

A REPORT BY ENVIROS CONSULTING LIMITED: JULY 2006

**EAST MIDLANDS REGIONAL
ASSEMBLY**

**STUDY TO DETERMINE THE CURRENT AND FUTURE
TREATMENT CAPACITY OF THE EAST MIDLANDS
REGION: PHASE 2**



Publication title Study to Determine the Current and Future Waste Treatment Capacity of the East Midlands Region
CAN EA0650001
Volume number Volume 1 of 1
Version Report
Date July 2006
File Reference Phase 2 Report Final Mar05.Doc

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1. LEGISLATION REVIEW

EXECUTIVE SUMMARY

In April 2004, the East Midlands Region Assembly commissioned Enviro Consulting Ltd to undertake a study into the current and future waste treatment capacity of the East Midlands Region.

To assess the treatment capacity required forecasts of waste arisings were made and using legislative and other drivers an estimation of the likely capacity required in future to manage the waste from the East Midlands was made and compared to existing treatment capacity determined in Phase I of the study.

Waste arising forecasts were made for Municipal Solid Waste (MSW), Commercial and Industrial (C&I) Waste, Construction and Demolition (C&D) Waste and Special (Hazardous) Waste. These forecasts are summarised below giving an upper and lower limit to the range forecasted.

		000s Tonnes				
		2004	2006	2010	2015	2020
MSW	Upper	2,594	2,762	3,131	3,663	4,285
	Lower	2,485	2,535	2,639	2,774	2,917
C&I	Upper	8,803	9,212	10,090	11,415	12,916
	Lower	7,788	7,838	7,788	7,753	7,507
C&D	Upper	12,207	12,925	14,491	16,718	19,846
	Lower	11,682	12,035	12,524	13,163	13,163
Special	NA	271	271	271	271	271
Total	Upper	23,874	25,170	27,983	32,067	36,758
	Lower	22,227	22,680	23,222	23,961	23,858

Capacity estimates were calculated based on for example, legislation. The extent to the legislation varies by waste stream for example for MSW this is comprehensive, with statutory requirements for recycling, and diversion of waste from landfill, whereas for C&I and C&D waste there are few drivers for the current situation to change making future requirements difficult to predict. For each of the waste streams considered, treatment capacity required was then compared to current capacity taken from Phase I of the study and estimation, where appropriate, of the likely number of facilities required was made. As with the waste and capacity forecasts the facility numbers were represented as a range of possible facilities.

In Chapter 5 & 6 estimates of future capacity requirements were made for the upper estimate of waste arising for each of the waste streams.

In Chapter 7 estimates of future capacity, capacity requirements and adequacy of current capacity based on the lower limit - RPG scenario using waste growth projections in line with the statements in the RPG about Regional Waste Strategy.

1. INTRODUCTION

In April 2004, the East Midlands Region Assembly commissioned Enviros Consulting Ltd to undertake a study into the current and future waste treatment capacity of the East Midlands Region.

The objectives of this study were to:

- ◆ Establish the number, location and capacity of existing waste treatment facilities; and
- ◆ Establish the scale of and sub-regional need for facilities that may be required in the region to manage waste, taking account of current and future legislation, recycling and waste diversion targets and waste growth.

This report covers the second objective of estimating the future waste treatment capacity for the region's waste.

The approach to the study was to assess six elements to provide as broad a picture of future capacity needs as possible. Those elements were:

- ◆ Legislative context – what legislative drivers are likely to affect the waste treatment capacity need;
- ◆ Waste forecasting – to provide a range of possible waste arising estimates for different waste streams;
- ◆ Current treatment capacity – using the results from Phase I of the study;
- ◆ Capacity requirements – combine the waste arising estimates with the likely treatment required;
- ◆ Adequacy of current facilities – compare the current capacity estimates to estimated future requirements; and
- ◆ Consider the planning and site location considerations for waste management facilities.

Although this is a comprehensive approach to planning for future waste management requirements there are a number of factors which limit the detail which can be given to areas of the study:

- ◆ Waste data used for arising forecasts is poor in many areas such as C&D and C&I waste;
- ◆ Although there are aspirations nationally to reduce material going to landfill and increase recovery and recycling there are not always the necessary drivers in place to make these changes happen, making prediction of future capacity requirements difficult.

This study follows on from work already carried out for the East Midlands Regional Assembly, 'Development of a Regional Waste Strategy for the East Midlands – Final Technical Report'. It should be noted that in order not to under estimate waste capacity needs, this study has taken a pessimistic view looking at the worst case scenario. This leads to waste arising forecasts in excess of those provided in



the Technical Report. However, where appropriate, a range of arising forecasts, capacities and facility numbers have been used.

In addition to the forecasts made here, the capacity requirements have been estimated using the favoured scenario from the Technical report which has been adapted for use in the Regional Planning Guidance (RPG) for the East Midlands. This scenario takes the lower projection and applies the capacity needs based on those waste forecasts and the recycling targets set out in the RPG.

2. LEGISLATIVE CONTEXT

This section summarises the potential impact on waste generation and treatment capacity of waste focussed legislation, for the East Midlands. The requirements of the legislation are covered in greater detail in Appendix 1.

2.1 The Waste Framework Directive

The Waste Framework Directive provides the foundation for waste management legislation in Europe. Although it does not have a direct effect on the waste generation or treatment capacity in the East Midlands it establishes the general rules from which further legislation is built.

2.2 The Landfill Directive

The Landfill Directive aims to improve waste management practices with regard to landfill. Provisions in the Directive will have a variety of impacts in the East Midlands, summarised below:

- ◆ Reduction in biodegradable municipal waste sent to landfill – local authorities will have to provide adequate treatment capacity to divert biodegradable waste from landfill;
- ◆ Ban of tyres, hazardous liquids and flammable, corrosive, explosive, oxidising and infectious wastes – other forms of treatment and disposal will be required for these waste types; and
- ◆ Requirement for pre-treatment – this will increase the cost of disposal and lead to an increase in required treatment capacity.

2.3 The Landfill Allowance Trading Scheme

In order for UK to meet its biodegradable municipal waste (BMW) diversion targets set out in the Landfill Directive. To ensure these national targets are met the Government has set targets for each Waste Disposal Authority (WDA). Through the Waste and Emissions Trading Act (WETA), each WDA will be allocated an allowance of BMW that it is permitted to dispose of to landfill in each year between 1st April 2005 and 2020.

2.4 Landfill Tax

The cost of landfill tax has been increasing annually with the current objective that the tax will reach £35 per tonne for non-inert waste in the medium term. The increasing cost of landfill should result in more waste being diverted from landfill to different disposal / treatment facilities, increasing pressure on the amount of treatment capacity required.

2.5 The Special Waste Regulations

The change in the legislation to introduce the Hazardous Waste Regulations and bring in the revised European Waste Catalogue (EWC) will cause an increase in the quantity of material which will be classified as Hazardous (currently termed special waste).

In addition to this the requirement to pre-treat hazardous wastes before landfill will lead to an increased requirement for treatment capacity of the hazardous waste produced in the East Midlands. Although this capacity may not necessarily be located in the East Midlands, as hazardous waste facilities could be developed at a national level. It is likely that solidification and stabilisation facilities will be developed near areas of production or disposal.

2.6 Producer Responsibility (Packaging Waste)

The aim of these regulations is to ensure that producers of packaging materials reduce the amount of packaging waste and maximising the recovery of packaging materials, by setting recovery and recycling targets for packaging wastes.

An increase in the recycling targets on a national level is likely to have a two fold impact on waste management in the East Midlands. Firstly there will be an increased need for reprocessing capacity and this may be coupled with an increase in the need for collection of post-consumer packaging waste from households.

2.7 Waste Electrical and Electronic Equipment (WEEE) Directive

The WEEE Directive aims to prevent WEEE arising, to encourage reuse, recycling and recovery of WEEE and to improve the environmental performance of all operators involved in the lifecycle of electrical and electronic equipment, especially those dealing with WEEE.

The regulations will mean a larger volume of WEEE requires collection, storage treatment and recovery.

2.8 End of Life Vehicles Directive

Owners must be able to have their complete ELVs accepted by collection systems free of charge, even when they have a negative value, from 1 January 2007 at the latest (earlier in respect of vehicles put on the market on or after 1 July 2002). This has implications for the ELV recovery network which will need to have the capacity to accept, store and treat the ELVs. The legislation also contains targets for the recycling of certain materials from End of Life Vehicles.

2.9 Ozone Depleting Substances Regulation

European Council Regulation No. 2037/2000 on substances that deplete the ozone layer, which came into effect in October 2001, requires Member States to remove ozone depleting substances (ODS) (including CFCs and HCFCs) from refrigeration equipment before such appliances are scrapped. This requirement came into force immediately for industrial and commercial appliances and applied to domestic appliances from 1 January 2002. The introduction of these regulations result in the development of treatment capacity to remove ozone from refrigeration equipment and it is considered unlikely that this treatment capacity will expand significantly in the future.

2.10 Other Influences

2.10.1 Municipal/Household Waste Recovery and Recycling Targets

The Waste Strategy 2000 contains a number of recycling and recovery targets for municipal and household waste:

- ◆ To recover 40% of municipal waste, at least 30% through recycling or composting by 2010;
- ◆ To recover value from two thirds of municipal waste, at least half of which should be through recycling or composting.

In order for England to achieve the recycling targets set out in the Waste Strategy 2000 each authority has been given statutory recycling performance standards to meet, one was set for the year 2003/04 and the next target is set for 2005/06.

Increases in recycling activity are likely to lead to an increase in required capacity. Materials collected separately (either via kerbside sorting techniques or through Civic Amenity and Bring sites) are likely to need bulking and those collected 'co-mingled' from the kerbside will need the provision of Materials Recycling Facilities (MRF).

2.10.2 Aggregates Levy

The Aggregates Levy was introduced in April 2002 to stimulate a reduction in the impact that aggregates extraction has on the environment. Those extracting primary aggregates from land or dredging sand from the sea within 12 miles of the coast must pay a tax of £1.60 per tonne of materials extracted.

The Aggregates Levy is likely to increase aggregates recycling facilities as companies (including primary aggregates producers) seek to re-use and recycling waste construction materials.

3. FORECASTING WASTE ARISING

This section describes the methodology by which future waste arisings for each of the waste streams has been forecasted up to the year 2021. The forecasts constructed aim to present a realistic, yet precautionary projection in order that future waste treatment capacity is not under estimated and continued effective development of a regional waste strategy can take place.

Work has already been carried out for the East Midlands Regional Technical Advisory Body (RTAB)¹ which contained waste forecasts. However, some of the methods and data used in this study differs from those used previously, so where appropriate the waste growth has been compared to the models used in the earlier study. The earlier report is referred to as the Technical Report in this study.

The waste streams considered in this report are:

- ◆ Municipal Solid Waste (MSW)
- ◆ Commercial and Industrial (C&I) Waste
- ◆ Construction and Demolition (C&D) Waste
- ◆ Special Waste

For each of the waste streams listed above and where appropriate, a range of potential waste growth scenarios were considered. It was decided that for the purposes of predicting future waste capacity requirements it would be better to over- rather than under-estimate the requirements. For this reason a precautionary approach has been taken and the upper limit estimated for each waste stream has been used for predicting capacity requirements.

In addition to the precautionary approach the lower waste projection, which is in line with that used in the RPG scenario, has been used for estimating future capacity requirements.

3.1 Municipal Solid Waste (MSW)

Forecasting MSW arisings can be complex, not least due to the inclusion of non-household waste in the MSW stream. When looking at this commercial waste element its generation and characteristics are similar to that for C&I waste. However, the nature by which it is collected and reported, such as the number of commercial properties being collected from can have a significant bearing on the quantity included within MSW.

This problem becomes particularly apparent when looking at data for the East Midlands as, since 1996, non-household MSW has grown almost four fold². (i.e. from 57,000 tonnes in 1996 to 222,000 tonnes in 2002/03, which is equivalent to an annual growth of 25%). This leads to two options for MSW projections with differing results:

- ◆ Projecting Household and non-household waste separately and making assumptions about how each may behave, or

¹ Development of a Regional Waste Strategy for the East Midlands – Final Technical Report, Land Use Consultants and SLR Consulting, January 2003

² Data taken from Municipal Waste Management Survey 2002/03, Defra

- ◆ Projecting MSW in total and making assumptions about how the entire waste stream will behave.

The Technical Report produced for EMRA chose to take the latter approach and therefore for the purposes of this study both scenarios have been considered so looking at each component of MSW (household and non-household) separately and as a single stream.

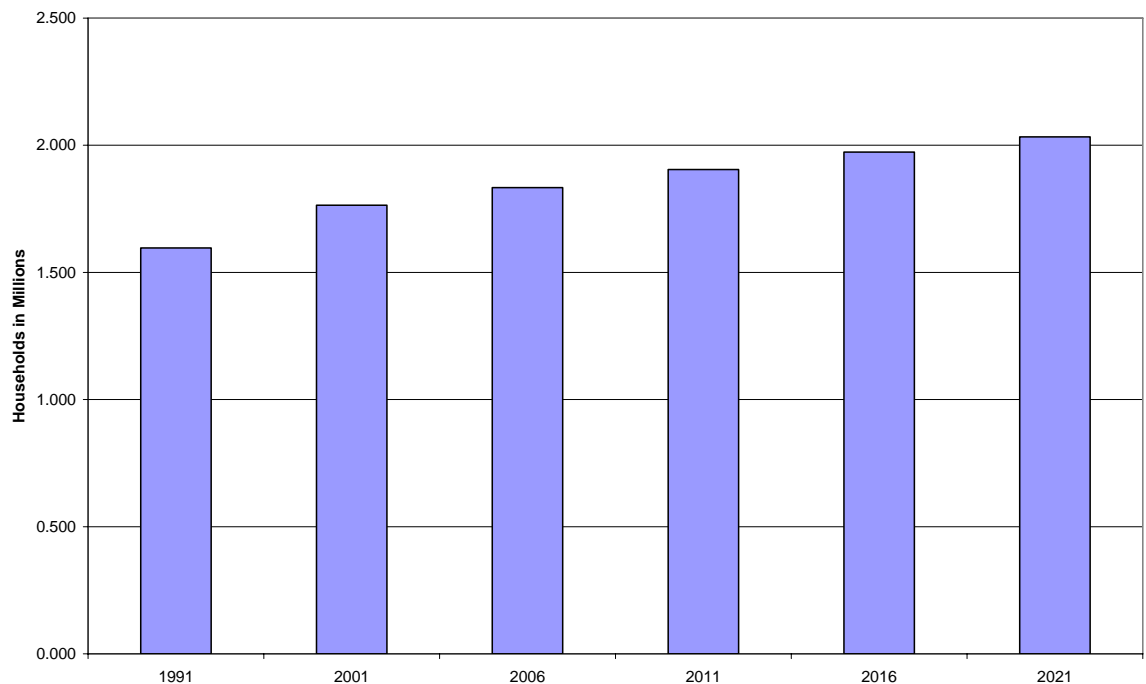
3.1.1 Non-household MSW

As non-household MSW generation is considered likely to behave similar to C&I waste arisings and it is unlikely that a 25% growth rate seen historically will continue, it has been assumed that the increase in waste arising can be linked to growth in GDP (see section 3.2 below). This leads to a compound annual growth rate for the forecast of 2.47%.

3.1.2 Household Waste

There is no widely used methodology for forecasting changes in waste growth per household. Household waste growth is influenced by a number of factors including changes in consumer spending, behavioural change and changes in waste management services. As no robust methodology exists, in this instance the waste per household has been held constant at today's rate providing a minimum arising without significant minimisation of waste per household. Household waste growth is then solely linked to growth in the number of households across the region³.

Figure 1 Growth in Household Numbers



³ Household projections taken from Projections of Households in England to 2021 (Based on 1996 data), DTLR, 1999

Parfitt (2002) notes that household waste growth rate is dependant on demographic changes, including change in household size and rate of new household formation, amongst other drivers⁴. This appears consistent with the approach being employed in this study. Figure 1 above shows the projected growth in household numbers for the East Midlands which gives a compound growth rate of 0.77%.

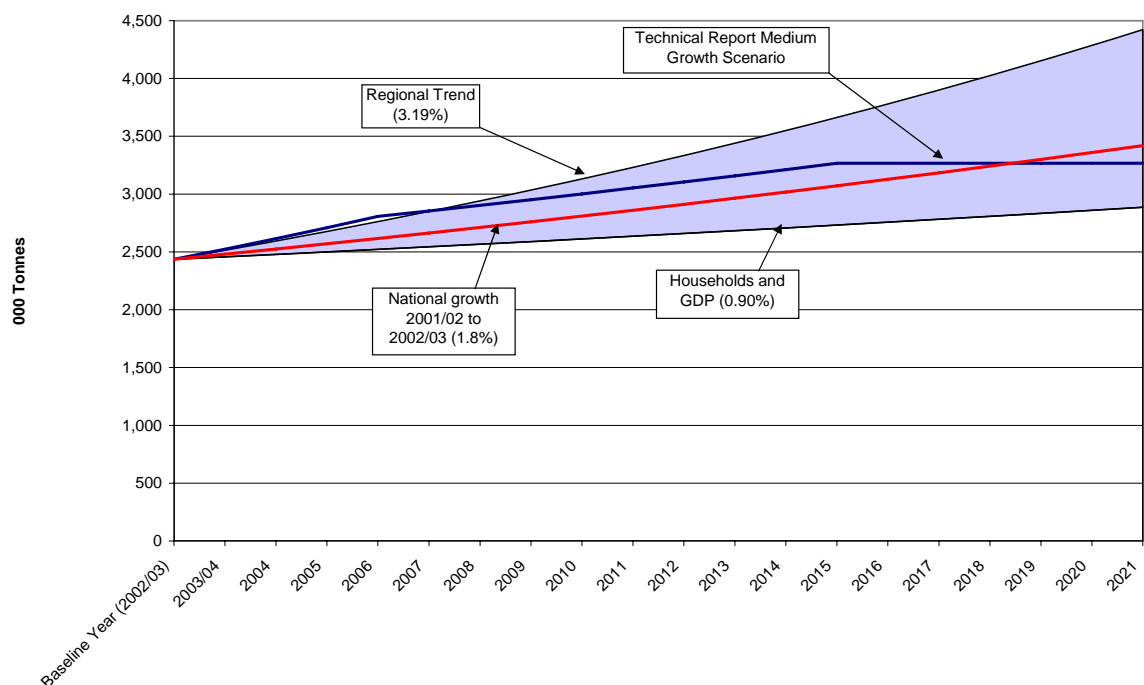
Both the household and non-household MSW projections were then summed to provide a projection for the total MSW in the East Midlands

3.1.3 Total MSW Projections

Projections based on four forecasting methods have been assessed:

- ◆ Separate projections as described in Section 3.1.2 (compound growth of 0.9%);
- ◆ Regional Trend in MSW as a whole over the past 6 years (compound growth of 3.19%);
- ◆ Technical Report Medium Scenario (3.6% until 2006, 1.7% until 2015 and zero waste growth from 2015 leading to a compound growth of 1.56%);
- ◆ The national waste growth in MSW between 2001/02 and 2002/03 (1.8%).

Figure 2 MSW Projections



The forecasts shown in Figure 2 above provide a range of likely MSW arising in the East Midlands which have been summarised below in Table 1. When assessing which growth rates to assume, the data from the Municipal Waste Management Survey 2002/03 was used to look at the difference in growth rates for the East Midlands across a range of time periods. This showed that growth rates of MSW

4 Analysis of Household Waste Composition and Factors Driving Waste Increases, Parfitt, 2002

when looking back at data over 2 to 6 years were all around 3% (i.e. no major anomalies in the data) and so the growth over the longest period possible was used (3.19%).

Table 1 Range of likely MSW arising in East Midlands

	000s Tonnes		
	Baseline 2002/03	2010	2020
Upper limit	2,436	3,131	4,285
Lower limit	2,436	2,639	2,917
Value used	2,436	3,131	4,285

The forecast used for the estimation of treatment capacity required is the least optimistic regional trend as this represents the worst case i.e. most capacity possibly needed in the East Midlands. This approach ties in with Phase I where estimates of current treatment capacity were estimated to provide the minimum likely capacity, i.e. the worst case.

3.2 Commercial and Industrial Waste (C&I)

Growth in commercial and industrial waste is influenced by two main factors:

- ◆ The output from industry and commerce in the region;
- ◆ Waste disposal into another stream.

There is a general lack of historical data for C&I waste across the UK making the establishment of historical growth trends impossible. The Environment Agency undertook a national survey of waste production in 1999⁵ and are currently compiling the data from a second national survey, the results from which will not be available until Spring 2005. There has been discussion on a European level about decoupling waste growth from economic development (rising GDP) however at present we believe this still to be the best indicator.

The target growth in GDP for the East Midlands⁶ has been used in this study to forecast C&I waste arisings. This forecast has also been compared with those undertaken for the Technical Report prepared for EMRA. The Technical Report suggests that linking C&I waste growth to GDP cannot be conclusively proved and that national and European policy and legislation and declining industrial activity will serve to reduce industrial waste over time. In addition commercial waste growth has been likened to that of MSW (described in section 3.1.3 above). It is suggested here that any increase in commercial and industrial activity, represented by GDP growth, will have a corresponding increase in waste arising from the C&I stream as a whole.

Table 2 below shows the target growth rates in GDP taken from the Regional Economic Strategy.

Table 2 GDP Growth Rate Targets

Average growth between 1992 and 1999	2.15%
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⁵ The National Waste Production Survey, Environment Agency, 1999/2000

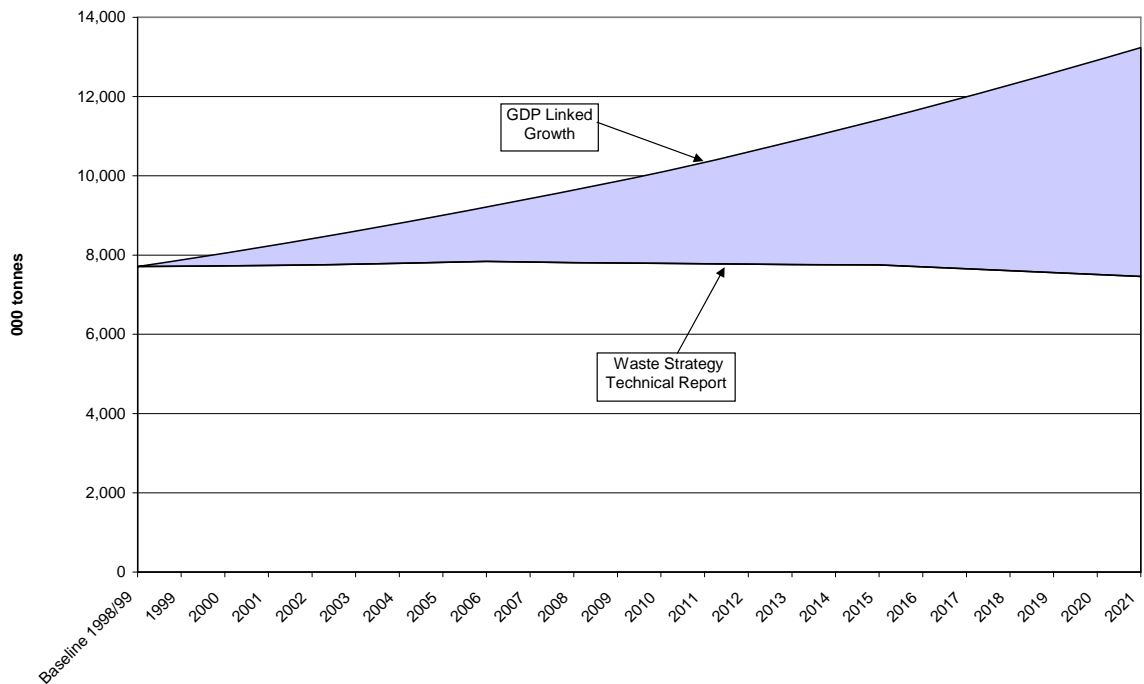
⁶ Destination 2010, East Midlands Development Agency, 2003

Increase in GDP between 2001 and 2005	2.30%
Increase in GDP between 2005 and 2010	2.50%

Figure 3 shows a comparison of the waste forecasts used for this study and that undertaken for the Technical Report. The difference is marked and the estimate used in this study incorporates the precautionary approach (over rather than under-estimating) whereas the Technical Report forecasts using the following model:

- ◆ Towards zero industrial waste with a 1% reduction year on year;
- ◆ A declining growth rate for commercial waste in line with that used for MSW (described in section 3.1.3 above).

Figure 3 C&I Waste Projections



Using the GDP linked growth by 2021 C&I waste arisings could reach levels of up to 13 million tonnes per annum.

As with MSW, the projections shown here provide a range of likely C&I waste arising in the East Midlands which are summarised in Table 3 below,

Table 3 Summary of likely C&I waste arising in the East Midlands

	000s Tonnes		
	Baseline 1998	2010	2020
Upper limit	7,714	10,090	12,916
Lower limit	7,714	7,788	7,507
Value used	7,714	10,090	12,916

As discussed previously for MSW, a pessimistic approach has been taken for the estimation of treatment capacity required in the future; using the figures from GDP linked growth.

3.3 Construction and Demolition Waste (C&D)

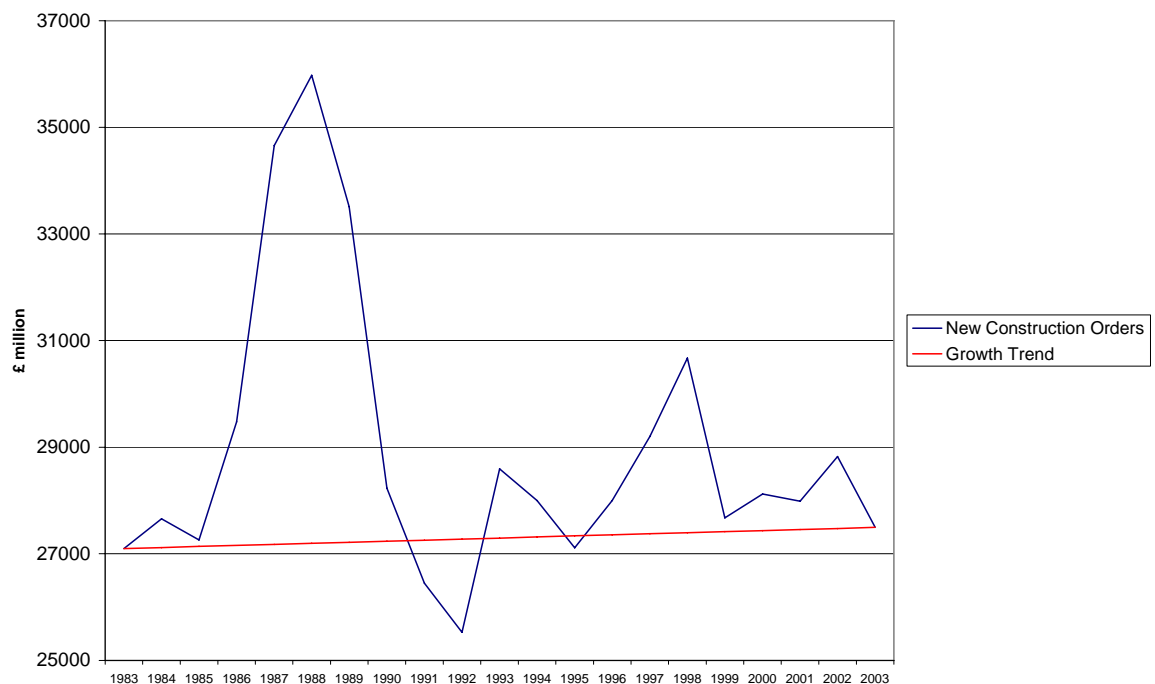
Construction and demolition waste arisings will vary according to a number of factors including:

- ◆ Working practices at construction and demolition sites; and
- ◆ Location of construction and demolition activity;
- ◆ Growth in construction and demolition activity.

As with C&I waste there is a lack of good historical data for C&D waste. In addition no sector specific GDP projections for the construction and demolition sector have been found. One way of representing the change in C&D activity is through statistics which are held by the government on new construction orders at constant prices (currently 2000 prices)⁷. This method varies from that used in the Technical Report so, as before, a comparison has been made.

Time series data for the UK on new construction orders is available from 1983 to 2003 and has been used to calculate a compound growth rate. Although growth in new construction orders fluctuates a general increasing trend can be seen from the data and as such a growth rate derived from the entire data set (20 years) of 0.1%, see Figure 4 below.

Figure 4 Growth in New Construction Orders, 1983 to 2003

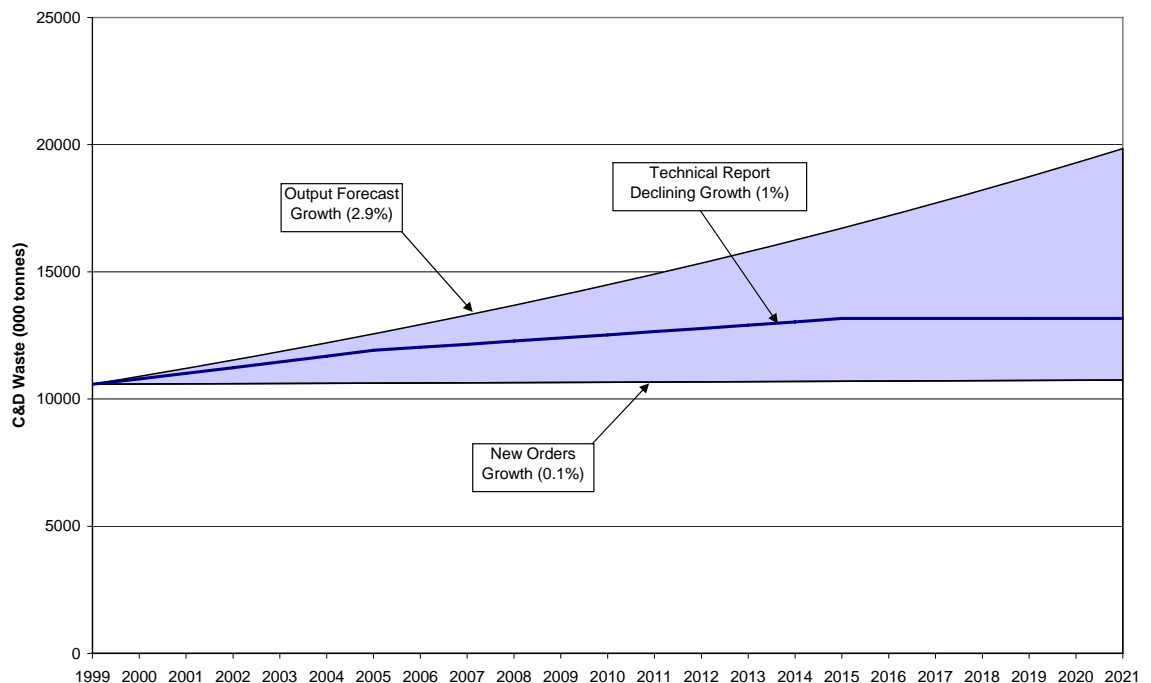


⁷ <http://www.dti.gov.uk/construction/stats/orders.htm>

Possibly a more representative indicator of C&D waste growth is the growth in construction output. A CITB (Construction Industry Training Board) report in 2002⁸ suggests that in the medium term (to 2006) total construction output in the East Midlands will grow at a rate of 2.9% per year.

Growth in total construction output has been included along with historical growth in new orders and the declining growth scenario used for forecasting C&D waste in the Technical Report (declining growth as used for C&I waste, 2% until 2006, 1% until 2015 and zero growth thereafter). Figure 5 shows a comparison of the projections considered.

Figure 5 C&D Waste Projections



Despite a number of factors which may serve to minimise waste from C&D activity cited in the Technical Report such as national waste policy and technology improvements, it is considered that increases in construction and demolition activity will lead to an increase in waste arising. As such, and to take a precautionary view of future treatment requirements, linking growth in waste to forecasted construction output is used in this study for estimating treatment requirements. The graph above shows a range of waste projections (with the construction output linked growth being the upper limit) and as the data on new construction orders is somewhat erratic the Technical Report projection has been used as the lower limit for waste arising, show below in Table 4.

It should be noted that although the Technical Report projection assumptions have been used here, the baseline data to which those assumptions were applied are different from those in the Technical Report. Data from Symonds⁹ was used in this study rather than that in the EA Strategic Waste Management Assessment. The

8 Construction Regional Skills Foresight Report 2002, CITB

9 Survey of Arisings and Use of Construction, Demolition and Excavation Waste as Aggregate in England in 2003, Capita Symonds Ltd, October 2004

data used here provides estimates of C&D waste which are some 4 million tonnes higher than that in the SWMA.

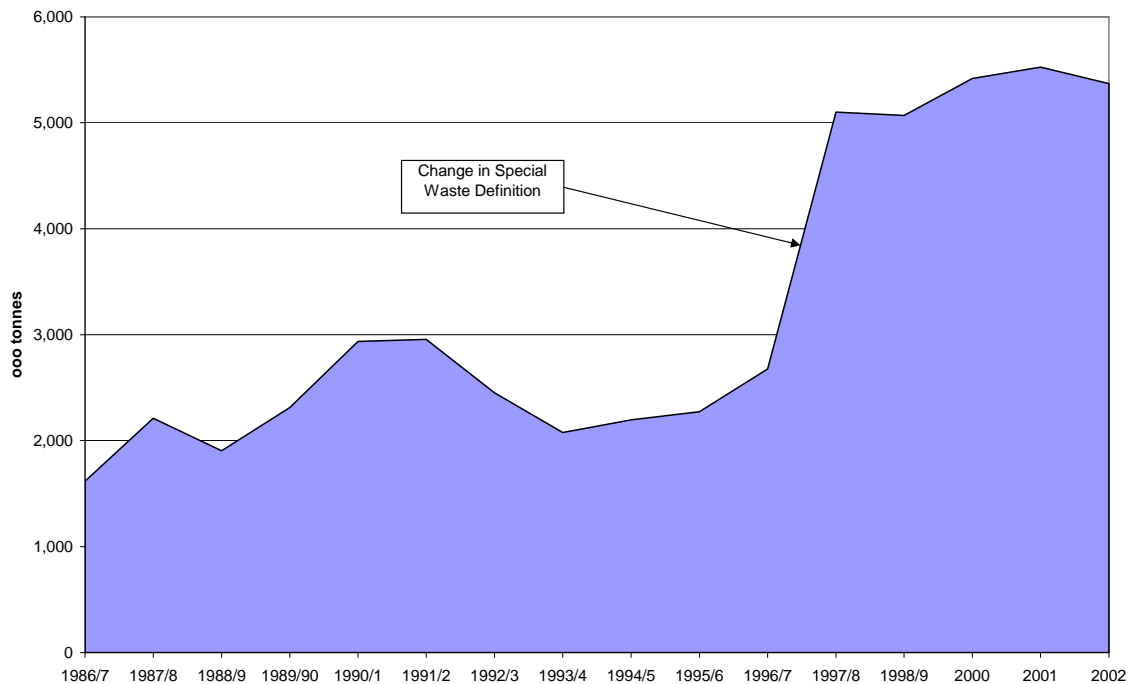
Table 4 Summary of likely C&D waste arising in the East Midlands

	000s Tonnes		
	Baseline 1999	2010	2020
Upper limit	10,581	14,491	19,846
Lower limit	10,581	12,524	13,163
Values used	10,581	14,491	19,846

3.4 Special (Hazardous) Waste

Historical trends in special waste arisings across the UK show that overall arising remains relatively constant from year to year, although the quantity doubled between 1996 and 1997 due to a change in definition of special waste in England, Wales and Scotland.

Figure 6 Historical trend in special waste arising in the UK



Source: Defra waste statistics

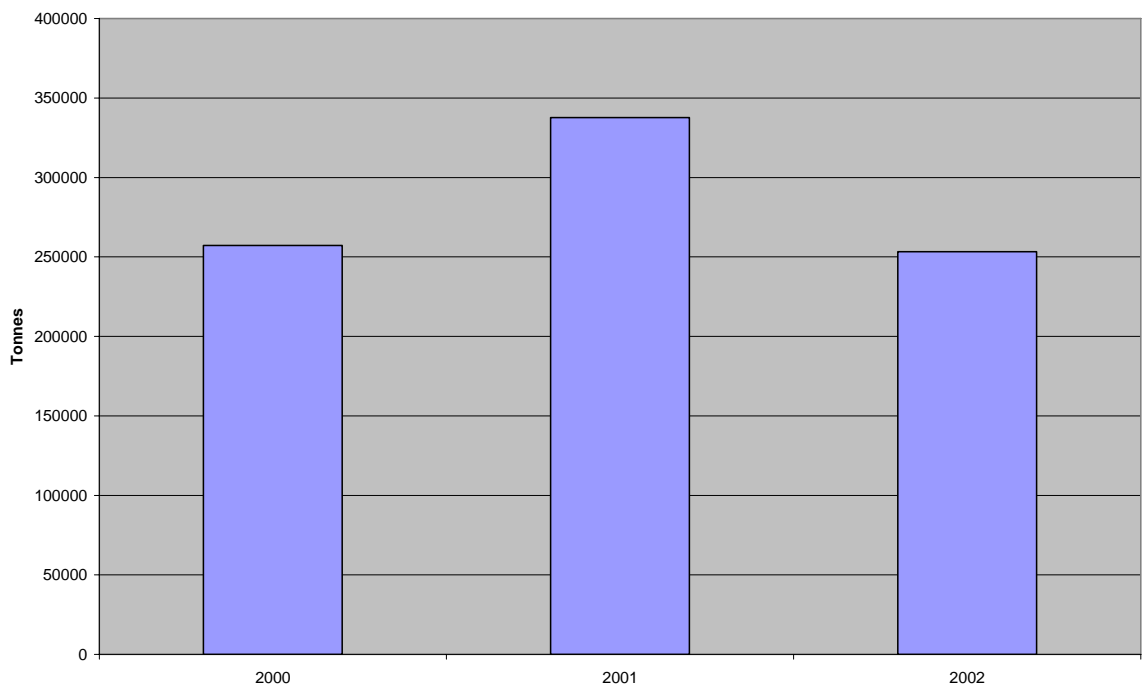
The relatively constant level of special waste arising in the UK is a view that is shared by the Hazardous Waste Forum¹⁰. As has happened in the past the upcoming change in definition of special waste to conform with the European Waste Catalogue (EWC) will cause more waste to be categorised as hazardous. In addition to this the requirements for pre-treating hazardous waste prior to landfill

10 Treatment and Capacity Task Force – Status Report, Hazardous Waste Forum

will result in greater treatment capacity requirements which are discussed later in chapter 5.4.

Although there are only three years data available for the East Midlands region, a fluctuating trend, similar to that for special waste nationally, appears to be present in the data from the Environment Agencies Hazardous Waste Interrogator which can be seen below in Figure 7 .

Figure 7 East Midlands Special Waste Arisings 2000 to 2002



Change in Definition

The revised EWC, which now incorporates the hazardous waste list, will have a significant impact on the management of hazardous waste across the UK. The new EWC came into force in January 2002 and is due to be implemented in the UK some time in 2005 following consultation on amendments to the Special Waste Regulations.

The main change that will occur as a result of implementation of the full EWC is that the term 'special waste' will be replaced by 'hazardous waste'. This will result in some EWC entries which are classified as hazardous which were not previously defined as special waste. Waste types which are likely to be affected include:

- ◆ End of life vehicles (16 01 04);
- ◆ Discarded equipment containing CFCs, HCFC and HFC (16 02 11);
- ◆ Waste containing cathode ray tubes (CRTs) (16 02 13);
- ◆ Contaminated soils (17 05);
- ◆ Other waste containing heavy metals and their compounds;

- Inorganic chemical processes (06);
- Thermal processes (inorganic) (10);
- Metal treatment and coating processes (11);
- Shaping/treatment of metals and plastics (12);
- Waste from incineration (19 01).

It is not possible to accurately predict the increase in special waste arisings due to the definition change imposed by the implementation of the EWC because waste needs to be assessed on an individual basis to determine its hazardous properties.

Implications for Special Waste Arisings

Future special waste arising in the East Midlands has been estimated using 2002 data from the Environment Agency's Special Waste Interrogator and assuming that waste arisings will remain constant unless affected by the definition change discussed above.

Percentage changes have been estimated for the waste types likely to be affected by changes in definition, in line with current modelling being undertaken by the Hazardous Waste Forum. The estimated percentage changes are shown in Table 5.

Table 5 Estimated Changes Resulting from Definition Change

EWC Code	Short Description	Estimated Change
0603	waste salts and their solutions	10%
0604	metal containing wastes	10%
0605	sludges from on site effluent treatment	10%
0701	waste from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals	10%
0702	waste from the MFSU of plastics, synthetic rubber and man-made fibres	10%
0703	waste from the MFSU of organic dyes and pigments (excluding 06 11 00)	10%
0704	wastes from the MFSU of organic pesticides (except 02 01 05)	10%
0705	waste from the MFSU of pharmaceuticals	10%
0706	waste from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics	10%
0707	waste from the MFSU of fine chemicals and chemical products not otherwise specified	10%
1001	waste from power station and other combustion plants (except 19 00 00)	500%
1003	wastes from aluminium thermal metallurgy	300%
1101	liquid wastes and sludges from metal treatment and coating of metals (e.g. galvanic processes, etching, phosphatizing, a	10%

EWC Code	Short Description	Estimated Change
1102	wastes and sludges from non-ferrous hydrometallurgical processes	10%
1103	sludges and solids from tempering processes	10%
1104	other inorganic wastes with metals not otherwise specified	
1201	wastes from shaping (including forging, welding, pressing, drawing, turning, cutting and filing)	10%
1202	wastes from mechanical surface treatment processes (blasting, grinding, honing, lapping and polishing)	10%
1501	packaging	100%
1502	absorbents, filter materials, wiping cloths and protective clothing	100%
1607	waste from transport and storage tank cleaning	100%
1701	concrete, bricks, tiles, ceramics and gypsum based materials	25%
1705	soil and dredging spoil	50%
1707	mixed construction and demolition waste	50%

The estimated annual arisings of special (hazardous) waste in the East Midlands are set out in Table 6 by EWC code, first 2 digits only.

Table 6 Estimated Future Arising of Special (Hazardous) Waste ('000s tonnes)

EWC Code	Short Description	Estimated Arisings
01	Mining and Minerals	<1
02	Agriculture and Food Production	<1
03	Wood and Paper Production	<1
04	Leather and Textile Production	<1
05	Petrol, Gas and Coal Refining / Treatment	7
06	Inorganic Chemical Processes	8
07	Organic Chemical Processes	18
08	MFSU Paints, Varnish, Adhesive and Inks	11
09	Photographic Industry	1
10	Thermal Process Waste (Inorganic)	24
11	Metal Treatment and Coating Processes	13
12	Shaping/Treatment of Metals and Plastics	14
13	Oil and Oil/Water Mixtures	35
14	Solvents	3
15	Packaging, Cloths, Filter Materials	3
16	Not Otherwise Specified	11
17	C&D Waste and Asbestos	64
18	Healthcare	1
19	Waste/Water Treatment and Water Industry	47
20	Municipal and Similar Commercial Wastes	6
99	Unclassified	4
Total		271

The projection for special waste arising in the East Midlands has been estimated using a different method to that of the other waste streams and so a range of waste arising is not provided. However, a comparison of the estimate special waste arising in the East Midlands and current special waste figures is given below in Table 7.

Table 7 Current and Estimated Future Special (Hazardous) Waste arising in the East Midlands

Waste Code	Description	Special Waste Arising 2002	Projected Special Waste Arising
01	Mining and Minerals	<1	<1
02	Agriculture and Food Production	<1	<1
03	Wood and Paper Production	<1	<1
04	Leather and Textile Production	<1	<1
05	Petrol, Gas and Coal Refining / Treatment	7	7
06	Inorganic Chemical Processes	8	8
07	Organic Chemical Processes	18	18
08	MFSU Paints, Varnish, Adhesive and Inks	11	11
09	Photographic Industry	1	1
10	Thermal Process Waste (Inorganic)	23	24
11	Metal Treatment and Coating Processes	13	13
12	Shaping/Treatment of Metals and Plastics	14	14
13	Oil and Oil/Water Mixtures	35	35
14	Solvents	3	3
15	Packaging, Cloths, Filter Materials	2	3
16	Not Otherwise Specified	11	11
17	C&D Waste and Asbestos	49	64
18	Healthcare	1	1
19	Waste/Water Treatment and Water Industry	47	47
20	Municipal and Similar Commercial Wastes	6	6
99	Unclassified	4	4
Total		253	271

Figures may not sum due to rounding

3.5 Summary of Waste Forecasts

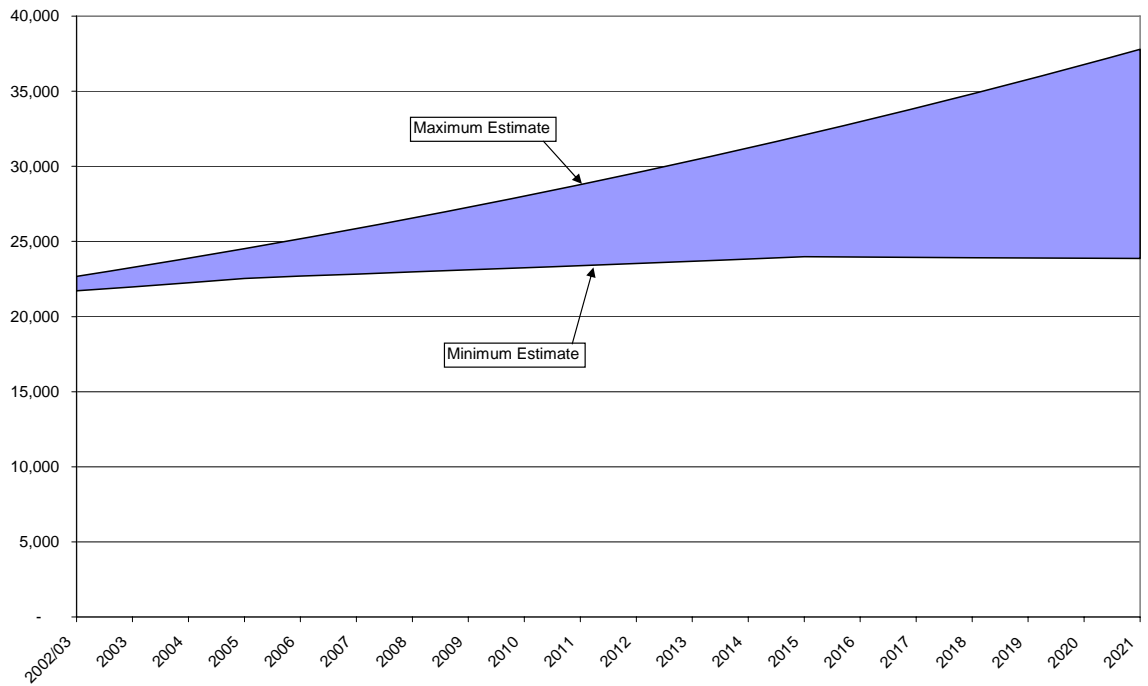
Each of the forecasts outlined above have been amalgamated to provide an estimated range of total waste arising in the East Midlands. A summary of the waste forecasts is provided in Table 8 below, with Figure 8 showing the projected growth in total waste arising in the East Midlands.

Table 8 Summary of Waste Projections

		000s Tonnes				
		2004	2006	2010	2015	2020
MSW	Upper	2,594	2,762	3,131	3,663	4,285
	Lower	2,485	2,535	2,639	2,774	2,917
C&I	Upper	8,803	9,212	10,090	11,415	12,916
	Lower	7,788	7,838	7,788	7,753	7,507

C&D	Upper	12,207	12,925	14,491	16,718	19,846
	Lower	11,682	12,035	12,524	13,163	13,163
Special	NA	271	271	271	271	271
Total	Upper	23,874	25,170	27,983	32,067	36,758
	Lower	22,227	22,680	23,222	23,961	23,858

Figure 8 Total Waste Projection Estimates



4. CURRENT TREATMENT CAPACITY

As reported in the Phase 1 report “Study to determine the current and future waste treatment capacity of the East Midlands region” the total the current treatment capacity in the East Midlands is estimated to be 12,376,100 tonnes per annum, this is within the range 10,167,600 to 16,405,400 tonnes per annum provided by 819 facilities of which:

- ◆ 7 are Part A processes under PPC regulations;
- ◆ 183 operate under WML;
- ◆ 61 are Part B processes; and
- ◆ 568 are carried out under exemptions from WML.

The capacity estimated per facility type is shown in Table 9 and number of facilities and tonnages by sub region are shown in Table 10.

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Table 9 Summary of number and capacity of operations by facility types, 2004

Facility type	Current number of facilities	Current treatment capacity (T/A)	Maximum Capacity Estimated (T/A)	Minimum Capacity Estimated (T/A)	Confidence %	Planned future facilities	Additional planned Future capacity (T/A)
Incineration (energy recovery)	4	167,000	167,000	167,000	±5,000 3%	0	-
Other incineration (clinical & hazardous)	5	158,000	158,000	158,000	-	0	-
Materials Recovery Facility	15	227,000	273,800	180,400	±46,700 21%	1	270,000
Chemical Treatment	1	0	0	0		0	-
Physio-Chemical	13	226,400	239,500	213,200	±13,200 6%	0	-
Composting	147	371,100	632,600	234,700	±137,000 36.9%	5	103,100 ± 12,200
Physical Treatment	22	1,412,200	1,536,700	1,287,800	±124,500 8.8%	1	75,000
Soil Screening & Concrete Crushing & Composting	159	2,436,900	4,670,100	1,577,100	±859,800 35%	1	20,000
Wood	4	64,000	64,000	64,000	-	0	0
Metal	296	5,618,600	6,744,700	4,650,900	±967,700 17%	8	118,000 ± 7,500
Other (11)	112	925,900	1,150,100	866,500	±59,400 7%	6	5,400
Other (fuel)	35	122,000	122,000	121,000	-	1	0
Other (biological treatment)	4	647,000	647,000	647,000	-	0	- 79,000
Other (not known)	2	0	0	0	-	0	0
Total	819	12,376,100	16,405,500	10,167,600		23	512,500

Table 10 Summary of number and tonnage of facility by sub-region

Facility type	Three Cities		Eastern		Southern		Northern		Peak	
	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage	No.	Tonnage
Incineration (energy recovery)	2	155,000	1	5,000					1	7,000
Other incineration (clinical & hazardous)	2	7,500					2	500	1	150,000
Materials Recovery Facility	2	70,500	4	49,750	3	41,750	6	65,000		
Chemical Treatment	1	20								
Physiochemical	2	90,800	2	90,800	3	27,700	5	17,000	1	100
Composting#	48	117,000	56	152,300	20	60,400	20	36,000	1	1,800
Physical Treatment	3	368,200	7	165,300	4	137,200	7	677,400	1	64,100
Soil Screening & Concrete Crushing & Composting	66	757,800	32	400,800	18	804,300	37	406,000	6	68,000
Wood	1	4,000	1	20,000	2	40,000				
Metal	119	2,169,800	58	1,300,400	45	1,109,000	69	1,033,600	5	5,800
Other (11)	46	650,800	24	114,300	21	18,900	20	141,000	1	900
Other (fuel)	6	400	8	120,300	2	50	17	1200	2	50
Other (biological treatment)			2	492,000	2	155,000				
Other (not known)	2	2								
Total	300	4,391,800	195	2,910,950	120	2,394,300	183	2,377,700	19	297,750

Two composting facilities of a combined capacity 3,600 tonnes per annum have no information to indicate their location.

5. UPPER CAPACITY REQUIREMENTS

Section 3 discusses the potential quantity of waste which may arise in the East Midlands until 2021. To determine the likely treatment capacity required for those wastes it is necessary to discuss the factors which lead to the treatment of waste by waste stream. In this section each waste stream is considered separately and estimates for treatment capacity made based on the upper waste forecasts as summarised in section 3.5.

5.1 Municipal Solid Waste (MSW)

The types of facilities required for the management of MSW will largely be dictated by targets for recycling, diversion of waste from landfill, local and regional strategy,. Although the impact of strategies are not considered here (this study forms part of the continued waste strategy development process for the East Midlands) the general types of capacity can still be determined assuming target achievement. Further discussion of actual facilities is outlined in Section 6.

5.1.1 Recycling targets

Table 11 shows the tonnage required to achieve the Best Value recycling targets for 2005/06 and the WS2000 recycling targets for 2010 and 2015. This projection is based on the assumption that waste growth in all of the counties will follow the regional trend of 3.19% compound growth.

Table 11 Best Value and WS2000 Recycling Targets

	000s Tonnes		
	2005/06	2010	2015
Derby City	46	53	62
Derbyshire	81	159	204
Leicester City	30	58	75
Leicestershire	129	151	177
Lincolnshire	115	135	174
Northamptonshire	121	157	202
Nottingham City	35	69	88
Nottinghamshire	128	187	240
Rutland Council	8	8	10
Total East Midlands	692	976	1,232

Figures may not sum due to rounding

This shows that by 2015 the East Midlands will potentially need access to 1.2 million tonnes of recycling and composting capacity, comprising windrow composting, in-vessel composting and bulking/materials recycling facilities (MRFs).

The split of capacity between recycling and composting required can also be estimated based on assumptions about the amount of materials collected for recycling and composting which are discussed in greater detail as part of the BMW diversion section 5.1.2 below. Data from the Strategy Unit (SU) report Waste Not

Want Not on the quantity of different materials available for recycling and their % by weight of the total MSW waste stream has been used to estimate the breakdown of recycling and composting to meet the relevant targets. This has then been used to estimate the contribution recycling and composting make to the diversion of BMW from landfill. Table 12 shows the potential requirements for recycling and composting treatment facilities.

Table 12 Estimated split of recycling and composting

	000s Tonnes			
	2005/06	2010	2015	2020
Total East Midlands	692	976	1,232	1,457
Recycling	304	429	542	816
Composting	388	547	690	641

5.1.2 Biodegradable Municipal Waste (BMW) Diversion from Landfill

Capacity will also be needed to accept BMW diverted from landfill in the East Midlands, in order to achieve Landfill Directive targets. Every disposal authority in England has been given a landfill allocation for BMW based on the amount of BMW they sent to landfill in 2001/02. Although the scheme will allow for trading banking and borrowing of landfill allowances, for the purposes of this study, capacity requirements have been estimated for the achievement of these allocated landfill allowances.

Table 13 shows the total estimated BMW arisings compared to the sum of allowances for all of the authorities in the East Midlands and calculates the BMW diversion that will be required in the target years of the scheme. Clearly if waste growth is less than assumed here (3.19%) the diversion required will be less than projected here and more should waste growth exceed that modelled.

Table 13 Landfill Allowances and Projected Diversion Required

	000s Tonnes		
	2010	2013	2020
BMW Tonnage	2,129	2,339	2,914
LATS Allowance	832	597	436
Projected Diversion Required	1,297	1,742	2,477

Although this provides an estimate of the amount of BMW diversion that may be required it may not reflect the amount of capacity which is required. Recycling and composting will contribute to BMW diversion with the remaining residual waste requiring treatment as a whole to provide the necessary diversion rather than separating out the biodegradable fraction. Treatment methods available for the residual waste fraction include mechanical biological treatment (MBT), and thermal treatment technologies such as incineration and pyrolysis which is discussed further in Section 6.

Although it is not possible to exactly predict what level of BMW diversion will be attained from recycling and composting schemes throughout the East Midlands in the future, a number of assumptions can be made to estimate the likely contribution recycling and composting might have in the region.



Assuming a waste composition similar to that used in the Strategy Unit (SU) report Waste Not Want Not, and that recycling and composting targets in the long term of 33% are at least met an estimate of biodegradable municipal waste diversion can be made. Table 14 shows the quantity of material available for recycling, assumed recycling contribution of each material and hence biodegradable proportion of waste recycled / composted.

For Example:

- ◆ Paper and Card is 19% of the waste stream
- ◆ 65% of Paper and Card is recyclable; therefore it can contribute up to 12% recycling if it were all collected.
- ◆ We have assumed that half of this material is collected for recycling (6%) and as Paper and Card is 100% biodegradable the potential BMW diversion from Paper and Card Recycling has been estimated as 6% of MSW.

This process was repeated for all recyclables and compostables and a total for BMW diversion estimate obtained (26%).



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Table 14 Strategy Unit waste composition and biodegradable elements of recyclables/compostables

Waste type	A Waste stream composition (SU)	B % of material biodegradable	C % of material recyclable	D=A*B % of MSW biodegradable	E=A*C Recyclable	F=D*C Potential % BMW diversion	G=E*50% Assumed recycling	H=F*50% Biodegradable % of waste recycled / composted
Paper/card	19%	100%	65%	19%	12%	12%	6%	6%
Putrescible	42%	100%	90%	42%	38%	38%	19%	19%
Textiles	3%	50%	95%	2%	3%	2%	2%	1%
Fines	3%	50%	0%	2%	0%	0%	0%	0%
Misc. combustib	8%	50%	0%	4%	0%	0%	0%	0%
Misc. non-comb	4%	0%	0%	0%	0%	0%	0%	0%
Metals	7%	0%	95%	0%	7%	0%	4%	0%
Glass	7%	0%	90%	0%	6%	0%	3%	0%
Plastics	7%	0%	33%	0%	2%	0%	1%	0%
Total				69%	68%	52%	34%	26%

From Table 14, above, it can be seen that using the assumptions outlined above recycling and composting could contribute to biodegradable diversion in the order of 26% of MSW. In 2020 this potentially represents 1.1 million tonnes of BMW diversion could be achieved through recycling and composting - nearly half of the projected diversion required. Using the same split of recycling and composting in other target years, estimates of BMW diversion achieved by recycling and composting can be estimated as shown in Table 15.

Table 15 Potential for BMW diversion through recycling and composting, 000s tonnes

	2010	2013	2020
a. Total MSW, 000s tonnes	3,131	3,440	4,285
b. Biodegradable proportion, 68% of MSW, 000s tonnes	2,129	2,339	2,914
c. Potential recycling & composting contribution, 000s tonnes (Table 14 col. H = 26%), 000s tonnes	814	894	1,114
d. Recycling & composting tonnage of MSW , 000s tonnes	971	1,066	1,457
e. Contribution to BMW diversion by composting & recycling tonnage = d x (Table 14 col. F = 52%), 000s tonnes	505	555	758
f. LATS Allowance, 000s tonnes	832	597	436
g. Projected Diversion Required (=b – f), 000s tonnes	1,297	1,742	2,477
h. Residual waste (=a – d), 000s tonnes	2,160	2,374	2,828
i. Estimated BMW proportion of MSW requiring diversion (=b-e-f), 000s tonnes	792	1,188	1,720

(Rounding errors may be present in this table)

Note: Row d. estimates shown in Table 15 above are based on 31% recycling and composting in 2010 and 2013 and 34% recycling and composting in 2020.

It is worth noting that the Landfill Directive contains requirements for the pre-treatment of waste prior to deposit in landfill. In the case of MSW this is unlikely to result in the need for extra treatment capacity for 2 reasons. Firstly the source separation of recyclable and compostable material constitutes pre-treatment¹¹ and secondly the residual material is likely to go through a treatment step for the purposes of BMW diversion.

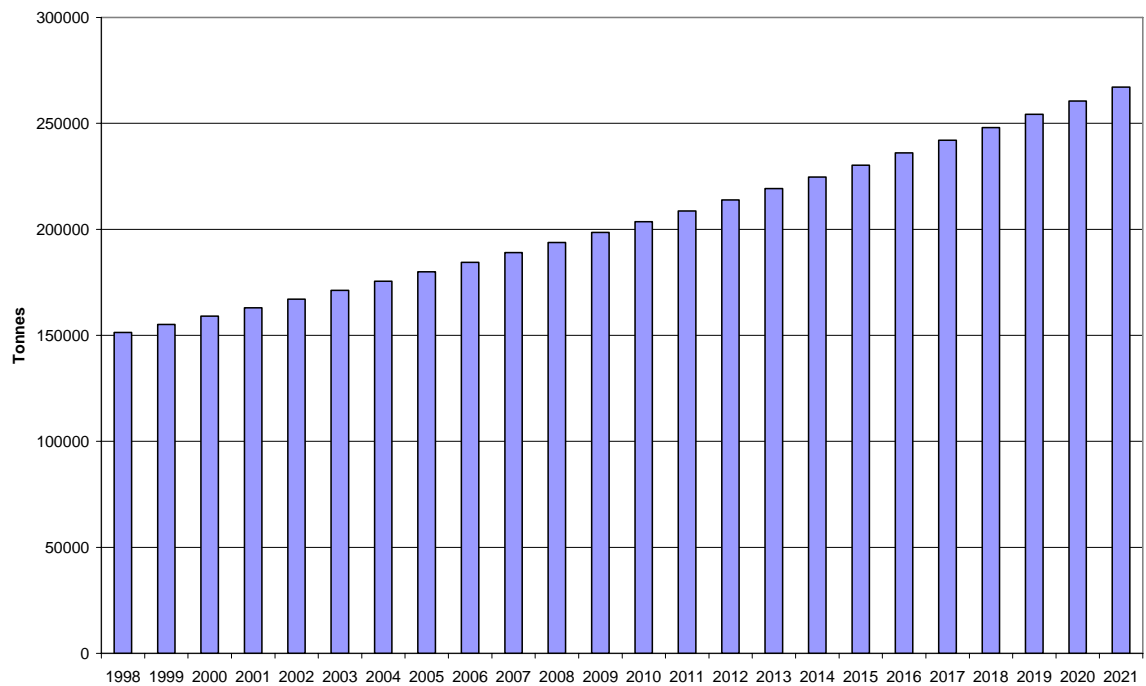
5.1.3 End of Life Vehicles (ELVs)

A forecast of end of life vehicles has been based on the national growth rate in vehicles of 2.5% per year¹² and an estimated average car weight of 1 tonne. 8.4% of national new vehicle registrations were in the East Midlands and if it is assumed that the same percentage of vehicles are scrapped in the East Midlands and estimate of end of life vehicles can be made.

¹¹ Guidance on waste treatment requirements of article 6 of the Landfill Directive, Environment Agencies
¹² ACORD

Using the forecast above, by 2020 an estimated 290,000 tonnes of ELV capacity will be required for the East Midlands. Figure 9 shows the projected growth in ELVs in the East Midlands.

Figure 9 ELV Projection



5.1.4 Fridges

The introduction of the ODS Regulations result in the development of treatment capacity to remove ozone from refrigeration equipment and it is considered unlikely that this treatment capacity will expand significantly in the future

5.1.5 Waste Electrical and Electronic Equipment (WEEE)

The WEEE Directive imposes a target on the collection of waste electronic and electrical equipment of 4kg per person by 2006 with specific targets for different categories of waste. The population of the East Midlands at present is approximately 4.2 million which means that as a region the East Midlands will have to provide capacity for handling approximately 16,700 tonnes of WEEE by 2006.

Data taken from a Regulatory Impact Assessment¹³ and the Industry Council for Electronic Equipment Recycling (ICER) suggests that by 2006 WEEE requiring treatment could reach 13.7kg per household. The data taken from the Regulatory Impact Assessment has been collated and applied to projections of population in the East Midlands (ODPM) to make an estimate of separately collected WEEE, the results of which are show in Table 16.

13 Partial Regulatory Impact Assessment of the Draft Statutory Instrument to Implement the Waste from Electronic and Electrical Equipment Directive, DTI, July 2004

Table 16 Estimate of Separately Collected WEEE, 000s tonnes

WEEE Streams	ICER UK Estimate 2006	East Midlands 2006	East Midlands 2020
White Goods	537	39	43
Brown Goods	57	4	5
Small Household Goods	24	2	2
ICT Equipment	179	13	14
Total, 000s tonnes	796	58	64

5.2 Commercial and Industrial (C&I) Waste

Commercial and Industrial (C&I) waste data is compiled by the Environment Agency covering both waste quantity and management. The national waste production survey was last carried out in 2000 and covered the year 1998/99 and although a second waste production survey is underway the Environment Agency could not provide any results at the time of conducting this study.

Details of current waste management methods for C&I waste are show in Table 17 which highlights a number of key points.

- ◆ Inert/C&D waste is included in the data, some or all of which will be included in the assessment of C&D waste.
- ◆ 18% of commercial and 73% of industrial waste is classified as 'General Industrial and Commercial Waste' and as such attributing this to a specific treatment requirement is difficult.
- ◆ A further 11% and 8% of commercial and industrial wastes respectively are classified as 'Other General and Biodegradable Waste' taking the total essentially unspecified waste to 29% for commercial and 81% for industrial.



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Table 17 Waste management methods for C&I waste by type of waste in the East Midlands, 000s tonnes

Waste type	Land Disposal	Land Recovery	Re-used	Recycled	Thermal	Transfer	Treatment	Unrecorded	TOTAL
Industrial wastes									
Inert/C&D	175		9	79		2	1	0	266
Paper & card	15		2	257	2	2	1	1	280
Food	15	0	146	45	2	2	44		254
General industrial & Commercial	933	4		24	50	49	8	16	1,084
Other general & biodegradable	147	64	115	225	49	9	40	5	654
Metals & scrap equipment	3		3	417		2	0	0	425
Contaminated general	359		3	44	0	5	1	0	412
Mineral wastes & residues	1,083	3	0	1,092		20	0	0	2,198
Chemical & other	175	0	4	63	20	6	91		359
INDUSTRY TOTAL	2,905	71	282	2,246	123	97	186	22	5,932
Commercial									
Inert/C&D	7		1	4		0	0	0	12
Paper & card	9		1	168	2	2	0	0	182
Food	2	0	15	6	0	0	5		28
General industrial & commercial	768			91	78	28	3	324	1,292
Other general & biodegradable	34	12	28	46	14	2	7	1	144
Metals & scrap equipment	0		0	38		0	0	0	38
Contaminated general	45		0	7	0	1	0	0	53
Mineral wastes & residues	1	0	0	1		0	0	0	2
Chemical & other	16	0	0	5	2	1	7		31
COMMERCE TOTAL	882	12	45	366	96	34	22	325	1,782
TOTAL	3,787	83	327	2,612	219	131	208	347	7,714

Source: Table 2.3: Strategic Waste Management Assessment 2000: East Midlands, Environment Agency

5.2.1 Packaging Recycling / Recovery Targets

The Packaging Regulations provide targets for the recycling and recovery of packaging waste which are show in Table 18 below.

Table 18 Packaging Waste Targets

	Paper	Glass	Steel/ Aluminium	Plastic	Overall Recycling	Overall Recovery
Directive Targets for 2001	15%	15%	15%	15%	25-45%	50-65%
Achieved by the UK in 2001	52%	33%	37/24%	16%	42%	48%
Commission Proposal for 2006	55%	60%	50%	20%	55-70%	60-75%
Environment Council Common Position October 2002	60%	60%	50%	22.50%	55% minimum, 80% maximum	60 % minimum, no maximum

As incineration with energy recovery no longer counts towards recovery for the purposes of the Packaging Waste Regulations it is likely that most, if not all, of the recovery targets set out above will have to be achieved through recycling. Table 19 below shows the quantity and % of packaging waste recycled in the UK in 2003 and a calculated total packaging waste. The majority of packaging waste recycled in the UK is direct from commerce and industry and in order to increase the quantity to between 55 and 70% as is the EC common position more material will have to be sourced from the post-consumer waste stream. In terms of need for new capacity this will be covered in the municipal recycling already covered earlier.

Table 19 UK Packaging Recycling 2003

	Tonnes Recycled 2003	%	Total Tonnage Estimate
Packaging Waste	4,771,680	47.4	10,066,835

Defra¹⁴ do not predict a significant increase in the amount of packaging waste entering the waste stream between 2004 and 2008. As such any increase in recycling (assumed here to be from post-consumer packaging in the municipal waste stream) will not lead to an increase in the need for C&I waste treatment capacity.

5.2.2 C&I Waste Diversion from Landfill

The Waste Strategy 2000 set an aspirational target for the reduction of C&I waste being sent to landfill, with the target for 2005 being 85% of that sent for landfill in 1998. If it assumed that this level be achieved and maintained the level of landfill diversion required can be projected and is shown in Table 20.

¹⁴ Producer Responsibility Obligations (Packaging Waste) Regulations (As Amended) 1997 Data Note, July 2004, Defra

Table 20 C&I Landfill diversion projection

	000s Tonnes			
	2005/06	2010/11	2015	2020
Projected Landfill Diversion Required	5,380	6,464	7,790	9,290

The targets for reduction in landfill of C&I waste are not statutory and it should be noted that the only driver that currently exists for this is the Landfill Tax escalator. Once the Landfill Tax reaches a high enough level one of two (or a combination of both) effects should be seen. If Landfill Tax reaches such a level that it becomes economically attractive to use alternatives to landfill the diversion targets could be achieved through use of facilities such as incineration or advanced thermal treatment, MBT and others. However, if the Landfill Tax does not make it viable for commercial waste to be diverted further waste minimisation is also possible.

The scenario for C&I waste growth in the Technical Report included waste minimisation elements (taken as the lower limit for C&I waste) and the upper limit (growth linked to GDP growth) provides the maximum waste that would need to be treated / disposed of.

5.3 Construction and Demolition Waste (C&D)

Management of construction and demolition waste nationally is surveyed for the ODPM by Symonds on an annual basis, the most recent of which covers the year 2003¹⁵ (survey carried out in 2004). The survey findings outline the current management of C&D waste on the basis that all is managed through recycling, landfill or use at registered exempt sites under paragraphs 9 and 19 of Schedule 3 of the Waste Management Licensing Regulations. This therefore does not include clean materials which are used on the site at which they arise for other purposes and are not managed as waste.

In addition the survey considers only wastes which can be used as aggregates and therefore excludes materials unsuitable for this purpose such as wood, plastics and metals. Data on the composition of C&D waste is very poor and reliable data for the quantities of materials such as wood and plastics being sent for disposal or recycling from the C&D sector does not exist in a format that would be appropriate for use in a study such as this. As such the C&D waste considered here has been limited to that which is identified in the Symonds report described above.

If the current split of C&D waste management methods (taken from the Symonds report) continues into the future, Table 21 shows the likely capacity required for the treatment of C&D waste by 2020.

Table 21 Fate of C&D Waste arising in the East Midlands

Fate of C&D Waste	2020, 000s tonnes
Recycled aggregate and soil	9,802
Material used for landfill engineering or restoration	1,687
Material used to backfill quarry voids	3,696
Material used at Paragraph 9&19 registered exempt sites	2,210

¹⁵ Survey of Arisings and Use of Construction, Demolition and Excavation Waste as Aggregate in England in 2003, Capita Symonds Ltd, October 2004

Material disposed of at landfills	2,451
Total	19,846

At the very least there will be no change in the current situation, but it is likely that if there is an increase in aggregates levy there will be an increase in the demand for secondary aggregates processing.

The current trend is for primary aggregates companies to invest in secondary aggregates business to be better placed to access and capitalize on these resources. It is expected that as the cost of primary aggregates provision increases (whether due to aggregates levy, transport costs or availability) the viability of secondary aggregates processing improves, regional variations in viability are to be expected.

The provisions for pre-treatment of waste prior to landfill disposal is also likely to have a significant effect on the quantity of construction and demolition waste which is sent for crushing and subsequent use, thereby reducing the quantity going to landfill. The primary method used for recycling construction and demolition waste is crushing and screening to produce products which can be utilised as engineering materials in a number of applications.

In order to estimate the likely increase in the quantity of material from C&D activities which is sent for recycling a number of assumptions have been made:

- ◆ It is likely that material from C&D will still be used for the backfilling of quarry voids, although this may reduce, it is considered that this impact will not be significant;
- ◆ Similarly there will be a reduction in the amount of material used for landfill engineering and restoration and it is suggested that this reduction will be in line with reduction in other wastes being sent to landfill;
- ◆ It is assumed that the use of registered exempt sites will stay the same; and most importantly,
- ◆ It has been assumed that there will continue to be a significant reduction in C&D waste being sent to landfill.

Table 22 below shows the effect of using the assumptions detailed above on C&D waste treatment and disposal.

Table 22 Estimated change in management of C&D waste, 000s tonnes

Fate of C&D Waste	Projected Tonnes at present management split (2020)	Potential Management Method Split	Explanation of Change
Recycled aggregate and soil	9,113	10,138	Equal share of material diverted from landfill
Material used for landfill engineering or restoration	1,966	420	Reduced to 50% of current value
Material used to backfill quarry voids	2,088	2,088	
Material used at Paragraph 9&19 registered exempt sites	5,869	6,894	Equal share of material diverted from landfill

Material disposed of at landfills	808	305	Reduced to 25% of current value
Total	19,846	19,846	

Figures may not sum due to rounding

5.4 Special (Hazardous) Waste

As discussed in Section 3.4 the treatment capacity required for the management of special waste will be dictated by both the upcoming integration of the amended European Waste Catalogue (EWC) and the requirements for pre-treatment of waste prior to landfill.

Data available through the Environment Agency's Hazardous Waste Interrogator provides information on the management of special waste in 2002 which is shown below in Table 23.

Table 23 Management of Hazardous (Special) Waste Arising in the East Midlands, 2002

Management Method	000s Tonnes
Incineration with energy recovery	0.67
Incineration without energy recovery	2.89
Landfill	139.69
Recycling / reuse	28.74
Transfer (Short term)	20.35
Treatment	60.98
Total	253.32

Figures may not sum due to rounding

Not all of the hazardous waste treatment capacity in the East Midlands is utilised by waste arising in the region. Hazardous waste is both imported and exported from the region and Table 24 below shows the tonnages moving in and out of the East Midlands.

Table 24 Imports and Exports of Special waste in 2002, 000s tonnes

	Imports	Exports	Difference
Incineration with energy recovery	53	0	53
Incineration without energy recovery	-	3	-3
Landfill	59	48	11
Recycling / reuse	89	23	66
Transfer (Short term)	15	16	-1
Treatment	73	50	23
Total, 000s tonnes	288	141	147

Figures may not sum due to rounding

The movement of special waste around the UK is likely to continue due to the relatively small quantities of waste and the need for facilities to be large enough to make them commercially viable. When considering the need for special waste treatment capacity in the East Midlands it is not reasonable to suggest that capacity be provided for all special waste arising in the region. Conversely capacity within the region is likely to continue to be used by other regions.

What is of importance in terms of capacity requirements is the need for solidification and landfill. Those wastes which are likely to be pre-treated using solidification techniques should not, once solidified, be transported large distances due to the increase in waste mass. Therefore solidification and landfill capacity for hazardous waste should be addressed.

Using the methodology employed by the Hazardous Waste Forum for estimating increases in treatment capacity, Table 25 shows the estimated increase in hazardous waste treatment capacity required to manage hazardous waste arising from the East Midlands.

Table 25 Estimated Future Hazardous Waste Treatment Capacity Required to manage the waste from the East Midlands

Management method	Capacity Required (tonnes)
Stabilisation/ Solidification	73,000
Physico-chemical	65,700
Solvent recovery	400
Bio-remediation	8,400
Waste Water Treatment	7,200
High Temperature Incineration	74,300
Co-incineration	86,200
Landfill	222,300

This provides details of the estimated additional capacity required. A discussion of the total capacity and facilities is contained in Section 6.

5.4.1 Healthcare Waste (Clinical Waste)

Although with the change in definition described earlier for hazardous waste more healthcare waste will be designated as hazardous it is unlikely that it will be managed or treated in a different way. This waste stream is not considered likely to increase significantly and so no further treatment capacity should be required for the East Midlands.

6. ADEQUACY OF CURRENT FACILITIES TO MEET UPPER CAPACITY REQUIREMENT

In this section each of the future capacity estimates made in section 5 are compared to the current capacity estimate determined in Phase I, this is based on the upper capacity requirement calculated in section 3.5. From this any capacity 'gap' has been determined and for each appropriate facility type a range of facility numbers has been provided along with a commentary on the likely residues from those facilities. Within the range of facility numbers discussed a capacity figure has been taken from the ODPM Planning for Waste Facilities Document¹⁶ and used to provide an indicative estimate of facility numbers required in the East Midlands.

In addition to assessing the adequacy of capacity, the capacity requirements have been split to provide estimates of capacity required on sub-regional basis using the East Midlands Planning Regions.

To fit with the RPG and to feed into the waste strategy development an assessment of the capacity 'gap' has been provided on the basis of the RPG scenario capacity requirements discussed in section 5.5 above.

6.1 MSW

Capacity needs for MSW has been identified for three areas:

- ◆ Materials Recycling Facilities (MRF);
- ◆ Composting facilities; and
- ◆ Facilities in addition to MRF and composting facilities to manage biodegradable waste diversion from landfill.

The data has been split by Sub-Region within the East Midlands on the basis of population to provide an indication of where capacity may be required; Table 26 provides a breakdown of the population percentages.

Table 26 East Midlands Sub-Regions and Percentage Population

Sub-region	Districts	Percentage of Population	
Eastern	Rutland East Lindsey North Kesteven South Kesteven Boston	Melton Lincoln South Holland West Lindsey	17.5%
Northern	Amber Valley Chesterfield Ashfield Mansfield	Bolsover NE Derbyshire Bassetlaw Newark & Sherwood	19.4%
Peak	Derbyshire Dales	High Peak	3.8%

Southern	Corby E Northants Northampton Wellingborough	Daventry Kettering S Northants	15.1%
Three Cities	Derby S Derbyshire Oadby & Wigston Harborough Charnwood Nottingham Broxtowe	Erewash Leicester Hinckley & Bosworth Blaby NW Leicester Gedling Rushcliffe	44.3%

6.1.1 Materials Recycling Facilities

Using the recycling targets which the constituent authorities within the East Midlands are to meet in coming years, the capacity for the management of recyclables was determined. It has been assumed for simplicity that all increases in recycling from current levels will require some form of bulking or MRF facility to handle them.

Based on the figures in Table 15 assuming recycling levels of 31% in 2010 and 2014 and 34% in 2020 and the split between recycling:composting of 44%:56% the recycling targets translate into the regional capacities shown in Table 27.

Table 27 MRF Capacity Required by Sub-Region, 000s tonnes

Sub-region	Current Capacity	2010	2015	2020	Predicted Shortfall by 2020
Eastern	50	75	87	112	62
Northern	65	83	97	124	59
Peak		16	19	24	24
Southern	42	65	75	97	55
Three Cities	71	189	221	284	213
Total, 000s tonnes	227	427	500	641	414

Table 27 above does not include 270,000 tonnes of MRF capacity which is developed but not currently operational in the East Midlands.

Capacity of MRF facilities can vary over a very wide range. Small 'low-tech' MRF facilities and those which act as little more than bulking stations for pre-segregated materials can have annual capacities of as low as 10,000 tonnes per annum. Conversely large facilities with high levels of automation and sorting are being developed across the UK with capacities of up to 220,000 to 250,000 tonnes per annum.

If the 270,000 tonnes per annum facility that is not yet operational is included with existing capacity an additional 144,000 tonnes of additional capacity is required, by 2020. Depending on the capacity of facilities and the method of MSW kerbside recycling collections between 1 and 15 additional MRF facilities will be required for

the East Midlands. Assuming an average capacity of 50,000 tonnes per annum, the East Midlands will require a further three facilities.

Residues

Residues from MRF activities represent any rejects from the sorting processes that cannot be sent for recycling and therefore have to be disposed of. The quantity of rejects will depend on the efficiency of the sorting process and the quality of material entering the MRF and as such will vary from facility to facility. Information from around the UK suggests that rejects can be between 3% and 15% of the input to the facility.

6.1.2 Composting Facilities

In addition to increased recycling to meet statutory targets it has been assumed that a high level of composting will be required. The composting facility estimates are based on the recycling and composting targets shown in Table 15 which assume recycling levels of 31% in 2010 and 2014 and 34% in 2020 and the split between recycling:composting of 44%:56%. Table 28 summarises the regional capacity required for composting to be provided by a mixture of windrow facilities and in-vessel systems.

Table 28 Composting Capacity Required split by sub-region, 000s tonnes

Sub-region	Current Capacity	2010	2015	2020	Shortfall by 2020
Eastern	152	95	111	142	-
Northern	36	105	123	158	122
Peak	2	21	24	31	29
Southern	60	82	96	123	63
Three Cities	117	214	281	361	244
Total, 000s tonnes	371	544	636	816	445
Total Current Capacity Includes 3,600 tonnes unknown area					

Composting facilities can have varying annual capacities. At present small on-farm windrow composting facilities can process up to approximately 3,000 tonnes per annum whereas large in-vessel systems are able to process 70,000-100,000 tonnes of garden and kitchen waste. Based on capacity estimates the East Midlands will need between 5 and 150 additional composting facilities by 2020 if recycling/composting targets are to be met. If an average capacity per site is assumed to be 25,000 tonnes per annum a further 18 facilities will be required in the East Midlands by 2020.

Residues

Residues from composting facilities arise when pre-screening incoming waste to remove and non-compostable materials. As with MRFs the main factor influencing the amount of materials rejected will depend upon the quality of the waste coming in. Information from sites around the UK suggests that rejects for disposal can be up to 10% by weight of the incoming material.

6.1.3 Biodegradable Municipal Waste Diversion from Landfill

To treat the biodegradable element of the waste stream that is not undergoing recycling or composting additional facilities will be required. There are a number of treatment options available which would provide diversion of biodegradable waste from landfill:

- ◆ Incineration with Energy Recovery
- ◆ Mechanical Biological Treatment (MBT)
- ◆ Advanced Thermal Treatment (such as pyrolysis and gasification)
- ◆ Autoclave Technology

In Table 15, earlier in this report, an estimate of the BMW diversion required was made, making assumptions about the amount of BMW diversion achieved through recycling and composting. However, in order to achieve this level of diversion it is likely that a greater quantity of the residual waste would need to be treated and without doing detailed mass flow assessments of a number of integrated options for residual waste the exact amount is impossible to estimate. To this end a top end potential capacity required has been provided across the time scale being considered. In addition it is likely that a combination of treatment types would be used across the region.

Table 29 below estimates the capacity to treat all MSW not captured through recycling and composting. Therefore these estimates indicate the maximum capacity that will be required as they do not take LATS allowances in to consideration or the fact that a significant proportion of the waste stream will not be biodegradable.

Table 29 Total Capacity Requirement to Treat Residual Waste by Planning Sub-region, 000s tonnes

Sub-region	2010	2015	2020
Eastern	377	441	494
Northern	418	489	547
Peak	82	96	108
Southern	326	382	427
Three Cities	956	1,119	1,252
Total Residual Waste, 000s tonnes	2,160	2,527	2,828
<i>Potential waste BMW to be diverted after LATS, 000s tonnes</i>	<i>792</i>	<i>1,366</i>	<i>1,720</i>

Note: Totals in italics are likely BMW only diversion required taking in to consideration LATS and the contribution to BMW diversion by recycling and composting.

The capacities given in Table 29 above represent the capacity required to manage all residual waste after recycling and composting. Although it is unlikely that one treatment type will be used for all residual waste, taking this approach will provide the maximum estimated capacity requirement. Detail of scenarios for residual MSW and hence a refinement of the capacity requirement should be considered as part of

the East Midlands Regional Waste Strategy development. The numbers of facilities proposed below represent no use of landfill as a primary disposal route.

6.1.4 Incineration with Energy Recovery

Incineration facility capacities vary depending upon the area for which they are designed to serve. Municipal incinerators in future are likely to have capacities of between 60,000 and 250,000 tonnes per annum.

There is currently 150,000 tonnes per annum of municipal waste incineration capacity in the East Midlands. If residual municipal wastes were treated solely by incineration, across the region, between 10 and 44 additional incineration facilities would be required, depending upon the capacity of facilities developed. Assuming any further incinerators would be large scale (250,000 tonnes per annum) a further 10 would be required by 2020.

Residues

The two residues from incineration facilities come in the form of ashes. The bulk of the residue, between 20% and 30% by weight of incoming waste, is bottom ash (the solid remainder of the waste feedstock after combustion). The bottom ash can in some cases be recycled but generally is sent for landfill.

The second residue arises from the flue gas cleaning to remove contaminants from the exhaust gases prior to venting to atmosphere. This 'ash' which is between 3% and 5% by weight of the incoming waste has to be sent to hazardous landfill.

6.1.5 Mechanical Biological Treatment

Similarly to incineration above the number of MBT facilities developed in the East Midlands will depend up strategy objectives both regionally and locally. MBT facilities are relatively new in the UK with several having just gone into operation (such as Biffa Leicester) and others being constructed.

Information from other countries in Europe and the Waste Technology Data Centre suggest that MBT facilities may have capacities of between 50,000 and 150,000 tonnes per annum. If MBT were to be the sole treatment type for residual waste potentially between 19 and 57 facilities would need to be developed. The ODPM planning for waste facilities document suggests MBT plants typical capacity would be 50,000 tonnes per annum. If this capacity is assumed the East Midlands would need a further 57 facilities to manage MSW diversion solely through the use of MBT.

Residues

There are a variety of different processes which come under the banner of MBT which utilise different biological processes in differing sequences with different end products. In general there is likely to be a reject fraction of approximately 10% by weight of the incoming waste as these materials will be considered non-compostable or non-combustible so will not be appropriate for further biological treatment or use as RDF.

6.1.6 Advanced Thermal Treatment

There are currently no facilities in the UK of a commercial scale treating MSW which could be described as advanced thermal treatment. Capacity information from Europe and the Waste Technology Data Centre suggests that capacities for

facilities such as this would be between 30,000 and 180,000 tonnes per annum. For ATT to provide residual waste treatment alone between 16 and 95 facilities would have to be developed. As with MBT the ODPM document suggests 50,000 tonnes as appropriate for ATT. This means that the East Midlands would require a further 57 facilities for ATT to be the sole technology used.

Residues

As with MBT there are a number of slightly different processes which come under the description advanced thermal treatment. If combined pyrolysis and gasification is considered, information from manufacturers brochures suggest that there are likely to be two residues similar to those seen from incineration. Between 17% and 30% is likely to come out of the process as a solid residue, char and flue gas cleaning will lead to a hazardous residue of between 2% and 3% of the input weight requiring disposal in hazardous waste landfill sites.

6.1.7 Autoclave

Autoclave technology for MSW treatment is even rarer across Europe than some of the other 'new technologies' discussed here. Information from the Waste Technology Data Centre and anecdotal information through conversation with staff working on the Defra New Technologies Supporter Programme suggest that capacities of autoclave and other mechanical heat treatment systems could be between 50,000 and 200,000 tonnes per annum. It is very unlikely for this technology to be the sole means of treating residual MSW but if it were between 14 and 57 facilities would be required. As with MBT the ODPM Planning document suggests plant of 50,000 tonne per annum capacity, leading to a further 57 facilities.

Residues

Autoclave technologies are not widely used for municipal wastes and as with ATT detail from manufacturers of processes have to be used to provide an estimate of likely residues. These suggest that around 14% by weight of the incoming waste will require disposal as a 'sanitised residue'.

6.1.8 Mixed Treatment Types

If it is assumed that an equal share of the MSW diversion tonnage will be provided through each of the treatment types discussed above. An estimate of the number of facilities required is shown in Table 30. These estimates are to treat all MSW not handled via recycling or composting facilities.

Table 30 Example estimation of the number and type of facilities required if a mix of all treatment types was assumed for 2020

Treatment Type	Number of Facilities by 2020
Incineration (250 tonnes each per annum)	3
MBT (50 tonnes each per annum)	14
ATT (50 tonnes each per annum)	14
Autoclave (@50 tonnes each per annum)	14
Total	45

6.2 C&I Waste

Predicting the requirements for C&I waste treatment is very difficult due to the number of uncertainties. As is mentioned earlier there is government strategy which proposes large reductions in landfill of C&I waste, however there are few drivers to actually bring about a change. In addition the treatment or disposal route used for the waste is likely to be decided upon through contracts with private waste management companies and will depend on what facilities they have available to them at the time.

If there is a presumption that levels of C&I waste landfill will reduce in line with the aspirational target in WS2000 and that facilities similar to those for municipal waste diversion would be required a range of facility numbers can be estimated based on the maximum range of facility capacities given above.

If the smallest facility were 30,000 tonnes per annum and the largest 250,000 tonnes per annum then potentially between 38 and 310 facilities may be required for diversion of C&I waste from landfill by 2020.

Data were provided on the breakdown of business stock for each of the County areas in the East Midlands which were used to provide an indicative split of waste and waste treatment capacity required. As discussed above this cannot be translated into facility numbers without making some assumption about the treatment type.

Table 31 Breakdown of C&I waste arising by sub- area, 000s tonnes

	Split from EMDA data	C&I Waste Arising Estimate		
		2010	2015	2020
Derbyshire	21.1%	2,127	2,406	2,722
Leicestershire	24.1%	2,436	2,756	3,119
Lincolnshire	17.3%	1,746	1,975	2,234
Northamptonshire	17.2%	1,739	1,968	2,227
Nottinghamshire	20.2%	2,042	2,310	2,614
Total		10,090	11,415	12,916

If it is assumed that landfill will remain the disposal route for C&I waste up to but not more than the aspirational target set in WS2000 and that 42% of C&I waste is recycled as suggested in the technical report then of 12.9 million tonnes of C&I waste arising, 3.6 will be landfilled, 5.4 recycled and 3.9 million tonnes will have to be treated by some other means (figures may not sum due to rounding).

As with MSW it has been assumed that the treatment of this 3.9 million tonnes not recycled or landfill will be via a number of technologies equally and as a result an indicative set of facility numbers has been provided below.

Table 32 Estimate of the number of facilities required to treat C&I waste not landfilled or recycled

Treatment Type	Number of Facilities by 2020
Incineration (250 tonnes each per annum)	4
MBT (50 tonnes each per annum)	19

ATT (50 tonnes each per annum)	19
Autoclave (50 tonnes each per annum)	19
Total	61

6.3 C&D Waste

The major capacity requirement identified for construction and demolition waste in the East Midlands is recycling capacity.

As with C&I waste, it is difficult to find data with which to split C&I capacity requirements by sub-region. In addition the use of mobile crushing and screening plant to provide the majority of current capacity suggests that estimating facility numbers, let alone facility numbers by sub-region would be a misrepresentation of the estimated capacity requirement. The need for capacity will change over time dependant upon where the regeneration and major construction activity is to occur.

However the data from the capacity survey can be used to suggest what plant may be required on a regional basis. Currently there is an estimated 2.4 million tonnes per annum of C&D recycling capacity provided by 159 facilities/sites/mobile plant. If the estimated 10.1 million tonnes per annum is required by 2020 then up to 660 sites would be required. However, this assumes that the current sites are all running to capacity or are being fully utilised which may not be the case. This leads us to a very pessimistic view of what may be required in future, more so than just the worst case capacity requirement alone.

To provide an indication of the waste tonnage split between counties, business stock information provided by EMDA has been used and is shown in Table 33 below.

Table 33 Breakdown of C&D waste and capacity requirements, 000s tonnes

	Split from EMDA data	Estimated Current Capacity	C&D Waste Recycling Estimate			Shortfall in 2020
			2010	2015	2020	
Derbyshire	21.1%	356	1,456	1,697	2,137	1,781
Leicestershire	24.1%	380	1,668	1,945	2,448	2,068
Lincolnshire	17.3%	388	1,195	1,393	1,754	1,366
Northamptonshire	17.2%	804	1,191	1,388	1,748	944
Nottinghamshire	20.2%	508	1,398	1,630	2,052	1,544
Total		2,436	6,907	8,054	10,138	7,702

6.4 Special (Hazardous) Waste

The need for specialised facilities for hazardous waste around England is likely to lead to the continued transport of hazardous waste into and out of the East Midlands for treatment depending on where that treatment capacity is located. One area of treatment capacity identified as a priority for the East Midlands is stabilisation / solidification capacity, in the region of 70ktpa to 75ktpa. The sizes of these facilities vary considerably and could be added to existing physico-chemical treatment facilities. The capacity need could be met by between 1 and 10 facilities.

For the reasons outlined above it is not appropriate to split treatment capacity requirements by planning region within the East Midlands.

6.5 Summary of Capacity/Facility Needs

Below Table 34 below summarises the capacity needs by facility type and provides an estimate of the number of facilities that may be needed across the East Midlands region. The estimate is for illustration only based on assumed facility capacities.

Table 34 Summary of Estimated Capacity and Additional Facility Needs, 000s tonnes

Facility	Assumed Capacity	Current Capacity Estimate	2010		2015		2020	
			Cap	Facilities	Cap	Facilities	Cap	Facilities
Materials Recycling Facilities	50	227	427	0	500	0	641	~ 3
Composting Facilities	25	371	544	~ 7	636	~ 11	816	~ 18
Incineration	150	150	2,160	~ 2	2,527	~ 3	2,828	~ 3
Mechanical Biological Treatment	50	100	2,160	~ 11	2,527	~ 12	2,828	~ 14
Advanced Thermal Treatment	50	0	2,160	~ 11	2,527	~ 12	2,828	~ 14
Autoclave	50	0	2,160	~ 11	2,527	~ 12	2,828	~ 14
C&I Facilities		n/a	6,464	~53	7,790	~57	9,290	~ 61
C&D Recycling	15	2,437	6,907	Up to 298	8,054	Up to 375	10,138	Up to 513
Stabilisation / Solidification	Variable	Limited	73	1 to 10	73	1 to 10	73	1 to 10
Other capacity not covered	8,891		NA					

Note: MRF facility estimates include a 270,000 tpa facility coming online.

Note: Facility numbers estimated are extra to current capacity estimates

Although the table above gives estimates of treatment capacity required it does not cover all categories of treatment capacity identified in Phase I. Determination of the treatment capacity requirements has been carried out for specific waste streams which could not be linked to certain treatment types (e.g. it is difficult to predict the amount of C&I metal recycling). Those treatment types listed below:

- ◆ Other incineration (clinical & hazardous)
- ◆ Chemical Treatment
- ◆ Physio-Chemical
- ◆ Physical Treatment
- ◆ Wood
- ◆ Metal



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- ◆ Other (11)
- ◆ Other (fuel)
- ◆ Other (biological treatment)
- ◆ Other (not known).

7. LOWER CAPACITY REQUIREMENTS (BASED ON REGIONAL PLANNING GUIDANCE FOR THE EAST MIDLANDS)

Work from the Technical Report was fed into the Revised Regional Planning Guidance (RPG) Document for the East Midlands. In terms of waste growth scenario used for the RPG is consistent with the Lower Growth scenario in this report. The guidance states that the Waste Strategy will be drawn up using the following guiding principles:

- ◆ Working towards zero growth rate in waste at a regional level by 2016;
- ◆ Reducing the amount of waste sent to landfill in accordance with the EU landfill directive;
- ◆ Exceeding government targets for recycling and composting, with the objective of bringing all parts of the region up to the levels of current best practice; and
- ◆ Taking a flexible approach to other forms of waste recovery, on the basis that technology in this area is developing very quickly and is difficult to predict over a 20 year period.

Using these principles estimates of recycling levels, treatment and disposal capacity requirements on a sub regional level have been made for 2010, 2015 and 2020.

The principles set out in the RPG have been covered in the following ways:

- ◆ The Lower Growth Scenario set out in this report, which uses the same growth projections as the Technical Report represents zero overall growth in currently controlled waste after 2016. However, this does not mean zero growth in each waste stream as it is considered more likely that decreases in C&I and C&D waste streams are achievable but with increasing populations MSW is likely to continue to increase as a whole. It should be noted that the initial arisings data in this report is 4 million tonnes greater than that used in the Technical Report due to updated C&D arisings data from Symonds.
- ◆ The Landfill Allowances for each authority in the East Midlands have been used to make an assessment of the overall diversion from landfill required for the region taking a mass balance approach, therefore including a contribution to landfill diversion from recycling.
- ◆ The following region-wide recycling levels have been assumed:
 - 30% recycling and composting from 2010
 - 50% recycling and composting from 2015
- ◆ Capacity for recovery of waste has been shown as landfill diversion capacity acknowledging the fact that a mixture of treatment types are likely to be used including energy from waste, mechanical biological treatment, advanced thermal treatment technologies and autoclaving.

To provide consistency with the Technical Report, and hence the figures used by EMRA as a consequence of that report, the breakdowns of capacity requirements have been made in line with the County split used in the Technical Report. Tables 35 to 37 show the results of this analysis.

Table 35 Capacity Requirements in 2010 for the RPG scenario, 000s tonnes

	Recycling/ Composting	Landfill Diversion (1)	Re-use (2)	Disposal (3) (5)	Total
Derbyshire MSW (~23% of regional total)	182	82	-	343	607
Leicestershire MSW (~23% of regional total)	182	82	-	343	607
Lincolnshire MSW (~11% of regional total)	87	39	-	164	290
Northamptonshire MSW (~15% of regional total)	119	53	-	224	396
Nottinghamshire MSW (~28% of regional total)	222	100	-	418	739
Regional sub total for MSW	792	355	-	1,492	2,639
Derbyshire C&I (~20% of regional non-inert total)	658	-	-	900	1,558
Leicestershire C&I (~14% of regional non-inert total)	460	-	-	630	1,090
Lincolnshire C&I (~9% of regional non-inert total)	296	-	-	405	701
Northamptonshire C&I (~11% of regional non-inert total)	362	-	-	495	857
Nottinghamshire C&I (~46% of regional non-inert total)	1,512	-	-	2,070	3,582
Regional sub total for C&I (4)	3,288	-	-	4,500	7,788
Derbyshire C&D waste (assumed ~23% of regional total)	1,471	-	1,365	44	2,880
Leicestershire C&D waste (assumed ~23% of regional total)	1,471	-	1,365	44	2,880
Lincolnshire C&D waste (assumed ~15% of regional total)	960	-	890	29	1,879
Northamptonshire C&D waste (assumed ~15% of regional total)	960	-	890	29	1,879
Nottinghamshire C&D waste (assumed ~24% of regional total)	1,535	-	1,424	46	3,005
Regional sub total for C&D	6,397	-	5,933	192	12,524
Regional sub total for special				271	271
Regional Total	10,477	355	5,933	6,456	23,222

1 Landfill Diversion includes energy recovery and alternative technologies such as MBT. For MSW it represents the minimum required for achievement of LATS allocations

2 Re-use of C&D waste represents landfill engineering, use on para 9&19 sites and backfill of quarry voids

3 Disposal does not include residues from treatment facilities

4 Assumes 42% C&I recycling/composting taken from Technical Report which means WS2000 Target met by recycling/composting. Note disposal could include energy recovery and alternative technologies such as MBT

5 MSW disposal figures cannot be used alone to check for LATS compliance. A mass balance approach has been used to calculate BMW diversion required and this leads to a contribution from recycling and composting. The % of BMW left in this residual fraction for disposal will therefore be less than 68%. This is consistent with the EA approach.

Note: numbers may not sum due to rounding.

Table 36 Capacity Requirements in 2015 for the RPG scenario, 000s tonnes

	Recycling/ Composting	Landfill Diversion (1)	Re-use (2)	Disposal (3) (5)	Total
Derbyshire MSW (~23% of regional total)	319	66	-	253	638
Leicestershire MSW (~23% of regional total)	319	66	-	253	638
Lincolnshire MSW (~11% of regional total)	153	32	-	121	305
Northamptonshire MSW (~15% of regional total)	208	43	-	165	416
Nottinghamshire MSW (~28% of regional total)	388	81	-	308	777
Regional sub total for MSW	1,387	289	-	1,098	2,774
Derbyshire C&I (~20% of regional non-inert total)	655	-		896	1,551
Leicestershire C&I (~14% of regional non-inert total)	458	-		627	1,085
Lincolnshire C&I (~9% of regional non-inert total)	295	-		403	698
Northamptonshire C&I (~11% of regional non-inert total)	360	-		493	853
Nottinghamshire C&I (~46% of regional non-inert total)	1,506	-		2,061	3,566
Regional sub total for C&I (4)	3,273	-	-	4,479	7,753
Derbyshire C&D waste (assumed ~23% of regional total)	1,546	-	1,434	47	3,027
Leicestershire C&D waste (assumed ~23% of regional total)	1,546	-	1,434	47	3,027
Lincolnshire C&D waste (assumed ~15% of regional total)	1,009	-	935	30	1,974
Northamptonshire C&D waste (assumed ~15% of regional total)	1,009	-	935	30	1,974
Nottinghamshire C&D waste (assumed ~24% of regional total)	1,614	-	1,497	49	3,159
Regional sub total for C&D	6,724	-	6,236	203	13,163
Regional sub total for special				271	271
Regional Total	11,384	289	6,235	6,051	23,691

1 Landfill Diversion includes energy recovery and alternative technologies such as MBT. For MSW it represents the minimum required for achievement of LATS allocations

2 Re-use of C&D waste represents landfill engineering, use on para 9&19 sites and backfill of quarry voids

3 Disposal does not include residues from treatment facilities

4 Assumes 42% C&I recycling/composting taken from Technical Report which means WS2000 Target met by recycling/composting. Note disposal could include energy recovery and alternative technologies such as MBT

5 MSW disposal figures cannot be used alone to check for LATS compliance. A mass balance approach has been used to calculate BMW diversion required and this leads to a contribution from recycling and composting. The % of BMW left in this residual fraction for disposal will therefore be less than 68%. This is consistent with the EA approach

Note: numbers may not sum due to rounding

Table 37 Capacity Requirements in 2020 for the RPG scenario, 000s tonnes

	Recycling/ Composting	Landfill Diversion (1)	Re-use (2)	Disposal (3) (5)	Total
Derbyshire MSW (~23% of regional total)	335	101	-	235	671
Leicestershire MSW (~23% of regional total)	335	101	-	235	671
Lincolnshire MSW (~11% of regional total)	160	48	-	112	321
Northamptonshire MSW (~15% of regional total)	219	66	-	153	438
Nottinghamshire MSW (~28% of regional total)	408	123	-	286	817
Regional sub total for MSW	1,458	439	-	1,020	2,917
Derbyshire C&I (~20% of regional non-inert total)	634	-		868	1,501
Leicestershire C&I (~14% of regional non-inert total)	444	-		607	1,051
Lincolnshire C&I (~9% of regional non-inert total)	285	-		390	676
Northamptonshire C&I (~11% of regional non-inert total)	349	-		477	826
Nottinghamshire C&I (~46% of regional non-inert total)	1,458	-		1,995	3,453
Regional sub total for C&I (4)	3,170	-	-	4,338	7,507
Derbyshire C&D waste (assumed ~23% of regional total)	1,546	-	1,434	47	3,027
Leicestershire C&D waste (assumed ~23% of regional total)	1,546	-	1,434	47	3,027
Lincolnshire C&D waste (assumed ~15% of regional total)	1,009	-	935	30	1,974
Northamptonshire C&D waste (assumed ~15% of regional total)	1,009	-	935	30	1,974
Nottinghamshire C&D waste (assumed ~24% of regional total)	1,614	-	1,497	49	3,159
Regional sub total for C&D	6,724	-	6,236	203	13,163
Regional sub total for special				271	271
Regional Total	11,352	439	6,235	5,831	23,858

1 Landfill Diversion includes energy recovery and alternative technologies such as MBT. For MSW it represents the minimum required for achievement of LATS allocations

2 Re-use of C&D waste represents landfill engineering, use on para 9&19 sites and backfill of quarry voids

3 Disposal does not include residues from treatment facilities

4 Assumes 42% C&I recycling/composting taken from Technical Report which means WS2000 Target met by recycling/composting. Note disposal could include energy recovery and alternative technologies such as MBT

5 MSW disposal figures cannot be used alone to check for LATS compliance. A mass balance approach has been used to calculate BMW diversion required and this leads to a contribution from recycling and composting. The % of BMW left in this residual fraction for disposal will therefore be less than 68%. This is consistent with the EA approach.

Note: numbers may not sum due to rounding



7.1 Adequacy of current facilities – lower capacity

Based on the analysis of capacity requirements undertaken using the RPG scenario the adequacy of current capacity has been assessed by waste stream.

For consistency with the work carried out in the Technical Report, which has subsequently been used by EMRA, the apportionment of waste to each county have been taken from the Technical Report and used in this section.

The existing capacities shown in Table 38 are those illustrated in section 6 and are repeated here to tie into the RPG scenario which discusses different areas within the region.



**STUDY TO DETERMINE THE CURRENT AND FUTURE TREATMENT CAPACITY OF THE EAST MIDLANDS REGION:
PHASE 2**

7.1.1 MSW

Table 38 Estimate of MSW treatment capacity required in 2020 by authority using RPG scenario (using Lower Growth estimates), 000s tonnes

	MRF Capacity			Composting Capacity			Landfill Diversion Capacity (col.2 Table 37)			Disposal Capacity	Total Disposal Capacity
	Current	2020 Estimate	Gap	Current	2020 Estimate	Gap	Current (2)	2020 Estimate	Gap	2020 Estimate	2020 Estimate (3)
Derbyshire MSW	47	148	101	38	188	150	0	101	101	235	336
Leicestershire MSW	32	148	116	66	188	121	0	101	101	235	336
Lincolnshire MSW	42	71	29	140	90	-50	0	48	48	112	160
Northamptonshire MSW	42	96	54	60	123	63	0	66	66	153	219
Nottinghamshire MSW	65	180	115	63	229	166	150	123	-27	286	409 (259 net) (4)
Regional sub total for MSW	227	641	414	371 (1)	817	446	150	439	289	1,020	1,459 (1,309 net)

Note: numbers may not sum due to rounding

1 Includes 3,600 tonnes capacity of unknown location

2 Current capacity represents total capacity for waste treatment which can provide BMW diversion, not the actual BMW diversion supplied by those facilities

3 This represents the diversion of all MSW not treated by recycling or composting.

4 In brackets the net 'gap' in existing facilities has been identified taking into account the existing capacity identified under landfill diversity capacity.

7.1.2 C&I Waste

Estimates of capacity requirements for C&I waste are based on the assumption that the region will strive to meet the aspirational WS2000 targets for the diversion of C&I waste from landfill. Using the assumption that 42% of C&I waste will be recycled (taken from the technical report) equivalent to 3.2 million tonnes. Landfill disposal estimated to be 3.6 million tonnes to meet the WS2000 aspiration target, adequate landfill diversion levels will not be attained through recycling alone and a further 0.7 million tonnes of treatment capacity will be required. Therefore a total of 3.9 million tonnes of landfill diversion capacity will be required including recycling and composting facilities. This assumes of course that the WS2000 diversion target will be met and the maximum landfill allowed by this target will be utilised.

If the same assumptions about treatment types and facility capacities are made as in section 6.2 above, the following facilities (Table 39) would be required for C&I waste in 2020.

Table 39 Table of indicative facility numbers to treat C&I waste not recycled or landfill

Treatment Type	Number of Facilities by 2020
Incineration (250 tonnes each per annum)	1
MBT (50 tonnes each per annum)	4
ATT (50 tonnes each per annum)	3
Autoclave (50 tonnes each per annum)	3
Total	11

7.1.3 C&D Waste Recycling Capacity

Assuming that the re-use tonnages estimated in Table 37 are achieved, using the estimated recycling capacity required for the RPG scenario in 2020 an estimate of C&D recycling capacity development has been provided below. It should be noted that much of the current capacity is provided through mobile crushing and screening and therefore breakdown of capacity requirements by authority is based on the registered site and current equipment may not be currently fully utilised.

Table 40 Estimate of C&D waste recycling capacity in 2020 by authority using RPG scenario

	Re-use Estimates	C&D Recycling Capacity, 000 tonnes		
		Current Capacity	2020 Estimate	Gap
Derbyshire C&D waste	1,434	356	1,546	1,190
Leicestershire (1) C&D waste	1,434	380	1,546	1,166
Lincolnshire C&D waste	935	389	1,009	620
Northamptonshire C&D waste	935	804	1,009	205
Nottinghamshire C&D waste	1,497	508	1,614	1,106
Regional sub total for C&D	6,236	2,437	6,724	4,287

1 Figures for Leicestershire include Rutland council



If the assumption that an average C&D crushing facility is 15,000 tonnes per annum a further 286 sites / pieces of mobile crushing plant will be required in the East Midlands by 2020. This also assumes that current sites and equipment are being utilised to their capacity.

7.1.4 Special (Hazardous Waste)

As has been discussed earlier in this report, the nature of special waste treatment capacity across England and the movements of special waste between regions suggests that it is inappropriate to provide capacity gap estimates for each authority area within the East Midlands.

As current stabilisation / solidification capacity is limited in the East Midlands, around 73,000 tonnes of additional stabilisation / solidification capacity may be required in future.

8. SITE LOCATION CONSIDERATIONS

It was considered that a site search was outside the scope of this study and with the uncertainty about what facilities and exactly how many would be required; a set of generic considerations for locating and planning for waste facilities is given in this section.

In August 2004 the ODPM published the findings of a research study into planning for waste management facilities. Along with some generic considerations for waste facility planning it gives details of site considerations for specific facility types under the current planning regime. Information from that research study has been used to provide general considerations for site location in this report.

8.1 Materials Recycling Facilities

Existing land use: Preference should be given to industrial or degraded sites or sites on or close to existing waste management facilities. B1/B2 and B8 use class designations may potentially be acceptable.

Proximity to sensitive receptors: If amenity issues such as noise and litter can be minimised operations could be located within 100 metres of sensitive receptors.

Access: Access considerations will be directly related to the volume of waste. If part of a centralised facility, which includes other process operations, sites should normally be located close to the primary road network without constraints on large number of HGVs and waste collection vehicles.

8.2 Composting Facilities

Existing land use: Traditional windrow composting plants can blend in with suburban and rural development due primarily to their low profile structures and their similarity to other rural developments (e.g. farms). Such facilities would not normally be compatible with a hi-tech business park environment or an urban setting. Enclosed facilities are suited to areas allocated for business use and traditional commercial/industrial urban areas, and are compatible with the more intensive Class B1/B2 activities under the Use Classes Order. Existing waste sites should also be considered for both types of composting facility.

Proximity to sensitive receptors: Site specific risk assessment needs to be a condition if composting operations are to be located within 250 metres of any working or dwelling place. Where possible facilities should be located at least 250 metres from sensitive properties, which may include business premises.

Transport infrastructure: Requires good access from primary road network and access roads which are free from restrictions for HGVs.

8.3 Incinerators – Large Scale

Existing land use: Preference should be given to areas allocated for business use or in traditional commercial industrial urban areas. Compatible with the more intensive Class B1/B2 activities under the Use Classes Order. Existing waste sites should also be considered.

Proximity to sensitive receptors: Where possible facilities should be located at least 250 metres from sensitive properties.

Transport infrastructure: Requires good access from primary road network and access roads which are free from restrictions for HGVs. Consideration should be given to sites which offer the potential for rail transfer.

8.4 Incinerators – Small Scale

Existing land use: In contrast to large thermal treatment facilities smaller scale plants afford the opportunity to consider wider locational options in mixed use areas. Preference should be given to areas allocated for business use or in traditional commercial/industrial urban areas. Compatible with most Class B1/B2 activities under the Use Classes Order. Existing waste sites should also be considered. Plants can be located in juxtaposition with modern industrial buildings or as a part of business parks where CHP potential can be developed.

Proximity to sensitive receptors: Sites closer than 250m of housing etc should generally be avoided where possible. However, scale and improved environmental performance standards should enable a reasonable case to be made for such plants to be located closer to houses etc, particularly when part of a CHP/district heating scheme.

Transport infrastructure: If waste feed is from on-site industrial operations then access is not critical. If it is a stand alone facility, access routes require capacity to meet input rates, usually good quality A/B class roads or primary road network free from restrictions on HGVs. Other forms of transport such as rail are unlikely to be economically viable if input rates are less than 100,000 tonnes per year, unless the infrastructure is already in place.

8.5 Mechanical Biological Treatment Facilities

Existing land use: Preference should be given to industrial or degraded sites or sites on or close to existing waste management facilities.

Proximity to sensitive receptors: Concerns over health risks from bio-aerosols generated by biological treatment processes may require plants to be located at least 250m from sensitive receptors.

Access: Access consideration will be directly related to the volume of waste. If part of a centralised facility, which includes other process operations, sites should normally be located close to the primary road network without constraints on large numbers of HGVs and waste collection vehicles.

8.6 Advanced Thermal Treatment Facilities

Existing land use: In contrast to large thermal treatment facilities smaller scale plants afford the opportunity to consider wider locational options in mixed use areas. Preference should be given to areas allocated for business use or in traditional commercial/industrial urban areas. Compatible with most Class B1/B2 activities under the Use Classes Order. Existing waste sites should also be considered. Plants can be located in juxtaposition with modern industrial buildings or as a part of business parks where CHP potential can be developed.

Proximity to sensitive receptors: Sites closer than 250m of housing etc should generally be avoided where possible. However, scale and improved environmental performance standards should enable a reasonable case to be made for such



plants to be located closer to houses etc, particularly when part of a CHP/district heating scheme.

Transport infrastructure: If waste feed is from on-site industrial operations then access is not critical. If it is a stand alone facility, access routes require capacity to meet input rates, usually good quality A/B class roads or primary road network free from restrictions on HGVs. Other forms of transport such as rail are unlikely to be economically viable if input rates are less than 100,000 tonnes per year, unless the infrastructure is already in place.



APPENDICES



1. LEGISLATION REVIEW

The following review includes a summary of the key legislative drivers affecting the quantity and management of key waste streams on a national level. The review includes legislation in force and draft, from the EU and UK.

The majority of UK waste management legislation is now derived fully or in part from European legislation. There are three types of legally binding European Union (EU) legislation:

- ◆ Regulations – which apply directly to all member states and do not need to be transposed into national legislation;
- ◆ Directives – set out the aims to be achieved and must then be translated into national law within a set period of time; and
- ◆ Decisions – which are binding on those to which they are addressed and are used to add more detail to adopted EU legislation.

Directives are the most common form of EU law affecting waste management, made up of Articles. Through Articles referring to the different matters within the legislation, Directives specify what is to be achieved, but do not specify how each national authority implements the requirements. Because Directives are not directly applicable to Member States each nation introduces enabling legislation to implement the requirements of the Directive.

In the UK, EU legislation is implemented through Acts of Parliament which create statute law and set out the general requirements which are then specified in the form of regulations.

A summary of EU and UK legislation which may have a direct impact on the collections, management and treatment of waste is provided below. However it must be recognised that this is an overview and the texts themselves should be consulted for more detail and up to date changes; legislation can be amended, superseded and withdrawn.

The legislation review covers the following:

- ◆ Framework Directive on Waste
- ◆ Landfill Directive 99/31/EC and the Landfill Regulations 2002 (SI 1559 Hazardous Waste Directive 91/689/EEC, amended by Commission Directive 94/31/EC
- ◆ Special Waste Regulations 1996 (SI 972)
- ◆ European Waste Catalogue 2000/532/EC
- ◆ Waste Management Licensing Regulations 1994 (SI 1056)
- ◆ Pollution Prevention and Control Regulations 2000 (England and Wales (SI 1973)
- ◆ Producer Responsibility (Packaging Waste) Regulations 1997 (SI 648)
- ◆ The Waste Electrical and Electronic Equipment Directive 2002/96/EC



- ◆ Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment Directive 2002/95/EC
- ◆ End-of-Life Vehicles Regulations 2003 (SI 2635)
- ◆ Proposed Agricultural Waste Regulations
- ◆ Proposed Biowaste Directive
- ◆ Household Waste Recycling Act 2003

Framework Directive on Waste

The foundation directive which established the general approach and rules to waste management is the EU Framework Directive on Waste (75/442/EEC as amended by 91/156/EEC, 91/962/EEC and 96/350/EEC). In 1991, the Framework Directive was amended by a Directive which defined waste and specified 16 specific categories of waste. An important objective of the Directive is to promote waste recovery and disposal which does not endanger human health or compromise environmental quality. The majority of the legislation summarised in this review is influenced by the Waste Framework Directive; the control of risks to the environment and human health are key to many regulations

Landfill Directive 99/31/EC and the Landfill Regulations 2002 (SI 1559)

The Directive aims to improve waste management practices and deals with the full social, environmental and economic impacts of landfill as a disposal option. Council Directive 99/31/EC on the Landfill of Waste came into force on 16th July 1999.

The Directive contains both strategic objectives for reducing the amount and changing the nature of wastes that are landfilled. In addition, it provides strict provisions for the regulation and management of landfills and specifies which wastes can be landfilled together. Changes to construction, operation and after care aspects of landfills are key areas covered and almost all wastes will require pre-treatment before landfilling.

Impact of the Directive

The key provisions of the legislation mean there will be an impact on the way a range of wastes are managed, including the following:

- ◆ Provision to ban the disposal of hazardous and non-hazardous wastes in the same landfill (co-disposal) from 16 July 2004 means hazardous municipal wastes must be disposed of in accordance with this provision.
- ◆ Landfills are classified according to one of three types: hazardous, non-hazardous or inert. Currently, there are twelve landfill sites which are able to accept hazardous wastes. Although this number is likely to increase when more applications are submitted, the cost of landfilling hazardous waste is likely to increase for which a premium can be charged.
- ◆ Waste must be treated before disposal; this will increase the cost of disposal and will lead to a requirement for provision of more treatment capacity. The types of treatment which may be appropriate to the wide range of waste streams arising in the EMRA area may include source segregation, size reduction, for example shredding and composting to reduce volume.



- ◆ Stringent reductions in biodegradable municipal waste (BMW) are to be introduced in phases. The first target is a reduction of BMW to 75% of the 1995 baseline by 2010. Local authorities must meet their individual targets; this may be through a range of approaches such as choosing appropriate treatment technologies of separation at source.
- ◆ Hazardous liquids, flammable, corrosive, explosive, oxidising and infectious wastes are banned from landfill from July 2002. Non hazardous liquids will be banned from landfill between 2004 and 2007. Alternative waste disposal methods will need to be sought, for example incineration in addition to further treatment capacity for liquid waste.
- ◆ Whole tyres will be banned from landfill from 2003, and shredded tyres banned from 2006. This will lead to a need for alternative uses or disposal approaches for tyres to be sought; this may include recovery operations to be expanded.

The Directive is implemented in England through the Landfill (England and Wales) Regulations 2002 (SI 1559). The Waste Acceptance Criteria determine the properties of a waste which are acceptable for landfilling. The criteria are set for inert, hazardous and non-hazardous wastes. In order to fulfil the waste acceptance criteria, a waste must demonstrate that it does not contain substances which leach from the waste in breach of the leaching limit values. If the waste does breach the thresholds, it will require treatment prior to landfilling. The potential implications of this include the need to test waste streams for leachability and the need for further treatment.

The Waste Acceptance Criteria give specific reference is given to a number of waste streams such as:

- ◆ Gypsum waste - Non-hazardous gypsum-based materials should be disposed of only in landfills for non-hazardous waste in cells where no biodegradable waste is accepted.
- ◆ Asbestos waste - materials containing asbestos maybe landfilled at landfills for non-hazardous waste in accordance with Article 6(c)(iii) of the Landfill Directive without testing.

Further Information

See <http://www.environment-agency.gov.uk/> for a range of guidance and supporting information including Landfill directive Technical Guidance.

See the Department for the Environment and Rural Affairs (Defra) <http://www.defra.gov.uk>.

Special and Hazardous Waste Regulations

Hazardous Waste Directive 91/689/EEC (as amended)

The Hazardous Waste Directive, amended) by Commission Directive 94/31/EC, redefines 'hazardous waste' and aims to improve the harmonisation of hazardous waste management in Europe. The Directive is implemented in part through the Special Waste Regulations; other requirements of the Directive such as the Duty of Care are implemented through separate UK legislation.

Impact of the Directive



All wastes with specific hazardous characteristics, such as corrosive, infectious or toxic are covered by this Directive. Annex I contains categories or generic types of hazardous waste listed according to their nature or the activity which generated them. Annex II lists constituent substances which will make the waste hazardous if it also has a property shown in Annex III e.g. chromium (VI) compounds which displays one of the Annex III hazardous properties including explosive, oxidising or highly flammable.

The Directive introduces further controls such as the prohibition of mixing hazardous waste except where it is a necessary part of a disposal process. Domestic waste is not covered by the Directive.

The Directive has no direct impact for waste managers, however the Special Waste Regulations and European Waste Catalogue introduce the rules by which hazardous waste should be managed.

Further Information

European Union On Line text of the Hazardous Waste Directive
<http://www.europa.eu.int>.

Special Waste Regulations 1996 (SI 972) (as amended)

The Special Waste Regulations (SWR) came into force on 1 September 1996 (England, Wales and Scotland). They are made under Section 62 of the Environmental Protection Act 1990 which enables the Secretary of State to make provision by regulations for the keeping, treatment or disposal of controlled wastes which are dangerous or difficult to manage. These 'special wastes' are defined in the regulations.

The main purpose of the regulations is to provide an effective system of control which ensures that special wastes are properly managed from the moment they are produced until they reach their final destination for disposal or recovery.

The Regulations apply to all movements of controlled waste (as defined by Section 75 of the Environmental Protection Act 1990) that is also a special waste.

Impact of the proposed changes

The SWR are currently being revised to incorporate amendments to the European Waste Catalogue. This will result in a wide range of wastes being classified as hazardous because additional hazardous properties (e.g. ecotoxic) need to be considered. Wastes which were not classified as special but may be considered as hazardous include waste which are commonly collected by local authorities e.g. some treated wood waste, end of life vehicles (prior to depollution) and cathode ray tubes. The Draft Regulations were published in September 2004, however the classification as hazardous will depend on the concentrations of dangerous substances within an individual waste stream.

The current SWR do not apply to household waste (except asbestos). However the definition of 'household' is wider than the definition of 'domestic' waste in the Directive, therefore the revised regulations will use the term domestic waste, which is limited to waste arising from domestic i.e. residential properties, and will exclude waste from prisons, camp sites, churches etc. Therefore, waste from these premises will now be subject to the regulations.



The producer of the waste must determine if the waste is special (hazardous). The waste manager may need to get the waste analysed to determine if the thresholds in the regulations have been met or obtain further information from the waste producer. A further impact is the increased disposal costs of hazardous waste which may be compounded by a currently limited volume of hazardous waste landfill space.

Further Information

For further information see the A guide to the Special Waste Regulations 1996, which is available from

<http://www.environment-agency.gov.uk/commodata/105385/specwaste.pdf>.

See also NetRegs at: <http://www.environment-agency.gov.uk/netregs/>

Environment Agency (2001) Guidance on the waste treatment requirements of article 6(a) of the landfill directive Version 2.1. Draft for external consultation

European Waste Catalogue 2000/532/EC (as amended)

Under the Framework Directive on Waste, the European Commission is required to draw up a list of wastes belonging to the categories listed in Annex I of the Directive. The purpose of the list is to provide common terminology for waste throughout Europe and to provide the basis for statistical analysis. The list is known as the 'European Waste Catalogue' (EWC), amended by Commission Decisions 2001/118/EC, 2001/119/EC and Council Decision 2001/573/EC.

In 2002, the EWC and Hazardous Waste List (HWL) were combined to create an extended list of wastes. The HWL was drawn up in 1994 and published as Council Decision 94/904/EC. The wastes listed in the HWL are those wastes that appear in the EWC which have been deemed to be hazardous. The EWC 2002 details a series of steps for identifying wastes in the catalogue and determining whether a waste is covered by a hazardous waste entry.

Wastes in the catalogue are listed according to individual six-digit codes. The full description of a waste includes the two-digit and four-digit chapter headings, which identify generic sources and types of waste. A waste is hazardous if an asterisk is assigned to the EWC code.

Many wastes, including those found in both the municipal and industrial waste streams are covered by entries that are known as 'mirror entries' meaning it may be identified as hazardous if it contains 'dangerous substances' and non-hazardous if it does not. If a waste is covered by a 'mirror entry', the waste is hazardous only if the concentrations of 'dangerous substances' in the waste are above the threshold limits (i.e. percentage by weight) for one or more of the hazardous properties listed in Annex III to Hazardous Waste Directive.

Thresholds can be derived for particular substances to determine if it contains 'dangerous substances', in line with guidance such as that issued by the Environment Agency in England and Wales.

Impact of the changes to the EWC

If the concentrations of the various dangerous substances in the waste streams arising in the EMRA area are greater than or equal to the appropriate thresholds for those dangerous substances, the waste must be treated as hazardous. The



changes proposed to the special (hazardous) waste regulations take account of the changes to the EWC, therefore the key implications of the revised EWC can be seen through the revised legislation.

Further Information

Environment Agency (EA) offer advice on the EWC on its website (Business section) <http://www.environment-agency.gov.uk/>

European Union On Line text of the Directive <http://www.europa.eu.int>

Waste Facility Permitting & Licensing

Waste Management Licensing Regulations 1994 (SI 1056)

Sections 35-44 of Environmental Protection Act 1990 are implemented by the Waste Management Licensing Regulations 1994 (SI 1056) (WML). The key implications of the WML regulations include:

- ◆ The requirement for a license to operate a waste management facility; and
- ◆ Exclusions from licensing; and
- ◆ Exemptions from licensing for the storage or recovery of certain wastes (currently being reviewed).

The PPC regulations will take over the licensing of landfill sites, incinerators and other waste disposal facilities meeting specific PPC thresholds from these regulations (see PPC Regulations 2002).

Impact of WML Regulations

The key impact of the regulations is that the waste management facility must fulfil the other requirements of the regulations, such as financial provision and appropriate staff must have a Certificate of Technical Competence.

Further Information

DOE Circular 11/94 provides information on waste management licensing and the Framework Directive on Waste. See also the Environment Agency site NetRegs at: <http://www.environment-agency.gov.uk/netregs/>

Pollution Prevention and Control Regulations 2000 (England and Wales (SI 1973)

The Regulations implement the requirement to transpose the EU's IPPC Directive. The Regulations apply to all installations including mobile plant, carrying out an activity listed in Annex 1 to the Directive. Installations include specific waste management activities e.g. a landfill site.

Impact of PPC legislation

The Regulations primarily affect the operators of waste management facilities. Depending on the activity being carried out, the relevant local authority or Environment Agency is the regulator. Key to the Regulations is the need for the operator to apply for a permit to operate which demonstrates Best Available Techniques (BAT).



Further Information

Environment Agency has produced regulatory packages to provide guidance which includes an applications form and guidance notes and sector guidance on determining BAT. See www.environment-agency.gov.uk, www.sepa.org.uk

Producer Responsibility (Packaging Waste) Regulations 1997 (SI 648) (as amended)

The regulations implement part of the EC Directive on Packaging & Packaging Waste (94/62/EC). The aims of the regulations are to ensure that producers (of packaging and packaging materials) reduce the amount of packaging waste produced through reuse and recycling.

A business is affected by the regulations and deemed to be an obligated company if it:

- ◆ performs one or more of the listed activities on packaging materials or packaging (raw material manufacture, packaging conversion, packing/filling, selling or importing), or has those activities performed on its behalf; and
- ◆ owns the packaging on which these activities are carried out; and
- ◆ supplies to another stage in the packaging chain or to the final user; and
- ◆ in the previous year, exceeded the threshold tests - a UK turnover of £2million and handles 50 tonnes of packaging materials and or packaging.

The current UK targets for recovery and recycling packaging waste are:

- ◆ Recovery 63%
- ◆ Recycling (material specific)
 - paper/fibreboard 65%
 - steel 52.5%
 - glass 49%
 - aluminium 26%
 - plastic 21.5%
 - Wood 18%

Implications of the regulations

The main impact of the regulations is on businesses which are obligated to provide data to the Environment Agency on packaging materials handled and provide evidence that the requisite tonnage of packaging material has been recycled or recovered on their behalf.

The recovery and recycling targets set for the Packaging Waste Regulations require the provision of reprocessing capacity to handle the packaging materials generated. This may include businesses which are able to reprocess materials into new



products such as glass reprocessors. There is scope for revenue generation through selling Packaging Recovery Notes to obligated companies if a reprocessing activity is registered with the Environment Agency.

Currently, packaging materials collected through the municipal waste stream, for example via kerbside collections, contribute to the overall UK packaging recovery and recycling targets. The increasing targets for packaging waste recovery and the more challenging recycling targets set in the UK for local authorities, are likely to lead to an increased collection of recyclables, of which packaging is a significant part, for example tins, plastic bottles and containers, glass packaging such as jars etc. Therefore local authorities will have an increasingly significant role in the collection of recoverable packaging.

Further Information

NetRegs at: <http://www.environment-agency.gov.uk/netregs/>

Environment Agency Producer Responsibility Explanatory Notes

The Waste Electrical and Electronic Equipment Directive 2002/96/EC

The Waste Electrical and Electronic Equipment (Producer Responsibility) Regulations ('the WEEE Regulations) implement provisions of the European Parliament and Council Directive on Waste Electrical and Electronic Equipment (2002/96/EC) ('the WEEE Directive'). The WEEE Directive came into force on 13 February 2003.

The WEEE Directive aims to prevent WEEE arising, to encourage reuse, recycling and recovery of WEEE and to improve the environmental performance of all operators involved in the lifecycle of electrical and electronic equipment, especially those dealing with WEEE.

The timing of the main requirements is:

- ◆ producers financial obligations start from 13 August 2005;
- ◆ there should be a separate collection of WEEE amounting to 4kg per person (equivalent to 250,000 tonnes per year in the UK) by 31 December 2006; and
- ◆ producers must ensure that recycling targets are achieved by 31 December 2006.

Draft WEEE regulations and guidance were issued at end of July 2004, with the final regulations and guidance expected December 2004. The draft guidance proposes a The National Clearing House as an administrative body to assist in the registration of producers and the allocation of WEEE to producers. These functions would underpin the delivery of their WEEE obligations under the Regulations.

The main recovery and recycling targets for the WEE Directive are:

WEEE Category	Recovery %	Recycling/ Reuse %
Large household appliances, vending machines	80	75
IT + telecom equipment	75	65
Small household appliances, lighting, tools, toys and leisure equipment, monitoring and control instruments	70	50



Implications of the Directive

The Directive sets requirements relating to criteria for the collection, treatment, recycling and recovery of WEEE. It makes producers responsible for financing most of these activities; retailers/distributors also have responsibilities in terms of the take-back of WEEE and the provision of certain information. Private householders are to be able to return complete WEEE without charge.

These Regulations apply to all electrical and electronic equipment placed on the market in the United Kingdom falling into any of ten product categories, unless the equipment is part of another type of equipment which does not fall into any of these categories. The Regulations also specify a voltage range into which the products in the ten categories must fall to be covered by the scope. This is up to 1,000 volts AC or up to 1,500 DC. The ten product categories are:

- 1) large household appliances
- 2) small household appliances
- 3) IT & telecommunications equipment
- 4) consumer equipment
- 5) lighting equipment
- 6) electrical and electronic tools
- 7) toys leisure and sports equipment
- 9) monitoring and control instruments
- 10) automatic dispensers

Local authorities may contribute to the WEEE Directive through offering facilities for separately collecting or storing WEEE from householders, for example civic amenity sites or transfer stations.

Retailers and distributors of electrical and electronic equipment are obliged to provide free in-store take-back of WEEE or to provide alternative arrangements to last holders of WEEE. Again, local authorities could be involved in the alternative arrangements; The Government expects that all local authorities will have the opportunity to bid for funding for civic amenity site upgrades.

The regulations will mean a larger volume of WEEE requires collection, storage treatment and recovery. In addition, private householders need to be informed of WEEE take-back facilities available to them and encouraged to participate in the separate collection of WEEE. The guidance recognises the potential role of local authorities and recommends that as stakeholders, local authorities are consulted on the development of the recovery infrastructure and that the collection systems are designed to complement the local authority civic amenity sites.

Further Information

See <http://www.dti.gov.uk/sustainability/> for draft WEEE Regulations and Guidance.



Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment Directive 2002/95/EC

Draft regulations and guidance were published in July 2004 in accordance with the Restriction of Hazardous Substances (RoHS) Directive, which limits the use of certain hazardous materials in electrical and electronic equipment.

RoHS Regulations ban the placing on the EU market of new Electrical and Electronic Equipment (EEE) containing more than the set levels of lead, cadmium, mercury, hexavalent chromium and both polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants from 1 July 2006. There are a number of exempted applications for these substances e.g. exemption for spare parts for the repair and upgrade of equipment put on the market before 1 July 2006.

The RoHS Regulations apply to all EEE containing hazardous substances placed on the European Union Single Market on or after 1 July 2006, which falls into any of the eight broad categories which reflect eight of the ten categories in Annex 1 of the WEEE Directive. In addition, the RoHS Regulations apply both to electric light bulbs and to household luminaires however exclude the categories of Medical Devices and Monitoring & Control Instruments.

Implications of the Regulations

The guidance and regulations propose Maximum Concentration Values (subject to ratification by the EC Environment Council) for the relevant substances. The impact of this legislation is primarily on producers of electrical goods which fall under the scope of the regulations. In addition, the restriction on the use of these substances will also facilitate increased recycling and recovery of WEEE which may impact of local authorities' activities.

Further Information

See <http://www.dti.gov.uk/sustainability/> for draft RoSH Regulations and Guidance.

End-of-Life Vehicles Regulations 2003 (SI 2635)

The End of Life Vehicles (ELV) Directive 2000/53/EC came into force on 21 October 2000. Member States should have transposed the Directive into national law by 21 April 2002. The Directive lays down measures which aim, as a first priority, at the prevention of waste from vehicles and, in addition, at the reuse, recycling and other forms of recovery of end-of-life vehicles and their components so as to reduce the disposal of waste, as well as at the improvement in the environmental performance of all the economic operators involved in the life cycle of vehicles and especially the operators directly involved in the treatment of end-of-life vehicles. In particular it:

- ◆ restricts the use of certain heavy metals in the manufacture of new vehicles;
- ◆ introduces a Certificate of Destruction, which triggers the removal of a vehicle from the national vehicle register;
- ◆ requires that certain components are marked to aid recovery and recycling, and that information is provided to facilitate dismantling;
- ◆ requires the establishment of adequate systems for the collection of ELVs, and specifies the site, storage and operating standards that must be met by businesses permitted to treat ELVs;



- ◆ requires that ELVs can only be scrapped ('treated') by authorized facilities, which must meet specified environmental treatment standards.

These provisions were transposed into national law by The End-of-Life Vehicles Regulations 2003 (SI 2635), which came into effect on 3 November 2003.

The remaining Directive provisions relating to producer responsibility will be transposed through the End-of-Life Vehicles (Producer Responsibility) Regulations 2004.

Implications of the Regulations

The regulations will impact significantly on producers of vehicles (vehicle manufacturers or professional importers), because they must pay 'all or a significant part' of the costs of take back and treatment for complete ELVs.

In addition, owners must be able to have their complete ELVs accepted by collection systems free of charge, even when they have a negative value, from 1 January 2007 at the latest (earlier in respect of vehicles put on the market on or after 1 July 2002). This has implications for the ELV recovery network which will need to have the capacity to accept, store and treat the ELVs.

Further Information

See <http://www.dti.gov.uk/sustainability/> for ELV Guidance.

See <http://www.legislation.hmso.gov.uk/si/si2003/20032635.htm> for The End-of-Life Vehicles Regulations 2003 (SI 2635)

Forthcoming Agricultural Waste Regulations

Waste management controls currently cover the management of household, commercial and industrial waste, however controls are to be extended to agricultural waste. The extension of current controls to agricultural waste is likely to mean that waste disposal or recovery on farms will no longer be possible without a waste management licence or exemption from licensing.

The regulations will affect people or organisations which deposit, keep, treat or dispose of agricultural waste. Agricultural waste is defined as 'waste from premises used for agriculture within the meaning of the Agriculture Act 1947 (England). Agriculture therefore includes:

- ◆ Horticulture;
- ◆ fruit growing;
- ◆ seed growing;
- ◆ dairy farming;
- ◆ livestock breeding and keeping;
- ◆ the use of land as grazing land, meadow land, osier land, market gardens and nursery grounds; and
- ◆ the use of land for woodlands where that use is ancillary to the farming of land for other agricultural purposes.



Agricultural wastes covered by the future regulations will include waste silage wrap, waste pesticide containers, waste pesticides, scrap machinery, waste oils and waste veterinary medicines.

The controls will not apply to any waste which is excluded from the scope of the Waste Framework Directive, such as animal carcasses and the following agricultural wastes:

- ◆ faecal matter; and
- ◆ other natural non-dangerous substances used in farming.

Currently, there are no draft regulations, however Defra, the Scottish Executive and the Department of Environment (Northern Ireland) will separately carry out consultations on the extension of control.

For further information, see www.environment-agency.gov.uk

Forthcoming Biowaste Directive (Draft)

The EC issued a Communication on the Soil Strategy in 2002, which includes a mandate on the forthcoming Biowaste Directive. The mandate confirms that:

“By the end of 2004 a directive on compost and other biowaste will be prepared with the aim to control potential contamination and to encourage the use of certified compost.”¹⁷

Impact of the draft Biowaste Directive

The Directive will seek to set quality standards for composted products which will aim to

- ◆ promote safe long-term beneficial application;
- ◆ prevent any damage to the soil resource; and
- ◆ preserve soil properties.

The Directive will boost recovery of organic matter in order to fulfil the aims of the Communication on the Soil Strategy itself (e.g. enhancement of biological fertility and biodiversity).

Information on the Directive is currently limited, however it is anticipated to provides a link to the diversion of biodegradeable waste in the Landfill Directive through provisions for source separation, which is mirrored by the current Working Paper on Biowaste.

Implications of the proposed Directive

Biowaste Management is a crosscutting environmental issue, which impinges upon Sustainable Resource Use and is relevant to the EU's Thematic Strategy on Soil protection. In terms of impact on waste management, a clear position cannot be

¹⁷ COM (2002) 179 of 16 April 2002.



provided until more detail on the Directive is given, however it is anticipated to have implications for the collection and treatment of biologically active waste.

Further Information

For further information on the Biowaste Directive see:

- ◆ proposed Directive on the Biological Treatment of Biowaste, ASSURE comments on an EU Biowaste Directive and related policy measures. Brussels, January 2004

UK Soil Action Plan

Reflecting the increasing concerns around soil quality in the European Union, England has developed a Soil Action Plan.

The *First Soil Action Plan for England* sets out a three-year programme designed to ensure that soil will be used and looked after in ways that get the best out of a vital natural resource.

The Plan's aims include:

- ◆ soil should be looked after with a view both to short-term needs and the interests of future generations;
- ◆ regulation, legislation and policy will provide appropriate protection of soil as an irreplaceable natural resource and empower and encourage people to manage it properly;
- ◆ a better understanding of, and access to, information on the state of our soils and the physical, chemical and biological processes which operate on and within them.

The Plan includes a planned programme to boost education and awareness of soil issues, new guidance to protect soils throughout the planning process and work to develop and provide better access to information on soils

Further Information

The Soil Action Plan can be viewed at:

www.defra.gov.uk/environment/landliability/soil/actionplan.htm

Household Waste Recycling Act 2003

Household Waste Recycling Act (previously known as the Municipal Waste Recycling Bill) was a Private Members Bill introduced by Joan Ruddock MP. The Act makes provision regarding the collection, composting and recycling of household waste.

Impact of the Act

The Act requires English Waste Collection Authorities to collect at least two recyclable materials from households separate from residual waste by 2010. Councils with particular difficulties in meeting the demands of the legislation could be granted a derogation. The provision of 'comparable' recycling facilities, such as



a bring bank or civic amenity site within 100 metres of households, could satisfy the Act's requirements.

Impact of the Act

The key impact is the adherence to the first legislative requirement for local authorities to collect two streams of recyclable materials from the kerbside. It is anticipated that in many authorities within the EMRA area this is already happening, however in areas where it is not, further action will be required or a derogation sought whilst suitable infrastructure is developed.

Further Information

For the full text of the Act see <http://www.hmso.gov.uk/acts/acts2003/20030029.htm>