

Delivering a 'Waste to Resources' Plan for Somerset's Urban Extensions

Report C: Site Waste Management Strategy

Somerset County Council

February 2012

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Delivering a 'Waste to Resources' Plan for Somerset's Urban Extensions

Report C: Site Waste Management Strategy

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Somerset County Council

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SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Purpose of Report

1.1.1 The building industry is a major producer of waste, resulting from a combination of excavation, demolition and construction processes. While a significant proportion of such waste has historically been disposed of, there is considerable potential for the diversion of such wastes from landfill, via a combination of reduction, re-use, recycling and recovery measures. The preparation of Site Waste Management Plans (SWMPs), which represent a forecasting tool for identifying the volume and type of material likely to be generated from a construction project, along with measures to demonstrate how the off-site disposal of waste will be minimised and managed, have been a mandatory requirement for construction projects over £300,000 in value since the introduction of the Site Waste Management Regulations in April 2008. Notwithstanding this current regulatory requirement, SWMPs have also become a recognised best practice approach towards forecasting and managing waste at the site planning and delivery stages of a construction project. The development of a site waste management strategy provides a valuable opportunity for the consideration of these issues at a macro-level, and enables measures to be put in place to facilitate the diversion of construction, demolition and excavation waste from landfill from the outset of a project.

1.1.2 This report seeks to provide the tools necessary to implement a robust site waste management strategy for the proposed urban extensions at Yeovil and Taunton, together with the proposed Taunton urban village. It seeks to evaluate current industry tools for estimating construction and demolition (C&D) waste, and provides an overview of current techniques, their coverage and an assessment of their merit. Based on current benchmarking data, the report includes calculations of waste arisings likely to be generated from the proposed eco-developments at Yeovil and Taunton. It also considers the impact that future technological change, legislation and the effect best practice techniques will have on waste generation.

1.1.3 The preparation of a robust Site Waste Management Plan (SWMP) is central to the strategy, comprising the focal point for efficient and sustainable waste management practices. An outline SWMP has been produced for the proposed urban extensions which builds on the expertise of WRAP¹/BRE² and is written to allow for best practice waste management as standard. This is attached as Appendix A. It is intended to be used as a framework, in accordance with which the necessary SWMPs for the proposed developments should adhere. The outline SWMP complies with all relevant waste legislation, including the SWMP Regulations 2008. It promotes the integration of all project staff, from urban designers and planners to contractors, in order to capture all stages of the development process and to ensure all environmental concerns are taken into consideration from the outset.

1.1.4 This report forms the third element of a series of documents which together comprise a Resources Plan for the proposed urban extensions. Together with Report A (Waste Infrastructure Study) and Report B (Integrating Waste to Energy) this Study is designed to provide an all-encompassing waste management approach that can assist developers to forecast and manage efficiently the waste arisings at each stage of the respective development work programmes.

¹ Waste and Resources Action Programme

² Building Research Establishment

1.2 Somerset County Council aspirations for Construction and Demolition Waste

1.2.1 In line with national waste policy, Somerset County Council (SCC) wishes to reduce significantly the amount of waste currently generated through construction activities by improved material and design efficiency, and aims to set ambitious waste reduction targets from 2011, starting with the two eco-developments at Taunton and Yeovil. SCC also wishes to improve its recycling rate for those materials sent for disposal, ultimately aspiring to 100% recycling of recyclable materials and recovery of resource through, for example, thermal treatment of the remainder³ and hence zero waste to landfill.

1.3 Objectives of Study

1.3.1 The overall approach to site waste management has two components: strategy and policy. The strategy element details commitments to waste management and minimisation and largely comprises the content of this document. The strategy will be supplemented by the policy element, which will be provided by SCC, Taunton Deane Borough Council and South Somerset District Council in their respective LDF documents.

1.3.2 There are a number of key objectives in this strategy report, which include:

- Overview of SCC's aims and policy drivers;
- Review of current techniques in forecasting C&D waste arisings;
- Critical review of current benchmarking and subsequent targets;
- Establishment of a set of performance indicators in line with industry;
- Setting of high level targets for C&D waste, namely, recycling and diversion from landfill;
- Setting of best practice waste targets (m³/100m² or m³/£100K) for:
 - Residential;
 - Commercial- retail;
 - Commercial- office; and
 - Education.
- Setting of segregation targets (overall and by waste stream);
- Setting of wastage rates for key materials;
- Identification of market leaders/ best practice case studies;
- Development of robust SWMP template;
- An understanding of the true cost of waste; and
- Review of current industry trends and future waste direction.

1.4 Construction waste

1.4.1 Construction waste has been defined by the former Office for the Deputy Prime Minister (ODPM) in the 'Survey of Arisings and Use of Demolition and Construction Waste, 2001' as:

³ Hazardous waste is not included within the zero waste to landfill commitment due to the difficulty and sensitivity of disposing of it.

"...waste materials, which arise from the construction or demolition of buildings and/or civil engineering infrastructure, including hard construction and demolition waste and excavation waste, whether segregated or mixed..."

- 1.4.2 Construction waste can be broken down further into the following categories:
- **Excavation waste** – naturally occurring soil, stone, rock and similar materials (whether clean or contaminated) which have been excavated as a result of site preparation activities;
 - **Demolition waste** - timber, mixed unprocessed brick, concrete, tiles, sheeting including asbestos containing materials (ACMs) from barns and sheds etc.; and
 - **Mixed hard construction (new build) waste** – a combination of packaging, pipes, cables, timber and mixed unprocessed/uncrushed materials (particularly concrete, masonry, bricks, tiles, etc.).

1.4.3 Construction waste as defined above is commonly referred to within the industry as 'Construction and Demolition' or 'C&D' waste.

1.5 UK statistics

1.5.1 WRAP reported in 2007 that 400 million tonnes of materials are purchased by the construction industry each year. Of that, 120 million tonnes of C&D waste is generated, of which 60 million tonnes is reused or recycled. 13% of all construction material on site goes straight into the skip.

1.5.2 In addition, over 80% of construction materials are natural resources and in most cases 85% of demolition materials can be reduced, reused, reclaimed or recycled (RICS).

1.6 Somerset statistics

1.6.1 There is a shortage of reliable data on C&D waste arisings in much of the country. SCC has outlined Somerset's estimated C&D waste arisings along with its vision for the future, in Section 4 of its Waste Core Strategy Topic Paper 1 'Waste Management Need to 2028' (July 2011). While the report highlights the gaps in waste data capture, especially with regard to C&D waste reuse, it produces estimates that can be used to calculate baseline quantities from which SCC can formulate targets.

1.6.2 The South West generated approximately 12.6 million tonnes of C&D waste in 2001, accounting for 62% of total waste arisings in the region⁴. Following the introduction of landfill tax, C&D waste has increasingly been recycled across the UK and this is expected to be the case across the South West region and in Somerset.

1.6.3 Using the EA's 2009 Waste Interrogator data tool, the total amount of C&D waste received by licensed facilities in Somerset in 2009 was recorded as 224,187 tonnes, comprising 149,379 tonnes inert C&D waste, 35,852 tonnes non-inert, and 38,955 tonnes other C&D waste.

1.6.4 While no data were available on the amount of C&D waste re-used, assumptions were made about C&D waste re-used on- or off-site, in order to arrive at a broad figure of total arisings within the Topic Paper referred to above. Using the results of

⁴ The Regional Waste Strategy for the SW 2004-2020

an Environment Agency Wales survey of construction and demolition companies in Wales in 2005/6, it was assumed that 74 per cent of inert C&D waste was re-used on- or off-site, which in turn inferred that inert waste received by licensed facilities represented 26 per cent of total inert waste arisings. Based on these assumptions, the following provides a summary of estimated total C&D waste arisings in Somerset in 2009.

Table 1.1: Estimated total C&D waste arisings in Somerset (in tonnes) in 2009

C&D Waste Type	Tonnage
Inert waste received by licensed facilities	149,379
Inert waste re-used	425,156
Total inert waste arisings	574,535
Total non-inert waste received by licensed facilities	35,852
Total other C&D waste received by licensed facilities	38,955
Grand total	649,343

Source: Environment Agency 2010, amended; re-produced in SCC WCS Topic Paper 1, March 2011

Somerset's drive for material resource efficiency

- 1.6.5 Resource efficiency means using resources such as materials, water, and energy more efficiently and effectively, maximising the use of materials and reducing and recovering waste. With the construction of the two eco-developments, material resource efficiency is of particular importance, focusing on 'materials in' and 'materials out'. As stated above, 13% of all construction materials nationally go straight into the skip, therefore implementing a framework to better manage site waste will require design and procurement teams to consider carefully those materials going in to construction, to eliminate unnecessary waste and improve cost savings.
- 1.6.6 Reductions in the overall quantities of construction and demolition waste being produced, coupled with greater sustainable material specification will reap rewards, these include:
- Reduced carbon emissions and greenhouse gases;
 - Conservation of natural resources and reduced demand on virgin materials; and
 - Reduced reliance on landfill space.
- 1.6.7 The national waste hierarchy, which focuses upon the prevention, re-use, recycling and recovery of waste ahead of its disposal, has been incorporated into this Site Waste Management Strategy. The hierarchy has played a pivotal role in dictating the generation and subsequent treatment of waste. Applying the rules of the hierarchy is part of the functionality of the SWMP, offering designers and contractors real opportunities to challenge and consider material selection, design and layout, and incorporate life cycle analysis into material selection. It provides site operators with the practical know-how to store and segregate waste to achieve overall best practice waste management. The hierarchy must be introduced at the outset of the construction projects.

SECTION 2

SOMERSET'S URBAN EXTENSIONS

2 SOMERSET'S URBAN EXTENSIONS

2.1 Introduction

- 2.1.1 The Eco-towns concept represents a government-sponsored program of new towns, introduced by the previous administration, with the intention of achieving exemplary standards of sustainability. They were designed to comprise small new towns of at least 5-20,000 homes, with the intention of exploiting the potential to create complete new settlements, achieving zero carbon development and more sustainable living, using the best new design and architecture.
- 2.1.2 Eco-towns were proposed with a view to making a significant contribution to achieving national housing targets and helping to address the threat of climate change. They were proposed as exemplar projects, intended to encourage and enable residents to live within managed environmental limits and in communities that are resilient to climate change.
- 2.1.3 In 2009, Gordon Brown promised these world-leading zero carbon developments ...
"... would address the twin challenges of climate change and the national housing shortage ...would have zero-carbon shops, restaurants and public buildings.....at least half of all journeys within and from the town would be made by foot, cycle or public transport."
- 2.1.4 In October 2007, the Department for Communities and Local Government (DCLG) announced a competition to build up to 10 eco-towns. On 16 July 2009, the UK Government announced the four successful eco-town bids: Whitehill-Bordon (Hampshire), St Austell (Cornwall), Rackheath (Norfolk) and North West Bicester (Oxfordshire).
- 2.1.5 In December 2009, the Housing Minister announced a second wave of eco-towns. A total of five authorities and partnerships, covering ten locations, have submitted proposals. These comprise:
- Taunton - Monkton Heathfield (1) and Comeytrowe (2);
 - Yeovil (3);
 - Leeds City Region - Aire Valley (4), York North West (5), North Kirklees (6) and Bradford-Shipley Canal Corridor (7);
 - Coventry (8);
 - Lincoln - Lincoln area (9) and Gainsborough (10).
- 2.1.6 It is recognised that Eco-towns are no longer actively promoted by Government, although the principles involved continue to be objectives for wider sustainable planning. The term 'eco-community' appears to be coming to the fore instead.

2.2 Eco-town requirements

2.2.1 The standards that eco-towns were designed to meet include the following, as set out in the Planning Policy Statement 1 Supplement: Eco-Towns (July 2009):

- **Affordable housing:** a minimum of 30% affordable housing in each eco-town;
- **Zero-carbon:** eco-towns must be zero-carbon over the course of a year (not including transport emissions);
- **Green space:** a minimum of 40% of eco-towns must be green space;
- **Waste and recycling:** eco-towns must have higher recycling rates and make use of waste in new ways;
- **Homes:** homes must reach Code for Sustainable Homes level 4 or higher;
- **Employment:** at least one job opportunity per house accessible by public transport, walking or cycling;
- **Services:** there must be shops and a primary school within easy walk of every single home, and all the services expected from a town of up to 20,000 homes;
- **Transition / construction:** facilities should be in place before and during construction;
- **Public transport:** real-time public transport information in every home, a public transport link within ten minutes walk of every home; and
- **Community:** there must be a mixture of housing types and densities, and residents must have a say in how their town is run, by governance in new and innovative ways.

2.2.2 In essence, Eco-towns should exceed national average expectations; they need to surpass current best practice. They also need to seek to be leaders in the transformation from a waste management economy to one based on integrated resource management.

2.3 Specific planning guidance in respect of Eco-Towns

2.3.1 The following planning guidance notes are of specific relevance to Eco-towns and provide guidance which assists in establishing the context for this study:

- Planning Policy Statement: Eco-Towns (Supplement to PPS1): DCLG July 2009;
- Towards Zero Waste: Eco-Towns Waste Management Worksheet: TCPA, November 2008.

PPS1 Supplement

2.3.2 This document provides specific planning advice regarding the development of Eco-towns. Section ET1 of the PPS1 Supplement sets out the principles for developing Eco-towns, in particular the emphasis for striving for exemplar forms of development. Eco-towns should “... develop unique characteristics by responding to the opportunities and challenges of their location and community aspirations. Eco-town proposals should meet the standards as set out in this PPS or any standards in the development plan which are of a higher standard. Developers and local planning authorities will need to consider how they should be applied in practice, recognising the unique nature of each site...”.

- 2.3.3 Section ET5 provides advice on determining planning applications, stating that the guidance in the PPS1 Supplement is intended to be a material planning consideration that should be given weight in determining planning applications for eco-towns. It should be noted that the PPS Supplement, along with other extant PPGs and PPSs, is proposed to be withdrawn and replaced in 2012 by the new single National Planning Policy Framework but the aspirations contained within it are still important in guiding the development of the proposed eco-towns.
- 2.3.4 The PPS1 Supplement contains a series of 'Eco-Town Standards' on a number of relevant criteria, including ET19 which relates to Waste. ET19 sets out the requirement for the provision of a sustainable waste and resources plan for Eco-towns, the detailed requirements of which comprise the following:
- Eco-town planning applications should include a **sustainable waste and resources plan**, covering both domestic and non-domestic waste, which:*
- (a) sets targets for residual waste levels, recycling levels and landfill diversion, all of which should be substantially more ambitious than the 2007 national Waste Strategy targets for 2020; it should be demonstrated how these targets will be achieved, monitored and maintained;*
- (b) establishes how all development will be designed so as to facilitate the achievement of these targets, including the provision of waste storage arrangements which allow for the separate collection of each of the seven priority waste materials as identified in the Waste Strategy for England 2007;*
- (c) provides evidence that consideration has been given to the use of locally generated waste as a fuel source for combined heat and power (CHP) generation for the eco-town, and*
- (d) sets out how developers will ensure that no construction, demolition and excavation waste is sent to landfill, except for those types of waste where landfill is the least environmentally damaging option.*
- Towards Zero Waste: Eco-Towns Waste Management Worksheet*
- 2.3.5 This guidance note outlines the important role that eco-town developments have in providing the mechanisms, facilities and services that will make it easier for people to manage their waste in a sustainable way. It stresses that, as exemplar developments, "... eco-towns should aim to achieve more than current best practice. They should be leaders in the transformation from a waste management economy to one based on resource management, and they should contribute to reducing the impacts of waste on climate change..".
- 2.3.6 All eco-towns should adhere to the following five principles set out within the guidance note:
- View waste as a resource;
 - Take an integrated approach to waste / resource management;
 - Seek solutions that provide multiple benefits, including contributing to 'zero carbon' development;
 - Eco-towns as exemplars, going beyond national average expectations;
 - Eco-towns as catalysts for change in performance in surrounding areas.

- 2.3.7 In order to achieve the above, the following minimum measures should be implemented:
- **Plan for zero waste** – via the preparation of a waste and resources plan;
 - **Set ambitious targets** – going substantially beyond those in the Government's 2007 Waste Strategy;
 - **Co-ordinate waste management** – making the most of opportunities presented, such as synergies for co-managing municipal, commercial and industrial waste;
 - **Set high building design standards** – achieving maximum points available on all waste components of the Code for Sustainable Homes (residential); maximum points for waste and materials under BREEAM (non-residential) and use of Green Guide A-rated building components and construction materials as standard;
 - **Move towards zero construction waste** – in excess of the Government's national target of at least a 50% reduction in construction, demolition and excavation waste to landfill (compared with 2008);
 - **Provide high quality waste facilities** – of high quality, visually attractive and not detrimental to their immediate surroundings.

2.3.8 This report seeks to apply those principles of specific relevance to commercial and demolition waste to the urban extensions planned for Yeovil and Taunton in Somerset, both of which have been conceived as being delivered in accordance with eco-towns' principles.

2.4 Somerset Eco-towns

2.4.1 The DCLG has indicated, subject to formal bid, that proposed urban extensions to Monkton Heathfield and Yeovil will be two of nine areas in the UK that will benefit from a £10 million pot that will support the design and development of aspirational eco-town standards and Demonstrator developments to showcase development with high standards of carbon saving (reflecting eco town standards). The following sections provide a brief overview of each of the proposals.

2.5 Monkton Heathfield urban extension in Taunton

2.5.1 Monkton Heathfield will be a new compact village of circa. 5,000 new homes, to the north east of Taunton within the administrative area of Taunton Deane Borough Council (TDBC). The proposed urban extension is based around the existing village of Monkton Heathfield, with the majority of the land to be developed lying to the east of the village. The site is identified within Policy SS1 of the Taunton Deane Core Strategy 2011-2028. The policy states that the preparation and adoption of SPD will be required to further guide development, incorporating a masterplan and design codes, to ensure a coordinated approach to the delivery of this site. The Core Strategy is to be subject to Examination in February 2012.

Development Mix

2.5.2 The development is scheduled to be built in three phases from 2011 to 2027 and will comprise a mix of residential, retail, business and public development. The key figures are provided in Table 2.1.

- 2.5.3 These figures have been derived from a combination of sources – the Taunton Strategic Masterplans, produced by Urban Initiatives, in January 2011, and the Taunton Masterplan Stage 1 Report for Monkton Heathfield, produced by Atelier Ten, April 2011. As such they comprise a ‘best estimate’ of current development breakdowns and phasing; while this may be the subject of further change it is considered to provide sufficient basis for the purposes of estimating waste likely to be derived from the proposals.
- 2.5.4 The first column provides a general description of the proposed quantum of development as set out within the Urban Initiatives report. With the exception of the figures for the district centre (which are also derived from the Urban Initiatives Report) the detailed figures provided in the remainder of columns, including the suggested phasing, are derived from the subsequent Atelier Ten report.

Table 2.1: Monkton Heathfield – Key Figures

Type of development	Total amount	Phase I 2011-2016	Phase II 2016-2021	Phase III 2021-2027
Residential ‘up to 5,000 units’	5,356 units	1,259 units	1,718 units	2,379 units
Employment: B2 ‘circa. 3 ha to the south of Monkton Heathfield at and adjacent to The Hatcheries’	9,492m ² on 3.16 ha	9,492m ² (3.16ha)		
Employment: B8 ‘Circa. 8 ha on NE edge of Monkton Heathfield at Walford Cross’	9,492m ² on 11.25ha		19,683m ² (9.44 ha)	3,790m ² (1.8ha)
‘Facilities in the village centre’ All figures in gross m²	4,400m ² food store (A1) 8,000m ² other A1, plus A2 (financial / professional services), A3 (restaurants / cafes), A4 (drinking establishments), and A5 (hot food takeaways). 1,000m ² offices (B1 (a))			
New primary schools	3	3,500m ²	3,500m ²	3,500m ²
New secondary schools	1			8,000m ²

Source: Taunton Strategic Masterplans, Urban Initiatives, January 2011, and Taunton Masterplan Stage 1 Report: Monkton Heathfield Strategic Masterplan, Atelier Ten, April 2011

Taunton Protocol

- 2.5.5 In designing and constructing the urban extension at Taunton, the developer/s will be contractually obliged to deliver in accordance with the Taunton Protocol.
- 2.5.6 The Taunton Protocol is a strict set of standards, designed to guide the redevelopment of Taunton town centre, via 'Project Taunton'. It has been developed jointly by a number of parties involved in this redevelopment, including Taunton Deane Borough Council, Somerset County Council, the former South West of England Regional Development Agency, the Environment Agency, and Fulcrum Consulting. The standards are not a prescriptive set of rules that dictate the design response of the development, rather they act as an overarching framework requiring the developer to act decisively on a wide range of issues and develop an appropriate, bespoke design solution.
- 2.5.7 The Taunton Protocol contains 30 standards split across six sections covering a wide range of sustainability issues. The standards have been designed so as to always be one step ahead of national policy, constantly raising the bar, challenging developers and designers to demonstrate to industry what is possible. The Protocol has been developed, where possible, to align assessment methodology with evolving national and regional policy and to build upon established industry assessment methods.
- 2.5.8 The Taunton Protocol will assist SCC in its goal to make the eco-development an exemplar, and surpass current best practice, paving the way to 'rethinking excellence' and the setting of the highest standards.

2.6 Urban extension plans for Yeovil

- 2.6.1 South Somerset District Council (SSDC) is investigating the potential for a proposed urban extension to Yeovil to be brought forward as a world leading eco-town. The exact location of the Yeovil Urban Extension is not defined at present but will fall within one of three potential areas to the south of Yeovil. These areas of search are as follows:
- Brympton & Coker;
 - East Coker, Keyford & Barwick (SSDC's preferred location);
 - East Yeovil & Over Compton.

Development Mix

- 2.6.2 The urban extension was originally identified as a location for 5,000 new dwellings in the Draft South West Regional Spatial Strategy. When the Government abandoned formal housing targets, however, SSDC opted to retain the urban extension proposal and reduce the number of homes to be built. The draft Core Strategy (October 2010) recommends that the urban extension accommodates 3,719 units. In addition, the development is anticipated to accommodate 23 ha of land for employment, primary and secondary school provision and appropriate supporting transport infrastructure. No detailed masterplans or phasing plans are as yet available for the proposed development.
- 2.6.3 The above policy requirements are encapsulated within policy YV2 of the draft Core Strategy, as set out below. As this policy is still at consultation stage, there may be changes to the proposed figures during the course of the plan-making process, but the core principals are expected to remain the same.

Policy YV2 Yeovil Urban Extension

Land is required for the Yeovil Urban Extension for strategic growth to provide for the following within the plan period;

- 3719 dwellings;
- 23 hectares of employment land;
- Secondary and primary school provision;
- Identified community and transport Infrastructure within the South Somerset Infrastructure Delivery Plan.

The preferred option for the strategic location for Yeovil Urban Extension is located on land to the south of Yeovil (in the vicinity of East Coker/Keyford/Barwick).

The Yeovil Extension will be developed to Eco-town standards as listed with the Eco-town PPS the supplement to PPS1. Adoption of Eco-town standards is subject to viability assessment.

Source: South Somerset District Council Draft Core Strategy (incorporating Preferred Options) October 2010

2.6.4 In addition, SSDC is promoting an urban village within the town centre aimed at regenerating an existing brownfield site via redevelopment. The site comprises a triangle of previously developed land between Stars Lane, Park Street / South Street and Dodham Brook. It was originally considered suitable for residential (around 400 units) along with retail / leisure development and was included as a strategic location for a mixed use scheme within SSDC's draft Core Strategy (SSDC Draft Core Strategy, incorporating Preferred Options, October 2010, policy YV3). Subsequent analysis of market demand and detailed consideration of other factors, including consultation responses, has resulted in revised proposals for the following development mix:

- 151 housing units in a proportion of 60% family houses and 40% flats;
- approximately 1,100 sq metres of commercial floorspace (of which a proportion could comprise shops / cafes / restaurants);
- a 60 bed hotel.

2.6.5 The revised proposals are set out within the Draft Summerhouse Village Masterplan prepared by Urbed and dated August 2011. The original site allocation within policy YV3 of the draft Core Strategy envisaged the development of the Urban Village to Eco-town standards, and this remains the case, notwithstanding the subsequent reduction of development quantum within the emerging masterplan. For the purposes of this assessment, the urban village will be considered in parallel with the urban extension when determining Yeovil's waste arisings.

2.7 Best Practice

2.7.1 This report seeks to identify innovative means to minimise and extract maximum value from waste generated during the construction of the Yeovil and Taunton urban extensions, taking on board the specific guidelines outlined in Section 2.3 of this report insofar as they are relevant to construction and demolition waste. This will be achieved via setting ambitious and progressive targets for C&D waste, requiring

developers to implement methods of waste minimisation in accordance with the requirements set out within a Site Waste Management Plan, the promotion of innovative means of managing waste at construction stage, and the facilitation of cultural change.

- 2.7.2 In partnership with local authorities, the eco-developments seek to set the ambitious goal of surpassing government targets for 2020 and current best practice, and embark upon a pathway to zero waste. The urban extensions have the potential to act as catalysts for Somerset-wide change.

SECTION 3

POLICY AND LEGISLATION

3 POLICY AND LEGISLATION

3.1 Introduction

3.1.1 There are a number of policy documents that directly relate to waste, which will need to be adhered to if the eco-developments are to demonstrate eco town status and exceed best practice. Section 3 of Report A provides an overview of those documents and legislative provisions of general relevance to waste management.

3.1.2 This Section provides a brief overview of those documents of specific relevance to commercial and demolition waste, at a national, regional and local level.

3.2 The Strategy for Sustainable Construction, June 2008

3.2.1 This Government document, published in 2008, sets out the vision for sustainable construction and establishes specific commitments by industry and Government to take the sustainable construction agenda forward, including the objective of achieving a 50% reduction of construction, demolition and excavation waste to landfill (compared to 2008) by 2012. This objective was set in response to the identification of construction waste as a priority sector for action within the 2007 England Waste Strategy, having regard to the scale of the construction industry's resource use and the quantity of CD&E waste entering landfill.

3.3 Site Waste Management Plan (SWMP) Regulations 2008

3.3.1 These Regulations were introduced as part of the Government's strategy to achieve its target of halving the volume of construction waste sent to landfill sites by 2012, established in recognition of the significant role played by the construction industry in generating a large proportion of the UK's total waste output and reflected in the Strategy for Sustainable Construction as outlined above.

3.3.2 The SWMP Regulations require any person intending to carry out a construction project with an estimated cost greater than £300,000 to prepare a Site Waste Management Plan. The purpose of the Regulations is to ensure that building materials are managed efficiently, that where waste is produced it is recycled, reused, or otherwise recovered, and that where waste is to be disposed of, it is done so legally.

3.3.3 The information to be contained within a SWMP is defined within the Regulations, and includes the following:

- A description of each waste type expected to be produced;
- Estimates of the quantity of each different waste type expected to be produced;
- Identification of the proposed waste management action for each different waste type, including re-using, recycling, recovery and disposal; and
- A declaration that the client and the principal contractor will take all reasonable steps to ensure that all waste from the site is dealt with in accordance with the waste duty of care in s34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations 1991, and that all materials will be handled efficiently and waste managed appropriately.

SECTION 3 POLICY AND LEGISLATION

3.4 Code for Sustainable Homes 2010

- 3.4.1 CSH is an environmental assessment method for new homes and contains a series of mandatory and non-mandatory performance levels in nine areas (including waste – category 5).
- 3.4.2 There are three components within the waste section of CSH, relating to the following elements of waste management.
- Was 1: Storage of Non-Recyclable Waste and Recyclable Household Waste;
 - Was 2: Construction Site Waste Management;
 - Was 3: Composting.
- 3.4.3 The TCPA guidance note 'Towards Zero Waste' advocates the achievement of maximum points available on all three waste components of CSH. In particular, maximum credits should be sought under CSH for construction waste, and eco-towns should exceed the Government's target of at least a 50% reduction in construction, demolition and excavation waste compared with 2008. The PPS1 Supplement advocates an across the board achievement of CSH Level 4 for residential development in eco-towns.
- 3.4.4 The requirements set out under Was 2 are relevant to the issues considered in this report.

3.5 BREEAM

- 3.5.1 BREEAM comprises an environmental assessment method and rating system for non-domestic buildings, which sets the standard for best practice in sustainable building design, construction and operation. A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria.
- 3.5.2 Section 10 of BREEAM relates to waste and contains four criterion against which buildings' performance is assessed. These comprise:
- Wst 1: Construction waste management;
 - Wst 2: Recycled aggregates;
 - Wst 3: Operational waste;
 - Wst 4: Speculative floor and ceiling finishes.
- 3.5.3 The TCPA guidance note expects non-residential buildings to seek to achieve maximum points for waste and materials under BREEAM, in order to contribute towards achieving an overall high BREEAM level, e.g. 'Very Good' or 'Excellent'. In particular, maximum credits should be sought under BREEAM for construction waste, and eco-towns should exceed the Government's target of at least a 50% reduction in construction, demolition and excavation waste compared with 2008.
- 3.5.4 Criterion Wst 1: Construction waste management is of relevance to this study.

SECTION 3 POLICY AND LEGISLATION

3.6 Green Guide to Specification 2008

3.6.1 The Green Guide is part of BREEAM. It contains more than 1,500 specifications used in various types of building. It includes information on the environmental performance of materials and components to assist in choosing the right material specification for each project. It examines environmental impacts of the construction materials commonly used in six different generic types building including:

- Commercial buildings, such as offices;
- Educational;
- Healthcare;
- Retail;
- Domestic; and
- Industrial.

3.6.2 The environmental rankings are based on Life Cycle Assessments (LCA), using BRE's Environmental Profiles Methodology 2008.

3.7 Planning Policy Statement: Eco-towns (Supplement to PPS1): July 2009

3.7.1 This PPS provides supplementary advice to PPS1 and is designed to be read alongside the PPS/PPG suite, setting out policies and minimum standards in respect of the Government's proposed eco-towns that are more challenging than would normally be required for new development. This PPS Supplement is due to be replaced by the emerging single National Planning Policy Framework (NPPF) document.

3.7.2 The PPS1 Supplement contains a series of 'Eco-Town Standards' on a number of relevant criteria, including ET 19 which relates to Waste. ET 19 sets out the requirement for the provision of a sustainable waste and resources plan for Eco-towns, the detailed requirements of which include the following:

*Eco-town planning applications should include a **sustainable waste and resources plan**, covering both domestic and non-domestic waste, which (inter alia):*

(d) sets out how developers will ensure that no construction, demolition and excavation waste is sent to landfill, except for those types of waste where landfill is the least environmentally damaging option.

3.8 From Rubbish to Resource: Regional Waste Strategy for the South West, 2004 to 2020

3.8.1 The RWS sets out how a framework for delivery of the 'South West Vision for Waste: Minimum Waste, Maximum Benefit' with a view to ensuring that "... the South West will become a minimum waste region by 2030, with households and businesses maximising opportunities for reuse and recycling..." and includes a target that by 2020 over 45% of the South West's waste is recycled and reused, and less than 20% of waste produced in the region will be landfilled.

SECTION 3 POLICY AND LEGISLATION

3.8.2 It contains a particular policy in respect of C&D waste: POLICY P10.8. This states that “... local and regional authorities and agencies and others should promote sustainable construction and demolition in accordance with the regional sustainable construction charter⁵ by:

(i) requiring that new development should be designed and planned so as to minimise the production of waste - development plans should encourage development proposals to minimise the use of raw materials and, reuse and recycle waste generated during construction and demolition;

(ii) before granting planning permission for major development involving demolition or the production of waste materials, encouraging developers to provide information on the proposed method of dealing with waste so as to minimise its production and maximise reuse and recycling....”.

3.9 Somerset Waste Local Plan 2001-2011 (adopted February 2005)

3.9.1 This comprises a statutory land use plan, providing a sub-regional interpretation of the broad guidance contained in national and regional waste policy, along with a local strategy and planning policies to achieve the broad aims for waste management set out in the Somerset and Exmoor National Park Joint Structure Plan Review. It also addresses the waste related issues which arise from other strategic documents, such as the Somerset Minerals Local Plan, Local Transport Plan and Municipal Waste Management Strategy. It will ultimately be replaced by the emerging Minerals and Waste LDF (see below).

3.9.2 Policy W9 relates to waste arising from new development, and states that “...it is the policy of Somerset County Council to encourage practices which:

- *Minimise waste production;*
- *Maximise the re-use of waste; and*
- *Manage any residual waste material in accordance with the principles of sustainable development.*

When considering planning applications for any form of development which will generate significant quantities of waste, planning permission should not be granted unless the proposals include details of the means which will be used to manage that waste, and those details are acceptable to the determining authority...”. Paragraph 4.2.6.3 states that “...it is particularly important to encourage the proper management of construction and demolition waste as it constitutes some of the densest material in the overall waste stream and it is relatively amenable to recycling...”.

3.10 Waste Management Need to 2028 (Waste Topic Paper 1) July 2011

3.10.1 This document forms part of the evidence base for the emerging Somerset Minerals and Waste Development Framework and determines capacity requirements for the following three principal waste streams: i) municipal solid waste (MSW); ii) commercial and industrial waste (C&I) and iii) construction and demolition waste (C&D). Consideration is also given to the requirements associated with hazardous waste, sewage waste and agricultural waste.

⁵ Future Foundations: Building a Better South West 2001

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3.11 **Somerset County Council Minerals and Waste Development Framework: Waste Planning: Issues and Options II, March 2011**

3.11.1 This consultation document represents an early stage in the preparation of the Waste Core Strategy, which will itself set out strategic planning policies for waste in Somerset as part of the Minerals and Waste LDF. Issues and Options II sets out the broad issues concerning waste management in Somerset and presents possible options to resolve these issues. It follows the previous consultation on issues and options undertaken by SCC in 2007. The next stage in the process will be the preparation of the pre-submission Core Strategy once consultation responses have been reviewed, assessed and acted upon.

3.11.2 One of the options currently being considered is the imposition of the following thresholds for requiring information from developers with respect to site waste management during construction. Adoption of these standards would go over and above those requirements of the SWMP Regulations:

- A Site Waste Management Statement would be needed for minor development not covered by a site waste management plan;
- A Site Waste Management Plan would be needed for developments of 10 or more dwellings, or where the floor space to be created by the development is 1000m² or more; and
- A Site Waste Management Strategy (SWMS) would be needed for large scale major projects, including more than 200 dwellings or where the development covers more than 10,000m², or for multi-site projects within the same application. The SWMS should set the criteria to which detailed Site Waste Management Plans (SWMPs) for the development should adhere. This enables more than one site waste management plan to be written for the project according to a standard model, thus supporting a phased approach to delivery of the development.

3.11.3 It is this latter proposed commitment that forms the basis of the preparation of this Site Waste Management Strategy for the proposed Somerset urban extensions.

SECTION 4

**FORECASTING CONSTRUCTION AND
DEMOLITION WASTE**

4 FORECASTING CONSTRUCTION AND DEMOLITON WASTE

4.1 Introduction

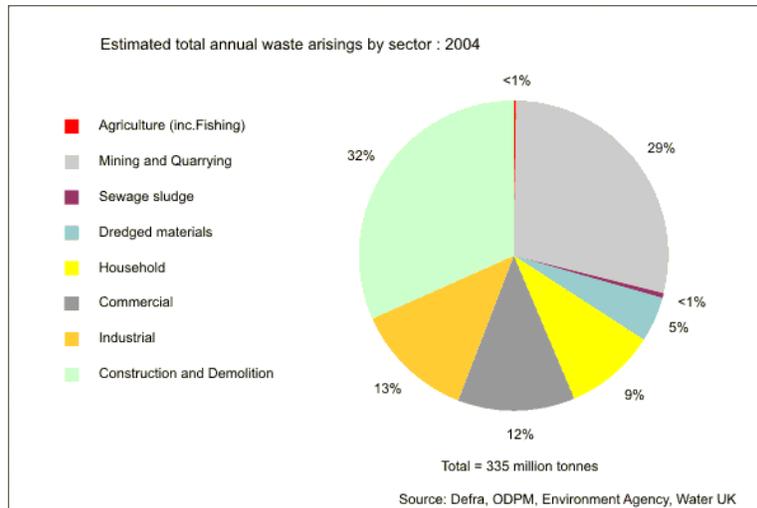
4.1.1 This Section examines the current tools employed to forecast construction and demolition waste (C&D waste) including the BRE's SmartWaste forecasting programme developed to inform the preparation and implementation of Site Waste Management Plans (SWMPs). It also examines the Key Performance Indicators (KPIs) used to benchmark the C&D waste arisings, and provides an overview of available data in respect of the UK. Finally, it provides an overview of best practice, including benchmarks for standard, good and best practice in respect of construction / demolition waste generation for a range of development types.

4.1.2 It should be noted that C&D waste is often referred to as 'Construction, Demolition and Excavation' (CD&E) waste. These terms are broadly compatible and can be used interchangeably.

4.2 Current tools

4.2.1 Construction, demolition, refurbishment and material supply processes are responsible for a significant amount of waste. In 2004, the UK produced about 335 million tonnes of waste, of which 32% was generated by the construction and demolition sector. It is estimated that around 25 million tonnes of CD&E waste is disposed of in landfill each year in England.

Figure 4.1: Estimated total annual waste arisings by sector, 2004



4.2.2 Until recently, with the introduction/revision of a number of waste policies, there has been modest focus on measuring construction and demolition waste arisings in England. As a consequence, there is very limited national or regional data on construction and demolition waste arisings.

4.2.3 In addition, there has been no specific official guidance on a methodology for predicting construction waste, and therefore any data that does exist has been used with caution and is of uncertain validity.

- 4.2.4 In light of the recent ambitious waste policy requirements, including a 50% reduction of construction, demolition and excavation waste to landfill (compared to 2008) by 2012, Defra has identified this gap in adequate waste reporting, and recognised the urgent need for greater understanding and capture of construction waste arisings across industry sectors if it is to be effectively managed. Defra and other industry bodies have acknowledged the important role that better understanding and prediction of construction, demolition and refurbishment waste would play in order to substantially minimise waste and maximise resource use.
- 4.2.5 In 2007, Defra funded BRE to collect and analyse data for construction waste. A number of distinct aims were set:
- Develop and define basic reporting requirements for construction, demolition and refurbishment waste;
 - Collect benchmarking data on construction, demolition and refurbishment waste in terms of quantity and composition of waste;
 - Convert the above data into indicators for construction type and sector;
 - Use the indicators to model and predict waste arisings on a site, local, regional and national scale.
- 4.2.6 A number of related publications have been produced across the waste industry to support this work, these include:
- 'Understanding and Predicting Construction Waste' (WR0111);
 - 'Tool for Measuring and Forecasting Waste Generated on Site', CIRIA, PR83.
- 4.2.7 Since commencing the Defra funded project, BRE have collected information from over 780 new build construction projects, 337 of which are residential projects.
- 4.2.8 With strict reporting requirements, including mandatory data fields, the project has obtained a wealth of consistent information across a range of sectors, locations and waste categories. This has allowed the development of a robust reporting portal, and the subsequent benchmarking of national and regional average figures, in addition to standard, good and best practice waste generation values. Targets have been set against these to provide policymakers with the guidance necessary to influence waste reducing activities and initiatives.
- 4.3 SMARTWaste**
- 4.3.1 SMARTWaste Plan was developed by BRE to help Industry prepare, implement and review SWMPs in full compliance with the legal requirements of the SWMP Regulations 2008 and to meet the Code for Sustainable Homes and BREEAM mandatory requirements for waste. Over time the tool has developed and now also includes an optional integrated waste measurement tool (SMARTStart) to help measure site waste.
- 4.3.2 There are currently over 3,000 companies registered to use the SMARTWaste Plan, including 72% of the top 50 construction contractors. Over 2,000 projects have been entered at a value of over £40 billion.
- 4.3.3 BRE are currently working with the Environment Agency to determine how the aggregated data from SMARTWaste can be used to estimate C&D waste arisings to inform waste planning at a regional and local level. The East of England, Central

Bedfordshire and Hertfordshire Councils have already endorsed the use of the SMARTWaste tools for guiding policy reform with successful results.

- 4.3.4 It is recommended that SCC use the SMARTWaste Plan or similar to write, implement and review SWMPs on all of their construction projects.

Indicators

- 4.3.5 Data obtained via BRE's SMARTWaste system and the benchmarking website for all completed new build projects goes through a number of logical and statistical tests, to ensure that the data used to produce the indicators is valid. It is recommended that SCC use these indicators to allow accurate information to be entered into the SMARTWaste Plan, and most importantly, to allow comparison across industry.

- 4.3.6 The two key indicators are:

Environmental Performance Indicator

m³ of waste per 100m² floor area

- The floor area must be greater than 10m³;
- The waste volume must be more than 10 m³ or the data is excluded;
- The volume of waste in m3 per 100m2 floor area should be between 5 and 75.

Key Performance Indicator

m3 of waste per £100,000

- The project value must be greater than £100;
- The waste volume must be more than 10m3 or the data is excluded;
- The volume in m3 per £100K of project value should be between 5 and 75.

- 4.3.7 After the logical tests outlined above are applied, the following statistical tests are performed:

- A count of the number of plausible results, the average, standard deviation and median of the results is obtained;
- Limits at a given confidence are calculated using a standard T-table and the basic formula where outlying results are suspected; and
- LIMIT (at confidence) value = average value + (standard deviation x T-table value (fn number of results, confidence level required)).

4.4 Benchmarking

"In order to manage something you must first be able to measure it"

- 4.4.1 BRE have established minimum reporting requirements for construction, demolition and refurbishment wastes as part of the Defra funded project. The project collected waste data based on minimum reporting requirements (developed in consultation with industry) and used this data to form self-updating performance indicators and benchmark figures.

- 4.4.2 Data has been collected through the benchmarking website (www.smartwaste.co.uk/wastebenchmarking) and BRE's SMARTStart system (part of SMARTWaste) where users can enter data for their construction project.

- 4.4.3 The waste categories in the newer SMARTWaste Plan tool have been modified slightly in order to align them with the European Waste Catalogue (EWC) categories to make it easier for industry to collect data and provided greater consistency.
- 4.4.4 A method for converting the existing data from both $m^3/100m^3$ and $m^3/£100k$ to tonnes/100m³ and tonnes/£100K has been developed so that data from SMARTWaste and the newer SMARTWaste Plan can be amalgamated and provide a more accurate reflection of actual waste arisings based on both product and waste type.
- 4.4.5 There are minimal differences between the volume performance indicators produced using the two sets of waste categories (these are shown in table 4.2 below, with the latest highlighted in yellow). Differences can be explained by the omission of hazardous and liquid and oil wastes and the separation of ceramics from bricks in the newer SMARTWaste Plan analysis, and the method of rounding.
- 4.4.6 The minimum reporting requirements include:
- Project type e.g. residential, commercial offices etc;
 - Gross internal floor area (m²) of project;
 - Project value;
 - Length of project (start and anticipated end date);
 - Location;
 - Number of employees;
 - If the project is construction, refurbishment and/or demolition;
 - Types of waste (based on EWC codes or BRE's SMARTWaste categories); and
 - Amount of waste generated (tonnes or volumes).

KPIs

- 4.4.7 As previously stated, the data collected is statistically analysed and the following Key Performance Indicators (KPIs) have been produced and are updated bimonthly:
- Volume of waste (m³) / 100m² of gross internal floor area;
 - Tonnes of waste / 100m² of gross internal floor area;
 - Volume of waste (m³) / £100,000 of project cost;
 - Tonnes of waste /£100,000 of project cost; and
 - % and amount (volume/tonnes) segregated on site.

- 4.4.8 The KPIs are broken down by the type of waste and project. There are currently nine different project types. The KPIs are currently only available for new build construction projects; however, they are being developed for refurbishment and demolition projects. Currently, there are 17 refurbishment projects from 6 companies and 2 demolition projects from 2 companies (2008).

- 4.4.9 Data collected through BRE's SMARTWaste Plan tool will continue to be analysed to generate more KPIs including recovery rates for different waste materials.

UK

- 4.4.10 The table below shows the recently published KPIs by project type (30 November 2010).

Table 4.1: C&D KPIs by project type, November 2010

Project type	No. of projects data relates to	Average m ³ /100m ²	No. of projects data relates to	Average m ³ /£100K
Residential	337	17.3	330	12.8
Public buildings	24	24.6	26	10.3
Leisure	33	15.8	31	9.0
Industrial buildings	29	17.2	28	11.9
Healthcare	54	15.8	50	9.6
Education	162	21.3	162	10.5
Commercial other	10	12.5	9	9.3
Commercial Office	53	19.9	53	9.6
Commercial Retail	81	20.8	87	17.3
Total no. of projects	783		776	

Ref: BRE. 31/08/10

4.4.11

The above data has been further broken down into waste product type; this is shown below for residential projects. This reflects the data collected in 2008. BRE have also calculated waste product type data for the other project types⁶.

Table 4.2: Breakdown of C&D waste by product type, residential schemes, 2008 data

Waste Group (EWC)	Housing EPI (m ³ waste/100m ²)		
	Average		
	Residential (23no.)	Conversion factor ⁷	Tonnes
Timber (17 02 01)	1.89	(0.3) 0.34	0.39 0.64
Concrete (17 01 01)	1.90	(1.11) 1.27	2.775 2.4
Inert (17 01 07)	0.67	(1.3) 1.24	1.43 0.83
Ceramic/bricks (17 01 02/03)	1.44	(0.78) 0.90*	2.18 1.3
Insulation (17 06 04)	1.09	(0.16) 0.25	0.16 0.27
Plastic (20 01 39)	1.05	(0.22) 0.23	0.13≤2 0.24
Packaging (15 01 06)	2.71	(0.55) 0.21	1.59 0.57
Metal (17 04 07)	0.59	(0.8) 0.42	1.04 0.25
Plaster & cement (17 08 02)	1.87	(0.4) 0.33	0.75 0.62
Liquid & oils ()	0.05	0.9	0.05
Canteen/office/ad-hoc (20 03 01)	1.73	0.21	0.36
WEEE (16 02 14)	0.15	0.27	0.04

⁶ Understanding and Predicting Construction Waste, WR 0111, Annex 1: Analysis of construction, refurbishment and demolition waste data

⁷ WRAP, A guide to volume to mass conversion factors and list of waste categories used within WRAP's tools

Waste Group (EWC)	Housing EPI (m ³ waste/100m ²)		
	Average		
	Residential (23no.)	Conversion factor ⁸	Tonnes
Hazardous (I)	0.06	1.35	0.08
Furniture (20 03 07)	0.08	0.18	0.01
Total EPI	15.28		7.66

Ref: Adapted from BRE data. 31/08/08

* Combined average ceramics (0.59) and brick (1.20) conversion factors

Please note: The average waste per residential property outlined above is lower than that calculated from the recent project type dataset provided by BRE in 2010. 2010 data by waste group had not been released at time of writing.

Amount of waste per house

4.4.12 From the above data the amount of waste and cost of waste per house can be calculated. The average amount of waste produced across the sites is 15.28m³ waste per 100m² floor area.

4.4.13 Taking this figure and applying it to an average dwelling (90m²) gives an average material waste generation of 13.75m³ of waste per house. When adding in an average of 50% void space in the skip, this equates to around 27.5m³ skipped waste.

4.4.14 A typical skip has a volume of 6.125m³, so around five skips would be needed to contain the waste from one house.

4.4.15 Based upon the WRAP conversion factors, the weight of waste from an average house is **7.66 tonnes**.

Cost of waste per house

4.4.16 Studies⁹ have shown that a typical construction skip costs around £1,343 when the cost of the skip is added to the cost of labour and materials that fill it. The breakdown of this is:

- Skip hire £85
- Labour to fill it £163
- Cost of materials in skip £1,095

4.4.17 Therefore, the financial cost of waste for an average house for five skips is **£5,372**.

Segregation

4.4.18 BRE have also calculated the average segregation rates per project type, which gives an indication on how much material is available for recovery.

⁸ WRAP, A guide to volume to mass conversion factors and list of waste categories used within WRAP's tools

⁹ AMEC- Darlington study

Table 4.3: Average waste segregation rates per project type, 2008

Project Type	Average % segregation	Median % segregation
Residential	18.3	5.3
Public buildings	59.0	63.5
Leisure	20.4	1.6
Industrial Buildings	43.0	47.6
Healthcare	26.7	24.3
Education	29.3	10.9
Commercial Retail	37.5	22.5
Commercial Offices	38.0	28.2
Civil Engineering	55.7	62.6

Ref: BRE.2008

4.4.19 As the table above shows, there is large variation in the segregation rates. However, the median values indicate that there is generally more segregation in public buildings, civil engineering and industrial building projects.

Regional performance

4.4.20 The data has also been analysed by region. The regions align with the former Government Office Regions.

Table 4.4: Volume of C&D waste per 100m² gross internal floor area for residential projects, by region, 2008

Region	No. of residential projects	m ³ /100m ²
East Anglia	7	13.4
East Midlands	5	16.1
London	31	17.7
North West	11	11.2
North East	6	17.2
South East	9	11.1
South West	8	14.1
West Midlands	10	14.1
Yorkshire & Humberside	9	10.9

Ref: BRE. 31/08/08

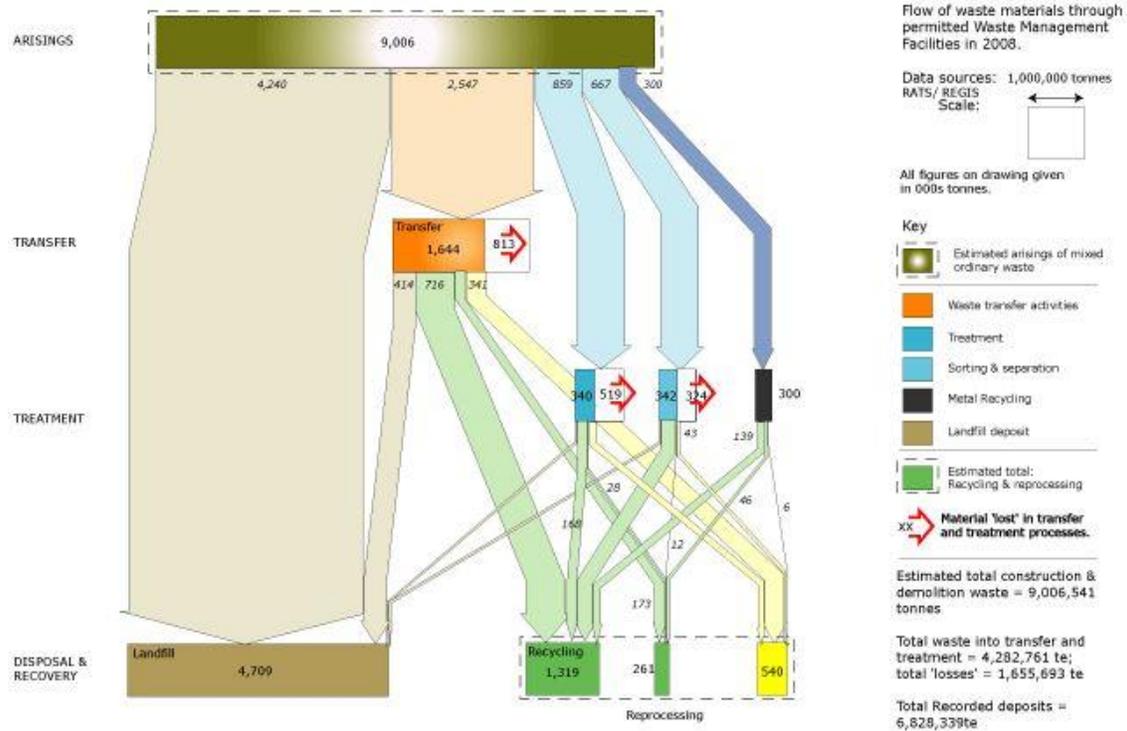
Example: South East

4.4.21 The above table indicates that the South East was one of the best performing regions in terms of volume of C&D waste generated for residential projects. The diagram below shows how in 2008 the South East diverted just under half of their total C&D waste arisings away from landfill through a range of treatment options. 4,709,000 of the 9,006,541 tonnes generated went to landfill.

**SECTION 4
FORECASTING CONSTRUCTION AND
DEMOLITION WASTE**



SOUTH EAST: PRODUCTION AND MANAGEMENT OF CONSTRUCTION & DEMOLITION WASTE 2008



4.5 Best Practice

4.5.1 Where enough datasets exist to be statistically robust, the data has been split to provide KPIs for standard, good and best practice. The three concepts of standard, good and best are accepted construction industry guidelines. The benefits of good practice can afford cost savings, more efficient operations and lower environmental impact. SCC seeks to surpass best practice to maximise the benefits offered by good practice waste management and minimisation, and become industry leaders.

Table 4.5: Defining Industry Standard, Good and Best Practice

Standard Practice	Good Practice	Best Practice
Baseline performance, based on achieving minimum standards and legal requirements	Going beyond standard practice to realise 'Quick win' – benefits that are easy to achieve on majority of projects without a fundamental change in working practice and are at least cost neutral.	Reflects the leading approach currently undertaken in the industry, but may bear a cost or require a change in working practice.

Ref: WRAP- Delivering Good Practice Waste Management, 2008

4.5.2 The tables below show the benchmarks for residential, commercial retail, commercial office and education.

Table 4.6: Benchmarks for residential projects

Benchmarks for residential projects	m³/100m²	m³/£100K
Best practice (lower quartile)	<9.0	<7.7
Good practice	9.0 – 12.9	7.7 – 13.1
Standard practice	>12.9	>13.1

Ref: BRE. 31/08/08.

Table 4.7: Benchmarks for commercial retail projects

Benchmarks for commercial retail projects	m³/100m²	m³/£100K
Best practice (lower quartile)	<6.2	<6.5
Good practice	6.2 – 12.1	6.5 – 8.8
Standard practice	>12.1	>8.8

Ref: BRE. 31/08/08.

Table 4.8: Benchmarks for commercial office projects

Benchmarks for commercial office projects	m³/100m²	m³/£100K
Best practice (lower quartile)	<8.3	<6.3
Good practice	8.3 – 14.0	6.3 – 9.0
Standard practice	>14.0	>9.0

Ref: BRE. 31/08/08.

Table 4.9: Benchmarks for education projects

Benchmarks for education projects	m³/100m²	m³/£100K
Best practice (lower quartile)	<9.3	<7.8
Good practice	9.3 – 12.1	7.8 – 10.0
Standard practice	>12.1	>10.0

Ref: BRE. 31/08/08.

Example: Marks & Spencer – Sending No Waste to Landfill

4.5.3

The following table shows M&S's commitment to recycling C&D wastes from their store construction activities (including refurbishment) through the setting of progressive recycling targets. The table shows their recycling targets by year and their progress in meeting these targets. M&S are currently industry leaders in the recycling of C&D waste.

Table 4.10: M&S Recycling Performance – C&D waste

Timeframe	% Recycling	Progress
07/08	75	Achieved
08/09	85	84%
09/10	90	On target
10/11	95	?
11/12	100	?

4.6

Conclusion

4.6.1

The standard, good and best practice benchmarks documented in this section will be used to generate total waste arising quantities for each of the eco-development to provide forecast targets for all elements of the construction. The eco-developments should seek to achieve or surpass current best practice targets.

SECTION 5

**APPLICATION OF FORECASTING
TECHNIQUES**

5 APPLICATION OF FORECASTING TECHNIQUES

5.1 Introduction

5.1.1 Successful case studies, coupled with a reliable, ever growing waste database, can provide the information, knowledge and understanding required to set ambitious and influential targets that will drive the future policy agenda and decision making. Section 5 looks at the ways in which SCC can use the data contained within the preceding sections of this report to strengthen and inform environmental policy at all levels. In particular, the data can be of assistance in planning for the proposed urban extensions at Taunton and Yeovil.

5.2 Overview

5.2.1 Hertfordshire County Council, amongst others, has successfully used the BRE benchmarking tool and derived statistics to calculate the likely waste arisings for forecast new housing developments across the County. Like the East of England, they have utilised the SMARTWaste system across the entire construction supply chain to maximise benefit.

5.2.2 The data generated from the SMARTWaste system can be utilised by all parts of the construction supply chain. This section details the different users, and its application.

5.3 Policy makers

5.3.1 The following indicates the potential benefits to policy makers afforded by the application of the SMARTWaste system:

- Provide data for forecasting and planning for sustainable waste management policy at a construction sector level;
- Help to prioritise actions and policies related to construction waste management;
- Provide evidence based benchmarks for measuring and evaluating performance of policies e.g SWMP Regulations;
- Model possible future scenarios and capacities required for recovery of construction waste; and
- Provide data to help progress the aims and objectives within the Waste Strategy 2007 for England and the Sustainable Construction Strategy.

5.4 Planners

5.4.1 As 'Planning for Sustainable Waste Management – A Companion Guide to PPS10' (June 2006, paragraph 7.3) states, "... *waste management is fundamental to the delivery of sustainable communities. Planning for sustainable waste management requires integration with other areas of spatial planning. Waste should not be considered in isolation from other planning concerns, even when addressed through thematic LDD. Early and ongoing dialogue between relevant local authorities will promote consistency and the integration of waste management with other spatial planning matters....*". The SMARTWaste data can assist planners at both the micro and macro level.

Micro level

- Help to assess planning applications in relation to construction waste;
- Help assess information in relation to SWMP Regulations in England, BREEAM and the Code for Sustainable Homes;
- Set evidence based targets for waste reduction and recovery for projects through planning conditions;
- Estimate the likely amount and type of waste arisings for a project;
- Move projects from standard to best practice; and
- Encourage developers to set appropriate waste requirements.

Macro level

- Assess development and construction policies in terms of likely amounts of waste produced e.g. housing;
- Aid in waste planning through assessing existing and future capacities of waste facilities for construction waste;
- Measure progress;
- Provide focus and priority action areas; and
- Set targets and/or provide appropriate guidance for reduction and recovery of waste in planning policies and guidance.

5.4.2 Policy W5 of the adopted Bedfordshire and Luton Minerals and Waste Local Plan 2000-2015 (adopted January 2005) provides an example of a policy approach focusing upon waste auditing as part of development proposals.

Policy W5

Proposals that are likely to generate significant volumes of waste through the development or operational phases will be required to include a waste audit as part of the application. This audit should demonstrate that in both construction and operational phases of a proposed development, waste will be minimised as far as possible and that such waste as is generated will be managed in an appropriate manner in accordance with the Waste Hierarchy. In particular, the waste audit should include the following information:

- the anticipated nature and volumes of waste that the development will generate;
- where appropriate, the steps to be taken to ensure the maximum amount of waste arising from development on previously developed land is incorporated within the new development;
- the steps to be taken to ensure effective segregation of wastes at source including, as appropriate, the provision of waste sorting, storage, recovery and recycling facilities;
- any other steps to be taken to manage the waste that cannot be incorporated within the new development or that arises once development is complete.

Before granting planning permission, the LPA will need to be satisfied that the measures identified in the waste audit represent appropriate waste management solutions in light of the Waste Hierarchy. Where appropriate, the LPA may require additional waste management measures in order to facilitate the movement of waste management up the Hierarchy.

5.5 Clients and designers

5.5.1.1 Waste auditing can be an important aspect at the design/procurement stage of a project, in respect of the following:

- Set targets for waste reduction and recovery (a requirement for the Code for Sustainable Homes);
- Work with designers and suppliers to design out and reduce key wastes e.g. packaging;
- Use data to help with tender design and evaluation; and
- Move from standard to best practice.

5.5.1.2 Similarly at the construction stage, the use of SMARTWaste data can be used:

- To forecast the type and amount of waste produced (a requirement of SWMPs); and
- As a means by which to monitor the performance of contractors.

5.5.1.3 At the Client company level, the data can be used to:

- Set targets for waste reduction and recovery;
- Benchmark performance across the company; and
- Aid with Corporate Social Responsibility (CSR) and Environmental Management Systems (EMS).

5.6 Contractors

5.6.1.1 SMARTWaste data can be used by contractors at construction project level:

- To forecast the amount and type of waste produced;
- To set appropriate targets for waste reduction and recovery;
- To set appropriate waste targets by material and/or work package;
- To assist with the reduction and recovery of waste through better understanding of the waste;
- To help with the development and costing of waste management packages;
- To work with trade contractors and the supply chain to reduce and recover waste;
- To benchmark performance against similar projects; and
- To move towards best practice for waste management.

5.6.1.2 At company level, contractors use the data to:

- Benchmark performance across the company;
- Benchmark performance across the industry; and
- Help in setting company-wide policies and targets for waste management.

5.7 Conclusion

- 5.7.1 These forecasting tools can represent an invaluable resource both in forward planning, including policy formulation and target setting, and in assessing specific development proposals and information on C&D waste submitted by developers. They form the basis of the forecasting exercises undertaken in respect of the Somerset Eco-town developments as reported in Section 7.

SECTION 6

**C&D TARGETS AND METHODS OF
MINIMISING WASTE**

6 C&D TARGETS AND METHODS OF MINIMISING WASTE

6.1 Introduction

6.1.1 This Section outlines current targets set out in respect of construction and demolition waste, and which provide the backdrop for the recommendations within this Report. Consideration is also given to ways in which the achievement of these targets can be facilitated, both due to the minimisation of waste materials and the use of modern methods of construction.

6.2 True Cost of Waste

6.2.1 Waste is a major cost and one that is increasing. It is a misconception that waste costs are only the costs of its disposal. In fact, the true cost of waste is:

The original purchase price & transportation costs of the material	+	The cost of their handling, storage, transport & disposal	+	The loss of income from not salvaging the materials
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6.2.2 Envirowise report that waste contributes 4% of business turn over, but the true cost of waste can be around 5 to 20 times the cost of disposal. CIRIA report that “...the average 8 cubic yard skip costs around £140. The average cost of what’s being thrown away is £900....”.

6.3 Targets

6.3.1 We are experiencing a paradigm shift with a fresh approach and attitude to waste management overall. With renewed government focus and waste industry support there is a concerted drive to build a zero waste nation. Moving from waste to resources management is of paramount importance in future UK developments, and the growth of local, regional and national legislation will aid the transition and cultural acceptance.

6.3.2 As a result of recent waste policy reform, a number of targets have been set, all of which feed into the objectives of the Waste Strategy for England 2007. These include, but are not limited to:

Revised EU Waste Framework Directive (2008)

6.3.3 The revised EU WFD sets the following target for the re-use, recycling and recovery of C&D waste “... by 2020, the preparing for re-use, recycling and other material recovery of all C&D waste, 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 [soil and stones] in the list of waste shall be increased to a minimum of 70% by weight.....”.

WRAP

6.3.4 WRAP has set a policy objective whereby half of C&D waste goes to landfill by 2012 (compared to 2008 baseline). In practical terms, this would equate to the cutting of 25 million tonnes of C&D waste to nearer 12 million.

6.3.5 WRAP have also established a best practice benchmark of greater than 90% landfill diversion.

BRE

6.3.6 BRE has set a target for waste generation to 25m³/dwelling, from an initial target of 50m³/dwelling.

Eco-towns

6.3.7 In addition to the above, in specific relation to those developments being brought forward under 'eco-towns' principles, there is a requirement to plan for zero waste, by setting ambitious targets, substantially beyond those in the Government's 2007 Waste Strategy. This includes a move towards zero construction waste, in excess of the Government's national target of at least a 50% reduction in construction, demolition and excavation waste to landfill (compared with 2008). These principles are enshrined within the TCPA's guidance note 'Towards Zero Waste' (see Section 2.3).

6.4 Reducing Construction Wastes

6.4.1 It has been well documented that the construction industry has high wastage rates. Significant volumes of waste result from activities such as inefficient design, inaccurate materials estimates and orders, design changes, poor logistics and storage, and a traditional low prioritisation of materials costs (as compared to labour costs). Some of the common causes are listed below:

- Off cuts;
- Unsuitable storage;
- Packaging;
- Over-ordering;
- Project management and programme; and
- Rework.

6.4.2 In conjunction with WRAP's half waste to landfill advocacy programme, WRAP has undertaken considerable research into waste minimisation in construction and has prepared a number of guidance publications around this topic including:

- Reducing material wastage in construction;
- Waste minimisation for managers;
- Achieving Good Practice Waste Minimisation and Management;
- Procurement guidance; and
- Guidance on Waste Minimisation, Waste Management, Recycled Content and Regeneration.

6.4.3 The Government's waste policy review published in June 2011 emphasised the requirement to focus upon the minimisation of construction waste at as early a point in the construction process:

"... The existing 'Halving Waste to Landfill' Commitment is on track to meet its 2012 target. While keeping the momentum going, there will be a greater focus on waste reduction at the earlier, design stages of construction projects as this is where the largest environmental and financial savings can be made. This will be part of a wider,

ongoing programme of work with the industry including support for the Sustainable Construction Task Group Action Plan ...”.

Wastage rates

6.4.4 Data collected by WRAP’s Net Waste Tool has enabled the production of average construction materials wastage rates. The wastage rate for common material types is shown below.

Table 6.1: Average wastage rates for construction materials

Material	Baseline % wastage	Good practice % wastage
Plasterboard	22.5	15
Timber	10	5
Insitu concrete	5	2.5
Carpets	5	2
Blocks	20	10
Bricks	20	5
Steelwork	1	1
M&E system	3	3

Ref: WRAP. 2008

6.4.5 Case studies have shown that projects can save up to 1.5% of construction value by reducing wastage. On individual trade packages the savings can be as high as 9.5%. The table below shows example cost savings from lower wastage rates and waste segregation in construction averaged across a number of projects.

Table 6.2: Example cost savings

Project type	Saving on cost of materials (A)	Reduction in disposal cost (B)	Total saving (A+B)	Cost of implementation (C)	Net benefit (A+B)-C
	Saving as % of construction cost				
Residential	0.55	0.21	0.76	0.34	0.42
Commercial	0.44	0.16	0.60	0.17	0.43
Public Building	0.29	0.07	0.36	0.05	0.30
Refurbishment	0.24	0.44	0.68	0.34	0.34

Ref: WRAP - Assessing the Costs and Benefits of Reducing Waste in Construction, May 2009

6.4.6 WRAP found that cost savings could be achieved across sectors and construction methods. For new build projects, the more significant saving potential is the reduction in value of materials wastes (achieved by reducing wastage allowances). For refurbishment projects, the reduction in disposal cost becomes a more significant potential saving, due to the opportunity to segregate or reuse strip out waste.

6.5 Methods of Modern Construction (MMC)

6.5.1 Modern Methods of Construction (MMC) are defined as: “...those which provide an efficient product management process to provide more products of better quality in less time. MMC has been defined in various ways: pre-fabrication, off-site production and off-site manufacturing (OSM). But while all OSM is MMC not all MMC is OSM. It can be classified in various ways and may involve key services (e.g.) plumbing, key items (e.g. foundations) inner shell (walls etc), external walls, or any combination of these elements. It can also be classified by material (timber, steel, concrete and masonry)...” (Home Builders’ Federation).

6.5.2 Building on the work of WRAP, the following table illustrates the potential level of waste reduction as a result of MMC when compared to equivalent traditional construction methods.

Table 6.3: Potential for waste reduction using MMC as evidenced by WRAP

MMC	Estimated % waste reduction*
Volumetric building systems	70-90
Timber frame systems	20-40
Concrete panel systems	20-30
Steel frame housing systems	40-50
OSB SIPS	50-60
Composite panels	20-30
Pre-cast cladding	40-50
LSF systems	40-70
Bathroom/shower & kitchen pods	40-50
Pre-cast flooring	30-40
Thin join masonry	30-40
Insulating concrete formwork	40-50
Tunnel form construction	50-60

Ref: AMA Research/ trade estimates

*NB – most of the above come with a reasonable level of confidence.

6.6 Conclusion

- 6.6.1 The targets and objectives set out within this Section, along with the proposed means by which they can be achieved, are of relevance in determining the targets for, and estimating the likely C&D waste arisings likely to be generated by, the proposed urban extensions at Monkton Heathfield and Yeovil, along with the Yeovil urban village. These are considered within Section 7 of this Report.

SECTION 7

**PROJECTED C&D WASTE ARISING AND
RECOMMENDED TARGETS FOR THE
SOMERSET URBAN EXTENSIONS**

7 PROJECTED C&D WASTE ARISING IN THE SOMERSET URBAN EXTENSIONS

7.1 Estimating C&D waste arisings

7.1.1 Waste modelling using SMARTWaste was recently undertaken by Hertfordshire County Council on predicted residential development for 2001 to 2021, to provide the council with information on construction and demolition waste amounts and types. It provided demonstrable evidence of how the benchmarks could be used to predict waste arisings during the construction process, and produce recommendations for construction waste management across the county.

7.1.2 The East of England Plan (which provides the strategic planning context for Hertfordshire) Panel Report¹⁰, gave recommendations on the future development of housing from 2001 to 2021. The full summary report can be found in Annex 2: Key Recommendations and modelling for waste reduction of the report: Understanding and Predicting Construction Waste; WR 0111.

7.1.3 Building on the success of the Hertfordshire example, the same exercise has been undertaken for the proposed Monkton Heathfield urban extension in Taunton, and the urban extension and urban village planned for Yeovil at the project level.

7.1.4 C&D arisings have been calculated based on national and regional average, and current industry standard, good and best practice. Standard is the upper quartile of total waste arisings across the UK industry sector, good is the range of the two middle quartiles, and best the lower quartile. For SCC to be industry leaders in waste minimisation they need to meet best practice.

7.2 Yeovil estimates

7.2.1 The following C&D waste arising figures have been calculated for the residential elements of the proposed 3,719 home urban extension and 400 urban village in Yeovil, Somerset under the various scenarios outlined above.

Table 7.1: Yeovil urban extension – estimated total C&D waste arisings: residential

Performance indicator	Total waste (m³)¹¹
National average	51,211
Regional average	47,194
Standard Practice	≥ 43,178
Good practice	30,124 – 43,178
Best Practice	< 30,124

¹⁰ East of England Plan 2004, Examination in Public, Panel Report. June 2006

¹¹ Based on each dwelling totalling 90m²

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AND RECOMMENDED TARGETS FOR
THE SOMERSET URBAN EXTENSIONS**



Table 7.2: Yeovil urban village – estimated total C&D waste arisings: residential

Performance indicator	Total waste (m ³) ¹²
National average	5,501
Regional average	5,076
Standard Practice	≥ 4,644
Good practice	3,240 – 4,644
Best Practice	< 3,240

7.2.2 Insufficient information exists at present to provide a similar assessment in respect of commercial retail / office development. However an assessment of estimated arisings from education development for the urban extension has been made below.

Table 7.3: Yeovil urban extension – estimated C&D waste arisings: education

Performance indicator	Total waste (m ³)
National average	2,450
Standard Practice	≥ 1,392
Good practice	1,070 – 1,392
Best Practice	< 1,070

7.3 Taunton estimates

7.3.1 The following C&D waste arising figures have been calculated for the different elements of the proposed 5,356 unit Monkton Heathfield urban extension in Taunton, Somerset, under the various scenarios outlined above. As initial information exists about project phasing for Monkton Heathfield, this has allowed the predictions to include broad estimates of C&D waste generation per project phase in respect of some elements of development.

Table 7.4: Monkton Heathfield urban extension – estimated C&D waste arisings: residential

Performance indicator	Total waste (m ³)	P1 Total waste (m ³)	P2 Total waste (m ³)	P3 Total waste (m ³)
National average	73,656	17,314	23,626	32,716
Regional average	67,968	15,977	21,801	30,190
Standard Practice	≥ 62,130	≥14,604	≥19,929	≥27,596
Good practice	43,384 – 62,130	10,198 - 14,604	13,916 – 19,929	19,270 – 27,596
Best Practice	< 43,384	<10,198	<13,916	<19,270

¹² Based on each dwelling totalling 90m²

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Table 7.5: Monkton Heathfield urban extension – estimated C&D waste arisings: commercial retail

Performance indicator	Total waste (m ³)	P1 Total waste (m ³)	P2 Total waste (m ³)	P3 Total waste (m ³)
National average	9,436	4,554	4,094	788
Standard Practice	≥ 5,489	≥2,649	≥2,382	≥459
Good practice	2,813 – 5,489	1,357 – 2,649	1,220 – 2,382	235 – 459
Best Practice	< 2,813	<1,357	<1,220	<235

Table 7.6: Monkton Heathfield urban extension – estimated C&D waste arisings: commercial office

Performance indicator	Total waste (m ³)
National average	199
Standard Practice	≥ 140
Good practice	83 – 140
Best Practice	< 83

Table 7.7: Monkton Heathfield urban extension – estimated C&D waste arisings: education

Performance indicator	Total waste (m ³)	P1 Total waste (m ³)	P2 Total waste (m ³)	P3 Total waste (m ³)
National average	3,942	746	746	2,450
Standard Practice	≥ 2,239	≥424	≥424	≥1,392
Good practice	1,721– 2,239	326 – 424	326 – 424	1,070 – 1,392
Best Practice	< 1,721	<326	<326	<1,070

7.4 Recommended targets

7.5 It is recommended that SCC aim to achieve best practice in all industry sectors. Best practice values have been calculated by WRAP from information inputted into WRAP's Net Waste Tool. The best practice targets illustrate the current industry lower quartile waste arising figures.

7.5.1 All C&D waste targets are summarised in section 10 below.

SECTION 8

FUTURE TRENDS

8 FUTURE TRENDS

8.1 Introduction

8.1.1 Section 8 looks at possible future drivers that could influence waste management and minimisation decisions. Future SCC policy documents will need to be reviewed regularly and reflect any change in waste management.

8.1.2 The Government has held a number of meetings with the waste industry and associated professional bodies/organisations to discuss the future direction of the industry and likely changes. A number of policy areas have been identified as potential drivers for change, and will be consulted on. No firm decisions have been made as of yet but the following bullet points illustrate the key policy areas which are likely to experience change.

8.2 Key drivers

8.2.1 Legislation:

- Landfill directive
- Hazardous waste
- Duty of Care
- Fly tipping

8.2.2 Fiscal Measures

- Landfill tax
- Aggregate Levy

8.2.3 Policy

- Code for Sustainable Homes
- PPS 10: Ecotowns
- SWMP Regulations

8.3 Current trends

8.3.1 The following table shows the national variation in monthly $m^3/100m^2$ figures for C&D waste from May 2007 to August 2008.

Figure 8.1: National variation in monthly $m^3/100m^3$ for C&D waste – 2007/08

Project Type	Date									
	31/5/07	20/6/07	03/9/07	10/10/07	5/12/07	14/2/08	23/4/08	30/6/08	31/8/08	
Residential	12.4	13.4	17.9	18.5	17.4	14.8	14.8	15.3	15.2	
Public building	19.1	19.1	13.0	13.0	11.1	24.0	21.5	21.2	26.1	
Leisure	-	15.4	12.8	13.2	13.8	13.8	13.8	13.8	12.3	
Industrial building	16.5	16.5	21.1	21.2	17.7	25.3	19.9	20.0	20.0	
Healthcare	7.6	7.5	7.5	7.5	7.0	15.0	15.0	15.1	15.0	
Education	9.2	8.4	10.9	10.9	10.9	12.5	12.5	13.3	13.4	
Commercial retail	8.5	8.7	8.6	8.6	11.7	15.8	16.7	20.0	20.1	
Commercial office	12.2	11.4	12.8	12.9	12.6	18.9	15.4	15.3	15.0	
Civil engineering	17.0	17.0	26.2	26.2	26.2	24.3	24.3	24.3	24.3	

8.3.2 The data above shows reasonable consistency over the data reporting period, particularly for residential and commercial retail where there are a large number of projects allowing for more stable average. This is in stark contrast to civil engineering, industrial buildings and public buildings where a greater variation is evident due to the smaller number of projects within these project types. As a consequence, the inclusion of an extra project has had a larger effect.

8.3.3 It is anticipated that the figures will change as a result of the requirements arising from the implementation of the SWMP Regulations 2008 and other key waste policies.

8.3.4 Initially, figures are predicted to rise slightly as a larger range of companies with more diverse site practices will be included in the data. However, with the introduction of waste minimisation strategies across the project construction supply chain and the increased use of modern methods of construction it is expected that figures will ultimately decrease. The benchmarks for standard, good and best practice will subsequently shift downwards as more companies introduce waste minimisation practices.

8.3.5 As more companies feed data into the SMARTWaste system, average figures will become more consistent and reliable. By 31 August 2008 116 residential projects ($\text{m}^3/100\text{m}^2$) had been added to the system. Between 31 August 2008 and 30 November 2009 a further 110 residential projects ($\text{m}^3/100\text{m}^2$) were added. Most recently, between 30 November 2009 and 30 August 2010 an additional 117 new residential projects ($\text{m}^3/100\text{m}^2$) were added to the system.

8.3.6 As predicted, the last two years data has seen a slight increase in average waste arisings for residential new builds – from $15.2\text{m}^3/100\text{m}^2$ in August 2008, to $16.3\text{m}^3/100\text{m}^2$ in November 2009, to $17.3\text{m}^3/100\text{m}^2$ in August 2010. It is envisioned that 2011 will see a further increase in projects added but a decline in average value.

8.4 Conclusion

8.4.1 With the new Coalition Government, the future of waste legislation is currently unknown. The waste industry has identified potential areas of change but only time will tell where the Government places the focus. With the introduction of robust waste measurement tools the industry has been able, for the first time ever, to gather accurate data on current waste arisings across the construction sector. With time these will improve our understanding, policy focus, and allow for both industry and client lead performance expectations. It seems that accountability will be high on the agenda for all.

SECTION 9

SITE WASTE MANAGEMENT PLAN

9 SITE WASTE MANAGEMENT PLAN

9.1 Introduction

9.1.1 Site Waste Management Plans (SWMPs) became a legal requirement for projects costing over £300,000 in April 2008. They have also become a recognised good practice tool in the approach towards construction waste minimisation and management.

9.1.2 A SWMP is a tool to regulate the efficient management of waste on site. This requires the contractor to forecast waste streams arising from the project, and identify waste management routes for each waste stream. By evaluating these options prior to starting on site, there are real opportunities to both reduce the overall quantity of waste, and increase the percentage of materials recovered.

9.1.3 The purpose of the SWMP is to describe the procedure by which waste will be managed by the Client and Principal Contractor during the lifetime of the project. The plan also acts as a guide to project personnel on how to manage all types of waste, in accordance with statutory and best practice.

9.1.4 The key benefits of having a SWMP include:

- Providing a structured and forward thinking approach to waste management and sustainability onsite;
- Identifying savings through improved resource efficiency, ordering, material storage and handling to eliminate waste at source;
- Assisting with compliance of internal Environment Management Systems (EMS), objectives and targets, and associated Key Performance Indicators (KPIs);
- Greater control of regulatory risks relating to virgin materials, waste storage, handling and disposal at site level;
- Greater transparency with interested parties including BREEAM, Local Authorities (LA), and the Environment Agency (EA); and
- Enhance waste storage and segregation practices to facilitate higher recycling and recovery onsite.

9.1.5 Both BRE and WRAP have developed interactive SWMPs, which are free to utilise.

9.2 SMARTWaste Plan

9.2.1 BRE have developed a web-based SWMP tool, SMARTWaste Plan. As well as preparing, implementing and reviewing a SWMP, the tool includes an integrated waste measurement tool.

<http://www.smartwaste.co.uk/swmp>

9.3 Net Waste Tool

9.3.1 WRAP have developed a web based SWMP tool, Net Waste Tool.

9.3.2 The tool assists in the generation of waste forecasts and prioritises waste reduction and recovery actions to input into a SWMP. It:

- Applies value engineering at the design stage to reduce the costs of wastage (value of wasted and unused materials, cost of waste recovery and disposal);
- Optimises strategies for on-site segregation of wastes for minimum cost within a known space constraint;
- Targets the top cost- effective opportunities to adopt more reused materials and higher recycled content in building product, e.g. in response to a client requirement; and
- Evaluates performance against corporate targets, such as reduction in construction waste to landfill (in line with Government policy objectives) and progress towards waste neutrality or zero Net Waste.

9.3.3 The Tool contains data on the dimensions, recycled content, wastage rates and density (t/m³) of several thousand generic construction components. Once the user has entered information about their project, the Tool uses this information to estimate levels of wastage based on either value or mass of wasted material component. The Tool then allows the user to identify specific actions to reduce the levels of waste generated, sorting this information by either mass of waste or value of wasted materials.

www.wrap.org.uk/nwtool

9.4 Proposed outline SWMP for the Taunton and Yeovil urban extensions

9.4.1 The proposed outline SWMP has been developed in accordance with the SWMP Regulations 2008 and WRAP's best practice SWMP guidance. It is intended to be used in conjunction with the SmartWaste or Net Waste interactive tools. A SWMP template is also available (in the form of an Excel spreadsheet) which offers a practical understanding of what is required under the SWMP Regulations, how it is collated and inputted into the interactive tool. The template provides guidance, definition and further assistance.

9.4.2 A copy of the Outline SWMP is attached as Appendix A. The SWMP template is available electronically.

SECTION 10

CONCLUSIONS AND RECOMMENDATIONS

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Introduction

10.1.1 This final Section brings together all of the findings of the report, and summarises the recommended best practice targets for both eco-developments.

10.2 Forecast best practice total waste arisings

10.2.1 The following tables outline the forecast best practice **total** waste arising targets for each sector of the eco-development.

*Table 10.1: Summary of recommended C&D waste arising targets for the urban extensions: **residential** development*

Eco-Development		Total waste (m ³)
Taunton	Best practice – residential	<43,384*
Yeovil	Best practice – residential	<30,124*
Yeovil urban village	Best practice – residential	<3,240*

* assuming each dwelling is 90m²

*Table 10.2: Summary of recommended C&D waste arising targets for the urban extensions: **commercial retail** development*

Eco-Development		Total waste (m ³)
Taunton	Best practice – commercial retail	<2,813
Yeovil	Best practice – commercial retail	<68m

*Table 10.3: Summary of recommended C&D waste arising targets for the urban extensions: **commercial office** development*

Eco-Development		Total waste (m ³)
Taunton	Best practice – commercial office	<83
Yeovil	Best practice – commercial office	(assumed all retail)

*Table 10.4: Summary of recommended C&D waste arising targets for the urban extensions: **education** development*

Eco-Development		Total waste (m ³)
Taunton	Best practice – Education	<1,721
Yeovil	Best practice – Education	<1,070

10.3 Summary of Targets

10.3.1 The following C&D overarching targets have been set for the eco-developments at Taunton and Yeovil. All have derived from current Industry best practice, and are to be used as a baseline in the quest to be at the forefront of waste minimisation.

Table 10.5: Summary of Targets

Benchmark	Target	Minimum segregation target***
Site recycling	85%*	n/a
Demolition recycling	90%	n/a
Diversion from landfill	90%**	n/a
Best practice -residential	<9.0 m ³ waste/100m ²	25%
Best practice – commercial retail	<6.2 m ³ waste/100m ²	45%
Best practice – commercial office	<8.3 m ³ waste/100m ²	45%
Best practice - Education	<9.3 m ³ waste/100m ²	35%
Best practice wastage rate – plasterboard	10%	n/a
Best practice wastage rate – timber	4%	n/a
Best practice wastage rate – in situ concrete	2%	n/a
Best practice wastage rate – carpet	1%	n/a
Best practice wastage rate – blocks	7%	n/a
Best practice wastage rate – bricks	2.5%	n/a

* year one of strategy, increasing by 5% each year thereafter.

** 100% by year 5 of strategy.

***year one – evidence of improvement year on year.

10.4 The Five Year Delivery Strategy

10.4.1 SCC appreciates the challenges involved in working towards the aspirational zero waste to landfill. It is recommended that SCC commits to a 5 year plan, that documents year on year progressive targets, and outlines how they will achieve them. This will enable SCC to continue to improve their waste performance on an annual basis. Continual improvement will promote SCC as a UK leader in waste minimisation and an exemplar in successfully reducing waste.

10.4.2 The targets outlined in this report will allow the two urban extensions to act as exemplars for the county, and be instrumental in driving up standards, which ultimately has the potential for consequential improvements in performance across the county as a whole.

10.5 Reporting

10.5.1 It is recommended that SCC utilise BRE's SMARTWaste or WRAP's NetWaste tool waste data application to collate monthly waste data collection, generate reports, reconcile waste data in SWMPs and assist in formulating KPIs.

10.5.2 It is recommended that SCC update and re-issue their policy document annually, reviewing current practice, sharing best practice and detailing innovative techniques and technologies for continued improvement.

SECTION 11

APPENDIX A – OUTLINE SWMP



**APPENDIX A:
Site Waste Management Plan**

**Somerset Urban
Extensions**

February 2012

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Site Waste Management Plan

Somerset Urban Extensions



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1 INTRODUCTION

The purpose of this outline Site Waste Management Plan (SWMP) is to set out a framework for site-specific SWMPs at the urban extensions proposed at Taunton and Yeovil and to outline the procedure by which waste will need to be managed by the **Client** and **Principal Contractor(s)** during the lifetime of the projects.

The SWMP will need to evolve during the course of the project when information becomes available, and regular monitoring and reviews will be undertaken to ensure continual improvement, legal compliance and the best cost effective solutions are in place.

This SWMP has been written with guidance from the following documentation:

- Site Waste Management Regulations 2008;
- Waste & Resources Action Programme (WRAP) Construction guidance (www.wrap.org.uk/construction);
- Waste Hierarchy;
- Code of Construction Practice (CoCP);
- The European Waste Catalogue (EWC); and
- Other relevant legislation.

The SWMP will also act as a guide to all persons involved with the project proposals on how to manage all types of waste, in accordance with statutory and best practice. This is summarised in the table below. The table shows the 15 Steps of this SWMP and whether each is WRAP standard or best practice.

This document is intended to be read in conjunction with an excel spreadsheet:

[WRAP SWMP Template Somerset UE.xls](#)

To aid understanding anything **highlighted in yellow** is an instruction to amend text as it requires site specific input. Anything in **BOLD** highlights a specific role. Anything highlighted in **red text** demonstrates something that is classed as a key compliance issue and must be adhered to. In addition:

SIGN OFF:	
where you see text highlighted within a box, this requires review, input and confirmation that you have understood the mandatory instruction.	

Table 1.1 The 15 Steps

Step	Worksheet	Standard Practice (Legal Compliance)	Best Practice	Excel spreadsheet tab reference
1	Administration & Planning	✓		1 Basic Details
2	Action Log		✓	2 Actions
3	KPIs and targets		✓	KPIS
4	Design measures and cost savings from design	✓		2 Actions

5	Responsibility for waste management	✓		1 Basic Details
6	Communication, training and distribution of the SWMP	✓		
7	Forecasting key waste production and planning reuse and recycling	✓		3 Forecast Waste, 4 Plan Waste Destination
8	Waste storage and disposal	✓		4 Plan Waste Destinations
9	Register of licences, permits and movements	✓		4 Specify Waste Carriers
10	Monitoring and Measurement	✓		6 Reporting
11	Summary of actual and estimated waste quantities and the costing of site waste management	✓ ¹		5 Actual Waste Movements
12	Project Completion	✓		1 Basic Details
13	Overall recycled content		✓	
14	Implementation	✓		
15	Final project declarations	✓ ¹		1 Basic Details

This SWMP has been developed in line with the requirements of the SWMP (England) Regulations 2008.

The key benefits of having a SWMP for the Client and Principal Contractor(s) include:

- Providing a structured and forward thinking approach to waste management and sustainability onsite;
- Identifying savings through improved resource efficiency, ordering, material storage and handling to eliminate waste at source;
- Assisting with compliance of internal Environment Management Systems (EMS), objectives and targets, and associated Key Performance Indicators (KPIs);
- Greater control of regulatory risks relating to virgin materials, waste storage, handling and disposal at site level;
- Greater transparency with interested parties including BREEAM, Local Authorities (LA), and the Environment Agency (EA); and
- Enhance waste storage and segregation practices to facilitate higher recycling and recovery onsite.

1.1 Project Overview

The outline SWMP covers the proposed urban extensions at Taunton and Yeovil and considers them on the basis of the information currently available.

The key work stream at each location will be the new construction scope which will be the preparation of the site, either phased or in a single stage followed by the phased delivery of the masterplanned scheme.



1.1.1 Geology

The SWMP will need to be refined when detail of the underlying geology at the development sites is confirmed and the final site levels and contours are established. This will determine the materials balance (i.e. relationship between cut and fill) and will allow any inert soil or rock materials needing to be taken off site for disposal to be quantified.

1.1.2 Contamination

The materials balance information will need to be combined with the findings of ground investigations to determine the extent of any contaminated material needing to be disposed of off site.

2 STEPS

Section 2 details the 15 steps of the SWMP.

2.1 STEP 1: Administration and Planning

Step 1 identifies basic information about the project and key individuals. This includes both the **Client** and the **Principal Contractor(s)**; both of whom are required to sign up to their key requirements under the SWMP Regulations.

See **1 Basic Details** tab in: [WRAP swmp Template Somerset.xls](#)

2.2 STEP 2: Action Log

The Action Log provides a framework for recording the outcome of project meetings on waste management. An Action Log will help maintain a record of those actions agreed throughout the project, and therefore will inform waste forecasts, thus assist compliance¹.

Table 2.2.1 Action Log.

Date	Organiser	Attendance record (name and company)	Notes taken by	List of Actions

¹ “6 – (3) It must record any decisions taken before the SWMP was drafted on the nature of the project, its design, construction method or materials employed in order to minimise the quantity of waste produced on site.”

2.3 **STEP 3: Key Performance Indicators and Targets**

Step 3 provides a means to report progress against a series of Key Performance Indicators (KPIs).

See **KPIS** in tab: [WRAP SWMP Template Somerset.xls](#). This information is generated from information inputted into **Basic Details**.

2.4 **STEP 4: Design Measures and Cost Savings from Design**

This step is to enable the recording of all waste reduction opportunities adopted during design². The table below records a series of design decisions, and helps quantify the impact of these.

On projects over £500,000 the **Principal Contractor(s)** must provide an estimate of the cost savings that have been achieved by completing and implementing the plan (Regulation 8 (4) (d)) must be provided and the cost savings from implementing waste reduction measures in design. Step 4, in combination with Step 10 satisfy this requirement.

See **2 Actions** tab in: [WRAP SWMP Template Somerset.xls](#)

² "6- (3) It must record any decision taken before the SWMP was drafted on the nature of the project, its design, construction method or materials employed in order to minimise the quantity of waste produced on site."

2.5 STEP 5: Responsibilities for Waste Management

Step 5 documents the waste management responsibilities. It is vital for the SWMP to be successfully implemented, that key roles and responsibilities for waste management are clearly defined, documented and communicated.

See **1 Basic Details** tab in: [WRAP SWMP Template Somerset.xls](#)

The **Client** is responsible for the production of the project SWMP via instruction to the **Project Manager**, with the **Principal Contractor(s)** responsible for maintaining the project SWMP and for making available the necessary resources to ensure that the SWMP is fully implemented. A series of key roles have been identified including:

2.5.1 Client

The **Client** understands his responsibility to prepare a SWMP for the project, and that it is passed down to (the **Design Team(s)** and) **Principal Contractor(s)** using the SWMP template and standards. The resulting SWMP will then form part of the contract between the Client and the relevant personnel/organisations involved in the project.

The **Client** is responsible for:

- Ensuring the SWMP is prepared prior to the start of demolition/construction;
- Ensure that the initial SWMP is prepared and relevant data collected;
- Work with Designers to accurately forecast waste data, and minimise waste production through design;
- The appointment of the **Principal Contractor(s)** for the project;
- The review and approval of targets suggested by the **Principal Contractor(s)**, as appropriate;
- Review, revise and refine the SWMP as necessary;
- Communicate changes in roles and responsibilities;
- Ensure site security measures are in place to prevent illegal disposal; and
- The sign off of the project once completed in conjunction with the **Principal Contractor(s)**.
- **The Client must be available to all persons involved with the project proposal/contractors to give reasonable direction in complying with the SWMP Regulations.**

2.5.2 Project Manager

The **Project Manager** is responsible for:

- Coordinating the estimation of total volumes of waste expected to be generated by the project with the **Principal Contractor(s)**, and the relay and review of targets with the **Client**;

- Identifying key SWMP related issues to tenderers at Tender stage, including information required to complete the site waste matrix;
- The effective relay of the SWMP to the **Principal Contractor(s)** to enable successful implementation of the SWMP on site.

2.5.3 Principal Contractor(s)

The **Principal Contractor(s)** is responsible for:

- Estimating the total volumes of waste expected to be generated by the project with the **Client**, and the setting of targets relating to reuse, recycling, and disposal of wastes on and off site prior to approval by the **Environmental Manager(s)**;
- Ensuring suitable resources are made available during the demolition/construction phase in relation to working towards the requirements of the SWMP;
- For the implementation and ongoing monitoring of the SWMP;
- Ensuring, so far as is reasonably practicable, that waste produced during construction is reused, recycled or other form of recovery³;
- The production and issue of the site waste matrix and implementation of the Site Waste Policy;
- Signing Waste Transfer Notes (WTN) and assigning responsibility for this to nominated persons on site in his absence;
- The identification and support of a suitable waste champion who will deal with the ongoing monitoring and enforcement of the SWMP at an operational level;
- For the collation of data relating to waste management and the input of data into the nominated monitoring tool; and
- The sign off of the project once completed with the **Client**.

Additional duties on the **Principal Contractor(s)** include:

- So far as is reasonably practicable, ensure coordination of the work and cooperation amongst all contractors at work during the demolition/construction phase⁴;
- Must ensure so far as is reasonably practicable that every worker carrying out the demolition/construction work is provided with-
 - Suitable site induction; and
 - Any further information and training needed for the particular work to be carried out within the terms of the SWMP⁵

³ SWMP Regulations 2008 Additional duties on the Principal Contractor. 1-(4)

⁴ SWMP Regulations 2008. Additional duties on the Principal Contractor. 1-(1)

⁵ SWMP Regulations 2008 Additional duties on the Principal Contractor. 1- (2)(a), (b)

- Must make and maintain arrangements that will enable the **Principal Contractor(s)** and the workers engaged in the demolition/construction work to cooperate effectively in promoting and developing measures to ensure that any waste arising on site is managed within the terms of the SWMP and in checking the effectiveness of such measures⁶.

2.5.4 CDM Coordinator

The **CDM Coordinator** is to liaise directly with the **Client** and **Principal Contractor(s)** regarding Health & Safety related issues and the SWMP.

2.5.5 Waste Champion(s)

It is good practice to appoint a suitable Waste Champion on site. Depending on the size of the project this may be the site agent or site foreman, site engineer or environmental manager.

The **Waste Champion(s)** is responsible for:

- The effective communication of the SWMP to his operatives and ensures enforcement of the SWMP at an operational level e.g. identifying areas for improvement where segregation is not being followed; and
- For the delivery of relevant toolbox talks where necessary.

Section 2.5 SIGN OFF:	
Please confirm you have read and understood your duties in this section by checking the boxes opposite	
Client	<input type="checkbox"/>
Designer(s)	<input type="checkbox"/>
Project Manager(s)	<input type="checkbox"/>
Principal Contractor(s)	<input type="checkbox"/>
CDM Coordinator	<input type="checkbox"/>
Waste Champion(s)	<input type="checkbox"/>

The above list of personnel forms the 'distribution list'.

⁶ SWMP Regulations 2008 Additional duties on the Principal Contractor. 1-(3)

Table 2.5.1 below is needed because the majority of projects are delivered by a range of sub contractors, each of which will need to manage their waste in line with the project SWMP. The table below allocates responsibility to individuals/ organisations for different elements of the work.

Table 2.5.1 Assignment of waste management responsibility by site Activity/ sub contractor.

Site Activity/ Sub contractor workplace	Primary waste stream	EWC Code	Waste Management responsibility	Relevant Specification/ Contract Clause for Waste Management
Earthworks				
Foundations				
Structure				
Dryliners				
Building Envelope/Cladding				
Mechanical and Electrical				
Trades (Joinery, painting, Plastering, Rendering, Plumbing, Heating etc.)				
Landscaping & habitat creating/ restoration				
Removal of site offices, temporary works & final clear away				

2.6 STEP 6: Forecasting Waste Production & Planning Reuse & Recycling

Step 6 forecasts the waste streams, sub divided by project activity (Construction, Demolition or Excavation) and material type. Waste forecasting is an essential part of the SWMP, and a minimum requirement. Forecasting waste allows a clear strategy to be established to effectively manage the waste.

See **3 Forecast Waste** tab in: [WRAP SWMP Template Somerset.xls](#)

The Client and Design Team have investigated all likely waste streams to be generated from this project, approximate volumes of material and assigned relevant targets. Targets have been set by the Principal Contractor(s) (with final approval by the Waste Champion(s)) to maximise reuse and recycling of material both on and offsite, and opportunities for both financial savings and environmental sustainability.

The **Forecast Waste** tab identifies the type and quantity of each material, and where this waste is to be sent (landfill or some form of recycling/reuse).

The Environment Agency accept the principle that contaminated soils not requiring treatment can be considered suitable for use, provided there is no risk of pollution. On this premise, all clean excavated material should be reused within the vicinity in which it was excavated and this should be a principle for the developments. The excavated material is not classified a waste if it is not being ‘discarded’ from site.

The design should ensure that the principles of the Waste Hierarchy - <http://www.defra.gov.uk/environment/waste/topics/documents/waste-hierarchy.pdf> (prevent, minimise, reuse, recycle, recovery, disposal) are applied to the SWMP to enable best practice onsite to improve the overall sustainability/improve green credentials of the projects. It is intended that this SWMP should evolve during the course of the projects. Regular monitoring and reviews need to be undertaken (Section 3.10) to ensure continual improvement, legal compliance and that cost effective solutions are in place.

2.6.1 Recycling & Reuse Initiative

As part of the development of the SWMP the following initiatives have been identified, aiming to reduce the amount of waste produced in the first instance, and assisting in the recycling and reuse of waste as an alternative to offsite disposal.

Table 3.6.1 Recycling & Reuse Initiatives

Material	Legislation/ Notes
Recycling Offsite	
Plastic packaging	
Paper & Cardboard	
Plasterboard e.g. via British Gypsum/ Knauf	
Concrete and demolition wastes (processed)	EA/ WRAP Quality Protocol
Steelwork	
Recycling Onsite	
Concrete and demolition waste (processed)	New Waste Exemption System 2010
Concrete will have to be crushed for use as an engineering fill or as aggregate for fresh concrete. Crushing of material may have to take place off site due to site space constraints. An alternative option is to bring to site recycled material from an approved supplier.	Environmental Permit Regulations 2010. Schedule 3. Chapter 2. i.e.: -Use waste under exemption U8; -Treat waste to make it suitable for use in construction under exemption T5; -Treat bricks, tiles, concrete by crushing T7. * if not in this chapter will require permit.

Reuse Onsite	
Arisings, uncontaminated ⁷	Environmental Permit Regulations 2010
Demolition waste (without processing)	It is unlikely that this will require an exemption as long as the material has not been processed further e.g. has not been crushed, and is simply reused in its demolition state, otherwise this must be subject to a suitable Environmental Permit Regulations 2010 Exemption.
Wood	

2.7 STEP 7: Communication, Training and Distribution of the SWMP

Copies of the SWMP will be made available to all Principal and Sub Contractors at the outset. The SWMP will also assist in defining terms and conditions through the implementation and monitoring of this plan relating to waste management on site during the project lifetime. In addition to these key project partners, the **Principal Contractor(s)** will have full access to the SWMP in order for comments to be made with regard to any additional Health & Safety requirements envisaged as part of the development of this project.

A Waste Planning Meeting will be scheduled for all key project team members (see distribution list) at the Tender stage to formulate a waste management strategy to optimise best practice waste management through the lifetime of the project.

Date Waste Planning Meeting set	__/__/__
Date Waste Planning Meeting held	__/__/__

A copy of the latest version of the SWMP should be displayed in a prominent location on site⁸ including the site office.

Training and communication of the SWMP will be made by the following means:

- Within the Principal Contractor’s site induction(s);
- Further information and training needed for the particular work shall be carried out within the terms of the SWMP;
- Formal training course on waste management (where appropriate); or
- The delivery of Toolbox talks by Principal/ Sub Contractor or Waste Champion(s).

⁷ If the excavated material does not prove to be contaminated in accordance with the WAC testing and Soil Guideline Values (SGVs), then there are a number of reuse and recycling opportunities that exist.

⁸ “9-(1) The Principal Contractor(s) must ensure that the SWMP is kept- (a) at the site office, or (b) if there is no site office, at the site.”

Training and communication shall be provided to all personnel working on the project. This shall be implemented in order to highlight the importance of the SWMP and individual responsibility in ensuring effective waste minimisation and management on site.

The Principal Contractor(s) is responsible for the distribution of the latest version of the SWMP to all parties on the distribution list. Each party will be responsible for distributing updated versions and removing superseded copies (hard and electronic format) in their particular work field. The Principal Contractor(s) must ensure that every contractor knows where [the SWMP] is kept, and must make it available to any contractor carrying out work described in the SWMP⁹

Section 2.7 SIGN OFF:	
Please confirm you have read and understood your duties in this section (including the provision of SWMP issues in induction, training and awareness programmes for site staff, distribution of SWMP) in this section by checking the box opposite.	
Principal Contractor	<input type="checkbox"/>

2.8 STEP 8: Waste Storage and Disposal Options

Suitable waste storage facilities/arrangements must be made onsite to ensure effective segregation of wastes onsite to aid higher rates of recovery (e.g. through recycling or reuse initiatives. See Section 2.7).

The placing of waste management contracts will, where possible, consider the implications of long distance travel in terms of health, safety and environmental risks, commercial terms and increased emissions from vehicles. The project team will consider using local waste contractors as far as possible.

It is essential that the construction work is carried out closely with the waste management contractors, in order to determine the best techniques for managing waste and ensure a high level of recovery of materials for recycling.

A specific area shall be laid out and labelled to facilitate the separation of materials for potential recycling, salvage, reuse and return. Recycling and waste bins are to be clearly labelled in order to avoid contamination of materials. Skips for segregation of waste identified currently are:

- Metal (e.g. copper and steel)
- Inert (e.g. inert plastics, brick, concrete and rubble)
- Hazardous (e.g. asbestos, used spill materials, waste oil)
- Mixed non-hazardous
- Waste Electrical & Electronic Equipment (WEEE) ;
- Wood;
- Packaging;

⁹ SWMP Regulations 2008 9-(2)

- Gypsum;
- Glass.

All waste management contracts (carriers and facilities) are listed within the **Specify Waste Carriers** tab of spreadsheet: [WRAP_SWMP_Template_Somerset.xls](#). This is to be updated regularly with any additional service providers, changes in destination sites or additional waste streams being generated. **The responsibility for ensuring the tab is completed and kept up to date is with the Principal Contractor(s).**

Both the Client and Principal Contractor(s) shall take reasonable steps to ensure that site security measures are in place to prevent illegal disposal of waste at the site.

Section 3.8 SIGN OFF:	
Please confirm that you have read and understood your duties in this section (e.g. have identified waste storage solutions on site, correct signage, completed the Waste Carrier and Destination Register and identified all relevant Duty of Care requirements for waste carriers and disposal sites) by checking the box opposite.	
Principal Contractor(s)	<input type="checkbox"/>

2.9 STEP 9: Register of Licences, Permits and Movements

This step documents the tracking of waste carriers and waste destinations. Both of which are mandatory to comply with the SWMP Regulations 2008 and the Environmental Protection Act 1990.

See **4 Specify Waste Carriers** tab in: [WRAP_SWMP_Template_Somerset.xls](#)

The Environmental Permitting (England and Wales) Regulations 2010 require that disposal sites are classified into one of three categories dependent on the chemical composition of the material; these are hazardous, non-hazardous and inert. Prior to disposal, if material is deemed hazardous it must be pre-treated to meet the Waste Acceptance Criteria. Further stipulations within the Environmental Permitting Regulations 2010 are as follows:

- Hazardous liquids, flammable, corrosive, explosive, oxidising and infectious wastes have been banned from landfill since July 2002;
- Non hazardous liquids have been banned since 2007;
- Co- disposal has been banned since 16 July 2004;
- Whole tyres were banned from 2003, and shredded tyres have been banned since 2006;
- Waste will be required to be “pre-treated” prior to landfilling; and

Operators must demonstrate that they and their staff are technically competent to manage the site, and have made adequate financial provision to cover the maintenance and aftercare requirements.

The **4 Plan Waste Destination** tab pulls information from the Forecast Waste tab and Specify Waste Carrier tab and requires a proposed destination to be chosen. Cost values (£/m³ or £/t) shall be inputted by the respective Principal Contractor(s).

2.10 STEP 10: Monitoring & Measurement

Step 10 satisfies the SWMP Regulations 2008 requirement to ensure projects are being monitored and going to plan.

The effectiveness of the SWMP will depend upon the enforcement of its requirements on site and include monitoring to be made by the **Waste Champion(s)** and **Site Manager(s)** on site. Responsibility for the formal recording of all waste movements shall be with the **Site Manager** and is to be recorded on a bi-weekly basis using the approved excel spreadsheet ([WRAP SWMP Template Somerset.xls](#)). It is the responsibility of the **Principal Contractor(s)** to ensure the data is collated and that this is inputted into the nominated monitoring tool, and that all waste transfer notes/ Hazardous waste consignment notes are forwarded to the **Waste Champion(s)** weekly.

The **six Reporting tab** pulls information from all tabs in the excel spreadsheet to provide a comparison of forecast versus actual data.

A 'spot check' will be made by the **Site Manager(s)** in relation to the completeness of the weekly monitoring sheet, any waste transfer note and any hazardous waste consignment note against the **Waste Carrier and Destination tab** in [WRAP SWMP Template Somerset.xls](#). This will ensure both the accuracy of data entered in to the monitoring tool and legal compliance issues are suitably identified.

The skips shall be monitored to ensure that cross-contamination of segregated skips does not occur. This will be covered in the toolbox talks –reviewing how the onsite waste management system is working and point out the extra costs associated with contamination. The **Principal Contractor(s)** shall continually review the type of surplus materials being produced and change the site set up to maximise on reuse or recycling and the use of landfill will be the last option.

If any problems are identified during the lifetime of the project in relation to exceeding the expected SWMP waste stream volumes, failure to meet stated targets or issues relating to cost effective and legal transfer of waste materials, then they are to be reported to the **Project Manager** for further discussion on the best solution. This may trigger a review of the SWMP in relation to adjustment of targets, however, any change would need to be documented and justified.

Any deviations need to be entered into the **Basic Details** tab.

This SWMP shall be reviewed at least every six months (but monthly is recommended) during the lifetime of the project by the **Client** and the **Principal Contractor(s)** to ensure that estimated targets are being achieved and that realistic solutions are provided for unplanned events or abnormal wastes. Updates also need to be inputted into the **Basic Details** tab.

Section 2.10 SIGN OFF:	
Please confirm you have read and understood your duties in this section (i.e. review of the SWMP at least every 6 months, regular review of WTNs/ Hazardous waste consignment notes and that copies of all tickets will be forwarded to the waste champion on a weekly basis, input of all waste related transfer note into the nominated tool) by checking the box opposite.	
Principal Contractor(s)	<input type="checkbox"/>
Please confirm you have read and understood your duties in this section (i.e. review of the SWMP	

with the Principal Contractor at least every six months) by checking the box opposite.

Project Manager



2.11 STEP 11: Actual Waste Arisings

This step provides a framework for recording the actual waste arisings from the project, allowing a comparison with earlier estimates.

See **5 Actual Waste Movements** in: [WRAP SWMP Template Somerset.xls](#).

The Environmental Permitting Regulations 2010 also require that waste is described by European Waste Catalogue (EWC) codes on Transfer Notes required under the Duty of Care Regulations. The EWC categorises wastes into 20 main groups and approximately 900 codes. The EWC also identifies Hazardous Wastes, many of which are currently Special Waste and dealt with by the Special Waste Regulations, but some of which are not, such as fluorescent tubes, certain batteries and cathode ray tubes.

2.12 STEP 12: Project Completion

Within one month of practical completion of the project, the **Client** and **Principal Contractor(s)** will review the SWMP and ensure that it is updated to reflect the following legal compliance requirements:

*“8-(4) within 3 months of the work being completed the **Principal Contractor(s)** must add to the plan-*

(a) confirmation that the plan has been monitored on a regular basis to ensure that work is progressing according to the plan and that the plan was updated in accordance with this regulation;

(b) a comparison of the estimated quantities of each waste type against the actual quantities of each waste type;

(c) an explanation of any deviation from the plan;”

(d) an estimate of the cost savings that have been achieved by completing and implementing the plan;”

(e) a description of any lessons learnt from any differences in circumstances between the first draft of the plan , and any subsequent updates and actual final performance (including detailed explanation as to why targets have not been met). Information to be provided as to how any associated corrective actions will be incorporated into future projects/ management systems; and

*“10-(1) The **Principal Contractor(s)** must keep the SWMP for two years after the completion of the project at the **Principal Contractor’s** principal place of business or at the site of the project.”*

See **1 Basic Details** tab for final declaration.

2.13 STEP 13: Overall Recycled Content

Step 13 is not a requirement of the SWMP Regulations 2008, although it demonstrates the project is meeting requirements for recycled content. It is becoming increasingly required by construction clients.



See **Recycled_Content.xls**

2.14 STEP 14: Implementation

Step 14 provides a check list to ensure that the necessary arrangements have been made to ensure effective SWMP implementation on site. This includes additional duties outlined in the SWMP Regulations 2008 to ensure the effective operation, monitoring and reporting of the SWMP.

Prior to implementation the SWMP, the **Site Manager(s)** or **Principal Contractor(s)** must complete all necessary checks as outlined in the worksheet below. The check list covers duties necessary for legislative compliance and other recommended actions to move towards best practice.

The checklist should be signed off by the **Client** and **Principal Contractor(s)** every time the SWMP is updated.

Table 2.14.1 SWMP Checklist

	Yes	No	Section
Client Checks			
The Client must give reasonable directions to any contractor so far as is as necessary to enable the Principal Contractor(s) to comply with the Regulations. ¹⁰	✓		Section 2.5
Principal Contractor(s) Checks			
The Principal Contractor(s) must ensure that so far as reasonably practical coordination of the work and cooperation among contractors at work during the construction phase. ¹¹	✓		Section 2.5
The Principal Contractor(s) must ensure that so far as reasonably practical every worker carrying out construction work is provided with a suitable site induction. ¹²	✓		Section 2.6
The Principal Contractor(s) must ensure that so far as reasonably practical every worker carrying out construction work is provided with any further information and training needed for the particular work to be carried out within the terms of the SWMP. ¹³			Section 2.6
The Principal Contractor(s) must make and maintain arrangements which will enable the principal Contractor and workers to engage in construction work to cooperate effectively in promoting and developing measures to ensure any waste arising on site is managed within the terms of the SWMP and in checking the effectiveness of such measures. ¹⁴			Section 2.4 2.6 2.7 2.8

¹⁰ SWMP Regulations 2008. Additional Duties on the Client 2-(1)

¹¹ SWMP Regulations 2008. Additional Duties on the Principal Contractor 1-(1)

¹² SWMP Regulations 2008. Additional Duties on the Principal Contractor 1-(2) (a)

¹³ SWMP Regulations 2008. Additional Duties on the Principal Contractor 1-(2) (b)

¹⁴ SWMP Regulations 2008. Additional Duties on the Principal Contractor 1-(3)



The Principal Contractor(s) must ensure so far as reasonably practical that waste produced during demolition/construction is reused, recycled or recovered. ¹⁵			Section 2.7
Have terms and commercial rates been agreed with waste management contractors?			Section 2.8
Have data reporting procedures been agreed with waste management contractors?			Section 2.10
For offsite waste management or disposal- Are all the waste destination details verified?			Section 2.7
Has a waste segregation/ collection area been prepared?			Section 2.8
Has the waste management area been adequately sign posted?			Section 2.8
Has a waste management planning meeting been set?			Section 2.6
Has the waste management document control/ filing system been set up?			Section 2.6
Have all necessary staff and contractors read and signed the SWMP?			Section 2.5
Have the waste management targets/ KPIs been set?			Section 2.3
Has the SWMP been approved by the Project Manager?			Section 2.1
Client & Principal Contractor(s) Checks			
Have the Client and Principal Contractor(s) reviewed, revised and refined the SWMP as necessary, and ensured that any changes in respective roles and responsibilities are clearly communicated to those affected? ¹⁶			Section 1.0 2.6
Have the Client and Principal Contractor(s) taken reasonable steps to ensure sufficient site security measures are in place to prevent the illegal disposal of waste? ¹⁷			Section 2.8
Section 2.14 SIGN OFF:			
Please confirm you have read and understood your duties in this section (i.e. completed all the necessary checks) by checking the box opposite.			

¹⁵ SWMP Regulations 2008. Additional Duties on the Principal Contractor 1-(4)

¹⁶ SWMP Regulations 2008. Additional Duties on both the Client and the Principal Contractor. 3-(1)

¹⁷ SWMP Regulations 2008. Additional Duties on both the Client and the Principal Contractor. 3-(2)



Principal Contractor(s)	<input type="checkbox"/>
Client	<input type="checkbox"/>

2.15 STEP 15: Document Declaration

Section 2.15 FINAL SIGN OFF:		
By signing this box I confirm that the Project has met all the requirements of the SWMP Regulations 2008 as outlined in this document and the accompanying excel spreadsheet (WRAP SWMP Template Somerset.xls)		
Principal Contractor(s)	____/____/____	
Client	____/____/____	

3 SITE WASTE MANAGEMENT GUIDANCE

The following section acts to serve as guidance to all persons involved in the waste management of the project proposals.

3.1 Classification of Waste

The overarching requirement of classifying waste is to ensure that it is adequately described such that it is disposed of at the appropriate disposal facilities. The responsibility for classification of waste resides with the producer of the waste, this could be classed as the Client or the Principal Contractor(s), and will depend upon the specific circumstance.

Waste Transfer Notes (WTN) and Hazardous Waste Consignment Notes must contain a written description of the waste and also a specific six figure code from the European Waste Catalogue (EWC) (implemented in the UK by the [List of Wastes \(England\) Regulations 2005](#) (SI 2005No. 895) amended by SI 2005/1673). The EWC is a list of wastes divided into 20 chapters. Chapter 17 is the most relevant section for classifying waste produced on construction sites.

3.1.1 Inert Waste

(<http://publications.environment-agency.gov.uk/pdf/GEHO0509BPWJ-e-e.pdf>)

Inert Waste is waste that does not:

- Undergo any significant physical, chemical or biological transformations;
- Dissolve burn or otherwise physically or chemically react;
- Biodegrade or adversely affect other matter with which it comes into contact; and
- its leachability is insignificant¹⁸.

Examples include: Glass, steel, concrete, bricks, tiles, and arisings excluding peat and topsoil)

3.1.2 Non Hazardous Waste

Non hazardous waste is simply defined as “waste that is not hazardous waste”.

Non hazardous waste is waste which does not feature on the list of hazardous waste in the EWC.

Examples include general mixed construction waste (EWC 17 09 04)

3.1.3 Hazardous Waste

[What is a Hazardous waste?](#)

Each movement of hazardous waste has to be accompanied by a Hazardous Waste Consignment note. These must be uniquely referenced but otherwise contain the same information as a standard WTN.

There are two types of waste listed in the EWC, referred to as “entries” they are termed “**absolute**” and “**mirror**” entries.

“Absolute entries” are always hazardous waste e.g. asbestos or fuel/oils.

¹⁸ Regulation 7 (4) of the Landfill Regulation 2002

“Mirror entries” are where the waste may or may not be hazardous. It will be hazardous if it contains hazardous properties (determined by the relevant hazardous (H) Code 1 -14) or chemical concentrations exceeding a set “threshold”. For example some contaminated soils may be considered non hazardous, but where those soil exceed the threshold for a particular contaminant it will be hazardous.

Example: Arisings excavated from site containing asbestos.

Asbestos is classed as a substance known to be carcinogenic of category 1 or 2. If the % concentration of asbestos within the overall stockpile of arisings exceeds or is equal to a concentration 0.1% then the entire stockpile will be classed as hazardous waste.

If, however, the concentration of asbestos within the stockpile is less than 0.1% then the entire stockpile will be classed non hazardous.

Guidance on determining whether material is hazardous is provided in Technical Guidance WM2: Hazardous waste – Interpretation of the definition and classification of hazardous waste”. It outlines the methodology for assessing wastes based on the EWC 2002, determination of dangerous substances within waste and provides a hazardous waste assessment methodology. See <http://www.environment-agency.gov.uk/business/topics/waste/32200.aspx>

In England and Wales, any [construction] site that produces hazardous waste must notify the Environment Agency (EA) of the premise where that waste is produced or is to be removed from, irrespective of the amount. The Principal Contractor is expected to register the construction site as ‘Hazardous Waste Producer’ with the EA prior to any removal of hazardous waste. This can be done quickly and cost effectively (prices at July 2011: £18 online, £23 by phone) by logging onto the EA’s website at: <http://www.environment-agency.gov.uk/business/topics/waste/32198.aspx>

Or alternatively by calling the EA using the following number: 08708 502 858.

3.2 Waste Acceptance Criteria (WAC)

Before contaminated or inert wastes can be accepted by a landfill the operator must be able to show that it can be accepted in accordance with its [Waste Acceptance Criteria \(WAC\)](#). Under this regime, it is the waste producer that has the responsibility for basic characterisation which uses a standard suite of leachate testing to ascertain the potential for the wastes to cause water pollution. There are published maximum leachate criteria for the following categories of waste, and are available from the landfill site you intend to use.

- Hazardous waste (numerical limits for leachable substances and organic content, along with standards for physical stability);
- Non-reactive hazardous waste;
- Non hazardous waste (no numerical limits for non-hazardous waste); and
- Inert waste.

Certain materials meet the definition of inert waste without the need for further analysis or need for testing to show they meet the WAC for inert landfill sites. These are as follows:

Table 4.2.1 Materials deemed inert without WAC testing.

Description	Exclusions	EWC code
Waste glass		10 11 12
Waste glass based fibrous materials	Only without organic binders	10 11 03
Glass packaging		15 11 07
Concrete		17 01 01
Bricks		17 01 02
Tiles and ceramics		17 01 03
Glass		17 02 02 20 01 02
Soil and stones	Excluding topsoil and peat	20 02 02
Soil and stones including naturally occurring sand and clay	Excluding topsoil and peat	17 05 04

All other waste needs to meet the total chemical concentration and leachability levels of the WAC and therefore will need to be tested. It should be noted that individual landfill sites may have additional acceptance criteria to the standard WAC and consequently operators should be consulted before finalising the decision on disposal site.

3.3 Disposal and movement of waste offsite

3.3.1 Transfer of Waste

When removing waste from site, a Waste Transfer Note (WTNs) (or Consignment Note for hazardous wastes) must be completed prior or at the point of removal from any site. WTNs must be used for all shipments of inert and non hazardous wastes. These documents are completed in three parts and include details for the following three parties: waste producer; waste carrier; and receiving site. The following details must be included on all WTNs:

- Producer site address;
- Written description of waste and EWC code;
- The quantity of waste and how it is contained (e.g. 8 yard skip);
- Waste carrier details and licence number; and
- Receiving site address and licence number.

Provided the nature of the waste does not vary and it goes to the same site via the same registered waste carrier, for a period of no longer than 12 months, it is possible to use one WTN to cover a complete consignment of waste irrespective of the number of loads, known as a season ticket or Annual Waste Transfer Note.

However, if the waste composition changes (e.g. degree of contamination, or different type of waste), or it is to be sent to a different site, or moved by a different carrier, then a new WTN has to be completed.

3.3.2 Pre-treatment

If the material is non hazardous and it is destined for disposal directly to landfill, pre-treatment must have been applied and a declaration detailing the treatment applied attached to the WTN.

All hazardous and non hazardous wastes will be pre-treated prior to disposal to landfill. The methods of pre-treatment will enable the waste to meet the 'three-point test' as follows:

- It must be a physical, thermal, chemical or biological process (including sorting);
- It must change the characteristic of the waste;
- It must do so in order to:
 - Reduce its volume; or
 - Reduce its hazardous nature; or
 - Facilitate its handling, or
 - Enhance its recovery.

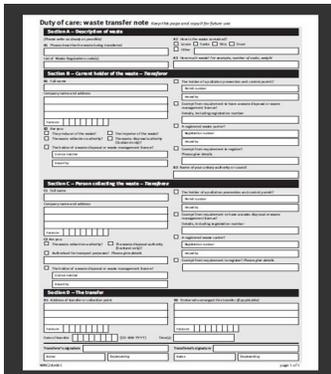
Source segregation is seen as a pre-treatment option. This can be applied to waste generation on site, including general waste and arisings.

A declaration stating the pre-treatment method applied to the waste must be attached to any WTN for non hazardous waste being disposed of to a landfill, the **Principal Contractor's Site Manager(s)** will ensure this accompanies the WTN.

An example pre-treatment confirmation form (declaration) can be found in Annex1 (page 35) of the EA's 'Treatment of non-hazardous wastes for landfill' 2007 publication. See:

<http://publications.environment-agency.gov.uk/pdf/GEHO0207BLWJ-e-e.pdf?lang= e>

3.3.3 Waste Transfer



By signing the WTN you are confirming that all the details are correct and that the material is to be sent by a licenced waste carrier to a suitably licenced receiving site, permitted to receive that type of waste. Your signature is binding of this fact and completes the WTN as a legal document, which must be retained for a minimum of two years (three years if it is hazardous waste).

It is the responsibility of the **Waste Champion(s)** or **Site Manager(s)** to ensure all WTN/Consignment Note information is inputted into the Register prior to review by the Principal Contractor(s).

WTN

3.3.4 Hazardous Waste Consignment Notes



The image shows a completed 'Appendix A - Completed consignment note' form. It is a detailed document with multiple sections, including fields for 'Waste Producer', 'Waste Receiver', 'Waste Description', 'Hazardous Waste Details', and 'Transport Details'. The form is filled out with text and numbers, representing a real-world example of a hazardous waste consignment note.

Consignment note

Hazardous Waste Consignment Notes must contain all the information identified above in section 4.3.1 for standard WTNs, however, they must also contain the following elements:

- Hazardous Waste Producer Premise Code;
- Details of what makes the Consignment Note hazardous;
- % concentration of contaminant; and
- The relevant hazard code (H1-H14).

A season ticket can not be used for hazardous waste; single Consignment Notes must accompany each waste load removed from site.

3.4 Environmental Permit Exemptions

Environmental permit exemptions (detailed in Schedule 3 of the Environmental Permitting (England and Wales) Regulations 2010) have been developed to provide a lighter regulatory touch in order to promote the recovery of waste, as opposed to waste being disposed of directly to landfill. These exemptions take up to 25 working days to be approved. The relevant forms need to be completed by the Principal Contractor(s) to the EA. The forms can be found at:

<http://www.environment-agency.gov.uk/business/topics/permitting/default.aspx>

“waste” is defined as any object or substance that either the holder discards; intends to discard; or is required to discard (Waste Framework Directive & EA guidance)

3.5 Landfill Tax

The tax relates to two bands, one for “inert/inactive” waste and the other for “active” waste. From 1 April 2010 the Landfill Tax rate for active waste increased to £48 per tonne. The rate for inactive waste is £2.50 per tonne (April 2010).

The Coalition Government Emergency Budget 2010 stated that the standard rate of landfill tax will increase by £8 per tonne each year from 1 April 2011 until at least 2014. There will be a floor under the standard rate at £80 per tonne, so that the rate will not fall below £80 per tonne from April 2014 until at least 2020.

The government has introduced a new qualifying criteria for lower rated wastes, which was legislated in the Financial Bill introduced in the autumn 2010, and came into effect on 1 April 2011.