000 Residual waste landfilled 10% - 57,000 (treated non biodegradable)	SSMT residues 57,000 tonnes residual collected plus 33,000 tonnes TRF residues 90,000 tonnes (treated non biodegradable)
Civic Amenity 374,000 tonnes	Soil rubble and hardcore 5% (non counting) 19,000 tonnes 355,000 tonnes Recyclables 35% 124,000 tonnes	Green Waste Composting 20% 71,000 tonnes		Assumes waste capable of treatment by SSMT 25% of residual Civic Amenity waste 40,000 tonnes RD Fuel 60% - 24,000 tonnes Recyclables 18% - 7,000 tonnes Aggregate 12% - 5,000 tonnes Residual waste landfilled 10% - 4,000 (treated non biodegradable)	Residual waste for landfill 128,000 tonnes 4,000 tonnes (treated non biodegradable)
Bulky Waste 167,000 tonnes (50)% reduction)					Residual waste for landfill 100% 167,000 tonnes
Totals 1,535,000 tonnes	Recyclables 413,000 tonnes	Compost 220,000 tonnes	Energy Recovery Gross 7.0% (Net figure 4.9%) 467,000 tonnes		Biodegradable landfill 295,000 tonnes (1m. tonnes permitted) Total Landfill 389,000 tonnes
Total Recycled and Composted 633,000 = 41.2% of MSW (46.2% of Household Waste) Total Recovery (Gross 467,000) = 30.4% of MSW Total Landfill (inc treated non biodegradable residues) 389,000 Biodegradable landfill 295,000 tonnes - WET permitted amount 1,000,000					

2013 Waste arisings, 50% Non Household waste reduction, with residual waste treatment by MBT

Waste Arisings Tonnes	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by MBT & production of RDF (tonnes)	Residual waste Landfill
Collected Household waste (HHW) 1046,000 tonnes Recycling @35%	Separate source collection 20% 209,000 tonnes	Separate source collection and composting 15% Green Waste 157,000 tonnes	Residual waste for energy recovery – 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	570,000 tonnes residual collected household waste produces loss to air & sewer 25% - 142,000 RD Fuel 50% - 285,000 Recyclables 5% - 29,000 Residual waste for landfill 20% - 114,000	MBT residues 114,000 tonnes residual collected plus 33,000 tonnes TRF residues Residual waste for landfill is 147,000 tonnes
Civic Amenity 402,000 tonnes	Soil rubble and hardcore 5% (non counting) 23,000 tonnes 382,000 tonnes Recyclables 35% 133,000 tonnes	Green Waste Composting 20% 76,000 tonnes		Assumes waste capable of treatment by MBT 25% of residual Civic Amenity waste 43,000 tonnes loss to air and sewer 25% - 10,000 RD Fuel 50% - 22,000 Recyclables 5% - 2,000 MBT residues for landfill 20% - 9,000	Residual waste for landfill 139,000 tonnes
Bulky Waste 162,000 tonnes					Residual waste for landfill 100% 162,000 tonnes
Totals 1610,000	Recyclables	Compost	Energy Recovery		Biodegradable landfill 415,000 tonnes

tonnes	373,000 tonnes	233,000 tonnes	417,000 tonnes		Total Landfill 448,000 tonnes
<p>Total Recycled and Composted 606,000 = 37.6% of MSW (41.8% of Household Waste)</p> <p>Total Recovery (Gross 417,000) = 26% of MSW</p> <p>Total Landfill (inc TRF residues) 448,000</p> <p>Biodegradable landfill 415,000 tonnes - WET permitted amount 669,000</p>					

2013 Waste arisings - 50% Non Household waste reduction with High performing residual waste treatment

Waste Arisings	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by steam sterilisation and mechanical treatment producing RDF	Residual waste Landfill
Collected Household waste (HHW) 1046,000 tonnes Recycling @35%	Separate source collection 20% 209,000 tonnes	Separate source collection and composting 15% Green Waste 157,000 tonnes	Residual waste for energy recovery 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	570,000 tonnes residual collected household waste produces RD Fuel 60% - 342,000 Recyclables 18% - 102,000 Aggregate 12% - 68,000 Residual waste landfilled 10% - 58,000 (treated non biodegradable)	Residual waste landfilled 58,000 (treated non biodegradable) 33,000 tonnes TRF residues Residual waste for landfill is 91,000 tonnes
Civic Amenity 402,000 tonnes	Soil rubble and hardcore 5% (non counting) 23,000 tonnes 382,000 tonnes Recyclables 35% 133,000 tonnes	Green Waste Composting 20% 76,000 tonnes		Assumes waste capable of treatment 25% of residual Civic Amenity waste 43,000 tonnes of residual waste produces: RD Fuel 60% - 26,000 Recyclables 18% - 8,000 Aggregate 12% - 5,000 Non bio-active landfilled 10% - 4,000	Residual waste for landfill 130,000 tonnes Non bio-active landfilled 10% - 4,000
Bulky Waste 162,000 tonnes					Residual waste for landfill 100% 162,000 tonnes
Totals	Recyclables	Compost	Energy Recovery		Biodegradable landfill

1610,000 tonnes	452,000 tonnes	233,000 tonnes	478,000 tonnes		292,000 tonnes Total Landfill 387,000 tonnes
<p>Total Recycled and Composted 685,000 = 42.5% of MSW (47.3% of Household Waste)</p> <p>Total Recovery (Gross 478,000) = 29.7% of MSW</p> <p>Total Landfill (inc TRF residues) 387,000</p> <p>Biodegradable landfill 292,000 tonnes - WET permitted amount 669,000 tonnes</p>					

2020 Waste arisings with growth reduced to zero and 50% recycling & composting of household waste with residual waste treatment by MBT

Waste Arisings Tonnes	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by MBT & production of RDF (tonnes)	Residual waste Landfill
Collected Household waste (HHW) 1,091,000 tonnes 50% recycled & composted	Separate source collection 30% 327,000 tonnes	Separate source collection and composting 15% Green Waste 163,000 tonnes 5% in vessel composted 55,000 tonnes Total 218,000 tonnes	Residual waste for energy recovery - 12.0% of collected HHW, (7.0%o MSW) 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	445,000 tonnes residual collected household waste produces loss to air & sewer 25% - 111,000 RD Fuel 50% - 223,000 Recyclables 5% - 22,000 Residual waste for landfill 20% - 89,000	MBT residues 89,000 tonnes residual collected plus 33,000 tonnes TRF residues Residual waste for landfill is 122,000 tonnes
Civic Amenity 420,000 tonnes	Soil rubble and hardcore 5% (non counting) 21,000 tonnes 399,000 tonnes Recyclables 35% 140,000 tonnes	Green Waste Composting 20% 80,000 tonnes		Assumes waste capable of treatment by MBT 25% of residual Civic Amenity waste 45,000 tonnes loss to air and sewer 25% - 11,000 RD Fuel 50% - 23,000 Recyclables 5% - 2,000 MBT residue for landfill 20% - 9,000	Total residual waste for landfill 143,000 tonnes
Bulky Waste 168,000 tonnes					Residual waste for landfill 100% 168,000 tonnes
Totals 1,679,000 tonnes	Recyclables 491,000 tonnes	Compost 298,000 tonnes	Energy Recovery 466,000 tonnes		Biodegradable landfill 400,000 tonnes Total Landfill 433,000 tonnes
Total Recycled and Composted 789,000 = 47 % of MSW (52.2% of Household Waste)					
Total Recovery (Gross 466,000) = 27.7% of MSW					
Total Landfill (inc TRF residues) 433,000					

Biodegradable landfill 400,000 tonnes - WET permitted amount 465,000 tonnes

2020 Waste arisings with growth reduced to zero, 50% recycling & composting of household waste with high performing residual waste treatment

Waste Arisings	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by steam sterilisation and mechanical treatment producing RDF	Residual waste Landfill
Collected Household waste (HHW) 1,091,000 tonnes 50% recycled & composted	Separate source collection 30% 327,000 tonnes	Separate source collection and composting 15% Green Waste 163,000 tonnes 5% in vessel composted 55,000 tonnes Total 218,000 tonnes	Residual waste for energy recovery - 12.0% of collected HHW, (7.0%o MSW) 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	445,000 tonnes residual collected household waste produces RD Fuel 60% - 267,000 Recyclables 18% - 80,000 Aggregate 12% - 53,000 Residual waste landfilled 10% - 45,000 (treated non biodegradable)	residues 45,000 tonnes residual collected plus 33,000 tonnes TRF residues Residual waste for landfill non- biodegradable 78,000 tonnes
Civic Amenity 420,000 tonnes	Soil rubble and hardcore 5% (non counting) 21,000 tonnes 399,000 tonnes Recyclables 35% 140,000 tonnes	Green Waste Composting 20% 80,000 tonnes		Assumes waste capable of treatment by SSMT 25% of residual Civic Amenity - 45,000 tonnes of residual waste produces: RD Fuel 60% - 27,000 Recyclables 18% - 8,000 Aggregate 12% - 5,000 Non bio-active landfilled 10% - 5,000	Residual waste for landfill 134,000 tonnes Non bio-active landfilled 5,000
Bulky Waste 168,000 tonnes					Residual waste for landfill 168,000 tonnes
Totals 1,679,000 tonnes	Recyclables 555,000 tonnes	Compost 298,000 tonnes	Energy Recovery 404,000 tonnes		Biodegradable landfill 302,000 tonnes Total Landfill 385,000 tonnes
Total Recycled and Composted 853,000 = 50.8% of MSW (56.4% of Household Waste) Total Recovery (Gross 404,000) = 24% of MSW Total Landfill (inc TRF residues) 385,000 Biodegradable landfill 302,000 tonnes - WET permitted amount 465,000 tonnes					

Quantities based on 2003 Waste arisings and no growth, 50% recycling and composting of household waste 2020 Targets

High performance residual waste treatment

Waste Arisings Tonnes	Recycling	Composting	Residual waste Bolton TRF	Residual waste treatment by MBT & use of RDF (tonnes)	Residual waste Landfill
Collected Household waste (HHW) 863,000 tonnes 50% recycled & composted	Separate source collection 30% 259,000 tonnes	Separate source collection & composting 15% Green Waste 129,000 tonnes 5% in vessel composted 43,000 tonnes Total 172,000 tonnes	Residual waste for energy recovery -) 110,000 tonnes Landfilled Residues 33,000 tonnes (non biodegradable)	322,000 tonnes residual collected household waste produces loss to air & sewer 25% - 80,000 RD Fuel 50% - 161,000 Recyclables 5% - 16,000 Residual waste for landfill 20% - 65,000	MBT residues 65,000 tonnes residual collected plus 33,000 tonnes TRF residues Residual waste for landfill is 98,000 tonnes
Civic Amenity 327,000 tonnes	Soil rubble and hardcore 5% (non counting) 16,000 tonnes 311,000 tonnes Recyclables 35% 109,000 tonnes	Green Waste Composting 20% 62,000 tonnes		Assumes waste capable of treatment by MBT 25% of residual Civic Amenity waste 35,000 tonnes loss to air and sewer 25% - 9,000 RD Fuel 50% - 18,000 Recyclables 5% - 2,000 MBT residues for landfill 20% - 6,000	Residual waste for landfill 111,000 tonnes
Bulky Waste 147,000 tonnes (50% reduction)					Residual waste for landfill 100% 147,000 tonnes
Totals 1,337,000 tonnes	Recyclables 386,000 tonnes	Compost 234,000 tonnes	Energy Recovery 289,000 tonnes		Biodegradable landfill 323,000 tonnes Total Landfill 356,000 tonnes
Total Recycled and Composted 620,000 = 46.4% of MSW (52% of Household Waste) Total Recovery (Gross 289,000) = 21.6% of MSW Total Landfill (inc TRF residues) 356,000 tonnes Biodegradable landfill 323,000 tonnes - WET permitted amount 465,000 (2020 Allowances) tonnes					

BPEO/Sustainability Analysis Matrix

The BPEO/Sustainability Analysis Matrix is used to compare the potential performance of each on the three potentially viable scenarios and awards a ranking of 1 to 3 against each indicator.

The weighting of each indicator does of course vary and this variation can generally only be evaluated by using professional judgement in specific cases. In some cases the evaluation showed little or no significant difference in the performance against each indicator, in which case no or reduced ranking points were awarded. Where significant differences were seen in the scenario's performance the relative ranking points were varied to reflect these differences. The matrix includes commentary on the performance of the scenarios for each question of indicator.

Most importance was placed on the four indicators: percentage of recycled and composted followed by percentage of energy recovered, direct and indirect emissions and environmental impacts, costs, proven practicality and reliability. This emphasis was determined in order to balance significant environmental indicators with deliverability of a workable solution to the choice of scenario and options.

It should be noted that BPEO assessment methodology has essentially been based on evaluation of technologies within projected scenarios. The BPEO assessment together with sustainability, business needs, risk assessment and consultation set out in this strategy document essentially inform and focus the decision making process on the key issues underpinning the choice of options. For the development and implementation of this strategy, including the specification for any tenders and contracts, it will be important to base these on prescribing the type of outputs required from the treatment process rather than a simple prescription of the process technology.

This BPEO assessment acknowledges the various tools that have been developed to aid in decision making. These include:

- Multi Criteria Assessment: A Manual, DETR February 2001;
- Best Practicable Environmental Option, SEPA September 2000;
- Guidance on Policies for Waste Management Planning, DTLR May 2002;
- WISARD (Waste Integrated Systems Assessment for Recovery and Disposal) a life cycle assessment tool, Environment Agency.
- CIWM Working Party on BPEO assessment

BPEO Analysis Matrix			
Scenario	2 Source segregated recycling and composting and in-vessel composting plus residual waste treatment by MBT and related processes with similar output specification with energy recovery from RDF	3 Source segregated recycling and composting, treating residual waste by SSMT (MBT/BMT/ and related processes) with higher output specification with energy recovery from RDF	4 Source Segregated recycling and composting plus EfW
Does the option comply with legislation and policy?	Narrowly meets long term and Landfill Directive targets.	Meets long term and Landfill Directive targets	Narrowly meets long term and Landfill Directive targets.
Ranking	2	3	2
What are the pollution impacts, including emissions which are injurious to public health, to air water and land of each option?	There are significant emissions from the biological processes that require emission controls, bio-aerosols/odours may form Spent emission control residues may be hazardous waste RDF combustion plants will have to meet Waste Incineration Directive controls	No significant emissions from sterilisation and mechanical processing. Emission controls required for RDF gasification plant that will have to meet Waste Incineration Directive controls	Waste Incineration Directive requires most stringent EU control of releases to air and water.
Ranking	3	2	2
What is the effect of each option on the built environment including the potential extent of visual and landscape Impacts? to conserve landscapes and townscapes?	Processing plant consistent with industrial manufacturing process	Processing plant consistent with industrial manufacturing process	Poor aesthetics as large-scale industrial-style plant required with chimney stack

Ranking	2	2	1
What is the effect on the local ecology?	Minimal impacts on local ecology subject to process emission controls. Biological processes present significant risk if emission controls inadequate or fail	Minimal impacts on local ecology subject to process emission controls for RDF gasification plant	Compliance with waste Incineration Directive results in minimal impacts on ecology subject to process emission controls
Ranking	2	3	3
What will be the global impact of each option i.e. the greenhouse gas impacts and quantity of emissions contribution to depletion of the ozone layer	Some concerns that if waste is not sufficiently bio-stabilised, could still produce methane when landfilled.	Relatively efficient in both recovery of recycle and energy Energy recovery – in the form of heat and/or power – can help to reduce fossil-fuel dependency, renewable CO2	Releases from combustion of the biogenic fraction of MSW are conducive with Climate Change policy. Energy recovery – in the form of heat and/or power – can help to reduce fossil-fuel dependency, renewable CO2
Ranking	1	2	2
What are the positive and negative impacts of each option on the local environment i.e. noise, odour, dust, litter and vermin also minimise local transport impacts (congestion, severance, fear and intimidation, physical damage)	Processing plant consistent with industrial manufacturing process. Deliveries of residual waste will have similar traffic impacts. Additional traffic will be generated by removal of recycle and haulage of RDF if fuel use for energy recovery is sited at a different location.	Processing plant consistent with industrial manufacturing process. Deliveries of residual waste will have similar traffic impacts. Additional traffic will be generated by removal of recycle and haulage of RDF if fuel use for energy recovery is sited at a different location.	Processing plant consistent with industrial manufacturing process. Deliveries of residual waste will have similar traffic impacts. However this scenario will have the least traffic impact for removal of small quantities of recycle and residual ash.
Ranking	2	2	3
What is the use of non-renewable resources?	RDF use could help displace virgin fossil-fuel use and assist in reducing long distance transport/import of coal Limited landfill if resulting RDF is used for energy recovery.	Net energy recovery reduces overall use of non renewable resources RDF use could help displace virgin fossil-fuel use and assist in reducing long distance transport/import of coal	Net energy recovery reduces overall use of non renewable resources

		Higher potential recyclate recovery reduces use of non renewable resources	
Ranking	2	3	1
What are the risks from accidents? (Environmental effects and health and safety)	Generic risks from failure of emission control. Safety and accident risk are subject to specific plant Health and Safety assessments and management measures.	Generic risks from failure of emission control. Safety and accident risk are subject to specific plant Health and Safety assessments and management measures.	Generic risks from failure of emission control. Safety and accident risk are subject to specific plant Health and Safety assessments and management measures.
Ranking	2	3	1
What is the total cost of each option?	Wide variation in costs (below EfW) depending on branded technology options and diverse outputs	The least cost scenario on the basis of current information projected costs (but marginally and with uncertainty)	High capital and operating costs Lack of flexibility once the commitment to EfW is made
Ranking	2	2	1
Is the project finance-able, affordable, deliverable, flexible and low risk? To ensure reliability of delivery, likelihood of planning permission being obtained (Operational flexibility/Risk in delivery)	See risk assessment Location of site and securing planning may attract significant public opposition	See risk assessment Location of site and securing planning may attract significant public opposition.	See risk assessment Public opposition to the location of the site and securing planning may be strongest of all scenarios.
Ranking	2	2	1
What are the impacts on the local economy?	Facilities may be unattractive to business neighbours if located in industrial/commercial area	Facilities may be unattractive to business neighbours if located in industrial/commercial area	EfW facilities will be unattractive to business neighbours if located in industrial/commercial area
Ranking	2	2	1
What will be the effect on local employment & diversity of skill levels?	Recovery of recyclate (additional to source segregation) and energy presents opportunities for new	Significant recovery of recyclate (additional to source segregation) and energy presents opportunities	Minimal additional recovery of recyclate but potential product uses for ash

	business and local employment	for new business and local employment	
Ranking	2	3	1
Are waste producers encouraged to take responsibility for their own waste?	Source segregation and minimisation of waste encourages producers to take responsibility for their waste.	Source segregation and minimisation of waste encourages producers to take responsibility for their waste.	Source segregation and minimisation of waste encourages producers to take responsibility for their waste. EfW may only discourage recycling and composting if oversized in capacity
Ranking	2	2	1
Will this meet with public approval?	Public largely unaware of the process technology and implications RFD more acceptable than mass burn incineration	Public largely unaware of the process technology and implications RFD more acceptable than mass burn incineration	Public opposition particularly from green pressure groups to mass burn incineration to recover energy from waste
Ranking	2	2	1
What are the implications for the welfare of local people?	Minimal impacts subject to process emission controls and effective regulation	Minimal impacts subject to process emission controls and effective regulation	This technology suffers from poor public perception with public concern over dioxins and deterioration of local air quality, however Risks to public health of exposure to pollutant releases regarded as insignificant in recent NSCA report
Ranking	Any ranking given on this indicator would suggest that operating parameters, regulation of the sites and facilities is ineffective in protecting the welfare of local people. Global impacts of process emissions are ranked under other indicators.		
Total	28	33	21

Overall Ranking Assessment

1 Source segregated recycling and composting, treating residual waste by high performance MBT or related processes with similar output specification with energy recovery from RDF (Ranking points 33).

This scenario achieves the highest rank on the basis of the highest level of potential recyclate recovery and lowest levels of emissions of the three scenarios considered.

2 Source Segregated recycling and composting and in-vessel composting plus residual waste treatment by Mechanical Biological Treatment and advanced thermal treatment of Refuse Derived Fuel, with some residual treated waste to landfill. (Ranking points 28)

Potential air emissions and spent emission control residues, together with residual landfill, reduce option ranking.

3 Source Segregated recycling and composting plus Energy recovery from Waste from mass burn incineration. (Ranking points 21).

This scenario produces the lowest ranking through its low recyclate recovery rates and poor public perception and acceptability together with high capital cost.

Risk Management Analysis

The risk management analysis set out below reviews the risks and assumptions made for the main option components of the 3 viable scenarios. This method highlights the risk and the potential management options that are available to mitigate identified risk. The potential management options also identify many of the significant considerations that must be in place in developing the implementation plan for the proposed strategy.

Source segregated recycling and composting has some significant risks in terms of delivery of targets and objectives. However, this option is included in all scenarios considered and therefore management actions will be put in place to ensure the mitigation of such risks.

EfW ranks least favourably against the other two viable scenarios in terms of BPEO assessment. Whilst EfW represents the option with the least risk in terms of proven technology, public and pressure group opposition to the establishment of any new EfW plant must be recognised as a major obstacle to the delivery of a strategy based on mass burn EfW.

Scenarios 3 and 4 produce a higher ranking than EfW in terms of BPEO and sustainability assessment. However this ranking is based on assumed and theoretical performance and outputs. There are risks in terms of their capability to deliver the assumptions made on performance and outputs (allied to this are costs). Some of these technologies are operational outside the UK but there is lack of experience with these options in the UK as a whole and specifically in dealing with residual municipal waste streams as projected by these strategy scenarios. In order to develop strategies based in scenarios 3 or 4 risk management actions will have to be taken. These actions will include; ensuring that there is comprehensive and conclusive demonstration of projected performance whilst any contracts for residual waste treatment have conditions that ensure that performance and out puts are met.

Risk Management Analysis

All Scenarios – Source segregated recycling and composting	
Proven to be effective but risks and uncertainties arise in securing high levels of participation and waste diversion with associated implications for costs	
Risk	Risk Management Options
<ul style="list-style-type: none"> • Source segregated recycling and composting of collected household waste and civic amenity waste fails to reach projected diversion rates • Public participation fails to meet projected levels 	<ul style="list-style-type: none"> • Increase investment in publicity campaigns, incentives and education to secure required participation rates • Increase or introduce minimisation, source separation and recycling and composting of commercial and “other waste” • Review waste collection and segregation systems to ensure these are in accordance with best practice.
<ul style="list-style-type: none"> • Difficulty in securing markets for recyclate and compost 	<ul style="list-style-type: none"> • Investment in market development required

Scenario 3 - Residual waste treatment by MBT with RDF and landfill	
Uncertainties over the status of the technology which is not operationally proven in the UK (design specifications are generally based on total MSW and continental European waste combine with uncertainties over the quantities and qualities of process outputs and productive end uses of product) produce a significant risk to be addressed	
Risk	Risk Management Options
Technology proven in mainland Europe with 70 plants in operation but mixed experience of attempts to develop similar technology in the UK. At least 7 different MBT processes suppliers are available, each with specific process characteristics and outputs. Different waste characteristic for Greater Manchester may result in significantly different performance and or outputs.	Full evaluation of potential MBT outputs is required from the wide range of branded technologies to ensure that the specific process selected could deliver the required outputs based on the waste characteristics of residual source separated MSW of Greater Manchester.
Implementation timescales: The status of RDF and whether this is burnt for energy recovery or landfilled could have a major impact on overall timescales, in particular if some form of energy recovery plant is co-located with the MBT plant	Implementation timescale, including securing site and permissions must be built into implementation project planning
If waste is not sufficiently bio-stabilised, potential for biological activity in residues will remain, in particular methane may be produced from these landfilled residues. Thus if MBT residues are landfilled this represents a significant investment that may only help comply with the Landfill Directive through volume reduction and residue disposal to landfill may exceed permitted landfill limitations	Select MBT process that enhances RDF production for energy recovery or alternatively select MBT that uses enhanced processes to produce more stable product (longer and more intensive processes will have significant cost implications as well as impacting on the scale of plant required)
Has significant emissions and requires emission controls, bio-aerosols/odours may form. The requirements of abatement technology could increase costs.	Biologically processed RDF combustion plants will have to meet Waste Incineration Directive controls. Spent emission control residues may be treated as hazardous waste
Difficulties in finding markets for recyclate produced	Market research and investment in market development required in advance of contract commitments
Difficulties in finding markets for RDF produced or ATT technology	Investment in market development for RDF and full evaluation of ATT (Advanced Thermal Treatment) options and implementation planning

	required to minimise risk of inadequate markets for RDF or inability to deliver recovery of energy through ATT
Costs - Capital and running costs may be higher than anticipated. Un proven technology in the UK with limited evaluation of treatment of source separated residues mean a wide envelope of uncertainty with regard to capital and operational costs may result.	Effective procurement and contract procedures will be required to ensure that costs are contained within projected budgets

Scenario 4 - Residual waste treatment SSMT/MBT or related processes with similar high performance output specification with RDF	
Uncertainties over the status of the technology which is not operationally proven in the UK (design specifications are based on total MSW) produce a significant risk to be addressed	
Risk	Risk Management Options
Technology status is not fully proven for the treatment of source separated residual MSW although an operational scale plant (combined with Gasification of RDF) is currently under evaluation in South Wales and similar type processes are also under development in the USA. Lack of available independent evaluation and assessment	Full evaluation of technical SSMT would be required to ensure that this could deliver the required outputs based on the waste characteristics of residual source separated MSW. This would include evaluation of emission controls particularly from the ATT element of the plant.
Implementation timescales: The status of RDF burnt for energy recovery could have a major impact on overall timescales, in particular if the energy recovery plant is co-located with the SSMT plant	Implementation timescale, including securing site and permissions must be built into implementation project planning
Markets for recyclate materials will require substantial development in order to make use of quantities and types of recyclate generated	Market research and investment in market development required in advance of contract commitments
Costs - Capital and running costs may be higher than anticipated. Un-proven technology in the UK with limited evaluation of treatment of source separated residues mean a wide envelope of uncertainty with regard to capital and operational costs may result.	Effective procurement and contract procedures will be required to ensure that costs are contained within projected budgets

Scenario 5- Source Segregated recycling and composting plus EfW	
Has status as proven technology; however there are significant risks in delivery of this option in terms of securing a site and planning permissions in the light of predictable public opposition.	
Risk	Risk Management Options
Has significant emissions and requires emission controls. Any future additional requirements of abatement technology could increase costs.	EfW combustion plants will have to meet Waste Incineration Directive
Implementation timescales may be protracted in the light of generic public opposition to EfW plants and could have a major impact on overall timescales	Implementation timescale, including securing a site and permissions must be built into implementation project planning
Costs - Capital and running costs may be higher than anticipated. Un-proven technology in the UK with limited evaluation of treatment of source separated residues mean a wide envelope of uncertainty with regard to capital and operational costs may result.	Effective procurement and contract procedures will be required to ensure that costs are contained within projected budgets

Evaluation of Scenarios – Business Needs Analysis

This business needs analysis is primarily focused on the practical business needs of the GMWDA and the practicality of implementing a strategy based on one of the scenarios considered in this document. It also takes into account the BPEO/sustainability assessment and risk assessment. Development of conclusions about the choice of preferred scenario is influenced by a number of factors. The factors are considered both with respect to relevant individual technical options or approaches and the scenario as a whole include

- proven performance levels and overall delivery of strategy targets for recycling, composting, recovery and bi-diversion
- operational criteria, reliability and technical suitability to local circumstances
- Capital and revenue funding options
- Capital costs of operations of short, medium and long term projections
- Costs and practicality of change
- Procurement and contract policy implications e.g. analyse market stability for recyclables, and make recommendations to reduce risks and secure long-term contracts with reprocessors
- Consideration of securing waste management sites and infrastructure including land-use planning
- public and community participation in minimisation, recycling and composting,
- Key stakeholders and partnerships and any additional players in the delivery of new waste management options together with their roles and responsibilities
- Consultation including the public as well as key stakeholders
- Risk management analysis

Rankings from the business needs evaluation

The rankings from the business needs evaluation are much closer in scoring than for the BPEO/sustainability assessment, although the ranking remains the same. This closer relative comparison of the scenarios arises principally from the status of EfW as proven technology, whilst assumptions and uncertainties remain about the MBT and thermal treatment technologies. EfW technologies are also less dependent on stakeholders and uncertain markets for recycle products.

Adding in both BPEO assessment rankings and risk assessment rankings again produces the same relative ranks although the actual score level of ranking points remain close.

Most importance was placed on the five indicators: percentage of recycled and composted followed by percentage of energy recovered, direct and indirect emissions and environmental impacts, capital and operating costs and proven practical reliability. This emphasis was determined in order to balance

significant environmental indicators with deliverability of a workable solution to the choice of scenario and options.

Overall ranking assessment

However it the conclusion of all three approaches to assessment is that Scenario 4 has the highest ranking closely followed by Scenario 3 whilst Scenario 5 is assessed as the least favoured practical option.

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Evaluation of Scenarios – Business Needs Analysis

Scenario	3 Source segregated recycling and composting and in-vessel composting plus residual waste treatment by MBT and related processes with similar output specification with energy recovery from RDF	4 Source segregated recycling and composting, treating residual waste by SSMT (MBT/BMT/ and related processes) with higher output specification similar output specification with energy recovery from RDF	5 Source Segregated recycling and composting plus EfW
Delivery of strategy targets for recycling, composting, and bi-diversion & compliance with policy and legislation	Narrowly meets long term and Landfill directive targets.	Meets long term and Landfill directive targets.	Narrowly meets long term and Landfill directive targets.
	2	3	2
Public participation rates.	Important to ensure source segregation is successful in meeting targets	Overall recycling rates can be achieved even if performance rates in source segregation fall below projections	Important to ensure source segregation is successful in meeting targets
	2	3	1
Technically proven and operational reliability	Operational in Europe but little experience in the UK although considerable interest by UK local authorities	Requires full technical development of mechanical separation and proving on residual MSW	Technically proven
	2	1	3
Costs capital, operational short, medium and long term	Capital costs and running costs are significant and typically require write off of capital investment over 20 year period	Capital costs and operational costs are significant uncertainties remain over projected operational costs and financing of investment costs	Highest cost option significant capital investment required

	2	2	1
Cost of change	Consistent with current plans for extended source segregation for recycling and composting Modular phased development possible	Consistent with current plans for extended source segregation for recycling and composting Modular phased development possible	Consistent with current plans for extended source segregation for recycling and composting
	2	2	1
Procurement and contract policy implications e.g. analyse market stability for recyclables,	Increased quantities of recyclates and compost from source segregation will require additional market development with some additional market development for recyclates from the MBT process	Increased quantities of recyclates and compost from source segregation will require additional market development with significant additional market development for recyclates from the residual waste treatment process	Increased quantities of recyclates and compost from source segregation will require additional market development. Recyclate from EfW residues should find ready markets
	1	1	3
Securing site infrastructure & land-use planning	Processing plant consistent with industrial manufacturing process	Processing plant consistent with industrial manufacturing process	Location of site and securing planning may attract significant public opposition
	3	3	1
Key stakeholders and partnerships	Public and other waste producers for source segregation, residue process providers, recyclate & compost markets	Public and other waste producers for source segregation, residue process providers, recyclate & compost markets. Partnership	Public and other waste producers for source segregation, residue process provides, recyclate & compost markets Least requirement for partnership
	2	2	3
Ranking – BPEO See table above	2	3	1
Risk management analysis	See risk management table	See risk management table	See risk management table
Ranking – Risk management	2	2	3
Totals	21	22	19

CONSULTATION REPONSES

1.0 WASTE COLLECTION AUTHORITY CONSULTATION

1.1 Visits were made to WCA's in January and February this year to discuss the strategy consultation paper following which each district submitted a response to the seventeen questions contained in the document.

1.2 Detailed below is a summary of the responses from the Districts.

Question 1 - Do you agree to undertake a review of household and non-household (especially commercial) waste in your authority, in conjunction with the WDA?

All Districts agreed to undertake a review with special mention of Commercial and Civic Amenity Site waste. The Joint Officer Group has since reached agreement across all WCA's on a revised categorisation to be introduced in October 2003 which will provide detailed management information on waste arisings by source.

Monthly statistics are now being provided by GMWDA of the tonnages being delivered to Greater Manchester Waste Limited (GMWL) facilities. From the information provided for 2003/4 to date it is clear that there is a insignificant increase in the residual waste from household collections and an increased tonnage of bulky waste arisings.

This information will be used to develop the strategy and procurement options for the future minimisation and treatments of waste by source. Furthermore it is clear that policies vary between WCA's as to the categorisation of waste between households and commercial, a review will be required to be undertaken during the next three months to identify variances.

Question 2 - An approach to waste arisings projection could be to plan for reducing Greater Manchester's waste arisings to the national average over a number of years, and then projecting a rate of growth based on Enviro's work after that. Do you agree with such an approach?

All Districts agreed with a programme to reduce arisings and it was suggested that a waste reduction target should be set. Bearing in mind the Strategy Unit proposal for a reduction to 2% by 2005 and the proposal within the North West Regional Waste Strategy to strive further towards a reduction of 1% before 2010 and 0% before 2014 across the region the Authority may wish to introduce progressive targets for waste reduction.

Question 3 - Whilst the benefits resulting from success would be considerable, waste arisings will only be reduced if policies are put in place at WDA and WCA level which would facilitate such a change,

including policies concerning commercial waste. Do you agree that, on balance, such policies are desirable?

WCA's supported the introduction of policies but recognition of local variations and the provision of suitable alternatives for trade waste disposal are requested. There is concern over fly tipping and a request to increase enforcement action across Greater Manchester.

Question 4 - Should residual waste collection frequency be reduced to fortnightly, once comprehensive recycling and composting services are put in place?

WCA's indicated that this is a local decision and would need a viable system to ensure public health implications are addressed. Authorities have indicated this would be subject to Public Consultation but in no case was the possible introduction totally ruled out.

Question 5 - Do you agree with the concept of direct 'Pay As You Throw?' Would you support a proposal for piloting it in your and other Greater Manchester authorities if Government introduced legislation allowing direct householder charging?

Most WCA's had reservations over introducing "Pay as you throw" and several said they would not. Reservations included the administration, fly-tipping, additional costs to the Council tax payer and some would prefer an incentive based scheme for recycling rather than charging.

Question 6 – There is compelling evidence that suggests that introducing penalties and incentives within CA site contracts is a key to succeeding in rapidly building recycling rates. Do you have any views on this issue?

There was support across all districts with comments relating to a preference for it to be based on partnership principles and a corresponding penalty for failure to reach targets should be included.

Question 7 - Would you support the introduction of tough new policies for controlling trade waste deposits based on UK best practice in Greater Manchester's CA sites?

All WCA's agreed with the introduction of new policies and most expressed concern though that this should be a structured approach to avoid risk of increased fly tipping.

Question 8 - Would you support the development, by the Greater Manchester authorities, of a Greater Manchester Remade market development initiative?

All Authorities supported this in principle but had reservations over the cost implications. Several considered this should be linked to existing local schemes and the introduction of green purchasing policies. All WCA's recognise that with the increased levels of recycling the development of local markets was essential.

Question 9 - *Do you think the projected recycling /composting rates adequately reflect the recycling and composting led concept? Do you think they are achievable, or unrealistic?*

All WCA's recognised they were achievable most considered them to be challenging but realistic. It was also considered that links need to be made to change public attitude and raise awareness to achieve these targets.

Question 10 - *Do you agree that biological treatment of residual waste should have a prominent place in the MWMS?*

There was considerable support for the prominence of biological treatment but concern was expressed that other options should not be excluded. Some WCA's had concerns over the locations of facilities.

Question 11 - *Do you think that energy recovery through anaerobic digestion (producing biogas) should be prioritised over biological treatments which do not produce energy?*

There was a mixed response to this question with a range of Authorities agreeing and disagreeing or reserving judgment which indicates that there are concerns over these new technologies and a lack of knowledge which needs to be addressed.

Question 12 - *What role should energy from waste have in the Strategy? Should it be restricted to particular 'clean' technologies such as anaerobic digestion? Or should all options be kept open, but decisions delayed until emerging technology has become proven?*

WCA's considered options should be kept open and requested more detailed information. One Authority considered there should be a higher prominence within the options for energy from waste.

Question 13 - *When designing and commissioning major new waste management facilities, would you support a policy of specifying equipment which conforms to the highest environmental standards available, rather than to the minimum allowed?*

WCA's agreed subject to cost benefit analysis, best practicable environmental option (BPEO) and best value considerations.

Question 14 - *Do you agree with the long term strategic option of continuing to strive for the development of a waste transportation infrastructure which minimises reliance on road haulage?*

All WCA's recognised the need to reduce road haulage but BPEO should be taken into consideration along with local traffic considerations and planning policies.

Question 15 - *Does the approach outlined above to reform the current Levy arrangements represent a position which you would like to see developed further?*

The Authority has agreed with WCA's, in principle, for the introduction of tonnage based levy systems and introduced in the current year a new arrangement. This is now subject to review and will require resolution to enable improved partnership working for future years.

Question 16 - Do you agree that a review of existing arrangements with GM Waste Ltd should be undertaken to help in establishing clearly the advantages and disadvantages of retaining a direct interest in the service delivery vehicle?

All WCA's supported a review with indications this should be independent, full and open, concurrent with best value and subject to market testing.

Question 17 - Do you agree that the range of procurement options outlined all merit further investigation and development?

There was a range of responses from the WCA's with some in full agreement and others indicating alternatives including best value principles and full and open market testing.

Since the consultation with WCA's discussions have indicated that support for a fully integrated waste contract is not supported by most Districts. The collection infrastructure is required to be kept with the WCA but there have been approaches to the Authority to undertake a wider remit of disposal for recyclable and compostable materials arising from kerbside household collection systems. This would provide a fully integrated waste disposal service with the benefits of volume being provided to all WCA's and could attract industry and employment to Greater Manchester for the reprocessing and production of recyclable products.

2.0 PUBLIC CONSULTATION

- 2.1 During the period January – July 2003 a public consultation process on the Municipal Waste Management Strategy was undertaken. The consultation involved the distribution of pre paid postage leaflets to all of Greater Manchester's households, advertisements and special features in each of the WCA's civic reviews. The public consultation was also publicised through the WCA local press, area committees, websites, road shows and community forums.
- 2.2 The closing date for the consultation was 31st July 2003 and by then 11,748 responses had been received. In marketing terms this is considered to be a good response rate.
- 2.3 Detailed below are the results illustrated in percentage terms for each of the questions and information on the implications of the response.

Question One - Do you agree with the proposed recycling and composting led approach?

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
74.28	23.03	1.52	0.34	0.39	0.44	100	11196

97.31% of those questioned agree or strongly agree with a recycling and composting led approach. Less than 1% of people disagreed with this approach which is encouraging for future recycling and composting services.

Question Two (a) - Are you willing to:

Reduce the amount of rubbish which you create, e.g., buying products with less packaging, using refills, reusing paper as scrap?

Already Do So	Very Willing	Willing	Not Sure	Unwilling	Not able to	%age total	Total number of respondents to question
53.76	26.54	14.67	3.5	0.6	0.9	100	11391

53.76% of those questioned feel that they already reduce the amount of rubbish they produce whenever they can which is very encouraging as it is far higher than envisaged.

41.21% stated they would be very willing or willing to reduce the amount of rubbish they create.

Only 0.6 % felt they were unwilling to reduce the amount of waste they create.

Question Two (b) - Are you willing to:

Compost grass, hedge clippings, vegetable peelings in your own garden?

Already Do So	Very Willing	Willing	Not Sure	Unwilling	Not able to	%age total	Total number of respondents to question
41.69	22.92	12.18	6.85	3.13	13.23	100	11185

41.69% of respondents claim to already compost in their own gardens.

35.1% would be very willing or willing to do so which would indicate that there is a considerable market still available for home composting.

Only 3.13% are unwilling to compost.

13.23% were not able to do so and it is assumed that these householders were either in flats or did not have gardens.

Question Two (c) - Are you willing to:

Separate out your recycling, e.g., newspapers, glass, cans and plastic so that it can be picked up at the doorstep by your Council.

Already Do So	Very Willing	Willing	Not Sure	Unwilling	Not able to	%age total	Total number of respondents to question
31.46	53.31	11.06	1.76	1.02	1.39	100	11346

31.46% stated that they already use a doorstep Council recycling service.

64.37% of respondent state that they would be very willing or willing to use a doorstep service if offered by their Local Authority which is very encouraging for the new kerbside recycling services being introduced.

Only 1.02% are unwilling to use doorstep service.

Potentially therefore 98% of all households could eventually be participating in doorstep collections.

Question Two (d) - Are you willing to:

Separate out your recycling ie, newspapers, glass, cans and plastic and take it yourself to a Bring bank or Local Civic Amenity Site.

Already Do So	Very Willing	Willing	Not Sure	Unwilling	Not able to	%age total	Total number of respondents to question
49.74	10.31	10.56	8.73	6.87	13.79	100	11113

49.74% of respondents claim to be utilising the bring bank and Civic amenity site facilities already to dispose of their recycling.

20.87% would be very willing or willing to use the “bring” facilities

13.79% are not able to use “bring” facilities.

6.87% are unwilling to separate their waste and take to a bring bank or CA site.

Question Three (a) – When recycling services improve my Council should look at reducing the number of collections of residual waste?

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
19.21	32.43	15.97	20.78	8.47	3.14	100	11373

51.64% have strongly agreed or agreed that Council’s should consider reducing the number of residual collections when recycling services have been improved.

29.25% strongly disagreed or disagreed with this approach.

19.11% neither agree or disagree or don’t know.

This would suggest that when introducing such a scheme education prior to the change and awareness of waste costs will be essential.

Question Three (b) - When recycling services have improved my Council should look at introducing “Pay as you throw” charging or rewards

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
19.20	27.02	15.66	19.49	13.31	5.32	100	11331

46% of those questioned think Council's should look at introducing a “Pay as you throw” or reward initiatives.

32.8% strongly disagreed or disagreed with this proposed initiative.

This indicates that it will be difficult to introduce a charging or reward scheme.

Question Three (c) - Tougher measures should be introduced to stop traders from using Civic Amenity Sites provided for householders only.

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
54.48	28.22	8.61	4.09	2.17	2.43	100	11545

82.7% strongly agree or agree with tougher measures being introduced at Civic amenity sites.

6.26% strongly disagreed or disagreed with tougher measures being introduced.

This indicates a high level of support for introducing tougher measures.

Question Four (a) – After maximising recycling I would support the development of the following new facilities in Greater Manchester for the treatment of the rest of my rubbish:

Material Reclamation Plants (MRF'S)

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
59.96	33.30	3.46	0.49	0.24	2.55	100	11237

93.26% would strongly agree or agree with the development of MRF facilities after the maximisation of recycling.

0.73 would strongly disagree or disagree with these facilities.

This is very encouraging and supports future investment for recycling.

Question Four (b) – After maximising recycling I would support the development of the following new facilities in Greater Manchester for the treatment of the rest of my rubbish:

Composting Plants

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
60.09	32.95	3.79	0.57	0.29	2.31	100	11244

93.04% strongly agreed or agreed with the development of composting plants after recycling had been maximised.

0.86% had a disagree or strongly disagree opinion with regards to the establishment of composting plants.

This indicates a high level of awareness of waste issues and should assist when introducing new facilities.

Question Four (c) – After maximising recycling I would support the development of the following new facilities in Greater Manchester for the treatment of the rest of my rubbish:

Bio Mechanical Treatment Plants

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
52.73	32.77	7.06	1.10	0.59	5.75	100	11111

85.5% strongly agree or agree with the introduction of Biomechanical treatment plant after recycling has been maximised.

1.69% strongly disagreed or disagreed with this option.

There are a high number of people neither agree/disagree or don't know which indicates a lack of knowledge with regards to this treatment method.

Question Four (d) – After maximising recycling I would support the development of the following new facilities in Greater Manchester for the treatment of the rest of my rubbish:

Incinerators

Strongly Agree	Agree	Neither agree or disagree	Strongly Disagree	Disagree	Don't know	%age Total	Total Number of Respondents to Question
40.20	30.05	10.56	7.50	5.50	6.19	100	11153

70.25% strongly agreed or agreed with an incineration option after recycling had been maximised.

13% strongly disagreed or disagreed with incineration as an option.

This result indicates that there would be support after maximising recycling for incineration facilities.

3.0 EXTERNAL ORGANISATION AND OTHER BODIES

3.1 There have been various responses from organisations, other Authorities and individuals. A summary of the key points is detailed below:

North West Regional Assembly - A response has been received from the NWRA. The document is a report that went to their Planning, Environment and Transportation Key Priority Group on 13th March 2003, it advises the consultation paper is an informative document and highlights where the suggested strategy is weakest is in providing no mechanisms to deliver facilities if participation rates are below expectations and growth rates exceed those predicted.

The only additional main comments not highlighted previously in this report by WCA's is the NWRA considers the date of 2013 is far too late to determine where the new thermal facilities will be needed and delivered through the planning system to make any contribution to the life of the strategy. They suggest the decision needs to be made in the next three years.

3.2 North West Waste Forum – The forum suggests there is a need for an action plan with specific targets for minimising waste together with developments in recycling and composting infrastructure. The forum suggests the recycling and composting target is a very conservative estimate and would look to increasing this to 60% for 2020 and bringing forward the target of 46% to 2012.

The forum supports suggestions about the potential to create “reuse and recycling waste exchange centres” in the place of CA sites and recommend extending the targets to 80% by 2015.

3.3 Friends of the Earth - FOE have expressed in the main opposition to incineration and supports the North West Forum 60% recycling and composting target together with zero waste growth.

3.4 Individual letters and correspondents raised similar points as the aforementioned, several though have requested the improvement of collection services to their areas and are critical of the overflowing bring bank facilities.

3.5 Greater Manchester Waste Limited – GMWL have responded to the seventeen questions and the response is considered to be in line with the opinions of the WCA's.

GMWDA

14 May 2004

ⁱ The Scenarios in this analysis use output performance data from; W. MÜLLER, H. BULSON." Does MBT aid compliance with EU and UK waste reduction and facilitate low environmental impact landfills?"; Dr C Coggins, "Conversion Technology, Future Vision", Resource publication Jan-Feb 2003; Dr Stuart RB McLanaghan, "Delivering the Landfill Directive: The role of new and emerging technologies" November 2002: Juniper Technology Reviews "Mechanical Biological Treatment Systems" 2002.