

# **WORCESTERSHIRE WASTE CORE STRATEGY BACKGROUND DOCUMENT**

## **CONSTRUCTION AND DEMOLITION WASTE**

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The Council is preparing a *Waste Core Strategy*: a plan for how to manage all the waste produced in Worcestershire up to 2027. To help provide a robust evidence base for the Waste Core Strategy the Council has prepared a series of background documents. These outline current thinking and have informed the approach taken in the development of the Waste Core Strategy.

We welcome any comments you would like to make on any of the background documents during the *Publication Document (Regulation 27) Consultation*. The consultation will run from **22<sup>nd</sup> March – 4<sup>th</sup> May 2011**.

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## INTRODUCTION AND BACKGROUND

This paper provides part of the evidence for the Worcestershire Minerals and Waste Development Framework regarding waste arising from construction, demolition and excavation activities.

It includes a simple summary of construction and demolition (C&D) waste in a national and local policy context. It also includes details of the waste arisings and available capacity to manage C&D waste within the County.

### ***What is Construction and Demolition Waste?***

Construction and demolition (C&D) waste is produced as a result of building, engineering or other activities which include construction, demolition or excavation.

The construction industry in England uses around 400 million tonnes of materials every year and produces around 90 million tonnes of inert C&D waste and a further 20 million tonnes of non-inert and mixed C&D waste. An additional 60 million tonnes of waste arises from construction-related quarrying<sup>1</sup>.

C&D waste makes up approximately a third of all waste in England<sup>2</sup>, with construction, demolition and excavation generating more waste than any other sector. This waste consists of:

**Aggregate waste:** the largest component of C&D waste is inert waste much of which is suitable for reprocessing into aggregates. This amounted to 90 million tonnes in 2004<sup>3</sup>.

**Non- aggregate waste:** in terms of tonnages this is small proportion, with estimates of about 15-20 million tonnes per year.

**Hazardous waste:** 1.7 million tonnes was hazardous waste and the construction, demolition and excavation sector was the largest generator of hazardous waste in England.

**Soils:** Excavation material often includes soil and subsoil. Topsoil is a (relatively) scarce, saleable material, easily re-used both at the site of origin or elsewhere. Subsoil, by contrast is of very little value and usually considered a problem to be disposed of. There are no reliable estimates of the volumes of top and subsoil produced or how they are used.

**Plasterboard:** plasterboard waste is rising and could potentially double over 15 years (from 2006) as a result of increase in building works and changes in building methods<sup>4</sup>.

Future demolition and refurbishment rates will have a big impact on the amount of construction waste in England. It is possible that the reduction in the availability of brownfield land re-development the quantity of demolition waste will grow sharply

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<sup>1</sup> Waste Strategy for England 2007

<sup>2</sup> Waste Strategy for England 2007 p24, based on 2004 figures.

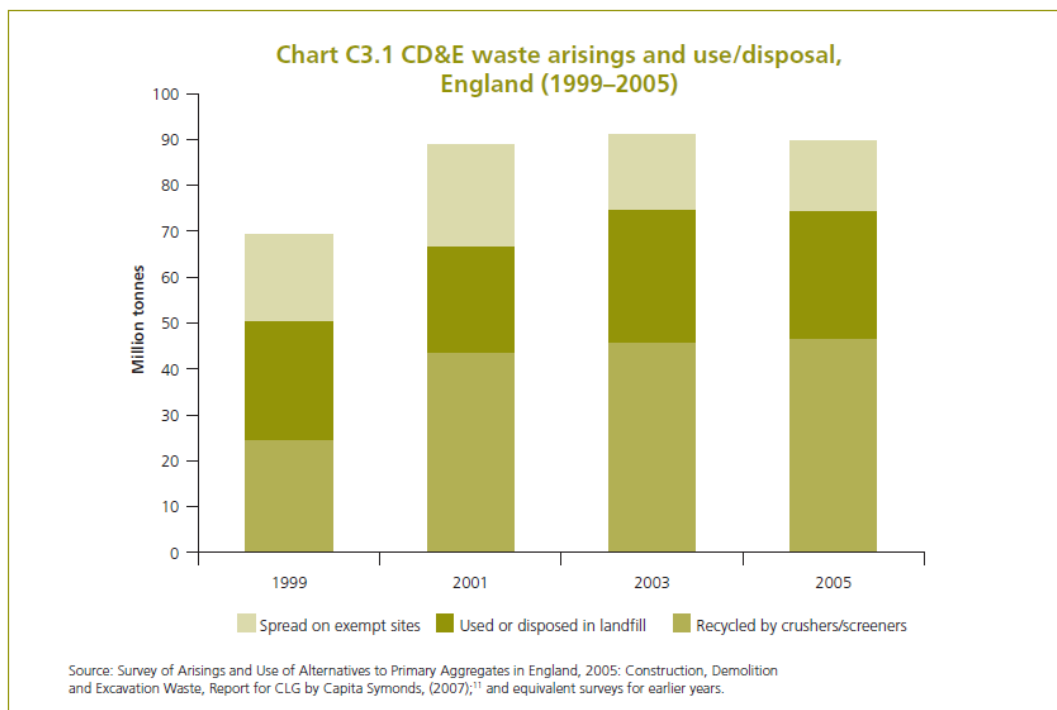
<sup>3</sup> Waste Strategy for England 2007 p69

<sup>4</sup> Review of Plasterboard Material Flows and Barriers to Greater Use of Recycled Plasterboard, Waste & Resources Action Programme (2006) referenced in Waste Strategy for England 2007.

over the next 20 years due to increased replacement of buildings that cannot be upgraded cost-effectively to meet the energy efficiency standards needed to combat climate change.

### ***How is construction and demolition waste managed?***

The re-use and recycling of inert demolition wastes is now well established, with half of all inert C&D waste recycled as aggregates and recycling rates of 80% or more being achieved on some projects. However rates of landfilling for site construction and refurbishment waste still appear to be high.



**Aggregate waste:** Half of all inert C&D waste is recycled as aggregates. This may be done off site but often occurs at the site of production where it is processed using mobile crushing and screening plant and is often reused on site.

**Non- aggregate waste:** in terms of tonnages this is small proportion, with estimates of about 15-20 million tonnes per year.

**Hazardous waste:** 1.7 million tonnes was hazardous waste and the construction, demolition and excavation sector was the largest generator is hazardous waste in England.

**Soils:** Soil wastes arising from housing and other developments on brownfield land are likely to be contaminated to some extent. Landfill disposal of contaminated soils that are classed as hazardous waste is more expensive and involves longer journeys as a result of the reduction in the numbers of sites able to receive hazardous waste. However, overall these changes help to reduce the volume of wastes going to hazardous waste landfill and, importantly, are encouraging the use of more sustainable treatment technologies such as soil washing, thermal desorption and bioremediation, often onsite.

**Plasterboard:** plasterboard waste is rising and could potentially double over 15 years (from 2006) as a result of increase in building works and

changes in building methods.<sup>5</sup> In the UK, most gypsum and plasterboard waste is currently disposed to landfill. However, since July 2005, with further restrictions in 2009, the Landfill Regulations require that gypsum and other high sulphate-bearing materials may only be disposed in landfill cells where no biodegradable waste is accepted. This is to avoid emissions of hydrogen sulphide. There are currently few landfill sites with segregated cells in the UK designed specifically to accept high sulphate-bearing loads, and few alternative treatment options currently in place.

The rates of re-use and recycling of construction wastes appear to be substantially lower than for demolition wastes (10% or less for some materials)<sup>6</sup>. For example, insulation materials, plastics and board materials are predominantly sent to landfill.

### **Reduction and reuse**

Evidence suggests that contractors tend to underestimate the true cost of waste, neglecting the lost value of materials in skips<sup>6</sup>. Amec have estimated the true cost of a skip to be 16 times the cost of skip hire, with the cost of materials put in the skip accounting for more than 80% of the total and Skanska found that the cost of wasted material was five times the disposal cost. However reduction of wastes and reuse of materials are becoming more common and best practice from pre-demolition audits carried out by BRE indicates that an increase in reclamation to 28% is feasible.

Potential methods to help minimise or reuse C&D waste include:

- refurbishment instead of demolition and rebuild;
- design for minimum waste (e.g. matching wall sizes to plasterboard dimensions);
- design for reduced materials usage;
- design for deconstruction, reclaim and recycling;
- efficient delivery logistics and stock control to minimise over-ordering and site waste;
- good site practice to reduce spoilage and cut-offs;
- use of reclaimed materials;
- use of reclaimed products such as windows and doors;
- on-site reprocessing of materials such as asphalt planings;
- use of higher recycled content in building products; and
- reduce or re-use packaging materials.

Substitution of locally-sourced reclaimed materials for new in construction work can radically reduce the lifecycle environmental impact of that particular item, with use of reclaimed timber estimated as having a 79% lower impact compared to new.

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<sup>5</sup> Review of Plasterboard Material Flows and Barriers to Greater Use of Recycled Plasterboard, Waste & Resources Action Programme (2006) referenced in Waste Strategy for England 2007.

<sup>6</sup> Waste Strategy for England 2007

## Recycling

Best practice from pre-demolition audits carried out by BRE indicates that recovery rates (recycling and reclamation) of 96% are feasible.

C&D recycling can be undertaken through the use of both fixed and mobile machinery. The way they are regulated, through permits granted by Environmental Health Authorities for their "home" base, regardless of where they operate in practice and the way they operate, often through planning "Permitted Development rights" means that monitoring their use and measuring throughput are very difficult.

Extensive case studies have shown that higher recycled content can be used in projects with no increase in cost of materials – and often with a cost saving where waste materials are reprocessed locally (e.g. for roads and other infrastructure). Moving to cost-neutral good practice can increase the mass of recovered material incorporated in a school or house tenfold. This includes the use of manufactured products with above-average recycled content, reclaimed materials and aggregates reprocessed on site or from nearby sites.

The carbon benefit of recycling will depend on the relative fuel/energy demand for transport and processing of recycled versus virgin materials. For example, recycling of non-ferrous metals offers a large carbon benefit, due to the high embodied energy of these materials. By comparison, recovered soils and mineral materials (e.g. recycled aggregates) have a low embodied energy and high volume, and therefore should be used locally in order to retain a carbon benefit. Net carbon benefits are also likely to result from the recovery of higher value inert materials such as brick and concrete, and their use in higher value applications.

Recycling aggregates may have a net carbon benefit or detriment, in particular depending on transport distances, however, on a more holistic basis, taking account of additional environmental impacts such as minerals extraction, recycling of aggregates is generally beneficial.

Symonds Capita<sup>7</sup> report that *"most recycling crushers serve a relatively small geographical area, with very little CDEW travelling more than 20 miles to be processed. This arises from a whole series of considerations, and in turn has implications and consequences which can be summarised as follows:*

- (i) the commercial viability of recycling CDEW is largely determined by the balance between the cost of waste disposal and the cost of primary aggregate, both of which are strongly influenced by haulage costs, which in turn are largely determined by travel distances, which tend to be higher (for both disposal and aggregate) in conurbations, where landfills and quarries have been squeezed out by rising land values;*
- (ii) operators of recycling crushers in rural areas can find suitable working sites more easily, but are often further from both raw materials (demolition waste) and markets (development sites in predominantly urban areas);*

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<sup>7</sup> Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005; Construction, Demolition and Excavation Waste. Capita Symonds for CLG February 2007

- (iii) *by contrast, operators in the most densely populated urban areas have plenty of raw materials and the recovered product can compete with primary aggregate, but the operators often have difficulty identifying permanent (fixed) recycling sites; and*
- (iv) *operators on the urban fringe are more likely to be able to combine proximity to both raw materials and market demand with workable and accessible fixed recycling sites.*

*Local population density is a reasonable proxy for several of these variables."*

### **Fly-tipping**

Fly tipping of these wastes is a significant concern. C&D waste is a major component of fly-tipped waste and formed over 31% of fly tipping incidents dealt with by the Environment Agency in 2005/06. Nearly 60,000 incidents involving construction-related waste were reported to English local authorities, resulting in significant clean-up costs.

### **Landfill**

The landfill tax for non-inert material will increase to £48/tonne in 2010/11, whilst a lower rate of £2.50 per tonne applies to inactive (or inert) wastes.

A number of policy drivers may be responsible for the re-use and recycling of C&D waste but the increase in the landfill tax, (the standard rate of which for non-inert material will increase to £48/tonne in 2010/11) and the aggregates levy (which encourages the use of recycled rather than virgin materials) are generally regarded as particularly significant. Whatever the cause, the diversion of C&D waste into material suitable for reprocessing into aggregates has increased. Rates of landfilling for site construction waste do however still appear to be high and there is scope for improved performance: at least one major contractor has set itself a target of sending zero non-hazardous waste to landfill.

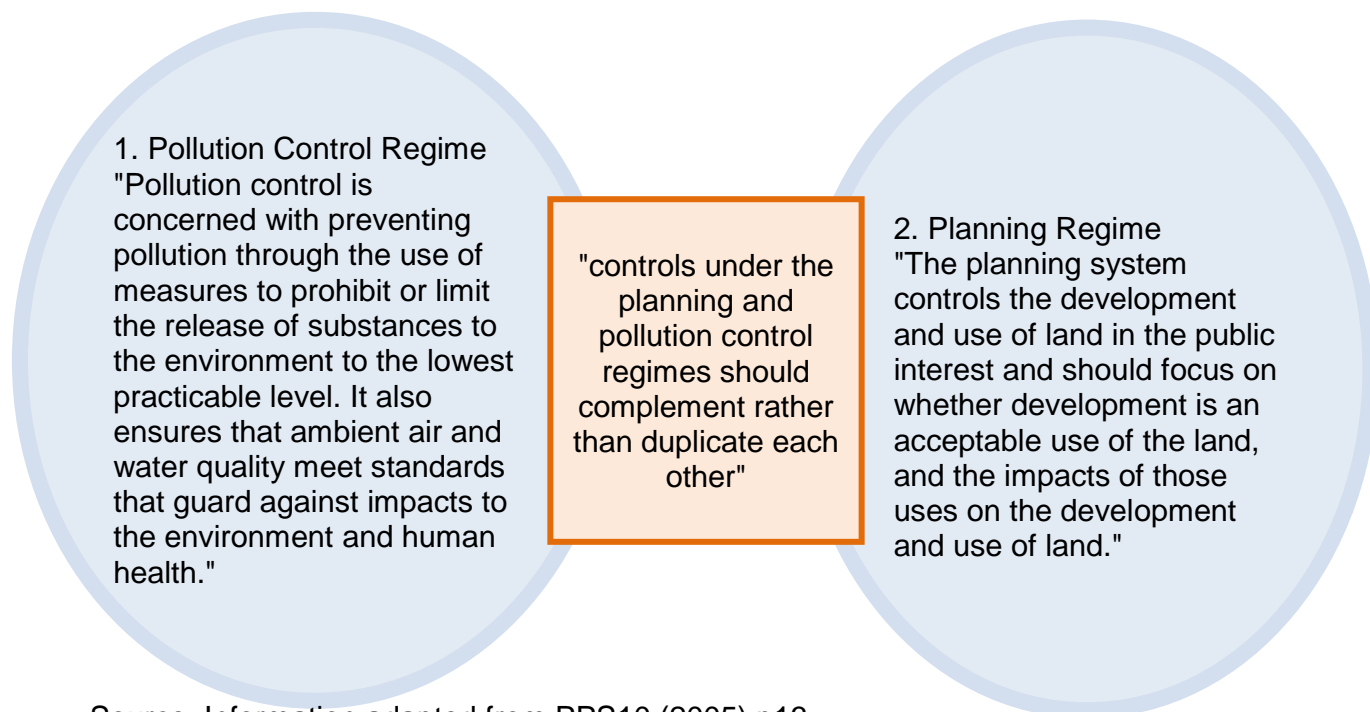
A current WRAP initiative has signed up 602 construction contractors to a commitment to halve waste to landfill by 2012. Of these 32 contractors are reporting their annual performance for C&D waste using WRAP's Waste to Landfill Reporting Portal. This shows a 28% decrease in C&D waste sent to landfill between 2008-9; which equates to a drop from 3.1 million tonnes in 2008 to 2.2 million tonnes in 2009.



## REGULATION

There are two main ways in which waste management activities are regulated:

**Figure 1: Regulation of Waste Management**



Source: Information adapted from PPS10 (2005) p13

### The Pollution Control Regime.

Under the *Environmental Protection Act (1990)* it is unlawful to deposit, recover or dispose of controlled waste without a waste management license, contrary to the conditions of a license or the terms of an exemption, or in a way which causes pollution of the environment or harm to human health.

The *Environment Agency* is the pollution control body responsible for issuing and monitoring of Environmental Permits under the Environmental Permitting Regulations<sup>8</sup>. Following a successful planning application for waste recycling, recovery or disposal operations, the developer is required to apply for an Environmental Permit and waste planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced.<sup>9</sup> Usually any waste treatment, recovery or disposal operation needs to be authorised by a permit issued by the Environment Agency. A waste exemption is a very specific type of low risk waste handling operation that does not require a permit. Most exemptions need to be registered.

On the 6 April 2010 new regulations came into force and that completely changed the waste exemption system. Anyone registering a new exempt waste operation on or

<sup>8</sup> The Environmental Permitting Regulations (EPR) came into force on 6 April 2008 prior to this the environment agency issued waste management licenses, under the requirements of either the Environmental Protection Act 1990 (EPA 1990) or the Pollution Prevention and Control (PPC) Regulations 2000.

<sup>9</sup> Planning Policy Statement 10: Planning for Sustainable Waste Management (2005) p13

after the 6 April 2010 has to register under the new waste exemption system. Waste operations that have already been registered under the old system will transfer across to the new system over a period of 18 months to three-and-a-half years.

Some exemptions particularly relate to C&D waste. Under the terms of the following categories:

- U1 Use of waste in construction
- U3 Use of waste in the construction of entertainment or educational installations etc
- U8 Direct and beneficial use of waste for a specified purpose
- U9 Use of waste to manufacture finished goods
- U10 Spreading waste on agricultural land to confer benefit
- U11 Spreading waste on non-agricultural land to confer benefit

Other categories of EA exemption may also be relevant.

C&D and other waste can be used in a number of beneficial ways. Examples include: using crushed bricks, concrete, rocks and aggregate to create a noise bund around a new development and then using soil to landscape it to enable grass to grow; using road planings and rubble to build a track, road or car park; using wood-chip to construct a track, path or bridleway and bringing in some soil from another place for use in landscaping at a housing development<sup>10</sup>.

These exemptions have however been significantly abused in the past. Under the former regulations for example few operations were monitored by the Environment Agency and records of what and how much was used in this way, were very poor.

The government has recently<sup>11</sup> issued advice to Local Authorities that:

*"Government's policy is to encourage the recovery of waste (which includes the re-use and recycling of waste, e.g. for construction), with an overriding objective to ensure that waste recovery and disposal are carried out so as to prevent harm to human health or pollution of the environment in accordance with Article 4 of the Waste Framework Directive. The Directive makes it clear that any deposit of waste that does not constitute recovery is considered a waste disposal operation. The disposal in or on land may be subject to additional controls of the Integrated Pollution Prevention and Control Directive and the Landfill Directive depending on the size and scale of the operation and subject to the grant of a permit by the Environment Agency.*

*Both CLG and Defra consider that landscaping developments of the scale of the current examples involving importing over 100,000 tonnes of waste would not have been undertaken if the material used to construct the landscaping were not waste. Therefore, given the quantity of waste being used such developments are unlikely to constitute recovery operations, but are more likely to be waste disposal operations."*

It is possible therefore that the number and scale of such proposals may reduce in future.

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<sup>10</sup> Planning permission (or compliance with the Permitted Development regulations) is also needed to undertake these.

<sup>11</sup> Letter from CLG to Chief Planning Officers 20<sup>th</sup> January 2009.

## Planning Regime

Planning decisions are based upon the development plan, national policy and other relevant material considerations. This document will contribute towards the production of the Core strategy which forms part of the development plan. The national and regional policy context for the management of commercial and industrial waste is set out in the next section of this paper.

## Policy Context

### ***National Policy***

#### **Permitted Development Rights**

Permitted Development Rights, in effect deemed planning permission, exist within the planning system and allow a number of activities using, and in effect, disposing of, C&D waste to be undertaken without specific planning permission. The regulations enabling this are complex and it is widely perceived that abuses do occur. The scale of overall activity and of abuse of the regulations is unknown. It is generally assumed by the WMRTAB that considerable volumes of C&D wastes are used in this way. It is not possible to determine how much or the scale of abuse is undertaken nationally or locally. The issue is important both in terms of planning how much capacity will be needed to manage C&D waste during the life of the strategy and of the risk to features of acknowledged importance, such as archaeological features, protected species or sites of nature conservation importance which could be adversely affected.

#### **Planning Policy Statement 10: Planning for Sustainable Waste Management (2005)**

PPS10 sets out the Government's policies on Waste Management planning. The overall objective is to protect human health and the environment by producing less waste and by using it as a resource wherever possible.

Positive planning has an important role in delivering sustainable waste management through the development of appropriate strategies for growth, regeneration and the prudent use of resources; and by providing sufficient opportunities for new waste management facilities of the right type, in the right place and at the right time. In doing this waste development frameworks should consider commercial and industrial waste. PPS 10 draws particular attention to the need to recycle construction and demolition waste.

#### **Waste Strategy for England (2007)**

The Government's key objectives are to decouple waste growth from economic growth, by encouraging prevention and re-use and to divert waste from landfill through investment in infrastructure, in order to get the most environmental benefit. The expected effect of the strategy is to reduce global greenhouse gas emissions from waste management.

Given the scale of the construction industry's resource use and the quantity of C&D waste entering landfill, the Waste Strategy for England 2007 identified construction waste as a priority sector for action. The Government is considering, in conjunction with the construction industry, a target to halve the amount of construction, demolition and excavation wastes going to landfill by 2012 as a result of waste reduction, re-use and recycling.

DEFRA and GOWM officials have however acknowledged privately that this target is unworkable because there is no data for C&D arisings for 2004.

The Environment Agency commented in response to the "Emerging Preferred Options" Consultation that a target should nonetheless be included. They advised that the amount of C&D waste disposed of to landfill in Worcestershire identified in the Waste Data Interrogator 2007 should be used as a baseline and that the revised Waste Framework Directive duty on member states to ensure that 70% of non-hazardous construction and demolition waste (excluding soil and stones) are re-used and recycled by mid 2020 should be used as a target.

However, in order to set ambitious targets, align with the targets for C&I waste and take account of the fact that soil and stones will inevitably form part of C&D waste without being able to be differentiated, we intend to set a more challenging target of treating 75% of C&D waste in Worcestershire and landfilling a maximum of 25% for the waste core strategy.

### **Site Waste Management Plans**

Waste Strategy 2007 also sets out the intention (now implemented) to make Site Waste Management Plans a mandatory requirement for construction projects over a certain value, and extend to other parts of the supply chain the recent agreement with the manufacturers on recycling of plasterboard, as part of reducing waste and increasing re-use and recycling by the construction sector. Site Waste Management Plans (SWMPs) are now required construction projects in England worth over £300,000.

SWMPs aim to reduce illegal waste activity, including fly-tipping, encourage reduction in the amount of waste produced and improved resource efficiency. They require projects to forecast and monitor the amount of waste produced, re-used and recycled, and to promote the opportunities of reducing waste at source. The regulations are accompanied by non-statutory guidance that highlights key waste materials, such as wood, which are predominantly consigned to landfill and identify beneficial alternatives such as reuse, recycling or combustion as well as encouraging separate collection of materials at construction and demolition sites. The intention is for the designer to consider ways that waste can be reduced and site-gained materials can be reused or recycled as part of the project. Identifying waste materials at an early stage that cannot be reused on that project should make it easier to find other alternative uses for them.

### **Code for Sustainable homes**

The Code for Sustainable Homes sets criteria to assess the sustainability of new development. Site Waste Management Plans (SWMP) were introduced as a mandatory element of the Code prior to the introduction of Site Waste management Plan Regulations in England.

When the regulations were introduced the Code was adjusted to raise the minimum value of a development affected from £250,000 (as required by the Code) to the statutory level of £300,000. The Code requirements for SWMPs currently set slightly higher standards than regulations. In general a SWMP that has been prepared to meet the Code also satisfied the regulatory requirement, however for some house builders have reported that the Code required them to

write additional and slightly different SWMPs when there are 'Code homes' on a development.

To address these issues, changes in the 2010 code replaced the requirement for mandatory SWMPs with voluntary credits for minimising or diverting waste from landfill.

## **National Aggregates Planning Policy**

MPS1 states<sup>12</sup> that "in order to secure the long term conservation of minerals it is necessary to make the best use of them.....by adopting a hierarchical approach to minerals supply, which aims, firstly to firstly to reduce as far as practicable the quantity of material used and waste generated, then to use as much recycled and secondary material as possible, before finally securing the remainder of the material needed through new primary extraction."

This concept is further elaborated in the "National and regional guidelines for aggregates provision in England 2005-2020" (CLG 2009) where a target to use 60m tonnes of recycled materials as aggregates (25% of the total use) is set for 2015.

The assumption is that LPAs will make provision for this scale of delivery in their Development Plans and Development Control decisions.

Figures for secondary and recycled materials sold as aggregates are only collected for the Region as a whole, and the latest estimate available is 4.29 million tonnes in 2003. This figure remains below the 5.5 million tonnes per year of alternative materials assumed by the Guidelines, and suggests a continued need to encourage the supply of alternative materials, especially in the Major Urban Areas where opportunities are likely to be greatest. No subsequent data is available.

## ***Regional Policy***

### **West Midlands Regional Spatial Strategy (2008)**

GOWM has confirmed that the evidence base for the RSS is still valid and can be material considerations in the development of the Waste Core Strategy.

Particularly useful documents are:

The RSS Phase 2 Future Capacity Requirements Study (WMRA Shropshire 18/11/2004)

Paras 4.6 to 4.8 of the report state:

"The SWMA (2000) provides only limited information about the generation and management of construction and demolition waste at a sub-regional level. More recent data for the West Midlands region is available from research carried out by the Symonds Group on behalf of the Office of the Deputy Prime Minister. Figures for the generation of construction and demolition waste have therefore been derived from regional estimates in Annex 8 of the 'Survey of Arisings and Use of

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<sup>12</sup>

Construction, Demolition and Excavation Waste as Aggregate in England in 2003 (ODPM October 2004). Several options for the disaggregation of the regional estimate given in the Symonds survey are available:

1. **Proportionality**: assumes that the relationship between C&D waste and other waste streams remains consistent with the regional average. Knowing the total quantity of waste in other waste streams allows an estimate of the quantity of C&D waste to be calculated;
2. **Employment**: assumes that the quantity of C&D waste is consistent with the relative levels of employment (including self employment) in construction and demolition businesses in each area;
3. **Population**: assumes that the quantity of C&D waste is consistent with the relative size of the population in each WPA area;
4. **Development**: assumes that the quantity of C&D waste reflects the relative levels of housing development (as a proxy for all development), including a weighting for the proportion of development on previously developed land and the level of demolition in each area.

It seems certain that the relative levels of C&D waste generated will not remain constant throughout the region and option 1 must therefore be rejected. It is not possible to accurately quantify the relative levels of employment in construction and demolition in each WPA area. Employment statistics are skewed by the numbers of employees of large construction firms, which are based in a particular area, but do not work just in that area, so option 2 must also be rejected. The relative levels of population can be measured but do not necessarily provide an indicator of the level of construction and demolition activity. Option 3 must therefore be rejected in favour of option 4 which, whilst it does not measure all development, may provide a proxy. Significantly, option 4 also allows a weighting to be built in to reflect relative levels of demolitions and the proportion of development on previously developed land, both of which have the potential to significantly increase the quantity of C&D waste.

We have decided to use option 4 of the ODPM report in order to estimate possible future arisings of C and D waste. Although it does not measure all development, it may provide a proxy and it allows a weighting to be built in to reflect relative levels of demolitions and the proportion of development on previously developed land, both of which have the potential to significantly increase the quantity of C&D waste. The report estimated the quantity of construction and demolition waste generated in each Waste Planning Authority over the period 2001-2021 using a development index to disaggregate the regional total. This index was based on RPG11: Regional Planning Guidance for the West Midlands which identified the distribution and rate of future housing development, demolitions and the use of previously developed land in each WPA area in three phases: the period to 2007; 2007-2011; and 2011-2021 (RPG11, Tables 1-3, pp.37-39). The calculations assume that development will initially be concentrated on previously developed (brownfield) land and that such sites will generate considerable volumes of C&D waste but that over time more new development will take place on greenfield sites and the wastes produced from redevelopment will decrease. The WMRSS has been rescinded by government and it is very likely that Core Strategies that are ultimately adopted by District Councils in Worcestershire will not be based on these figures. They are however the best available and, although their report was not considered by the Secretary of State, were subject to Examination and largely confirmed. The summary

calculation is illustrated for Worcestershire in Table 1: Calculation of Construction and Demolition waste arisings using weighted annual % share of housing development 2001-2021 below:

**Table 1: Calculation of Construction and Demolition waste arisings using weighted annual % share of housing development 2001-2021**

	<b>Weighted Share to 2007</b>	<b>C&amp;D Waste to 2007 (tonnes p.a.)</b>	<b>Weighted Share 2007-2011</b>	<b>C&amp;D Waste 2007-2011 (tonnes p.a.)</b>	<b>Weighted Share 2011-2021</b>	<b>C&amp;D Waste 2011-2021 (tonnes p.a.)</b>
<b>Worcs</b>	10.06%	818,015	7%	510,555	6%	419,520

Source: RSS Phase 2 Future Capacity Study table 4.2

#### West Midlands Landfill Capacity Study 2009 Update (Scott-Wilson/ WMRA 2010)

Alternative projections can be found in the Scott Wilson 2009 update report on landfill capacity for the WMRA. This report made is based on the WMRSS growth assumptions with a different projection, predicted to be affected in line with economic changes being experienced in commercial and industrial sectors during 2009 – 2011. Using the UK Economic Outlook (PWC, March 2009) information in relation to the expected impact on economic growth for the periods 2008 to 2011 construction growth was assumed to mirror the general sector growth changes, namely a 1% decline in 2008, a 4.25% decline in 2009, and 0.4% growth in 2010, after which growth returns back to the WMRSS basis. These give the following figures:

**Table 2: Table 2: C&D Total Arisings (tonnes) Scott Wilson: Update 2009**

	2007 Base year	2010/1	2015/1	2020/2	2025/2	2030/3	Cumulative total
Worcestershire	747,868	711,759	611,767	605,015	598,943	593,482	15,097,723
West Midlands total	9,526,031	9,066,083	8,959,751	8,860,863	8,771,931	8,691,953	214,211,202

Source: Projections in the West Midlands Landfill Capacity Study 2009 Update (Scott-Wilson) Table 4.4.3 and Appendix C

These figures were not discussed at the Examination into the WMRSS Phase 2 Revision and we have therefore decided not to use them.

### **Wider Policy Considerations**

The WMRA AMR for 2009<sup>13</sup> states that:

"The proportion of construction and demolition waste that was estimated to have been recycled as aggregate or soil increased from 50% in 2001 to 61% in 2003 (the

<sup>13</sup> The 2009 Annual Monitoring Report (AMR) covers the period April 2008 - March 2009, the sixth prepared since the publication of the West Midlands Regional Spatial Strategy (WMRSS).

highest performance for any Region in England), but dropped back to 50% in 2005. Again, there are no more recent data. For the West Midlands, the production of recycled aggregate appears not to have changed from 2003 levels, but there would seem to have been an overall increase in the amount of construction and demolition waste disposed of at landfills and used at registered exempt sites. Regional and sub-regional level data from the survey are subject to wide confidence levels, however, and these results should be treated with caution". Appendix WD6 to the AMR shows the following.

**Table 3 Estimated re-use, recycling and disposal of hard construction & demolition and excavation waste, 2001, 2003 and 2005, West Midlands Region ('000 tonnes)**

	<b>2001</b>	<b>2003</b>	<b>2005</b>
Recycled aggregate and soil	4.28	4.94	4.92
Material used for landfill engineering or restoration	1.04	0.54	0.83
Material used to back-fill quarry voids	1.1	1.14	
Material used at Paragraph 9 & 19 exempt sites	1.81	0.78	2.91
Material disposed of at landfills	0.4	0.73	1.19
<b>Total</b>	<b>8.62</b>	<b>8.13</b>	<b>9.84</b>

NB:

(1) Data are subject to wide confidence levels.

The report warns that the sub-regional data 'should not to be relied on as anything other than a reasonable indication of arisings and recycling of CDEW, and should only be used with caution by Mineral Planning Authorities (and others) to provide contextual background in the undertaking of functions such as development control.'

*Source: ODPM/ Capita Symonds surveys, 2001, 2003 and 2005.*

Together with the figures for the re use of C and D waste for aggregates, these figures suggest that, at least at the regional scale, more material could and should be recycled than is currently the case to meet all the aims of government policy.



## WORCESTERSHIRE: THE CURRENT SITUATION

### ***Waste Arisings***

There are no set approaches for making estimates about waste arisings or projecting waste growth for C&D waste. Several alternative approaches have been considered:

- EA waste data interrogator
- The Environment Agency Strategic Waste Management Assessments (2002/3)
- Survey of arisings and use of Construction, Demolition and Excavation waste as aggregate in England 2003 (ODPM 2004)
- The RSS Phase 2 Future Capacity Requirements Study (WMRA, Shropshire 2004)
- The West Midlands Landfill Capacity Study 2009 Update (Scott-Wilson Report)

Full discussion of these alternatives is set out in Background Document *Arisings and Capacity*.

The preferred methodology for making C&D projections is the *Phase 2 Future Capacity Study*. This applies a national approach (ODPM) to a local level. It has been tested at examination and attempts to identify all C&D waste generated, not just those managed at licensed sites.

This method is based on the relative levels of housing development (as a proxy for all development), including a weighting for the proportion of development on previously developed land and the level of demolition in each area. It gives a projection for C&D waste arisings as shown in **Table 4**.

**Table 4. Projection of C&D waste arisings**

	2007 - baseline	2010/1	2015/6	2020/1	2025/6	2030/31	2035/36
<b>Total</b>	818,015	510,555	419,520	419,520	419,520	419,520	419,520

### ***Treatment Capacity***

The current capacity to manage C and D waste can be partly identified from the Waste Data Interrogator 2007 by running the query for WPA Worcestershire, by waste category 'inert', by site category 'all', reporting waste received and showing facility by site category. These figures show actual throughputs, rather than the potential capacity included in planning permissions and EA permits. This gives the following data. The total weight recorded as managed is 164,223t (for 2007).

**Table 5: Current Operational Facilities managing C and D in Worcestershire**

Site Name	Operator	Basic Waste Cat	Landfill	Transfer	Treatment
Beacon Waste Hoobrook Waste Recycling Centre	Mercia Waste Management Ltd	Inert/C+D		1,658.04	

Site Name	Operator	Basic Waste Cat	Landfill	Transfer	Treatment
Bilford Road Household Waste Site	Mercia Waste Management Ltd	Inert/C+D		2,608.30	
Blackpole Recycling W T S	Dew Mr David & Dew Mr Jonathan	Inert/C+D		12,028.00	
Bonemill Household Waste Site	Mercia Waste Management Ltd	Inert/C+D		1,763.11	
Bromsgrove Bulking Bay	Mercia Waste Management Ltd	Inert/C+D		8.00	
Droitwich Household Waste Site	Mercia Waste Management Ltd	Inert/C+D		1,153.54	
Dummy Regis Number For Augean Treatment ( P P C Permit No. Pp32375f)	Augean Treatment Ltd	Inert/C+D		0.22	
Dummy Regis Number For Weights Farm ( Bv3995ie )	Wood Stephen	Inert/C+D	37,469.00		
H T Waste Recycling Transfer Station	H T Waste Recycling Ltd	Inert/C+D		14,245.00	
Hanley Castle Transfer Station / H W S	Mercia Waste Management Ltd	Inert/C+D		348.65	
Hill & Moor Landfill Site	Mercia Waste Management Ltd	Inert/C+D		1,278.22	
Landfill Site At Throckmorton Rd ( Permit Number Z P 3933 L D )	Severn Waste Services Ltd	Inert/C+D	83,705.00		
Lawrence's Skip Hire Transfer Station	Lawrence's Skip Hire Ltd	Inert/C+D		18,403.00	
Ledbury H W S	Mercia Waste Management Ltd	Inert/C+D		472.44	
Lickhill Quarry	Hills ( West Midlands ) Ltd	Inert/C+D			22,863.00
Maile Skips	Costello Phillip Royston	Inert/C+D		16,342.68	
Malvern Household Waste Site	Mercia Waste Management	Inert/C+D		1,819.61	

Site Name	Operator	Basic Waste Cat	Landfill	Transfer	Treatment
	Ltd				
Mill Farm Sandpit Landfill ( Pinches 2)	Brian Hill Quarries Ltd	Inert/C+D	5,974.00		
Peter Eric Bott	Bott Mr Peter And Peter Eric Bott	Inert/C+D		4,095.13	
Quantry Lane Household Waste Reclamation Centre	Mercia Waste Management Ltd	Inert/C+D		1,528.71	
Redditch & Lower Park Skip Hire	Redditch Skip Hire Ltd	Inert/C+D		13,953.99	
Redditch H W S	Mercia Waste Management Ltd	Inert/C+D		3,151.91	
Severn Waste Transfer Station	Mercia Waste Management Ltd	Inert/C+D		782.77	
Stephen Betts & Sons Ltd	Stephen Alexander Betts & Sons Ltd	Inert/C+D		0.30	
The Nathan Transfer Station	Fernihough Martin H	Inert/C+D		1,810.76	
Unit 5 Crossgate Road Transfer Station	Redditch Skip Hire Ltd	Inert/C+D		14,763.00	
Waresley Landfill Site	Biffa Waste Services Ltd	Inert/C+D	31,757.43		
Waste Management Site	Augean Treatment Ltd	Inert/C+D			28.04
Waste Management Site	Lawrence's Skip Hire Ltd	Inert/C+D		12,278.00	
Wildmoor Quarry	J & B Williams Brothers Ltd	Inert/C+D		10,175.00	
Wyre Forest Recycling Ltd Transfer Station	Wyre Forest Recycling Services Ltd	Inert/C+D		6,379.39	
Z Skips Ltd	A - Z Skip Ltd	Inert/C+D		285.50	

The use of mobile plant to sort and crush on-site arisings of C and D waste in redeveloping sites is now commonplace in Worcestershire. The capacity involved and the material generated are not recorded however. It is clear and generally accepted therefore that considerably more capacity exists in theory and that much more material is processed in practice than is recorded by the Environment Agency. It is not possible however to calculate what the scale of these might be.

## Capacity Gap

### Treatment

It is assumed that much of the C&D waste will be treated by mobile plant. The Capacity gap for mobile plant is calculated below. (See background document *Arisings and Capacity* for further details)

**Table 6. Capacity gap for re-use and recycling of C&D waste (tonnes per annum)**

	2010/11	2015/16	2020/21	2025/26	2030/31	2035/36
Projected C&D arisings	510,555	419,520	419,520	419,520	419,520	419,520
<b>Capacity gap (1/4 of total arisings)</b>	<b>127,638.75</b>	<b>104,880</b>	<b>104,880</b>	<b>104,880</b>	<b>104,880</b>	<b>104,880</b>

### Transfer

Sorting and transfer facilities for C&I (including agricultural waste) and C&D waste often treat elements of both waste streams and as such it is not practicable to distinguish the current capacity for each stream separately.

The capacity gap for C&I and C&D waste sorting and transfer is shown in **Table 7**.

**Table 7. Capacity gap for C&I and C&D waste sorting and transfer**

	2010/11	2015/16	2020/21	2025/26	2030/31	2035
Capacity required for 30% of C&I arisings	180,537.12	193,211.64	207,621.78	224,005.2	242,632.17	263,809.86
Capacity required for 30% of C&D arisings	153,166.5	125,856	125,856	125,856	125,856	125,856
Combined capacity requirement for 30% of C&I and C&D arisings	333,703.62	319,067.64	333,477.78	349,861.20	368,488.17	389,665.86
Current capacity	415,891	415,891	415,891	415,891	415,891	415,891
<b>Capacity gap</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Capacity needed to Landfill C and D waste

### C&D waste

Using a target of landfilling a maximum of 25% of C&D waste, (see background paper Waste and Arisings), gives the maximum requirement for landfill of C&D waste as shown in Table 8.

**Table 8. C&D waste landfill capacity requirements**

	2010	2015	2020	2025	2030	2035
Projected arisings	510,555	419,520	419,520	419,520	419,520	419,520
Maximum landfill requirement (25% of total) (tonnes per annum)	127,638.75	104,880	104,880	104,880	104,880	104,880
<b>Cumulative total (tonnes)</b>	<b>127,638.75</b>	<b>674,797.5</b>	<b>1,199,198</b>	<b>1,723,598</b>	<b>2,247,998</b>	<b>2,772,398</b>

Note: Cumulative total of all years, not 5 year intervals

This shows that the landfill requirement for C&D waste by 2025 is 1,723,598 tonnes.

In order to determine whether there is a capacity gap, this tonnage must be converted into a volume, as landfill capacity is calculated in cubic metres (m<sup>3</sup>). The WMRA/ Scott Wilson "Study into Future Landfill Capacity in the West Midlands" (May 2007) used a conversion rate of 1.5 tonnes per cubic metre for inert waste. This is the best evidence we have for inert waste conversion.

This can be used to calculate the cumulative volume of landfill required by 2025/26 for C&D waste:

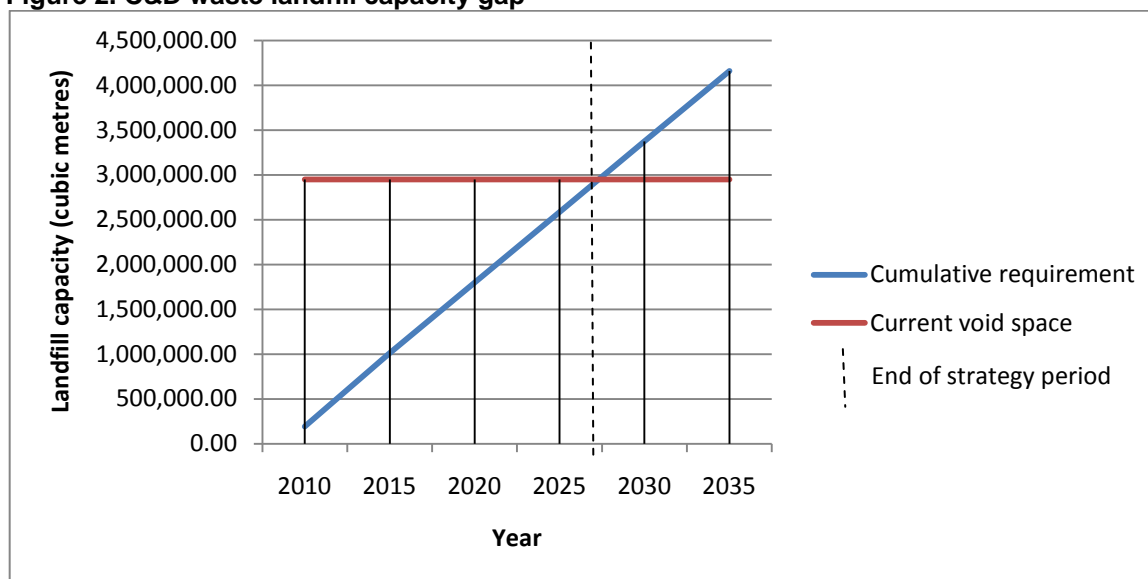
1,723,598 tonnes x 1.5 tonnes per cubic metre = 2,585,396 m<sup>3</sup>.

The Environment Agency's Waste Information 2009 Data Tables show that the county's void space for inert waste is 2,949,000 m<sup>3</sup>. Table 9 and Figure 2 show that this means there is no capacity gap for C&D landfill until approximately 2028.

**Table 9. C&D waste landfill capacity gap (m<sup>3</sup>)**

	2010/11	2015/16	2020/21	2025/26	2030/31	2034/35
Cumulative C&D requirement	191,458.1 25	1,012,196. 25	1,798,796. 25	2,585,396. 25	3,371,996. 25	4,158,596. 25
Current void capacity	2,949,000	2,949,000	2,949,000	2,949,000	2,949,000	2,949,000
<b>Capacity gap</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>422,996.2 5</b>	<b>1,209,596. 25</b>

**Figure 2. C&D waste landfill capacity gap**



## CONCLUSIONS

There are considerable difficulties in identifying accurate figures for C&D waste arisings and limited information about how they are managed. Without robust data it is difficult to make assessments of the capacity gap for how much additional capacity is needed to manage Construction and Demolition waste in Worcestershire.

Estimates of what additional waste management capacity is needed are also subject to constant revision as facilities open and close, expand and contract and to changing assumptions about how, where and when the population and economy of the County will change. All of these are also subject to wider changes in the economy. The amount of brownfield land redeveloped is expected to reduce as the easier sites to build on are used up. Regulatory changes in what the Environment Agency defines as "exemptions" or how materials used in landfills are defined change. This document and the estimates of what waste management capacity we have to provide for are therefore subject to constant change but provide the most accurate estimations possible at the time of writing.

This paper will be updated to reflect the availability of further data and will be used to assist the development of the Waste Core Strategy.

## APPENDIX 1: WORCESTERSHIRE WASTE CORE STRATEGY BACKGROUND DOCUMENTS

To help provide a robust evidence base for the Waste Core Strategy the Council has prepared a series of background documents. These outline current thinking and have informed the approach taken to date in the development of the waste core strategy. All of these background documents are *living document* and are in a state of development and comments are invited on all available documents during the consultation period.

### **Key Themes**

- *Towards a Vision Statement:* sets out the vision which is driving the Waste Core Strategy and details how it has evolved through consultation process.
- *Spatial Portrait:* provides additional detail to the spatial portrait set out in this consultation. It includes a description of the County and the local factors that need to be taken into account in developing the Waste Core Strategy.
- *Spatial Strategy:* Set out how the Spatial Strategy for the WCS has been developed
- *Arisings and capacity gap:* considers waste arisings in Worcestershire and makes projections about future arisings, treatment capacity and the need for facilities.
- *Monitoring Baseline:* Establishes the baseline for indicators set out in the WCS monitoring schedule and makes recommendations for those indicators that are not currently monitored
- *Identifying 'areas of search':* sets out the approach to identifying locations suitable for waste management development, termed 'areas of search' and details all of the alternatives methods considered. It lists all potential locations assessed and details why they were, or were not, considered suitable for waste management development. This document has been informed by *ERM Industrial Estate Report*.
- *Climate Change:* is intended to form a basis for addressing climate change issues in the Waste Core Strategy. It considers mitigation through the reduction of greenhouse gas emissions, energy demands and the adaptation of waste management facilities to climate change.
- *Links with Districts & Neighbouring Local Authorities Plans and Strategies:* identifies the aspects of the guidance 'Creating Strong, Safe and Prosperous Communities' which are relevant to the production of the Waste Core Strategy. As a result of the guidance, this paper goes on to examine the links to waste in Worcestershire's Districts and neighbouring Local Authorities plans and strategies. It also evaluates what these links mean for the Waste Core Strategy.

- *Waste Sites in Worcestershire*: details existing waste management operations in Worcestershire and analysis of the relationship between size and throughput. In order to gain this information, the majority of known waste sites in the County were visited between September 2008 and July 2009. During these visits operators were asked about any issues currently faced, any future changes anticipated, these meetings are summarised in the report.
- *Inland Waterways*: The document was developed in response to consultation comments received on behalf of British Waterways regarding the Worcestershire County Council Waste Core Strategy: Refreshed Issues & Options Consultation. It sets out the policy context relating to Inland Waterways in Worcestershire.
- *Waste Freight by Rail*: considers the potential for movements of waste by rail in Worcestershire.

## **Waste Streams**

- *Municipal Waste*: sets out the national and local policy context. It also includes details of the waste arisings and available capacity for treatment of municipal waste within the County.
- *Commercial and Industrial Waste*: sets out the national and local policy context. It also includes details of the waste arisings and available capacity for treatment of municipal waste within the County.
- *Construction and Demolition Waste*: sets out the national and local policy context. It also includes details of the waste arisings and available capacity for treatment of municipal waste within the County.
- *Agricultural Waste*: considers waste arising from agricultural activities in Worcestershire. It examines what agricultural waste is, how it is treated and explores the planning permitted development rights. and identifies the potential options for making provision through the Waste Core Strategy.
- *Hazardous Waste*: The document considers hazardous waste arising in Worcestershire. It includes information relating to hazardous waste in a national and regional policy context and includes details of the demand and available capacity for the treatment of hazardous waste within the County.
- *Waste Arisings from Healthcare and Related Activities - Clinical Waste and Low Level Radioactive Waste*: considers waste arising from health care and related activities, focusing on Clinical waste; and Non-nuclear low level radioactive waste. It includes information relating to clinical waste and non-nuclear low level radioactive waste in a policy context. It also includes details of the demand and available capacity for treatment of clinical and non-nuclear low level radioactive waste within the County.



Annex I considers low level radioactive waste from the nuclear industry in more detail, however it is not felt to be a significant issue in the County and is, therefore, not considered in the main body of the report.

## ***Management Facilities***

- *Types of Facilities:* is intended to be a simple guide that gives an overview of the processes that tend to happen at a range of different facilities and lists the things that might need to be thought about when deciding where a facility would be best situated. It also sets out some of the possible impacts and benefits of each type of facility.
- *Landfill* includes background data and considers issues around types of landfill and the policy context. It also details of the demand and available capacity for landfill within the County, based on EA data and the Council's own research.
- *Metal Recycling Sites:* considers all sites in Worcestershire involved in the recycling of metal, this includes sites which sort, bulk and/or process metal and any other sites that form part of the chain of processes of recycling waste metal into a material which can be re-used. It sets out the context and background data relating to metal recycling, detailing the demand and available capacity for metal recycling within the County.
- *Waste Transfer Stations:* considers Waste transfer stations, looking at the current need and capacity in Worcestershire and wider policy context.
- *Resource Recovery from Biodegradable Waste - Composting and Anaerobic Digestion* The document considers composting and anaerobic digestion. These treatment options are considered in the same document as they both offer the opportunity to recover resources from biodegradable waste. It sets out the context and background data relating to composting and anaerobic digestion.
- *Recovering Energy from Waste - Biological and Thermal Treatment Technologies:* sets out the context and background data relating to biological and thermal technologies for recovering energy from waste including anaerobic digestion, incineration and refuse derived fuels. There is some overlap with the Worcestershire Waste Core Strategy Background Document: Resource Recovery from Biodegradable Waste: Composting and Anaerobic Digestion.
- *Waste Water Treatment Infrastructure:* examines the need for waste water treatment infrastructure in Worcestershire. It includes information relating to waste water treatment policy context. It also proposes a possible way forward for the potential issues regarding who is responsible for what aspects of managing waste water treatment and related development.