DERBYSHIRE COUNTY COUNCIL AND
DERBY CITY COUNCIL JOINT WASTE PLAN

TOWARDS A STATISTICAL BASIS FOR THE WASTE PLAN

MARCH 2013
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Derbyshire County Council and Derby City Council (the Councils) are working together to replace the Derby and Derbyshire Waste Local Plan which was adopted in March 2005. The new document once adopted will be “The Derby and Derbyshire Waste Plan” (the Plan). There is a pressing need to get an up to date, flexible, fit for purpose Plan in place that fits the unique, locally distinctive character of Derby and Derbyshire. Without this planning decisions will be purely based on National Waste Policy which may not reflect local priorities and aspirations.

The Councils have been working jointly on a range of background studies and have carried out consultation exercises, such as the “Big Choices for Waste” consultation in February 2010. As well as on-going stakeholder engagement, the work has involved sustainability appraisal, which is on-going, evidence gathering and consideration and interpretation of national policy and guidance. The picture with regards to national policy and guidance remains fluid with key national waste policy documents due to be published later in 2013.

This statistical basis background paper is a tool to inform the Plan process. In order to complete this work the following key tasks have been undertaken:

- Establish baseline waste arisings
- Establish waste growth assumptions
- Establish waste targets and develop scenarios
- Identify how those scenarios effect existing waste capacity
- Review landfill void data
- Draw conclusions with regards to capacity gap

Once the baseline arisings and growth scenarios were established the figures were then used, through the development of a number of scenarios, to forecast the likely waste capacity outcomes. Table 3 identifies that over the Plan period approximately 131,000,000 tonnes of controlled waste is forecast to arise up to the end of the Plan period. The biggest proportion of this is Constructional and Demolition (C&D) waste (49%) followed by Commercial and Industrial (C&I) and agricultural waste that make up (41%) when combined. Local Authority Collected Municipal Waste (LACMW) or household waste makes up a relatively small 8% of the overall stream. This stream is sometimes referred to as Municipal Solid Waste (MSW). It is
clear from the scale of waste arisings where the majority of the focus around waste prevention, minimisation and promotion of the waste hierarchy objectives should be.

This statistical basis document will be used to inform the Plan preparation process in order to provide a meaningful evidence base for consultees and other decision makers when considering and formulating the Plan policies. These policies will then help infrastructure investment decisions within Derby and Derbyshire.

At this stage this initial work only takes account of waste that arises within Derby and Derbyshire. Cross border movements of waste are currently under assessment through the Duty to Co-operate working with other waste planning authorities (WPAs), the result of which will be factored into further work. The work also does not take account of waste operations that are exempt from the Environment Agency (EA) permit regime at this stage. The monitoring of waste exemptions and the collation of accurate data remains a challenge and so this will be part of a separate piece of work with the EA, along with the consideration of other issues such as waste water.

The baseline non-landfill capacity for waste is explored in the final chapter. This is of particular importance because, as the Plan recognises the waste hierarchy objectives and accelerates the move away from final disposal, there is a clear gap opening up in available treatment and reprocessing capacity within the Plan area. The Plan will need to develop policies to bridge that gap. In terms of the landfill capacity using the scenarios developed, for the most part landfill void remains available, with the only potential landfill deficit coming in the latter part of the Plan period if the less ambitious landfill diversion targets are used.

It is well understood that the provision of accurate waste data remains a challenge and that the scenarios developed within this document are merely a development of some of the options. As such, the application of this document is one of informing debate and helping to shape future thinking as to waste development requirement for the Plan.

The data and evidence papers will play a key role in guiding policy principles within the Plan. This in turn will inform investment decisions within the County and City for waste and resource infrastructure.

Text Boxes such as the one below appear at various points throughout this paper in order to provide some additional information or clarification on certain issues. They are designed to be brief rather than all encompassing. They are green in colour and labelled in order to aid the reader.
Text Box 1: What is the Waste Plan and why is it needed?

The Waste Plan is a document that will set out the Strategic Vision and development management objectives for waste and resource infrastructure in Derby and Derbyshire. The document is needed to ensure that the right type of waste infrastructure can come forward in the right place at the right time within the Plan period.

Recent changes to the planning system through the National Planning Policy Framework (NPPF) and the Localism Act put a clear focus on ensuring decision making occurs at the lowest possible level and that decisions made reflect local circumstances. The Waste Plan provides the mechanism to ensure that important decisions regarding waste and resource infrastructure are taken locally.
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1. INTRODUCTION

1.1 Purpose of the Report

1.1.1 The purpose of this report is to set out the statistical basis for the Derby and Derbyshire Waste Plan (the Plan) to assess the need for facilities to manage waste and resources within the Plan area (Derby and Derbyshire) over the Plan period (2011 – 2030)

1.1.2 The report details the process, assumptions made and conclusions taken. To do this a range of tasks have been undertaken in stages. This report looks at stages 1 and 2.

Stage 1:

- Evaluating current waste arisings
- Forecasting future waste growth
- Assessing implications for waste management by applying known or potential targets to the forecasts

Stage 2:

- Assessing the gap between what is currently managed and future needs
- Assessing future capacity need for managing waste

Stage 3:

- Assessing significant cross border flows and their implications for the Plan
- Making assumptions on the effect that strategic flows and facilities will have on the Plan through Duty to Co-operate
- Assessing other issues, such as waste water

1.1.3 The report looks to build on and improve the understanding built up through previous consultations. The report does not take into consideration specific public or private sector contracts
for the management of waste that may currently be in progress or any other procurement strategies.

1.2 Modelling Waste Management

Keeping up to date with waste data to model future arisings and facility need is an on-going and a constantly changing task. The report uses the most up to date data at the time of publication whilst also building on previous consultations.

1.3 European, National and other Waste Management Targets

Text Box 2: Legislation

A full list of the planning related legislation can be found at 32.19 Legislation and Govt guidance/Notes on legislation link. This includes an overview of the current interpretation of the waste hierarchy.

European Targets

1.3.1 The EU Waste Framework Directive (2008/98/EC) is the principal European legislation of relevance to the Plan. It focuses on prevention and reduction of waste arisings. The original 1975 Directive introduced the key concept of the waste hierarchy as a requirement for member states to manage more effectively the amount of waste requiring disposal.

1.3.2 The 2008 Directive sets a number of important measures and targets for member states: by 2015 separate collections should be set up for at least paper, metal, plastic and glass and it requires the separate collection and treatment of bio waste.

The Directive also sets the following recycling targets:

50% for household waste (i.e. by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other
origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight) and,

70% for construction and demolition waste by 2020. (i.e. by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70 % by weight).

1.3.3 These targets will be examined and reviewed by the European Commission in 2014 with a view to reinforcing the targets and considering the setting of targets for other waste streams.

1.3.4 The Landfill Directive is also important. The overall aim of the EU Landfill Directive (99/31/ED) is “to prevent or reduce as far as possible negative effects on the environment from the landfilling of waste, during the whole lifecycle of the landfill”. The Directive has provisions covering location of landfills, and technical and engineering requirements for contaminants and emissions control.

1.3.5 The main changes introduced by the Directive are that certain wastes are banned from landfill. All landfill sites must be classified as inert waste, hazardous waste or non hazardous waste (this latter category covers most biodegradable waste). All wastes must be pre-treated before going to landfill.

1.3.6 In addition the Directive sets demanding targets to reduce the amount of biodegradable municipal waste (BMW) landfilled. Member states that landfilled more than 80% of their municipal waste in 1995 may postpone each of the targets by a maximum of 4 years. The UK Government has adopted this approach.

1.3.7 The resultant targets for the UK are:

By 2010 to reduce BMW landfilled to 75% of that produced in 1995
By 2013 to reduce BMW landfilled to 50% of that produced in 1995
By 2020 to reduce BMW landfilled to 35% of that produced in 1995
Construction and Demolition Waste

1.3.8 The Waste Framework Directive sets the following target to be achieved by 2020. The preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70% by weight. The Waste Strategy for Wales increases this target to a minimum of 90% by 2019/20.

**National targets**


1.3.10 The Strategy sets the following targets for recycling and composting household waste - at least:

- 40% by 2010,
- 45% by 2015, and
- 50% by 2020.

1.3.11 The Strategy sets the following targets for the recovery of municipal waste -

- 53% by 2010,
- 67% by 2015, and
- 75% by 2020.

1.4 **National Policy**

1.4.1 Since 2010 Government has made large scale changes to the planning system putting in place proposals to eliminate the regional planning tier and by making the planning process a more simple one with a presumption in favour of sustainable development, a theme which runs through the new Localism Act and the National Planning Policy Framework (NPPF). The Localism Act and NPPF
also foster a bottom up approach to planning whereby decision making is taken at the lowest possible level. As part of this process, the NPPF supersedes most Planning Policy Statements (PPS) which have been removed. However, until the new National Waste Policy for England is launched in 2013, PPS 10 remains in place.

1.4.2 Planning for Sustainable Waste Management (PPS10) (2005) (amended 2011 to incorporate the revised waste hierarchy) and its Companion Guide (2006) provides specific national planning policy for waste planning. One objective of this PPS is to help to implement the National Waste Strategy and supporting targets, including obligations under European directives etc. A key way of delivering this objective was through Regional Spatial Strategies (RSSs) which set out the identified needs of the region for the future waste management of all waste streams. PPS 10 requires waste planning authorities to prepare plans that reflect their contribution to delivering the RSSs.

1.4.3 With the election of the Coalition Government in May 2010 the pre-election commitment to scrap the regional planning tier was taken forward. Currently all RSSs in England are undergoing Sustainability Appraisals to assess the impact that revoking them will have. An order to revoke the East Midlands RSS was laid before Parliament on Wednesday 20th March 2013. The revocation order has since been issued confirming that the East Midlands Regional Plan will be revoked on 12th April 2013.

1.4.4 The adopted East Midlands Regional Plan, March 2009 (the Regional Plan) sets out regional priorities for waste management. The overall regional context for waste policy is set by the East Midlands Regional Waste Strategy, January 2006.

1.4.5 The Regional Plan at Policy 38 sets out the following priorities for the future management of waste:

- All relevant public and private sector organisations should work together to implement the Regional Waste Strategy and promote policies and proposals that will result in zero growth in all forms of controlled waste by 2016 and waste being treated higher up in the ‘waste hierarchy’.

- All waste collection authorities and waste disposal authorities should achieve a minimum target for the recycling and composting of Municipal Solid Waste (MSW) of 30% by 2010 and 50% by 2015.
• Waste planning authorities with the exception of the Peak District National Park Authority, should make provision in their Waste Development Frameworks for waste management capacity equal to the amount generated and requiring management in their areas, using the apportionment data set out at Appendix 4 of the Regional Plan, subject to further research and analysis as part of the annual monitoring process and recognition of the particular operational and locational requirements of individual waste process technologies.

1.5 Local Authority Collected Waste - Policy and Targets

1.5.1 The Derbyshire Joint Municipal Waste Strategy (DJMWS), July 2006 prepared jointly by the County, City, Borough and District Councils, provides a framework for strategic decisions to be taken on the management of municipal waste over the next 20 years. The preferred strategy for municipal waste management in Derbyshire is as follows:

• Expansion of recycling and composting schemes to achieve up to 55% recycling level by 2020,

• All residual waste, in the absence of a suitable regional facility, will be treated at in-county treatment facilities,

• The combination of recycling and recovery will ensure that the EU Landfill Directive targets for each of the key years are met and in fact exceeded.

1.5.2 The DJMWS is currently in the process of being reviewed. The review will reflect any revisions to the national position currently contained within Waste Strategy 2007 as part of the National Waste Plan 2013. The new National Waste Plan is likely to place an increased emphasis on initiatives at the top of the waste hierarchy, specifically around waste prevention and minimisation within the boundaries of municipal household waste.

1.6 Future National Policy Direction

1.6.1 The Government Review of the National Waste Policy in England 2011 emphasises the need to move towards a ‘zero waste’ economy in which material resources are re-used, recycled or recovered wherever possible, and only disposed of as the option of very last resort. The Review
reiterates the need to at least meet the European targets if ‘zero waste’ is to become a reality in the medium term. The National Waste Plan for England is likely to be published by the end of 2013.

1.6.2 In the absence of this National Plan in England a useful comparison is the Towards Zero Waste – The Overarching Waste Strategy for Wales (the Welsh Strategy), recently published in 2010, which sets targets to move towards a ‘zero waste’ economy. The recently published Scottish Zero Waste Plan sets out similar targets to the Welsh Strategy. It is highly likely that when published in 2013 the new national policy direction in England will be largely similar to that of the other devolved regions of the UK who are at a slightly more advanced stage.

The Welsh Strategy sets the following targets:

**Municipal Waste**

Minimum levels of preparing for reuse/recycling/composting (or AD) for Municipal Waste:

- 2009/10 40%
- 2012/13 52%
- 2015/16 58%
- 2019/20 64%
- 2024/25 70%

Maximum level of landfill of municipal waste:

- 2019/20 10%
- 2024/25 5%

Maximum level of energy from waste of municipal waste for individual local authorities:

- 2015/16 42%
- 2019/20 36%
- 2024/25 30%
Table 1 Comparison of UK National Targets for Municipal Waste Recycling (%)

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<tbody>
<tr>
<td>England (2007)</td>
<td>40%</td>
<td></td>
<td>45%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Wales (2010)</td>
<td>40%</td>
<td>52%</td>
<td>58%</td>
<td>64%</td>
<td>70%</td>
</tr>
<tr>
<td>Scotland (2010)</td>
<td></td>
<td>50%</td>
<td></td>
<td>60%</td>
<td>70%</td>
</tr>
<tr>
<td>Northern Ireland (2006)</td>
<td>35%</td>
<td>40%</td>
<td>45%</td>
<td></td>
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<tr>
<td>Northern Ireland Review (2012)</td>
<td></td>
<td>45%</td>
<td>50%</td>
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</table>

Table 2 Comparison of Derby and Derbyshire Recycling Target (DJMWMS, 2006) and Recycling Targets within the Waste Strategy for England 2007

![Chart showing comparison of recycling targets]
1.6.3 Table 2 compares the recycling targets in the current DJMWMS (2006) with the National Waste Strategy for England (2007). It shows that currently at a local level Derby and Derbyshire are challenging to exceed national targets. Table 1 shows that other parts of the UK that have developed more recent recycling targets go further than the current targets for England. It is likely therefore that when the new Waste Plan for England is published later in 2013 it too will strive for even more challenging recycling targets.

1.6.4 The current recycling performance for Local Authorities across England varies greatly. Recycling rates can vary due to factors such as the geography of an area or what collection arrangements the Local Authority has in place. It also needs to be recognised that the performance of those authorities responsible for collecting waste will be different from those responsible for final processing. A full list of recycling performance figures is available from the Department for the Environment Food and Rural Affairs (DEFRA) website.

**Commercial and Industrial Waste**

Recycling commercial waste

2015/16 57%
2019/20 67%
2024/25 70%

Recycling industrial waste

2015/16 63% (Industrial waste has higher recycling rate currently).
2019/20 67%
2024/25 70%
1.7 Environment Agency Engagement & Duty to Co-operate

Text Box 3: The Environment Agency (EA)

The EA are an Executive Non-Departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and a Welsh Government Sponsored Body responsible to the Minister for Environment and Sustainable Development.

EA principal aims are to protect and improve the Environment, and promote sustainable development. The EA carries out a central role in delivering the environmental priorities of Central Government and the Welsh Government through its functions and roles. In Scotland the Scottish Environmental Protection Agency (SEPA) carries out a similar role, as does the Department of the Environment (DOE) in Northern Ireland.

1.7.1 The EA in their primary regulatory function has a key role to play with regards to waste data provision, management and dissemination. All stages in this data work have involved liaison with the EA in order that there is a common understanding as to how the data has been used and how, where and why certain assumptions have been made.

1.7.2 What does the ‘Duty to Co-operate’ mean for councils?

Section 110 of the Localism Act sets out a new ‘Duty to Co-operate’. This applies to all local planning authorities, national park authorities and county councils in England – and to a number of other public bodies. The new duty:

- relates to sustainable development or use of land that would have a significant impact on at least two local planning areas or on a planning matter that falls within the remit of a county council
- requires that councils set out planning policies to address such issues
- requires that councils and public bodies ‘engage constructively, actively and on an ongoing basis’ to develop strategic policies
- requires councils to consider joint approaches to plan making.

Paragraph 156 of the NPPF sets out the strategic issues where co-operation might be appropriate.
Paragraphs 178-181 of the NPPF give further guidance on ‘planning strategically across local boundaries’ and highlights the importance of joint working to meet development requirements that cannot be wholly met within a single local planning area through either joint planning policies or informal strategies, such as infrastructure and investment plans.

1.7.3 What does the ‘Duty to Co-operate’ mean for other public bodies?

The 'Duty to Co-operate' also covers a number of public bodies in addition to councils. These bodies are set out in Part 2 of the Town & Country Planning (Local Planning) (England) Regulations 2012 and comprise:

- Environment Agency
- English Heritage
- Natural England
- Mayor of London
- Civil Aviation Authority
- Homes and Communities Agency
- Primary Care Trusts
- Office of the Rail Regulator
- Highways Agency
- Transport for London
- Integrated Transport Authorities
- Highway Authorities
- Marine Management Organisation

These bodies are required to co-operate with councils on issues of common concern to develop sound Local Plans.

1.7.4 Derby and Derbyshire’s adjoining authorities and Duty to Co-operate

Adjoining authorities with adopted Waste Core Strategies include Barnsley, Doncaster and Rotherham (March 2012), Leicester & Leicestershire (March 2009), the Greater Manchester Authorities (March 2012) and the Peak District National Park (October 2011). Sheffield’s Core Strategy includes 3 policies with relevance to waste and was adopted March 2009.
Stoke on Trent City and Staffordshire County Council submitted their Joint Waste Core Strategy in January 2012 with the Examination in Public starting in April 2012. Consultation was carried out on proposed additional modifications following the examination in October and November 2012. The Inspector’s final report was published on the 4th February 2013 finding the Core Strategy sound.


In terms of Derby and Derbyshire, some cross border work on waste flows has begun with Nottinghamshire principally using the EA’s waste interrogator tool. The work with Nottinghamshire will hopefully prove to be a pilot exercise with a view to using the same methodology with other WPA’s.

1.8 The Impact of Waste Prevention, Minimisation and Zero Waste Principles

1.8.1 Reducing and minimising waste are key principles of the waste hierarchy and therefore will form a key part of the Plan. As drivers such as landfill tax and commodity prices continue to rise this will speed the rate at which material is diverted from final disposal. To recognise this within this data paper some very tough scenarios for dealing with waste arisings have been developed that work on the assumption of minimal waste going to final disposal and in some cases zero waste to landfill towards the latter part of the Plan period.
Text Box 4: Landfill Tax

The Landfill Tax, introduced in October 1996 is a tax on the disposal of waste. It was the UK’s first environmental tax. It aims to encourage waste producers to produce less waste, recover more value from waste, for example through recycling or composting and to use more environmentally friendly methods of waste disposal by making landfill more expensive and therefore making alternative waste technologies more cost effective.

Landfill Tax operates at two rates: a standard rate for active waste (substances that either decay or have the potential to contaminate land - which includes household waste); and a lower rate for inert (for example bricks & construction wastes) materials. The rates in 1996 were £7 per tonne for active waste and £2 for inactive waste. This has risen sharply and for 2012 the levy is £64 per tonne for active waste and £2.50 per tonne for inactive waste. The cost trend for landfill is therefore an upward one and will continue to be so in line with Government and Waste Hierarchy objectives. It is anticipated that by 1st April 2014 the cost per tonne for active waste will be £80.
2. **UNDERSTANDING THE SCALE OF WASTE IN DERBY AND DERBYSHIRE: WASTE STREAM PROJECTIONS – WASTE ARISINGS IN THE PLAN AREA**

2.1 **Introduction**

2.1.1 In order to ensure that there is sufficient and flexible capacity for the management of the waste streams we need to understand how much waste currently arises in Derby and Derbyshire and whether this is likely to change over the Plan period. We have set out different ways (forecasts) of estimating current and future arisings based on the knowledge that we have. Waste arisings have been calculated over the Plan period 2010/11 to 2029/30. Information on earlier years has been shown where this date is regarded as the most reliable information that we have on that particular waste stream.

2.2 **Projections of Waste Arisings in the Plan Area – Municipal Solid Waste**

<table>
<thead>
<tr>
<th>Text Box 5: What is Local Authority Collected Municipal Waste (LACMW) / Municipal Solid Waste (MSW)?</th>
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<tbody>
<tr>
<td>Local Authority Collected Municipal Waste (LACMW) / Municipal Solid Waste (MSW) is waste that predominately arises from households and is the responsibility of Local Authorities to collect and manage.</td>
</tr>
<tr>
<td>LACMW is the latest term for this waste stream, however some sources, particularly data sources still use the term MSW to describe the waste stream. As such you may find both terms used in the report.</td>
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</table>
Growth Scenarios

For the Purposes of MSW arisings, three growth scenarios were considered:

Forecast A – Waste Management 2013
Forecast B – Big Choices for Waste 2010
Forecast C – Regional Plan 2009

Text Box 6: Why forecast?

The Waste Plan will contain policies and targets over the next 15-20 years. The picture of waste management today will not look the same in the future & so targets and assumptions are used to forecast what waste will need to be managed in future years. It is important to get this as accurate as possible and to monitor throughout the plan to ensure that enough of the right waste infrastructure is provided to deal with the waste that is generated.

Forecast A – Waste Management 2013

Baseline
The most current and reliable baseline figure for MSW arisings is taken from DEFRA Waste Data Flow and work by Derbyshire County Council with consultants SKM Enviros. 2011/12 is the most recent date that information is available. This data has been used as a statistical basis for the review of the DJMWMS.
Text Box 7: What is the difference between the Derby and Derbyshire Waste Plan and the Derbyshire Joint Municipal Waste Management Strategy? Why are two documents needed?

The Waste Plan and the DJMWMS are two separate documents with separate aims and objectives. The principal difference is that the Waste Plan looks at all waste streams within the Plan area (see legislation paper at 32.19 Legislation and Govt guidance/Notes on legislation for a more detailed description of the legislation that underpins the Waste Plan), what needs to be managed, how and where those facilities will be needed across Derby and Derbyshire over the Plan period.

The DJMWMS looks principally at municipal or household waste. The strategy is an agreement between Derby City, Derbyshire County and the eight District and Borough Councils within Derbyshire and is an agreement between those Councils as to how MSW/LACMW will be managed.

Whilst the two documents have similarities, especially around municipal or household waste, they will have a number of different aims and objectives.
Text Box 8: Waste Data Flow

Waste Data Flow is a web based system for municipal waste data reporting by UK local authorities to government. The system went live on 30 April 2004. The system only covers waste which is collected and handled by Local Authorities, predominately household waste.

Waste Data Flow is designed for local authorities:

- to allow faster and more accurate data collection of municipal waste statistics, more regularly and efficiently;
- to enhance their local data management for reporting and strategic planning purposes;
- to offer them streamlined access to performance benchmarking with other authorities and;

Waste Data Flow allows government:

- to monitor progress towards European, National and Local targets;
- to produce National Statistics on municipal waste;
- to monitor progress towards national and local targets;
- to provide an evidence base to guide government policy.

Growth Rate

Growth rates are based on information from Derbyshire County Council/Derby City Council (DCC/DC) Waste Management Service. They are supplied by consultants SKM Enviros employed by DCC/DC to assist in the procurement process for the long term waste disposal contract which was originally let in 2009. As well as this SKM Enviros data is also being used for the review of the DJMWMS. They have developed a model for forecasting waste arisings in Derby and Derbyshire and provide ongoing up to date forecasts to the Waste Management Team. The latest updates for 2012 are used in this paper.

The model forecasts arisings on the following basis. Waste growth assumptions are derived from the report “Forecasts of population and household for Nottinghamshire and Derbyshire
authorities” published by Edge Analytics Ltd in February 2011. The specific scenario adopted is the ‘SNPP’ scenario which replicates 2008 based Sub-National Population Projections using all SNPP assumptions on births, deaths and migration.

The SKM Enviros data uses a base case model in which the waste growth assumptions are derived from the net value of the increase in households (taken from the above report) and an annual decrease in arisings of 0.5% per annum as a result of waste minimisation activities. This figure is considered to represent a good balance in terms of both an aspirational and pragmatic approach to waste minimisation. Overall, this model is considered to be a robust and up to date method of forecasting arisings over the Plan period.

**Forecast B – Big Choices for Waste 2010**

Baseline
The most current and reliable baseline figure for MSW arisings is taken from DEFRA Waste Data Flow. 2008/9 was the most recent date available when the Big Choices for Waste supporting paper, which assessed the need for waste treatment and disposal in Derby and Derbyshire to 2030, was published in February 2010.

Growth Rate
The growth rate is based on the DJMWMS 2006, scenario 5, page 51. Six growth rates were considered in the DJMWMS. The growth rate chosen is based on regional growth (calculated as a steadily declining growth rate starting at 3.6% and reducing gradually to a zero growth rate in the year 2015/16) but modified by a 0.75% increase in the year 2007/8 on top of the predicted results. This increase was to account for the introduction of green waste collections by some Councils in that year.

**Forecast C – The Regional Plan 2009**

Baseline

East Midlands Regional Plan 2009, Appendix 4: Sub Regional Waste Apportionment (Policy 38), page 172. Derbyshire assumed to have a 22% share of East Midland’s regional total.

Growth Rate


Figure 1: MSW Growth Rate Forecast

2.2.1 Summary

Given the reliability of DEFRA Waste Data Flow and the up to date and robust nature of the model developed by SKM Enviros, Forecast A – Waste Management 2013 is considered to be the most realistic estimate of current and future arisings. Using this scenario, 471,487 tonnes of MSW was generated in 2009-10 up to an estimated 495,267 tonnes at the end of the Plan period in 2029-30. Over the period 2009 to 2030 the projection estimates that 9,973,240 tonnes of municipal waste will be generated within the Plan area.
2.3 Commercial and Industrial Waste (C&I)

Text Box 9: What is Commercial and Industrial Waste?

Commercial and Industrial Waste (or C&I) is waste that arises from businesses. This maybe from commercial operations such as offices and warehouses or from industry and industrial processes.

Growth Scenarios

For the Purposes of Commercial and Industrial Waste arisings, five scenarios were considered:

Forecast A – DEFRA Survey of Commercial and Industrial Waste Arisings 2010
Forecast B – ADAS Study 2006/07
Forecast C – Environment Agency’s Strategic Waste Management Assessment 2003 (Used for the Big Choices for Waste Consultation 2010)
Forecast D – The Regional Plan 2009

A larger number of scenarios have been developed for C&I than MSW in recognition that the data for C&I is not as robust or reliable.

Forecast A – DEFRA Survey of Commercial and Industrial Waste Arisings 2010

Baseline
The most recent survey on C&I arisings was published in December 2010 and is being used to inform the review of the National Waste Strategy. This study was commissioned by DEFRA to obtain data from businesses in England on C&I waste arisings and management methods in 2009. However, the study only reports data at the regional level; further extrapolation is required to obtain data at the WPA level for Derby and Derbyshire.

There is an estimated commercial and industrial arisings figure for Derby and Derbyshire for 2006/7 based on the ADAS study. The arisings figure at 2006/7 was 1,048,968 tonnes with the combined
City and County areas having a 17% share of arisings in the East Midlands (evidence on the sub regional apportionment of arisings can be viewed on request). Applying this percentage share to the DEFRA 2009 survey regional data total produces an estimate of 1,072,186 tonnes for Derby and Derbyshire in 2009/10.

Growth Rate
The growth rate is taken from a preliminary study (Comprehensive Assessment of Existing and Required Waste Treatment Capacity in the East Midlands by RPS Planning & Development Ltd Commercial and In Confidence for East Midlands Councils March 2010) commissioned by the East Midlands Regional Waste Technical Body (RTAB), page 45. ‘….WPAs agreed to use a consistent growth rate of 1% per annum up to and including 2014/15 and 0% thereafter.’ It corresponds with Policy 38 of the East Midlands Regional Plan 2009 which seeks to achieve ‘zero growth’ in controlled waste arisings by 2016.

Forecast B - ADAS Study 2006/07

Baseline
The baseline figure is based on the sub regional apportionment of the 2006/7 arisings set out in the ADAS study. Urban Mines completed a survey in 2006/07 of C&I waste arisings in the North West region on behalf of the North West Regional Technical Advisory Body, published in December 2008. The Urban Mines, North West survey provided detailed information on the production of C&I waste by businesses within the North West region. This survey was subsequently repeated in 2009, covering the 2008/09 financial year, published in March 2010.

ADAS were subsequently commissioned in 2009 to use the findings from the North West study to produce estimates of C&I waste arisings in 2006/07 for all regions in England. ADAS used information from the Office for National Statistics (ONS) on the size of the regions and the demography of businesses within regions, to estimate the number of employees in each sector and at each scale. This was then coupled with the North West study to generate rudimentary forecasts of arisings across all regions in England based on the assumption that companies in different regions in the same sectors and in the same employee size band produce similar quantities and types of waste. They then utilised East of England economic forecasts (provided by Oxford Economics) on future employment trends to derive 2020 forecasts for C&I waste arisings. Estimated arisings at 2009/10 total 1,080,753 tonnes.
Growth Rate

The growth rate is taken from a preliminary study (Comprehensive Assessment of Existing and Required Waste Treatment Capacity in the East Midlands by RPS Planning & Development Ltd for East Midlands Councils March 2010) commissioned by the East Midlands Regional Waste Technical Body (RTAB), page 45. ‘...WPAs agreed to use a consistent growth rate of 1% per annum up to and including 2014/15 and 0% thereafter.’ It corresponds with Policy 38 of the East Midlands Regional Plan which seeks to achieve ‘zero growth’ in controlled waste arisings by 2016.

**Forecast C - Environment Agency’s Strategic Waste Management Assessment 2003 (Used for the Big Choices for Waste Consultation 2010)**

Baseline

Baseline figures used the Big Choices for Waste supporting Needs Paper based on Environment Agency (EA) 2002/3 Strategic Waste Management Assessment of C&I waste.

Growth Rate

The growth rate is from East Midlands Regional Waste Strategy 2006, Appendix 4, page 89. This source provides separate growth rates for industrial and commercial arisings. The growth rates shown in Table 2 represent the actual percentage increases between the total arising figures using these two separate growth rates. Growth rate derived from Development of a Regional Waste Strategy for the East Midlands Final Technical Report prepared for the East Midlands Regional Technical Advisory Body by Land Use Consultants and SLR Consulting Ltd January 2003.

**Forecast D – East Midlands Regional Plan 2009**

Information taken from East Midlands Regional Plan 2009, Appendix 4: Sub-Regional Waste Apportionment (Policy 38).

Baseline

Baseline figures are based on EA’s Strategic Waste Assessment 2002/3 survey. Derbyshire assumed to have a 24% share of the East Midlands regional total.
Growth Rate


Information is taken from the East Midlands Regional Waste Strategy 2006, Appendix 4, page 89.

Baseline

The baseline date is 2003/4. Derbyshire assumed to have a 24% share of East Midland’s regional total, taken from the East Midlands Regional Plan 2009.

Growth Rate

The information is taken from East Midlands Regional Waste Strategy 2006, Appendix 4, page 89. Derbyshire assumed to have a 24% share of East Midland’s regional total. The growth rates shown in Table 2 represent the actual percentage increases between the total arising figures using these two separate growth rates.

Figure 2: C&I Growth Rate Forecasts
2.3.1 Summary

The C&I forecasts may need to be reviewed in light of Strategic Economic Forecasts for Derby and Derbyshire (commissioned in February 2013). Clearly, waste arisings are likely to be influenced by both the impact of the Government’s drive to reduce waste arisings and the current low point in the economic cycle. How arisings trends may change against changes in future economic activity will need to be considered.

Forecast A and B are very similar. Forecast A represents the most up to date work available on C&I arisings. At the start of the Plan period in 2009/10 the baseline is 1,072,186 rising to 1,126,878 at the end of the Plan period in 2029/30. This assumes a 1% growth in C&I arisings up to 2016 where there is anticipated to be zero growth in arisings as per the adopted Regional Plan 2009. This also correlates with the Government drive to decouple the assumption that economic growth means growth in commercial waste arisings.

2.4 Construction & Demolition (C&D)

**Text Box 10: What is Construction and Demolition Waste?**

Construction and Demolition or C&D waste is waste that arises from construction and demolition activities. Arisings of C&D waste can be significantly affected by the economy and the rate at which infrastructure or regeneration takes place. According to the EA around 20 million tonnes of construction, demolition and excavation (C, D & E) waste was sent to landfill in England in 2010. At the end of 2011 C, D & E waste was the largest contributing waste type in illegal waste sites.
Growth Scenarios

For the Purposes of C&D arisings, two growth scenarios were considered:

**Forecast A – CLG, 2007 Survey of Arisings and Use of Alternatives to Primary Aggregates in England / Big Choices for Waste 2010**

**Forecast B – The Regional Plan 2009**

C&D and inert waste principally arises from construction and demolition activities. It is a major waste stream in terms of tonnage as it is often made up of materials such as bricks, concrete and aggregate etc. which tend to be heavy and bulky. Virgin material and global resource costs continue to rise which is driving a continued improvement in recycling techniques and in the amount of C&D material captured, reprocessed and recycled on site before it enters the waste stream. This also continues to be driven by the hierarchy approach which sees disposal as a last resort leading to less of an abundance of disposal sites that are consequently more expensive as an option. On this basis and consistent the Regional Plan a zero growth rate for C&D waste beyond 2016 has been assumed.

**Forecast A – CLG, 2007 Survey of Arisings and Use of Alternatives to Primary Aggregates in England / Big Choices for Waste 2010**

**Baseline**


**Growth Rate**

Baseline
Baseline Figures based on EA’s Strategic Waste Assessment 2002/3 survey. Derbyshire assumed to have a 23% share of East Midland’s regional total.

Growth Rate

Figure 3: C&D Growth Rate Forecasts

2.4.1 Summary
Forecast A, taken from the National CLG survey provides the most up to date analysis available. It produces a forecast of 2,931,306 in 2009/10 rising to 3,080,833 at the end of the plan period in 2029/30 assuming a 1% growth rate up to 2016 and a zero rate thereafter as per the Regional Plan.
2.5 Agricultural Waste Arisings

Text Box 11: What is Agricultural Waste?

Agricultural waste is waste that arises from farm operations. This includes commercial type waste such as scrap metal and plastics from silage wraps, empty pesticide containers and used tyres but is also made up of slurries and animal waste. It can also include a small proportion of hazardous waste such as asbestos from farm buildings. Since 2006 agricultural waste has been subject to the same controls that have applied to other sectors for many years. On 15th May 2006, uncontrolled burning or tipping of waste on farms became illegal.

The changes to the control of agricultural waste mean that the Plan needs to deal with it.

Growth Scenarios

For the Purposes of Agricultural Waste forecasting the following scenario was considered:

Forecast A – East Midlands Regional Waste Strategy 2003 / Big Choices Consultation

Baseline
The baseline data is taken from the East Midlands Regional Waste Strategy 2006 which provides a figure for regional agricultural arisings for 2002/3. It was estimated, in this Strategy, that Derbyshire’s agricultural waste arisings represented 26% of the regional total.

Growth Rate
2.5.1 Summary

The amount of agricultural waste arisings which are managed ‘off site’ is currently a relatively small proportion of the overall waste stream in terms of arisings but these arisings can often be large and bulky by nature. The vast majority of material generated on agricultural premises is natural or organic waste such as animal slurry and manure, much of which does not enter the waste stream and is often handled on site, for example through application to land. Much of the other waste arising is of a “commercial” type (for example pesticide washings, plastics, paper, oils, empty containers etc) for which it is predicted that the commercial waste sector will handle, much like any other commercial or business waste.

In the future more agricultural waste may need to be managed in specific facilities. Accordingly, over the Plan period a projection of 16,566,227 tonnes of agricultural waste generated could be assumed.

Further research will be required to ascertain the estimated proportions of the agricultural waste stream to be managed by different types of management facility. However, for the purposes of this paper and from initial work it could be assumed that 10,000 tonnes of this stream will be required to be managed in MSW/C&I facilities.
2.6 Hazardous Waste Arisings

Hazardous waste is waste that may cause harm to human health or the environment. Some everyday items such as computer monitors, TV’s, refrigeration equipment and some batteries may be hazardous waste as well as the more obvious materials such as asbestos and oil. Hazardous waste is present in all of the waste streams but predominantly C&I arisings.

Growth Scenarios

For the Purposes of forecasting Hazardous Waste arisings, two growth scenarios were considered:

Forecast A – EA Waste Interrogator 2010/11
Forecast B – East Midlands Regional Waste Strategy

Forecast A – EA Waste Interrogator 2010/11

Baseline
Baseline data was taken from the EA’s Hazardous Waste interrogator for the period 2010/11. Hazardous waste arisings can often fluctuate and typically deal with material from large or one off processes.

Growth Rate
Hazardous waste arisings can often be linked closely to economic activity due to their specialised nature. The evidence from the EA Hazardous Waste Interrogator would appear to bear this out. Arisings in the Plan area in 2006/07 were at their pre-recession peak of 140,808 before falling back to 59,503 in 2010/11 with the economy growing very little, if at all.

Using the 2010/11 figure as a baseline a 1% growth scenario has been assumed over the Plan period. This is on the basis that hazardous waste arisings grow over the Plan period as economic activity increases and a wider range of waste types are categorised as ‘hazardous’.
Forecast B – East Midlands Regional Waste Strategy 2006

Baseline
Baseline for this forecast has been taken from the East Midlands Regional Waste Strategy 2006 (RWS). The RWS based Hazardous waste arisings in Derbyshire in 2002/03, representing 44% of the Regional total.

Growth Rate
The RWS figure assumed a 0% growth rate assuming that hazardous waste arisings in Derby and Derbyshire were unlikely to change significantly over the Plan period.

Figure 5: Hazardous Waste Arisings Growth Rate Forecasts

2.6.1 Summary
The two scenarios show a high and low estimate of hazardous waste arisings over the Plan period. Scenario A, with a 1% growth rate, shows a figure of 71,875 at the end of the Plan period in 2029/30 verses a figure of 126,280 taken from the RWS. There is little difference between the two projections, apart from in the period 2009-2011. On the basis that the figures could have been influenced by the economic downturn and changes to site licencing, it is considered reasonable to assume a figure of 126,230 will be generated year on year over the plan period. This will mean around 2,650,830 of hazardous waste will be generated up to 2029/30.
2.7 Conclusion

Table 3 below presents the projected arisings in the Plan area using the preferred scenarios for each waste type as identified in the previous sections.

Table 3: Projected arisings

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Chosen Projection Method</th>
<th>Arisings at baseline 2009/10</th>
<th>Arisings 2015/16</th>
<th>Arisings 2021/22</th>
<th>Arisings 2025/26</th>
<th>Arisings 2029/30</th>
<th>Total Arisings over Plan Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LACMW</td>
<td>Waste Management 2012</td>
<td>471,487</td>
<td>463,586</td>
<td>479,387</td>
<td>487,992</td>
<td>495,267</td>
<td>9,973,240 (Rounded)</td>
</tr>
<tr>
<td>C&amp;I</td>
<td>Defra Survey 2010</td>
<td>1,072,186</td>
<td>1,126,878</td>
<td>1,126,878</td>
<td>1,126,878</td>
<td>1,126,878</td>
<td>22,427,088 (Rounded)</td>
</tr>
<tr>
<td>C&amp;D</td>
<td>National CLG Survey</td>
<td>2,931,306</td>
<td>3,080,833</td>
<td>3,080,833</td>
<td>3,080,833</td>
<td>3,080,833</td>
<td>64,245,937 (Rounded)</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>RWS 2006</td>
<td>126,280</td>
<td>126,280</td>
<td>126,280</td>
<td>126,280</td>
<td>126,280</td>
<td>2,651,880 (Rounded)</td>
</tr>
<tr>
<td>Agricultural Waste</td>
<td>RWS 2006</td>
<td>1,444,415</td>
<td>1,518,095</td>
<td>1,518,095</td>
<td>1,518,095</td>
<td>1,518,095</td>
<td>31,657,488 (Rounded)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>130,955,633 (Rounded)</td>
</tr>
</tbody>
</table>
2.7.1 As Table 3 shows, over the Plan period approximately 130,956,000 of controlled waste is forecast to arise. The approximate composition of this waste is shown in Figure 6. This shows that the major proportion of the waste arising in the plan area will be C&D and C&I wastes. Although agricultural waste is also a significant stream, it may largely be required to be managed in agricultural related facilities.

Figure 6: Composition of Controlled Waste arisings in the Plan Area over the Plan period
3. HOW COULD WASTE BE MANAGED IN THE FUTURE?
WASTE MANAGEMENT SCENARIOS

3.1 Introduction

3.1.1 Chapter 2 set out the amount of waste likely to arise in the Plan area over the Plan period. In this chapter different ways that this waste could be managed will be explored by looking at a number of scenario options. We need to explore the possible ways in which Derby and Derbyshire could plan for waste over the Plan period.

A key aspect of scenarios is that they are a tool to inform the Plan process. They provide a basis for predicting potential land use requirements in terms of scale, number and facility type. Logic follows that the scenarios developed represent one possible outcome of many, they are simply provided to provide some level of context.

3.1.2 The baseline year is taken as 2010/11. The modelling period is taken from this year to the end of the plan period in 2029/30.

3.1.3 Assumed targets for each waste management type were applied using some assumptions about the rate and timing of their contribution over the Plan period. In Scenario 3 Energy from Waste (EFW) is assumed not to be contributing until 2015. This is due to the lead in time required and the fact that operators will not normally make a large investment in this type of technology until they have a guaranteed flow of waste, for example via a municipal waste contract. Derby and Derbyshire are jointly developing various technology options through their Waste Management Contract arrangements.

3.1.4 The scenarios were applied to MSW, C&I & hazardous waste. Scenario 1 and 2 were applied to C&D waste, however, Scenario 3 was deemed not applicable to C&D largely due to its inert nature and the fact that there are a more limited number of treatment options.

3.1.5 The scenarios include an element of waste reduction, as outlined in the previous chapter. Some scenarios combine faster or slower elements of waste reduction by way of scenario options.
3.1.6 Waste Management Technologies

Before working through the various scenarios it is worth stressing that not all waste streams are suitable for all waste technologies. As such, in this section some key aspects associated with the composition of the different streams are explored although this is merely to provide a flavour rather than to be all encompassing.

Recycling

(a) Introduction

Recycling refers to the recovery of recyclate materials from the waste streams, which are suitable for re-processing into new products. For the purposes of this section biological treatment has been dealt with separately.

(b) Inert waste recycling

Inert waste incorporates a range of recyclable materials such as sub-soils, concrete, and bricks. Specialist inert waste treatment centres sort, crush, screen and grade these materials into marketable products that compete with primary aggregates. There is little information on the maximum practicable levels of recycling of inert waste. This recycling level includes landfill engineering uses (such as capping) which are normally excluded from recycling rate calculations. Studies on housing construction activities and the composition of skip waste suggest that about 60% of inert waste could be reprocessed in some form. To achieve this would require greater attention being given to source segregation and storage than at present.

(c) Non-hazardous waste recycling

C&I waste contains a wide range of waste materials. These are often targeted for commercial recycling due to the larger, more homogeneous and material specific loads that can be economically collected compared to MSW. Examples include office grade paper, metals, process off-cuts and packaging materials.
Using assumptions about collected MSW, some 65% of MSW is, in theory, recyclable (Defra (1999) ‘A Way with Waste’), which includes about 20% compostables. The amount of these materials which are actually captured by a scheme depend on a variety of factors such as the number of producers actively participating in a collection scheme; the contamination levels of separated materials; and the process efficiencies at recycling plants (termed the recovery rate).

Recycling schemes will have a direct effect on other strategy components including collection, energy recovery and disposal in terms of the quantity and characteristics of waste materials being handled. Recycling schemes tend to increase in performance as new recycling markets become viable, leading to extra materials being added to the scheme.

**Recycling and Recovery**

Four main recycling techniques are described below.

(d) Materials Recovery Facilities

Materials Recovery Facilities (MRFs) are a frequent component of major recycling programmes, acting to sort, bale and store collected recyclable materials, which have been segregated by the waste producer. They provide opportunities for the development of local businesses for the re-processing of recyclable materials and are valuable for the education of the public on recycling. MRFs can be designed to process recyclables from municipal and commercial sources either separately or together.

(e) Mixed Waste Processing

Mixed waste plants such as mechanical biological treatment (MBT), mechanical treatment (MT) and mechanical heat treatment (MHT) facilities involve mechanically and manually sorting waste to remove the recyclable materials and separate other fractions for biological treatment and/or processing into a Refuse Derived Fuel (RDF). The advantages of mixed waste plants is that the waste producer does not need to segregate their waste, some recycling can still take place, and a compost product and fuel source can potentially be derived.

Potential disadvantages are:
• The quality of recyclable materials (i.e., paper, steel and aluminium cans, plastics) may be poor due to contamination from organic materials;

• Recovery of dry recyclables within a typical MBT plant processing the residual household waste is 3-15% by weight. Higher levels of recovery can be achieved if the most sophisticated mechanical sorting and extraction processes are included; and

• Compost from mixed waste may not meet compost quality specifications, leading to market outlet difficulties.

Mixed waste plants technology is developing rapidly and there appears to be scope for its use with anaerobic digestion, or to also focus on commercial wastes which can generate higher quality recyclables. In the UK it is a largely newer technology whose full potential has yet to be realised. Suppliers of the technology report that with RDF and composting these plants can reclaim up to 75% of incoming waste. A hybrid of the two preceding examples is the wet and dry mixed waste plant. This facility processes waste which has been segregated at source by the producer into the ‘dry’ (mainly recyclable) fraction and the ‘wet’ (mainly the putrescible, organic fraction). They are therefore able to extract higher quality materials than conventional mixed waste plants and capture more volume of materials than MRFs. One plant in North America reports a 60% waste recovery rate.

(f) Bring Bank Recycling

Recycling through bring banks has been successfully integrated with other recycling systems, either taking complementary materials or providing additional opportunity to recycle. In the past this has offered benefits in capturing relatively ‘uncontaminated’ streams of recyclates, such as glass. In the future a wider use of bring sites for charitable bodies may provide banks for textiles, books, and shoes etc. For the purpose of the three municipal scenarios in the following section the performance of bring banks has not been separately documented from other recycling components. This allows flexibility over which form of collection is utilised, and allows for recycling facilities (MRFs or mixed waste plants) to be sized to allow for the sorting, baling or storage of bring bank collected materials.
(g) Kerbside Recycling

A kerbside recycling collection is generally taken to mean materials destined for recycling that are collected separately from residual household waste. Waste collection authorities can choose how they collect paper, metal, plastic and glass. These materials can be sorted at source which allows collectors to reduce contamination and maximise any potential revenues from the recyclate.

Biological treatment

(h) Introduction

Biological treatment refers to the use of natural organisms to break down wastes such as garden waste, food waste and some paper, into a product that could potentially be used for horticultural or agricultural purposes. Treatment of food waste (such as kitchen waste or food processing off cuts) usually requires an in-vessel biological treatment system due to its putrescible nature. There are a number of technologies available to treat these wastes, the current methods being:

· Segregation of biodegradable waste from residual waste at a mixed waste processing facility, and treatment in a composting plant or anaerobic digester; and,

· Source segregation of compostables (or wet waste) from residual waste by the waste producer, with the materials being: collected and taken to a composting plant or anaerobic digester, and delivered by the producer to a suitable facility.

Removing the organic waste stream will change the composition of the waste requiring further treatment. At a landfill, this will reduce the production of landfill gas, minimise odours and also reduce the environmental effects of leachate produced at the site. Treating the organic waste stream will also change the thermal value of the waste being processed.

Treatment Techniques

(i) Composting Facilities
Green waste windrow composting (where ‘windrow’ refers to the long elongated treatment piles which are created) is typically used with garden type waste. Operational size limitations mean that in-vessel treatment at a centralised facility is preferred for larger volumes of green waste. In-vessel composting refers to composting undertaken in an enclosed container or vessel under controlled conditions, e.g. time and temperature. This method of composting allows for greater control on emissions. Suitably licensed In Vessel Composting (IVC) facilities can also compost food waste.

(j) Anaerobic digestion

Anaerobic digestion (AD) refers to the process where biodegradable material (such as kitchen waste or food processing off-cuts) is encouraged to break down in the absence of oxygen. A facility involves the placement of waste material into an enclosed vessel, and under controlled conditions the material breaks down into digestate and biogas. Anaerobic digesters can be used for power generation using the methane gas which is produced in the digestion process. This technology is extensively used in the treatment of sewage sludge.

Energy from Waste

Energy from Waste (EfW) facilities recover the energy from thermally treated wastes. They therefore reduce the need for, and effects of, landfills and also conserve other energy resources. Some of the by-products of thermal treatment such as ferrous metals and ‘bottom ash’ from the grates are recyclable. Ferrous metals can be captured and ash can be processed into an aggregate.

The main variations of EfW technology are mass-burn moving grate, fluidised bed, gasification, pyrolysis and rotary kiln. The effectiveness of EfW can be dependent on the types and quantities of waste reaching the facility. The facilities can be designed to process waste of a specific composition range in terms of moisture content, particle size distribution and calorific heat value. A given facility may require a minimum operating tonnage which could be affected by the subsequent implementation of other initiatives including for example, waste prevention. However, conversely, this could enhance the performance of an EfW facility through the diversion of low thermal value wastes, mainly with high ash contents, or wastes which contribute significantly to air emissions. EfW can achieve large reductions in weight of the incoming waste (higher if the waste is pre-treated, such as RDF). Secure markets for bottom ash, remaining after incineration are developing, e.g. as aggregate for construction purposes.
3.2 C&D Waste Scenarios

3.2.1 Future management of inert waste depends upon national policy changes and targets. Changes to levels of economic growth are also important as this influences activity in the construction sector. At present for example, house building is at historically low levels. A further key consideration is also the cost competitiveness of recycled aggregates compared to primary aggregates.

Do Nothing Scenario (0)

This scenario is a projection of what may happen if current practices are continued and if no new infrastructure is added over the Plan period to deal with this waste arising. As current recycling rates of C&D waste are unclear it assumes a minimum 50% diversion rate in 2009/10.

Meet Waste Framework Directive Targets Scenario (1)

This scenario incorporates an annual waste reduction element of 1% throughout the Plan period (assuming that material is reused/minimised in situ)

This scenario assumes an active 70% recycling rate by 2020 as set out in the Waste Framework Directive. As current recycling rates of C&D waste are unclear it assumes a 50% diversion rate in 2009/10.

High Minimisation & Diversion Scenario (2)

This scenario incorporates a more aggressive annual waste reduction element of 10% throughout the Plan period (assuming that material is reused / minimised in situ)

This scenario assumes a 90% recycling rate by 2020 as set out in the Waste Strategy for Wales 2010. The Welsh Strategy has been chosen in this scenario as it is much newer than the English Waste Strategy 2007 which is currently under review.
Figure 7: Scenario 0 for C&D Waste

Figure 8: Scenario 1 for C&D Waste
3.3 **Municipal Solid Waste Scenarios**

3.3.1 There are a number of existing scenarios associated with MSW in the Plan area. There are also a number of key pieces of Government work in the pipeline that will look to target MSW, particularly in terms of further reducing MSW to landfill and focusing on zero waste initiatives that may look to target for example zero waste to landfill. This section will project the MSW arisings that were detailed in the previous chapter against a range of scenarios:

**Scenario 1 for MSW:**

This scenario will focus on the priorities as identified in the current DJMWMS 2006. The DJMWMS seeks to achieve a 55% recycling level by 2020 with all remaining material being treated and landfilling only for residues and wastes that cannot be recycled/composted or recovered.

**Scenario 2 for MSW:**

This scenario will focus on the priorities as identified in the National Waste Strategy 2007. The strategy sets targets for the recovery of MSW of:

53% by 2010
67% by 2015
75% by 2020

**Scenario 3 for MSW:**

This scenario will focus on the priorities as identified in Towards Zero Waste – the overarching Waste Strategy for Wales 2010. DEFRA are currently working on new waste priorities and policy to build upon the National Waste Strategy 2007. This is due to be published in 2013. The devolved administrations in Scotland and Wales have already produced their updated strategies which incorporate some ambitious targets. It is likely that when published the new National Waste Plan for England will look similar to that of the other regions of the UK and so it has been used as a guide on this basis.

The strategy identifies minimum levels of recycling for MSW:

- 2009/10 40%
- 2012/13 52%
- 2015/16 58%
- 2019/20 64%
- 2024/25 70%.

It also identifies the maximum level of landfill of municipal waste:

- 2019/20 10%
- 2024/25 5%.
Figure 10 - Scenario 1: MSW - DJMWMS 2006

Figure 11 - Scenario 2: National Waste Strategy 2007
Figure 12: Scenario 3: MSW – Waste Strategy for Wales 2010

Figure 13: Total Void Space Required for Municipal Waste

Scenarios and Final Disposal Requirement
3.3.2 Figure 13 shows the final disposal requirement over the plan period for MSW. Each scenario shows a steady and persistent decline in final disposal through the implementation of some challenging landfill diversion targets.

3.4 Commercial and Industrial Waste (C&I) Scenarios

3.4.1 Despite the size of the stream there are fewer national targets associated with C&I waste. The disposal of wastes generated from businesses is usually dealt with privately through a range of storage, collection and processing arrangements. In some instances a trade waste agreement may exist between business and the Local Authority. Despite the complexity of these arrangements, the WPA needs to identify waste capacity needed for all waste types. It is also important to recognise that, as we established in the previous chapter, MSW counts for a relatively small amount of the overall waste generated. Notwithstanding this issue, it is important not to think of MSW and C&I as being separate matters. Instead it should be recognised that synergies exist between different waste sources, for example, waste that is generated in a house is on the whole fairly similar to that which is generated in an office. Much of the future drive for waste prevention, recovery and efforts to shift from final disposal will come from the private sector.

3.4.2 In this section three main scenarios have been developed for C&I waste:

**Scenario 1 for C&I:**

This scenario assumes that the percentages of re-use/recycling, recovery and disposal remain at the baseline 2010/11 position throughout the plan period. This effectively represents a no change approach.

**Scenario 2 for C&I:**

This scenario is based on C&I targets taken from Towards Zero Waste – The Overarching Waste Strategy for Wales, 2010. This document has been chosen as it contains a number of C&I targets and provides a more up to date picture than the Waste Strategy for England 2007 document which is currently under review.
Scenario 3 for C&I:

This scenario as with the others begins at baseline targets but then assumes a more aggressive approach to diverting waste from landfill and driving waste up the hierarchy. It therefore assumes zero waste to landfill from 2020 based on the assumption that technologies and alternative options will be available by this time to negate the need for final landfill disposal.

Table 4 Percentage of C&I waste in each forecast based on targets

<table>
<thead>
<tr>
<th>Waste Management Forecasts</th>
<th>Reuse/Recycling %</th>
<th>Recovery %</th>
<th>Landfill %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>52</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>2015</td>
<td>52</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>2020</td>
<td>52</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>Scenario 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>52</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>2015</td>
<td>60</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>2020</td>
<td>67</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>2025</td>
<td>70</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Scenario 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>52</td>
<td>18</td>
<td>33</td>
</tr>
<tr>
<td>2015</td>
<td>70</td>
<td>20</td>
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<tr>
<td>2020</td>
<td>75</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>2025</td>
<td>80</td>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>
Figure 14: Scenario 1 for C&I:

- Tonnage
- % Reuse/Recycling
- % Recovery
- % Landfill

Figure 15: Scenario 2 for C&I:

- Tonnage
- % Reuse/Recycling
- % Recovery
- % Landfill
Figure 16: Scenario 3 for C&I:

![Graph showing Tonnage vs. Year for different scenarios.]

Figure 17: C&I Scenarios and Final Disposal Requirement

![Graph showing Scenarios and Final Disposal Requirement.]

Scenarios and Final Disposal Requirement

![Graph showing void required (Tonnes) vs. Year for different scenarios.]

- Scenario 1
- Scenario 2
- Scenario 3
3.5 **Agricultural Waste Scenarios**

3.5.1 The previous chapter set out the likely arisings for agricultural waste over the Plan period. It was also established that agricultural waste arisings are generally similar to other C&I arisings.

3.5.2 In terms of scenarios for agricultural waste there is little current national guidance on what the priorities should be for the agricultural sector, however, as this waste is largely commercial in nature it is reasonable to assume that as with other waste types the drive will be to move agricultural waste away from final disposal and focus on greater resource efficiency, re-use/recycling in line with the waste hierarchy objectives. On this basis the three scenarios used are the same as those used in the previous section with regards to C&I.

**Scenario 1 for Agricultural Waste:**

This first scenario provides a baseline. There are no defined scenarios in terms of Agricultural Waste arisings and so it assumes the same baseline scenario as that for C&I.

**Scenario 2 for Agricultural Waste:**

This scenario is based on C&I targets taken from the Waste Strategy for Wales 2010. This document has been chosen as it contains a number of C&I target and provides a more up to date picture than the Waste Strategy for England 2007 which is currently under review.

**Scenario 3 for Agricultural Waste:**

This scenario as with the others begins at baseline targets but then assumes a more aggressive approach to diverting waste from landfill and driving waste up the hierarchy. It therefore assumes zero waste to landfill from 2020 based on the assumption that technologies and alternative options will be available by this time to negate the need for final landfill disposal.
Table 5: Percentage of agricultural waste in each forecast

<table>
<thead>
<tr>
<th>Waste Management Forecasts</th>
<th>Reuse/ %</th>
<th>Recycling %</th>
<th>Recovery %</th>
<th>Landfill%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>2010</td>
<td>52</td>
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<td>33</td>
<td></td>
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<tr>
<td>2015</td>
<td>52</td>
<td>15</td>
<td>33</td>
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<tr>
<td>2020</td>
<td>52</td>
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<tr>
<td>Scenario 2</td>
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<tr>
<td>2010</td>
<td>52</td>
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<td>2015</td>
<td>60</td>
<td>18</td>
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<td></td>
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<tr>
<td>2020</td>
<td>67</td>
<td>23</td>
<td>10</td>
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<tr>
<td>2025</td>
<td>70</td>
<td>25</td>
<td>5</td>
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</tr>
<tr>
<td>Scenario 3</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2010</td>
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<td>2015</td>
<td>70</td>
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<tr>
<td>2020</td>
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<td></td>
</tr>
<tr>
<td>2025</td>
<td>80</td>
<td>20</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Figure 18: Scenario 1 for Agricultural Waste

Figure 19: Scenario 2 for Agricultural Waste
3.6 Hazardous Waste Scenarios

3.6.1 It was identified in the previous chapter that the baseline arisings for hazardous waste were to be taken from the East Midlands Regional Waste Strategy. This identified baseline arisings of 126,280 and a total of 2,651,880 over the plan period, roughly 2% of overall arisings.

3.6.2 Given that hazardous waste makes up such a small amount of overall waste arisings it is not considered necessary at this stage to apply scenarios over the plan period. The implementation of the landfill directive in the UK has had a major impact on the availability of landfill in the UK, particularly hazardous waste landfill that needs to be highly engineered. Given the expense and restrictions associated with final disposal of hazardous waste it is likely that there will be a continuing drive to reduce arisings and implement a national network associated with re-use and recovery of hazardous materials.
4. WHAT DOES ALL THIS MEAN FOR DERBY AND DERBYSHIRE’S WASTE? IMPLICATIONS FOR THE WASTE PLAN

4.1 Introduction

4.1.1 This chapter considers the arisings and modelling exercise carried out in the previous chapter. The Plan will need to continue to strive to move waste up the hierarchy, away from landfill and final disposal option. Indeed, a number of the scenarios reflect work on the basis of a goal of zero waste to landfill. Having said that, it is recognised that landfill plays an important part of the disposal method in the Plan area and will continue to do so, at least into the early years of the Plan period before other technologies further up the waste hierarchy become more widely available. As such this section looks at landfill void requirements. It also looks at:

- The effects that each scenario has on landfill void space depletion and whether additional void space will be needed during the plan period;

- The effects that the scenarios have on the need for non-landfill based solutions that encompass a network of resource facilities;

- The projected gap between what is required in the scenarios developed and the capacity that currently exists in the plan area.

4.2 Landfill Void

4.2.1 Landfill is currently the principal method of waste disposal in Derby and Derbyshire. As mentioned previously there is and will continue to be a drive away from landfill over the Plan period but this will inevitably take time and therefore it is important to recognise landfill in the overall mix of waste management options. There is a finite amount of landfill void space remaining within the Plan area. There are a number of factors which govern how quickly landfill void space is “used up” which includes influences such as economics, how much waste is imported and exported. If more waste is diverted from final landfill disposal then inevitably existing landfill space will last longer.
4.2.2 A detailed assessment of landfill void, fill rates and capacity can be are set out in spreadsheets. These have not been attached as part of this report but are readily available upon request. In terms of available landfill void the baseline is taken from 2011, which broadly fits in with the date at which arisings and scenarios have been developed in previous chapters.

Table 6: Estimated Landfill Void at baseline 2011

<table>
<thead>
<tr>
<th>Landfill Type</th>
<th>Total Void at baseline 2011 (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hazardous Landfill</td>
<td>12,672,753</td>
</tr>
<tr>
<td>Inert Landfill</td>
<td>2,215,544</td>
</tr>
<tr>
<td>Hazardous Landfill (Bonded Asbestos only)</td>
<td>200,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>15,088,297 (t)</td>
</tr>
</tbody>
</table>

4.2.3 In this section the available landfill void will be compared to the amount of landfill required in each scenario for each waste stream.

Conversion Factors

Before landfill fill rates are considered more closely it is important to establish some assumptions around conversion rates.

Landfill void space is a measure of available final disposal volume whereas a tonne of waste arising is a measure of mass or weight of waste; therefore there is no easy conversion from one to the other. This is further complicated by the fact that the density of certain waste materials will be different, for example one tonne of light office paper would not take up the same amount of
volume as one tonne of heavy construction aggregate. Therefore the following conversion factor has been used:

Inert Waste 1.5 tonnes = 1m³
Other Waste 0.8 tonnes = 1m³

These conversion rates have been taken from the recently examined Cambridgeshire and Peterborough Waste Plan.
Figure 21: C&D Scenarios: Effect on Inert Landfill Void
Figure 22: MSW Scenarios: Effect on Non-Haz Landfill Void
Figure 23: C&I Scenarios: Effect on Non-Haz Landfill Void

![Bar Chart](image-url)

- Scenario 1 Remaining Non Haz Void
- Scenario 2 Remaining Non Haz Void
- Scenario 3 Remaining Non Haz Void

Total Void Space Requirement (m³)

Years:
- 2011-12
- 2013-14
- 2015-16
- 2017-18
- 2019-20
- 2021-22
- 2023-24
- 2025-26
- 2027-28
- 2029-30
Figure 24: Remaining Non Haz Void depletion from Agricultural Waste

- Scenario 1 for Agri Waste m3
- Scenario 2 for Agri Waste m3
- Scenario 3 for Agri Waste m3
4.2.4 Figure 21 works on the basis of having 2,215,544 m$^3$ of inert landfill available at the baseline year. Using the three scenarios developed in the previous chapter shows that the effect on inert landfill void, assuming that no further void space is added to the Plan area over the Plan period, is stark falling into a deficit of provision very early in the Plan period. Obviously that will be affected by efforts to divert C&D waste away from final disposal through increased recycling. It is also unlikely in practice that all inert material will only be deposited in inert fill.

4.2.5 Figure 22 shows the landfill requirement for each of the three MSW scenarios developed in the previous chapter. It has been assumed that all of the landfill void required is non-hazardous in nature. Starting at the baseline figure each scenario shows that estimated non-hazardous landfill void will not drop below an available void of approximately 14,000,000 m$^3$ by the end of the Plan period in 2029-30.

4.2.6 Figure 23 displays the non hazardous landfill void for each of the three C&I scenarios previously developed. Taken from the baseline date assuming that no further non hazardous landfill void is added it shows that even using the worst case scenario landfill void does not drop below around approximately 11,000,000 m$^3$ by the end of the plan period in 2029-30.

4.2.7 Figure 24 identifies the likely non hazardous landfill requirement for agricultural waste taken from the three scenarios developed. It shows that none of the three scenarios would cause available void space to drop below around 9,500,000 tonnes.

4.2.8 Figure 25 looks at the accumulation effect on existing non hazardous landfill void. The three previous graphs shows the effect that each individual waste stream has on landfill depletion from baseline void space, of course in reality all waste streams will be utilising this void and so it is helpful to look at the effect that the combined scenarios have on projected landfill capacity over the Plan period.

4.2.9 This graph shows that for the most part, landfill void space remains available. However, it does show that, using the less ambitious scenarios 1 & 2, if no further landfill void is added then the amount of available void drops considerably in the latter part of the Plan period in 2027-28 and 2029-30. This will need to be closely monitored throughout the Plan period.
4.3 Other Waste Facility Implications

4.3.1 In the earlier part of the chapter the rate at which final disposal void is used up was looked at on the basis of arisings scenarios previously developed. All the scenarios developed reflect the fact that final disposal is the least preferred waste management option in the waste hierarchy featuring a number of ambitious landfill diversion targets, some of which go further and faster than current English national targets. As waste is moved away from final disposal over the Plan period inevitably this will mean that other treatment and reprocessing facilities will be required. In this part of the chapter the implications of this is explored further.

4.3.2 Extensive previous work has been carried out to look at all forms of existing capacity using information obtained from the EA. Through these spreadsheets a system of “nominal” capacity for each facility that currently exists in the Plan area was developed. Essentially the reason for selecting a nominal capacity approach was an attempt to smooth out issues that can arise when adding up available capacity, for example if one input year is chosen as a basis this maybe a year that has been adversely effected by the economic cycle which can lead to a skewed picture when projected over a number of years.

It is not the intention in this section to go through all decisions made on calculating capacity; this is fully documented elsewhere in the evidence base and is readily available on request. This section will use the conclusions from that process to look at facility implications.

4.3.3 Transfer capacity

When looking at overall capacity, transfer capacity has the greatest potential to artificially skew figures. This is because it is becomes easy to double count transfer capacity as waste tends to move across various stages of transfer before it becomes finally processed or residual material goes off to final disposal. Unlike other forms of available waste capacity ‘transfer’ often represents an enabling process rather than one that genuinely reprocesses waste and diverts from landfill. Transfer is important by its very nature, as more treatment, recycling and reprocessing facilities are needed to divert from landfill more transfer will be required for the storage, sorting and movement of waste.

On this basis within this section capacity has been considered without transfer capacity included in the overall capacity calculation. In effect this gives a “worst case” scenario.
Table 7: Baseline Capacity (Non-Landfill)

<table>
<thead>
<tr>
<th>Capacity Type</th>
<th>Amount of capacity available (Tonnes) at baseline year (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>565,586</td>
</tr>
<tr>
<td>Incineration</td>
<td>95,420</td>
</tr>
<tr>
<td>Metal Recycling</td>
<td>482,161</td>
</tr>
<tr>
<td>Transfer</td>
<td>776,161</td>
</tr>
<tr>
<td><strong>Total (with Transfer)</strong></td>
<td><strong>1,919,328</strong></td>
</tr>
<tr>
<td><strong>Total (without Transfer)</strong></td>
<td><strong>1,143,167</strong></td>
</tr>
</tbody>
</table>
4.3.4 Figure 26 displays the non-landfill MSW scenarios projected over the Plan period without transfer capacity added. Looking at this waste stream in isolation all scenarios have adequate capacity peaking at just over 500,000 tonnes at the end of the plan period. It should be remembered however, that as identified in the earlier chapter MSW accounts for a proportionally minor quantity of overall waste arising.
4.3.5 Figure 27 displays the non-landfill C&I scenarios projected over the Plan period without transfer capacity included. It shows that looking at this waste stream in isolation all scenarios have adequate capacity but due to higher levels of arisings than MSW the maximum baseline has less room for manoeuvre. From 2019-20 onward the amount of available existing capacity for C&I waste becomes severely limited.
4.3.6 The scenarios for C&D waste have been considered against available non-landfill capacity in a slightly different way to other waste streams. The C&D scenarios that were developed in the previous chapter have only been considered against baseline treatment capacity as C&D waste is unlikely to be suited for processing in many types of conventional facilities such as EfW. On this basis, Figure 28 shows that consistently C&D waste arisings are higher than those facilities available to process it. This could be because much of this material is currently ‘landfilled’ or it is treated and processed outside the licenced water treatment network. Taking all this into account and given that C&D waste represents around half of the overall waste arisings it is likely that additional non-landfill capacity to process this waste stream will be required over the Plan period. It will also be important to work closely with the construction and demolition sector to reduce arisings of this waste stream as far as possible.
Figure 29: Agricultural Waste Scenarios & Non Landfill Waste Capacity (without transfer)
4.3.7 When looked at in isolation, the agricultural waste scenarios show that there is an issue with regard to sufficient capacity around 2015-16. On paper agricultural waste arisings appear high, this may be due to the rural nature of Derbyshire and the fact that waste that arises on farms often tends to be bulky. The composition of this material tends to be commercial in nature and will be dealt with through the private commercial waste stream. It is important therefore to monitor closely and ensure that enough facilities can be provided for this stream through the Plan.

It is important to note that, while scenarios are provided for discussion, agricultural waste could, or perhaps should, be regarded as a ‘special case’. This could mean, for example, that all but a minor element (say a nominal 10,000 tonnes per annum) of all the wastes will need to be managed on specialist agricultural facilities. This could include, for example, joint farm AD plants.
Figure 30: Total Non Landfill Capacity and Waste Scenarios

- **Total for all Waste Types in Scenario 1**
- **Total for all Waste Types in Scenario 2**
- **Total for all Waste Types in Scenario 3**
- **Available non landfill capacity (without transfer)**
4.3.8 Figure 30 looks at all of the Waste Scenarios in total. When added together it shows a significant gap between non-landfill, non-transfer facilities available and arisings to be dealt with. Obviously, not all waste types will be suitable for all waste facilities, for example, it is unlikely that a large quantity of agricultural waste arisings would be suitable for metal recycling capacity. It is clear however, that as efforts are made over the Plan period to divert more waste from final disposal then more non-landfill alternatives will be required. The figures appear to show that Derby and Derbyshire have an overall non-landfill capacity deficit from very early in the Plan period. If no further non landfill, non-transfer capacity is added in the Plan area over the Plan period then under Scenario 3 (the most ambitious landfill diversion scenario) the capacity gap stands at around 4,500,000 tonnes.
5. CONCLUSIONS

5.1 By using a range of data sets and then applying a number of scenarios this document has begun to identify what tonnage of waste will be generated over the Plan period. There will be further work to do in terms of how this translates into treatment facility need. This will be closely linked to work that is currently ongoing to look at cross border movements of waste and the issue of ‘strategic’ facilities verses more smaller facilities. Waste imports and exports once clearly established will ultimately change the amount of waste that requires management.

5.2 Hazardous waste has been considered in terms of baseline and arisings but at this stage has not had different scenarios attributed to it. This is because it accounts for only around 2% of overall arisings in the Plan area. Hazardous waste because of its non-homogenous nature tends to travel greater distances to specialist facilities. On this basis it is likely that hazardous waste requirements will be more accurately picked up as part of the work on cross border waste flows. Further work will also be required on waste water issues.

5.3 Dealing with agricultural waste may require a new generation of on-farm solutions. This could potentially include joint farm initiative or schemes.

5.4 Although, as identified above there is still some work on going, this document clearly outlines the priorities for the bulk of the waste stream that will need to be managed over the Plan period. By clearly identifying C&I, C&D, agricultural and MSW streams this encompasses over 90% of the waste to be managed. By applying scenarios to each of these streams it has helped to develop a picture of what priorities the Plan will need to address.

5.5 If no new non-landfill facilities are bought on line over the Plan period then a deficit between the waste arising and the ability to manage it in the Plan area sustainably becomes a stark possibility. All European, national and local policy points to a continued drive to divert waste from landfill, all the scenarios have been developed on that basis some reducing landfill dependence faster than others but all with that overall aim. It is inevitable that in order to be ambitious and divert increasing tonnages from final disposal will take a concerted effort to embrace waste prevention and minimisation policies and priorities as set out in the waste hierarchy. This will need to be driven
by the Waste Plan and other supporting national and local waste policies. A firm commitment to encourage waste prevention and minimisation across all waste streams and sectors is the most effective way of ensuring that less waste will need to be managed over the plan period. Notwithstanding this, it must be recognised that any continued move away from landfill reliance will require a network of facilities to recycle, reprocess and treat waste streams.