SOUTH WEST WALES REGIONAL WASTE GROUP

SOUTH WEST WALES REGIONAL WASTE PLAN

1ST REVIEW

August 2008

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

FOREWORD BY THE CHAIR OF THE REGIONAL WASTE GROUP

The time has come for local authorities across Wales to make crucial decisions regarding the management of waste. Waste, and the way we deal with it, remains one of the largest environmental issues facing the principality as a whole and each of the individual regions. The expectations on local authorities are great and each face impending large fines from the European Commission and the Welsh Assembly Government if a new generation of resource recovery facilities for waste are not built soon.

Collaborative working is seen as an integral part of the solution. This Regional Waste Plan 1st Review has been prepared by the South West Wales Regional Waste Group, which is made up of a wide range of interests including planning and waste management officers from local government, the Welsh Assembly Government, Environment Agency Wales and other government bodies, and representatives from the waste industry and environmental groups. The process has therefore been inclusive and the Plan has benefited from a wide range of views.

In producing this document we have both reviewed the different combinations of waste management technologies which would enable the region to meet or exceed the targets and developed further the spatial strategy through the identification of 'areas of search' for the location of the required waste management and resource recovery facilities across the region.

The RWP 1st Review is supported by a Sustainability Appraisal, Strategic Environmental Assessment and by both public and stakeholder preferences as well as a Strategic Health Impact Assessment.

On behalf of the South West Wales Regional Waste Group therefore, I am pleased to present this Regional Waste Plan 1st Review for South West Wales.

The RWP 1st Review will assist the region in developing an integrated and adequate network of waste management facilities by providing strategic information on the types of waste facilities required and the types of locations likely to be acceptable. The RWP 1st Review will provide a strategic framework for the preparation of Local Development Plans and will be a material consideration in the development control process.

Councillor Pam Palmer
Chair of the South West Wales Regional Waste Group

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PART A:

BACKGROUND & INTRODUCTION

1. INTRODUCTION

1.1 Waste

1.1.1 Wales has historically approached waste as a problem that is most conveniently and cost effectively disposed of in landfill. It is now widely recognised that this approach is unsustainable in the long-term because of growing volumes of waste, the risk of environmental pollution and the burying of valuable resources.

1.1.2 Waste must now be approached as a resource from which value can and should be recovered. The recovery approach will see the value in waste being realised through the reuse, recycling or composting of products and materials and the production of energy. New facilities will need to be developed in South West Wales to recover value from the waste produced in the region.

1.1.3 Unfortunately, there will always be a proportion of waste that cannot be reused, recycled, composted or used to produce energy. There will therefore always be a need for landfill facilities in South West Wales to dispose of the waste produced in the region from which value cannot be recovered.

1.1.4 Proposals for the development of facilities to deal with waste often face opposition because they are perceived to be a '*bad neighbour*'. This can result in a costly and lengthy planning process in some cases with the proposal ultimately being rejected. This in turn makes developing waste management facilities expensive, risky and time consuming.

1.1.5 This Regional Waste Plan (RWP) 1st Review provides strategic information on the types of waste management / resource recovery facilities required through a '*RWP Technology Strategy'* and provides strategic information on the types of locations likely to be acceptable through a *'RWP Spatial Strategy'*. The RWP Technology Strategy and RWP Spatial Strategy will be brought together through the Local Development Plan (LDP) preparation process in individual Unitary Authority (UA) areas in order to identify appropriate sites for waste management / resource recovery to provide developers – both UA's and the wider waste management industry – with more certainty in developing waste management / resource recovery facilities.

1.2 Regional Waste Planning

1.2.1 This Regional Waste Plan 1st Review has been prepared by the South West Wales Regional Waste Group (RWG) in line with the requirements of Planning Policy Wales Technical Advice Note 21: Waste (TAN 21)[1] and later guidance from the Welsh Assembly Government (WAG)[2].

1.2.2 The South West Wales Group is one of three such bodies set up in Wales to provide regional coordination and a strategic integrated approach to the management of all waste streams. The Group is led by a Regional Member Forum (RMF) made up of Councillors from the 8 constituent Local Planning Authorities (LPA's) in the region and is supported by a Regional Technical Group (RTG) of officers from local government, WAG, Environment Agency

[1] Planning Policy Wales Technical Advice Note 21: Waste (November 2001).
[2] WAG, 2006. *The Revision of the Regional Waste Plans*. Cardiff: WAG.

Wales (EAW) and other government bodies and representatives from the waste industry and environmental groups. Full membership of the RMF and RTG is set out in Appendix A.

1.2.3 The geographical area covered by the RWG is shown in Figure 1.

Figure 1: The South West Wales Region[3]

Bridgend County Borough Council

Brecon Beacons National Park Authority

Carmarthenshire County Council

Ceredigion County Council

Pembrokeshire County Council

Pembrokeshire Coast National Park Authority

Neath Port Talbot County Borough Council

City & County of Swansea

1.3 The Region

1.3.1 In 2001 the South West Wales region had a resident population of 848,328[4], which represented 29.2% of the population of Wales. Subsequent mid-year estimate figures for the region indicate a slow and continual increase in population over the period 2001-2005[5].

1.3.2 The region has a distinct mix of urban and rural areas. The urbanised area is centred on Swansea Bay at the western end of Industrial South Wales. The remaining part of rural West Wales is a mix of service centres, market towns and dispersed rural villages. Such areas present different problems and challenges for the management of waste.

1.3.3 The Swansea Bay area is restructuring an economy originally based on coal, iron, steel, tinplate and petrochemicals, and has achieved some success in attracting private and public investment. Rural South West Wales has traditionally attached its economic strengths to the agriculture industry, service sector employment, petrochemicals and tourism.

1.3.4 South West Wales is overall, an area of high landscape and ecological value. It has the only primarily coastal National Park in the UK (Pembrokeshire Coast), part of the Brecon Beacons National Park and Gower AONB. It also has many national [Sites of Special Scientific Interest (SSSI's); National Nature Reserves (NNR's)] and international sites

[3] Unitary Authorities are Waste Planning Authorities, Waste Collection Authorities and Waste Disposal Authorities. National Park Authorities are Waste Planning Authorities but not Waste Collection Authorities or Waste Disposal Authorities. For this reason the capacity requirements for the strategic waste management Options are broken down by UA area and no capacity requirements are presented for the National Park Authorities.

[4] 2001 Census: Office for National Statistics (ONS).

[5] Mid-Year Estimate figures indicate that over the period 2001-2005, the total population in South West Wales has increased by approximately 17,900 (+2.1%). ONS August 2006.

[Special Areas of Conservation (SAC's); Special Protection Areas (SPA's); and Ramsar sites] within its defined area that have been designated for their important nature conservation interests. As well as its designated areas, the environmental quality of its remaining coastline and many parts of its countryside are of a particularly high quality. It is these qualities that have made the region a preferred destination for visitors, with tourism a key employer of increasing significance in the region.

1.3.5 The commercial ports and freight handling facilities of Milford Haven Waterway, Fishguard, Port Talbot and Swansea are of particular importance to the area. The ports link with the remainder of the UK via the A40 / A48 / M4 corridor. The rail network in the region comprises the Inter City and West Wales lines, and the Heart of Wales line. The main rail links are however east-west, with no significant rail penetration on a north-south basis.

1.4 Overview of the first Regional Waste Plan

1.4.1 The first RWP for South West Wales was agreed by the RMF, endorsed by all of the local planning authorities in the region and published in March 2004.

1.4.2 The first RWP set out the Regional Waste Strategy shown in Figure 2. The RWP allocated the required capacity for each waste management / resource facility type to each local authority area with the purpose that provision is made for meeting those capacity requirements in Development Plans. The RWP also provided a guide to the locational requirements of each facility type to assist LPA's with site selection.

Figure 2: The First Regional Waste Strategy

- Aim to achieve the 2020 Landfill Directive targets by 2013;
- Achieve this principally through maximising recycling and composting;
- Deal with residual waste by Mechanical Biological Treatment (including an element of energy from waste or landfill);
- Send the residual waste from this process to landfill; and
- Limit the amount of waste going to landfill to that which cannot be dealt with acceptably in any other way.

1.4.3 In order to develop the Regional Waste Strategy it was necessary to generate and assess a number of strategic waste management 'Options' – different combinations of waste management technologies that would enable the region to meet or exceed legislative targets. These Options were generated on the basis of choices at three levels.

1.4.4 At level 1, the choice was: ***Should targets be met or exceeded?*** There were three choices:

- To 'do nothing' and continue with existing measures to deal with waste;
- To aim to meet targets set for composting, recycling and diversion of waste from landfill; or
- To seek to exceed targets.

1.4.5 At level 2, the choice was: ***What amount of recycling and composting should be aimed for?*** Targets have been set for recycling and composting together, with flexibility as to whether to put more emphasis on one or the other, or to pursue both equally.

1.4.6 At level 3, the choice was: ***What method should be used for dealing with residual waste[6]?*** There were a number of choices for dealing with the residual waste. It was considered that at the time this amounted to the use of either Mechanical Biological Treatment (MBT), Energy from Waste (EfW) or landfill.

1.4.7 From the above choices, 6 Options were established which between them allowed a broad comparison of all the choices either directly or indirectly and were considered to represent a sufficient range of choices for dealing with waste in the region.

1.4.8 The Options were characterised by whether they met or exceeded targets and by the principal method for dealing with the residual waste:

- Option 0: A 'Do-Nothing' strategy;
- Option 1: Meet 2013 Targets / MBT-led strategy for residual waste;
- Option 2: Meet 2013 Targets / Thermal-led strategy for residual waste;
- Option 3: Meet 2013 Targets / Landfill-led strategy for residual waste;
- Option 4: Meet 2013 Targets / Landfill-led strategy for residual waste;
- Option 5: A 'Do More' strategy / Landfill-led strategy for residual waste;
- Option 6: A 'Do More' strategy / MBT-led strategy for residual waste (including energy from waste or landfill).

1.4.9 The advantages and disadvantages of these 6 Options were then assessed using the following methods:

- Agreeing and weighting Objectives and Indicators;
- A Life-Cycle Assessment to compare the environmental costs and benefits of each Option in relation to environmental indicators; and
- A wider Sustainability Appraisal which took account of economics, social consequences, practicability and consistency with policy, in addition to environmental factors.

1.4.10 Following these assessments and a wide stakeholder and public consultation, Option 6 emerged very clearly as the 'Preferred Option' and was therefore selected as the basis for the Regional Waste Strategy.

1.5 The reasons for reviewing the RWP

1.5.1 TAN 21[7] requires that RWP's are reviewed every 3 years. In addition to these requirements, there are a number of practical reasons for reviewing the RWP and can be broken down into two groups:

- The need to **review the generation and assessment of the strategic waste management options** (i.e. the different combinations of waste management technologies which would enable the region to meet or exceed legislative targets); and
- **Developing the spatial strategy** (i.e. the influence the RWP exerts over the location of the required waste management / resource recovery facilities).

[6] Residual Waste – waste remaining to be managed after reuse, recycling and composting.
[7] Para. 2.11: Technical Advice Note 21: Waste (November 2001)

1.6 Reviewing the Strategic Waste Management Options

1.6.1 It is appropriate to review the strategic waste management options for the following reasons:

- The first RWP was based on forecasts of future waste arisings made in 2002. It has been necessary to **review the forecast models** in light of new data on arisings, current thinking on future arisings and an up-to-date understanding of the regional context. The data contained in the 2006 Annual Monitoring Report[8] provided updated baseline information for forecasting;
- A number of **new waste management / resource recovery technologies** were not included in the Options developed for the first RWP because, at that time, little information was available about these technologies. More information about these technologies is now available;
- **Research into the markets for the products of MBT processes** can now be factored into the sustainability appraisal; and
- The Environment Agency has produced an **updated Life Cycle Assessment tool (WRATE[9])** which will allow more accurate assessment of MBT and assessment of other new waste management / resource recovery technologies.

1.7 Developing the RWP Spatial Strategy

1.7.1 EU legislation (The EU Waste Framework Directive) lays down a requirement for Member States to establish an *"integrated and adequate network of waste disposal installations"* and also to produce waste management plans that *"relate to suitable disposal sites or installations"*. The devolution settlement means that the WAG is responsible for ensuring that the requirements of the Waste Framework Directive are met in Wales. The three RWP's form an important part of Wales' compliance with the Directive.

1.7.2 The next three to four years will be critical in determining whether Wales establishes the necessary infrastructure in time to meet EU and Waste Strategy targets and to provide the alternatives to landfill that are required. The revision of the RWP's thus comes at a critical juncture and it is considered essential that a choice of locations for waste facilities is identified so that more certainty can be provided to the market.

1.7.3 The first RWP contained two elements with spatial implications:

- It allocated the required capacity for each waste management / resource recovery facility type to each local authority area with the purpose that provision be made for meeting these capacity requirements in Development Plans; and
- It gave a guide to the locational requirements of each facility type to assist local planning authorities with site allocation.

1.7.4 This approach did not fully address the location and distribution of facilities that can serve more than one local authority area. One of the key elements identified for the review therefore is to develop further the spatial strategy.

[8] Annual Monitoring Report 2006 is available on www.walesregionalwasteplans.gov.uk
[9] WRATE – Waste and Resources Assessment Tool for the Environment.

2. THE POLICY CONTEXT

2.1 European Policy

2.1.1 Waste is an international issue and accordingly there are a number of European Union (EU) Directives that affect Member States. The most relevant Directives are identified below:

- **Waste Framework Directive** – requires Member States to establish an integrated and adequate network of disposal installations, taking account of the best available technology not involving excessive costs and requires that waste management plans relating to the type, quantity and origin of waste to be recovered or disposed of and suitable disposal sites or installations are produced (See Appendix B);
- **Landfill Directive** – includes a requirement to limit the amount of Biodegradable Municipal Waste (BMW) sent to landfill;
- **Hazardous Waste Directive**;
- **Waste Incineration Directive**; and
- **Integrated Pollution Prevention and Control Directive**.

2.2 National Policy

2.2.1 EU Directives set the context for National waste legislation, policy and initiatives. The most relevant of these which provide the context for the RWP 1st Review are identified below:

- **The National Waste Strategy for Wales**[10] (NWSW) – specifies various targets for the management of wastes and contains information relevant to the process for producing Regional Waste Plans. The targets are classified as either: UK targets where Wales must meet targets for the UK set in EU Directives; Primary Wales-specific targets where the WAG and its key partners (e.g. local government) have a direct influence over their outcome; and finally Secondary Wales-specific targets where the WAG's influence is less;
- **Planning Policy Wales Technical Advice Note (TAN) 21**[11] – details the process for producing and reviewing Regional Waste Plans;
- **Environment Strategy for Wales**[12] – includes an outcome[13] that appropriate waste management facilities are in place to minimise the amount of waste going to landfill by 2013 and states that this will mean producing energy from waste that cannot practically be recycled;
- **The Landfill Allowances Scheme (Wales) Regulations 2004**[14] – transposed the Landfill Directive requirement to limit the amount of BMW sent to landfill by setting each Waste Disposal Authority (WDA) in Wales decreasing annual BMW landfill allowances in order that Wales meets the Landfill Directive and allows the WAG to impose financial penalties on any WDA's that exceed landfill allowances or fail to comply with reporting requirements;
- **The Landfill (England and Wales) Regulations 2002**[15] – banned the practice of co-disposing of hazardous and non-hazardous wastes in the same landfill;

[10] Wise About Waste: The National Waste Strategy for Wales (WAG, 2002).
[11] Planning Policy Wales Technical Advice Note 21: Waste (WAG, 2001).
[12] Environment Strategy for Wales (WAG, 2006).
[13] Pages 28 & 30: Environment Strategy for Wales (WAG, 2006).
[14] Welsh Statutory Instrument 2004: No. 1490 (W.155).
[15] Statutory Instrument 2002: No. 1559.

- **The Hazardous Waste (England and Wales) Regulations 2005**[16] and the **List of Wastes (Wales) Regulations 2005**[17] – increased the number of wastes classified as 'hazardous' to include items such as waste televisions, computer monitors, fluorescent tubes and pesticides;
- **The Waste Management (England and Wales) Regulations 2006**[18] **'The Agricultural Waste Regulations'** – prohibits unregulated burying and burning of agricultural waste on farms and requires farmers and growers to: send or take their waste for disposal off-farm at licensed sites; and / or register a licensing exemption with the EA to recycle waste on-farm; and / or apply to the EA for a licence to continue on-farm disposal;
- **Pollution Prevention & Control (England and Wales) Regulations 2000**[19] – covers the disposal of waste by landfill, waste treatment and storage facilities; and
- **Animal By-Products (Wales) Regulations 2006**[20] – specifies how animal by-products must be used or disposed of.

[16] Statutory Instrument 2005: No. 894.
[17] Welsh Statutory Instrument 2005: No. 1820 (W.148).
[18] Statutory Instrument 2006: No. 937.
[19] Statutory Instrument 2000: No. 1973.
[20] Welsh Statutory Instrument 2006: No. 1293 (W.127).

3. VISION, AIMS AND OBJECTIVES

3.1 Vision and Aims

3.1.1 Guided by the European and National policy context, the following vision and aims have been set for the RWP 1st Review.

Figure 3: Vision & Aims

Vision:	To provide a land use planning framework for the sustainable management of wastes and recovery of resources in South West Wales, with the following aims:
Aim A:	To minimise adverse impacts on the environment and human health.
Aim B:	To minimise adverse social and economic impacts and maximise social and economic opportunities.
Aim C:	To meet the needs of communities and businesses.
Aim D:	To accord with the legislative requirements, targets, principles and policies set by the European and national policy framework.

3.2 Objectives

3.2.1 To meet these aims, the following objectives have been set for the RWP 1st Review. Again, these have been guided by the European and National policy context and informed by the Strategic Environmental Assessment (SEA) and Sustainability Appraisal (SA) processes.

Figure 4: Objectives

Environmental and Health Objectives (Aim A)	
Objective 1:	Ensure prudent use of land and other resources.
Objective 2:	Safeguard soil quality.
Objective 3:	Minimise greenhouse gas emissions.
Objective 4:	Adapt to the effects of climate change.
Objective 5:	Minimise adverse impacts on air quality and public health.
Objective 6:	Conserve landscapes, townscapes and cultural heritage.
Objective 7:	Protect local amenity.
Objective 8:	Minimise adverse effects on water quality.
Objective 9:	Avoid increasing flood risk.
Objective 10:	Protect biodiversity and valuable sites.
Socio-Economic Objectives (Aim B)	
Objective 11:	Minimise local transport impacts.
Objective 12:	Provide employment opportunities.
Objective 13:	Provide opportunities for public involvement and education.
Waste Management Service Delivery Objectives (Aim C)	
Objective 14:	Minimise the costs of waste management.
Objective 15:	Ensure reliability of delivery of waste management services.
Policy Framework Objectives (Aim D)	
Objective 16:	Conform to waste legislation and policy – European, UK and Welsh waste management / resource recovery targets, principles and policies.

4. UNDERLYING PRINCIPLES

4.1 Background

4.1.1 It is essential that the RWP 1st Review be guided by sound principles as a basis for the consideration of alternative strategic waste management Options and developing the spatial strategy. The following key principles have been drawn from the European and National policy context and are considered to be fundamental:

- Sustainability;
- The Waste Hierarchy;
- The Proximity Principle; and
- The Self-sufficiency Principle.

4.2 Sustainability

4.2.1 Sustainability in its simplest form is defined as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. The NWSW states that sustainable development requires that *"waste management should be carried out in a way that does not place undue social, economic or environmental burdens on either present or future generations and that ensures social equity, effective protection of the environment, the prudent use of natural resources and the maintenance of high and stable economic growth and employment"*[21].

4.2.2 TAN 21 requires that the Options considered for dealing with waste be subject to a 'Best Practicable Environmental Option' (BPEO) assessment[22] and also advocates a study of 'Sustainable Waste Management Options' (SWMO) – a combined assessment process incorporating additional factors relating to economics, social consequences, practicability and consistency with policy[23].

4.3 The Waste Hierarchy

4.3.1 The Waste Hierarchy is a useful framework which has become the cornerstone of sustainable waste management. It sets out the order in which approaches to waste management should be considered based on environmental impact. The hierarchy suggests that the most effective environmental solution is to minimise the generation of waste. Where further reduction is not practicable, products and materials can sometimes be used again, either for the same or for a different purpose (re-use). Failing that, value should be recovered from waste through recycling or composting, or through energy recovery. Only if none of these offers an appropriate solution should waste be incinerated without energy recovery or disposed to landfill.

4.3.2 It is accepted that even in the long term, certain wastes might only be dealt with by disposal. It is also accepted that although the clear preference is to move away from disposal, there will be a period where landfill will remain to be the main available option. In that period,

[21] Paragraph 2.9 Wise About Waste: The National Waste Strategy for Wales (WAG June 2002).
[22] The BPEO is defined as *"for a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable cost in the long term as well as in the short term"*. Royal Commission on Environmental Pollution 12th Report February 1988.
[23] Paragraphs 3.17-3.20 Technical Advice Note 21: Waste (November 2001).

and for those materials still destined for disposal only, LPA's must ensure that there is adequate capacity available.

4.4 The Proximity Principle

4.4.1 The Proximity Principle states that waste should be treated and / or disposed of as near to the source of origin as possible because transporting waste itself has an environmental impact. The principle recognises the need for us all to take responsibility for our own waste arisings and not be content with distributing it to other locations for disposal.

4.5 The Self-sufficiency Principle

4.5.1 The Self-sufficiency Principle sets out that as far as practically possible, waste should be treated and / or disposed of within a sensibly defined region where it is produced. Therefore, each of the three regions in Wales should aim, as far as is practicable, to provide for facilities with sufficient capacity to manage the predicted quantity and nature of waste arisings from that region.

4.5.2 It is accepted however, that in the case of a regionally significant facility (e.g. hazardous waste treatment / disposal), both the Self-sufficiency and Proximity principles may be over-ruled.

4.6 Other Considerations

4.6.1 There are a number of other principles which have implications for the land-use framework of the RWP 1st Review and for the way in which the Plan is prepared:

- ***Producer Responsibility***: this approach is intended to require producers who put goods or materials onto the market to be more responsible for these products or materials when they become waste;
- ***Precautionary Principle***: this approach is used by decision makers in the management of risk. Precaution should be applied where scientific evidence is insufficient, inconclusive or uncertain, or where there are indications through preliminary evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection;
- ***Consultation and Equal Opportunity***: as a matter of principle, consultation on the preparation of the RWP 1st Review should be as wide as possible. This will ensure that the Plan benefits from the views and contributions of all those with an interest in planning for waste management, including local communities, producers of waste, the waste management industry, environmental organisations and those with regulatory responsibilities; and
- ***Integration and Partnership***: such concepts are integral to the RWP approach. Partnership between local authorities, the voluntary sector, the private sector and communities can allow a greater range of choices to be implemented and widen 'ownership' of both problems and solutions.

5. WASTE ARISINGS AND MANAGEMENT – THE CURRENT POSITION

5.1 Types of Waste

5.1.1 The RWP 1st Review provides the framework for dealing with waste arising from all sources in South West Wales needing management, treatment and disposal. The Plan relates to the following principal 'controlled'[24] waste streams:

- Municipal Solid Waste (MSW);
- Industrial Waste;
- Commercial Waste;
- Construction & Demolition Waste (C&D);
- Hazardous Waste; and
- Agricultural Waste (the proportion requiring external management only).

5.1.2 MSW includes household waste and any other wastes collected by a Waste Collection Authority, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipping. Household waste includes domestic waste from household collection rounds, waste from services such as street sweepings, bulky waste collection, litter collection, hazardous household waste collection and garden waste collection, waste from civic amenity sites and wastes separately collected for recycling or composting through bring recycling schemes and kerbside recycling schemes.

5.1.3 Industrial Waste is waste from any factory or industrial process (excluding mines and quarries).

5.1.4 Commercial Waste is waste arising from premises used wholly or mainly for trade, business, sport, recreation or entertainment, excluding MSW and Industrial Waste.

5.1.5 C&D Waste is waste arising from the construction, repair, maintenance and demolition of buildings and structures, including roads. It consists mostly of brick, concrete, hardcore, subsoil and topsoil, but it can also contain quantities of timber, metal and plastics.

5.1.6 The term 'Hazardous Waste' covers a wide range of waste materials that present different levels of risk. Some could present a serious and immediate threat to human health and the environment, for example those that are toxic, are carcinogenic or contain pathogens. Others, such as fluorescent tubes or cathode ray tubes in televisions, pose little immediate threat but could cause long-term damage over a period of time. In July 2004 the Landfill (England and Wales) Regulations banned the practice of co-disposing of hazardous and non-hazardous wastes in the same landfill and introduced a requirement to pre-treat hazardous waste prior to landfill. In July 2005 the Hazardous Waste (England and Wales) Regulations and the List of Wastes (Wales) Regulations came into force, replacing the Special Waste Regulations. These new regulations had the effect of increasing the number of wastes classified as 'hazardous' – they include waste televisions, computer monitors and some other waste electrical and electronic equipment, fluorescent tubes, and pesticides.

[24] *'Controlled waste'* comprises household, commercial, industrial and certain agricultural waste.

5.1.7 Agricultural Waste is waste produced at agricultural premises as a result of an agricultural activity. New agricultural waste regulations came into force on 15 May 2006[25]. With the introduction of the new regulations, all substances or objects from premises used for agriculture, and which the holder discards, are subject to control as waste. This includes many non-natural types of waste. However, manure and slurry is not classified as waste when used as a fertiliser[26]. The regulations prohibit unregulated burying and burning of agricultural waste on farms and require farmers and growers to:

- send or take their waste for disposal off-farm at licensed sites; and / or
- register a licensing exemption with the EA to recycle waste on-farm; and /or
- apply to the EA for a licence to continue on-farm disposal.

5.1.8 Very Low Level Radioactive Waste (VLLW) including Substances of Low Activity (SOLA), may be disposed of in the same way as municipal, commercial and industrial waste and should therefore be considered as part of this 1st Review. However, there is limited knowledge with regard to the arisings of this type of waste and it is therefore suggested that any detailed evaluation of the requirements for this waste stream are undertaken in a subsequent review.

5.2 Annual Monitoring Reports

5.2.1 Central to the process of undertaking the RWP 1st Review is the collection and analysis of information regarding the waste situation within the region and the implementation of the first RWP. This information is published annually in Annual Monitoring Reports (AMR's)[27].

5.2.2 Information on the waste situation within the region is collected and reported in order to monitor the region's waste arisings, recovery and disposal and in order to make forecasts of future arisings. The challenge of planning for waste management and resource recovery facilities must be undertaken with a sound information base; it is therefore important to have comprehensive, accurate, timely and consistent information. This information has provided a sound basis for analysing current trends and growth rates and enabled a review of the forecast models that were utilised in the preparation of the first RWP.

5.2.3 Information on the region's waste management / resource recovery facilities is collected and reported in order to monitor implementation of the first RWP – both in terms of the facilities that are being planned for in local authority Development Plans and in term of the facilities that are currently operating.

5.2.4 Whilst the AMR's provide detailed information and analysis setting out the scale of the problem, a summary of the key headline figures and issues is given in this section of the Plan[28].

[25] The Waste Management (England and Wales) Regulations 2006

[26] DEFRA, 2006. "The Agricultural Waste Regulations" – Frequently Asked Questions and Answers. Version 2.0. London: DEFRA.

[27] Annual Monitoring Report 2005 / 2006 / 2007 are available on www.walesregionalwasteplans.gov.uk

[28] EAW release new data on the arisings and management of wastes on a continuous cycle. New data sets released since the AMR 2007 include: 2006 Hazardous Waste Data; 2006 Commercial & Industrial Waste Arisings (estimate based on 2002/3 survey data re-grossed to 2006 ONS figures); 2006 Agricultural Waste Arisings Data; Landfill Void as at 31 March 2007; 2006 Construction & Demolition Waste Data; and Numbers and capacity of waste management operations (PPC, WML & Exemptions).

5.3 Current & Forecast Waste Arisings

5.3.1 The most recent data available on the arisings of each of the principal controlled waste streams is as follows:

- In 2005/06 regional arisings of MSW were 561,423 tonnes. Household Waste arisings were 1,199 kg per household and 505 kg per person;
- In 2002/03 regional Industrial & Commercial waste arisings were 1,912,800 tonnes – Industrial waste arisings were 1,616,200 tonnes and Commercial waste arisings were 296,600 tonnes;
- In 2003, estimated regional arisings of C&D waste were 1,754,920 tonnes;
- In 2003, estimated regional arisings of Agricultural waste were 16,404 tonnes; and
- In 2004, regional arisings of Special / Hazardous waste were 112,393 tonnes.

5.3.2 It is not possible to calculate the known arisings of all controlled waste each year because annual data on arisings is collected only for the MSW and Special / Hazardous waste streams. The most recent year for which the most complete set of arisings data is available is 2002/03. It is estimated that in 2002/03 all controlled waste arisings totaled 4.34 million tonnes (Figure 5).

5.3.3 In addition, in order to review the strategic waste management Options it has been necessary to review the forecast of future waste arisings in light of new data on arisings, current thinking on future arisings and an up-to-date understanding of the regional context. During this exercise consideration was given to past trends; future population change; economic activity and legislation; and to the effect of minimisation campaigns and waste reduction plans. Appendix C provides details of the waste growth projections applied to the principal waste streams for the 1st Review (Table C1) and the forecast waste arisings for the region up to the year 2025 (Table C2).

5.3.4 A summary of predicted arisings for 2012/13 and 2019/20 is shown in Figure 5. Based on the assumed growth forecasts it is predicted that all controlled waste will increase by 0.18 million tonnes by 2013 and by 0.28 million tonnes by the year 2020, the equivalent of 4% and 6% respectively.

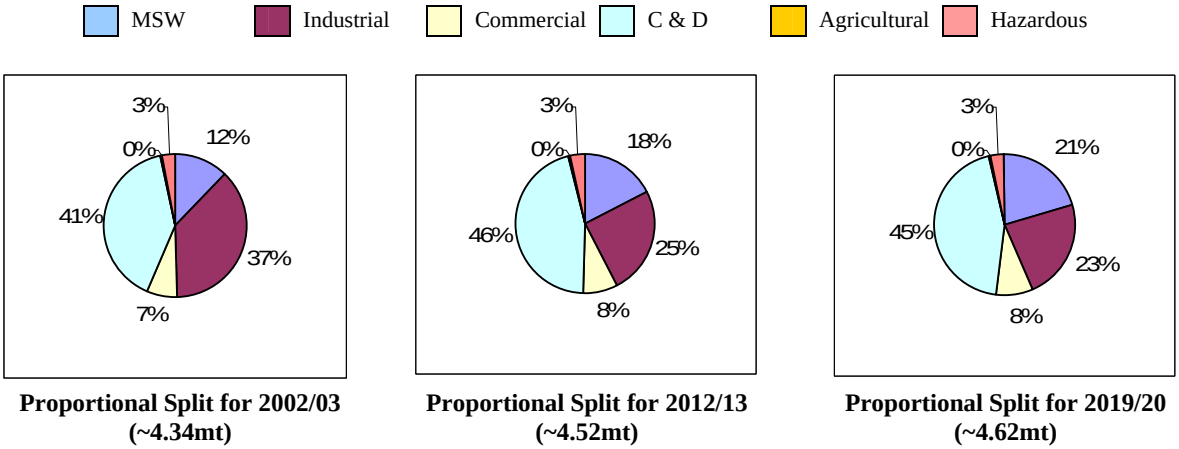
Figure 5: Current and Forecast Controlled Waste Arisings in South West Wales (Tonnes)

Waste Stream	2002 / 03	2012 / 13	2019 / 20
Municipal	534,464	794,777	958,279
Industrial	1,616,200	1,125,594	1,049,127
Commercial	296,600	356,261	374,794
Construction & Demolition	1,754,920	2,076,883	2,076,883
Agricultural	16,404	14,836	13,828
Special / Hazardous	122,313	157,083	147,219
Total Controlled Waste	**4,340,901**	**4,525,434**	**4,620,130**

5.3.5 Figure 6 shows how the relative proportion of each principal waste stream is forecast to change between the years 2003, 2013 and 2020. Comparison of this data indicates that:

- Whilst I&C waste is currently the most significant proportion of the total controlled waste stream, projections suggest that C&D waste will become the most significant proportion in the future;
- MSW will continue to be the fastest growing principal waste stream; and
- The proportion of agricultural waste requiring external management remains insignificant compared to the other principal waste streams.

Figure 6: Current and Projected Proportional Waste Split (2002/03, 2012/13 and 2019/20) in South West Wales



Proportional Split for 2002/03 (~4.34mt)

Proportional Split for 2012/13 (~4.52mt)

Proportional Split for 2019/20 (~4.62mt)

5.3.6 The forecast growth or reduction of the individual waste streams between 2002/03 and 2024/25 can be summarised as follows:

- **MSW** arisings are forecast to change from 580,736 tonnes in 2004/05, by **+73%**, to 1,007,160 tonnes in 2024/25;
- **Industrial waste** arisings are forecast to change from 1,616,200 tonnes in 2002/03, by **-38%**, to 997,710 tonnes in 2024/25;
- **Commercial waste** arisings are forecast to change from 296,600 tonnes in 2002/03, by **+21%**, to 378,212 tonnes in 2024/25;
- When combined, **I&C waste** arisings are forecast to change from 1,912,800 tonnes in 2002/03, by **-28%**, to 1,375,922 tonnes in 2024/25;
- **C&D waste** arisings are forecast to change from 1,754,920 tonnes in 2002/03, by **+18%**, to 2,076,883 tonnes in 2024/25;
- **Hazardous waste** arisings are forecast to change from 122,313 tonnes in 2002/03, by **+12%**, to 140,003 tonnes in 2024/25; and
- **Agricultural waste** arisings that are likely to require an external management route are forecast to change from 16,404 tonnes in 2003, by **-20%**, to 13,150 tonnes in 2024/25.

5.3.7 It should be noted that there is inherent uncertainty in the robustness of future waste projections, particularly as far ahead as the year 2025. For the purposes of this 1st Review however, these projections were considered sufficiently robust to enable a range of options to be assessed and to allow conclusions to be drawn. The RWG will keep the actual rate of the growth of arisings under constant review and will form an integral part of the on-going monitoring of the RWP.

5.4 Current Management of Wastes

5.4.1 The most recent trends and data on the management of the principal controlled waste streams is as follows:

- In 2005/06, the proportion of MSW arisings either recycled or composted by local authorities continues to increase, whereas the BMW arisings sent to landfill continues to decrease;
- In 2002/03, 621,400 tonnes (32.5%) of Industrial & Commercial waste arisings were sent to landfill. This was a significant reduction in both the quantity and proportion landfilled since the previous survey year. As the proportion of Industrial and Commercial waste arisings sent to landfill has reduced, the proportion recycled has increased; in 2002/03, 34.6% was recycled;
- In 2003, 45% of C&D arisings were recycled as aggregate and soil. This represents a continued increase in both the quantity and proportion recycled; and
- In 2004, 32.9% of Special / Hazardous waste arisings were landfilled and 26.8% was recycled / reused.

5.5 Performance against the NWSW Targets

5.5.1 The performance of the region against the NWSW targets has been closely monitored throughout the review process. Whilst both the availability and quality of data across the various waste streams has improved over time, there remains however a lack of data to fully establish the performance against a number of the targets. Of the targets to which sufficient regional data is available, the data shows a variety of significant challenges and met targets:

- **Stabilisation and reduction of household waste**[29] – the latest figures show that household arisings per household in the region remains above that of the 1997/98 target figure for Wales. In addition, the region also faces the significant challenge of reducing household waste per person by approximately 40% over the period;
- **Recycling and Composting of Municipal Waste**[30] – a number of authorities are already achieving the combined recycling and composting target for 2006/07. In addition, all the remaining authorities are continuing to make the required progress in order to achieve the 25% target. The data also shows that all authorities are already achieving the 10% 2006/07 recycling target but an increase in composting levels will however be required in each authority to achieve the 10% composting target;
- **Landfilling of Biodegradable Municipal Waste**[31] – the data shows that for the 2005/06 Scheme Year all authorities in the region achieved their respective landfill allowances. Three authorities (Bridgend / Neath Port Talbot / Swansea) are well within their landfill allowances, whereas the remaining authorities (Carmarthenshire / Ceredigion / Pembrokeshire) have met their allowances but with only a small margin;

[29] By 2009/10 (and to apply beyond) waste arisings per household should be no greater than those (for Wales) in 1997/98 / By 2020 waste arisings per person should be less than 300Kg per annum: Para. 5.15 NWSW (WAG, 2002).
[30] By 2006/07 achieve at least 25% recycling / composting of municipal waste with a minimum of 10% composting and 10% recycling / By 2009/10 achieve at least 40% recycling / composting of municipal waste with a minimum of 15% composting and 15% recycling: Para. 5.29 NWSW (WAG, 2002).
[31] By 2010 no more than 75% of the BMW produced in 1995 can be landfilled / By 2013 no more than 50% / & By 2020 no more than 35%: Para. 2.5 NWSW (WAG, 2002).

- **Landfilling of Industrial & Commercial Waste**[32] – the data shows that the region is already achieving the 2010 diversion target;
- **Hazardous Waste Arisings**[33] – whilst acknowledging that in relation to the latest available data the target date is still 6 years away, the figures show that the region is generating approximately 35,000 tonnes over and above the 2010 target. When further broken down by local authority it can be seen that in those areas where the production of hazardous waste does not meet the respective target there is considerable variation in the degree to which the target was not met; and
- **Facilities for Hazardous Household Waste**[34] – even though there has been significant improvement with regard to the wastes specified in the target, the region is still failing to meet the target for providing facilities for the improved segregation of hazardous household waste.

5.6 Existing Waste Management Facilities

5.6.1 Appendix D provides details of existing waste management / resource recovery infrastructure across South West Wales. Table D1 identifies the maximum licensed capacity and number of non-landfill facilities that held either a Pollution Prevention & Control (PPC) permit or Waste Management Licence (WML) at 31st March 2006 and also identifies the landfill capacity in the region at 31st March 2006.

5.6.2 It should be noted that waste management facilities registered '*exempt*' are not included in the table. Lower risk waste management activities, such as recovery and recycling are often not seen as a threat to the environment or human health and are therefore exempt from the waste licensing regulations. There are around 45 categories of exemption, most of which are subject to specific constraints on waste types, quantities, capacities and duration of storage. Most exempted categories of activity need to be registered with the EA. However, very little detail is required in order to register an exemption. Therefore, it is both difficult to determine the exact details of the activity concerned and determine the capacity / tonnage of each facility.

5.6.3 Furthermore, the capacity figures identified in Table D1 should be treated with some caution. The capacities identified are the legislative maximum throughput allowed under the terms of the license or permit. In reality there may be other limiting factors that restrict the site from operating up to the licensed maximum and therefore the capacity information obtained from the WML may be an overestimate.

5.6.4 Table D1 shows that whilst there is a total of 134 non-landfill facilities with a maximum capacity of 3,283,392 tonnes per annum existing in the region, it can be seen that the existing capacity of the newer generation of residual waste treatment technologies is very limited. **There is therefore an urgent need to commission new infrastructure in order to meet 2013 targets for landfill diversion**.

[32] By 2010, to reduce the amount of industrial and commercial waste going to landfill to less than 80% of that landfilled in 1998: Para. 5.122 NWSW (WAG, 2002).
[33] By 2010, to reduce the amount of hazardous waste generated by at least 20% compared with 2000: Para. 5.129 NWSW (WAG, 2002).
[34] By 2003/04 all civic amenity sites should have facilities to receive and store, prior to proper disposal, bonded asbestos sheets. All sites should also have facilities for receiving and storing, prior to recycling, oils, paints, solvents and fluorescent light bulbs: Para. 5.60 NWSW (WAG, 2002).

5.6.5 The landfill capacity data presented is the best-case scenario taken from the 2005/06 EA landfill void survey and categorises the data by landfill type. The available void assumes that all sites currently going through the PPC permitting process receive their permit.

5.6.6 As of 31st March 2006, the data predicts a best-case remaining void space of 7,270,770m³ in the region. A comparison of time-series data shows that landfill void space continues to decrease across the region. Furthermore, there remains no merchant capacity for hazardous landfill in South West Wales or indeed Wales as a whole.

5.6.7 A series of maps in Appendix D show the regional distribution of existing waste management / resource recovery facilities.

5.7 Progress in Developing New Waste Management Facilities

5.7.1 Between 2004/05 and 2005/06 the number of non-landfill waste management facilities which held either a waste management licence or PPC permit increased by 26 and the capacity by 880,366 tonnes (26.8%).

5.7.2 Significant steps forward have also been taken by local authorities in procuring facilities for municipal waste management. In 2006, the South West Wales Consortia was established in order to submit a bid for funding for joint working proposals via the Welsh Local Government Association (WLGA) *'Making the Connections'* initiative. A 3-year funding commitment is now in place and progress to date has included (1) the commissioning of a detailed audit of the current regional position; (2) the identification of various work packages that may benefit from funding; and (3) the establishment of a formal Regional Joint Committee (RJC). The RJC has the following core aims and objectives:

- To achieve a better coordinated and more effective waste management system;
- To work in partnership with the people and with organisations with a stake in waste management;
- To coordinate the delivery of an integrated waste management strategy, seeking to influence the development and use of more sustainable solutions through an appropriate mix of projects and supporting policies in waste management and related activities;
- To promote the essential role of effective waste management in economic and land use planning and to influence land development to make the necessary provision for waste management solutions;
- To ensure that full account is taken of safety and sustainability in waste management plans and schemes;
- To seek to increase the resources for waste management for Wales and to maximise the share available for the region;
- To pursue appropriate standards for waste management based on best practice, to seek cost-effective use of resources, and to identify and monitor targets to judge the success of its Strategy; and
- To drive the policy debate as a champion for waste management and in particular regional solutions and to raise awareness of the role of local government in waste management.

5.7.3 Overall the project seeks to assist in identifying and facilitating regionally collaborative initiatives involving some or all of the parties as appropriate, in the fields of research,

procurement and delivery of waste services to deliver national improvement targets. It is anticipated that the 3-year funding commitment will support:

- The operation of the RJC;
- Further development of the initial audit work undertaken on the current position of the constituent authorities. This will involve the further mapping of this work and the identification of those areas (i.e. geographical, technical procurement) where the potential either currently exists, will exist or can be made to exist for collaborative working arrangements;
- Specialist regional advice to identify core facilities needed to achieve both WAG and landfill diversion targets; and
- Specialist procurement advice in the context of the current regional position where this can support either ongoing or potential initiatives or where such work has a wider regional value to partners.

PART B:

THE REGIONAL WASTE PLAN TECHNOLOGY STRATEGY

6. DEALING WITH WASTE – THE METHODS AVAILABLE

6.1 Background

6.1.1 A necessary pre-curser to the Options development process for the review is understanding the principal waste management methods and technologies.

6.1.2 The aim of this chapter is to:

- Provide an overview and present the basic principles of the alternative methods and technologies for managing MSW and similar waste streams;
- Identify the various outputs from each technology; and
- Provide an evaluation of the effectiveness of each of the technologies by identifying the key issues and benefits of each process.

6.1.3 Before considering the alternative methods and technologies, the following should be noted:

- **Reduction** – society needs to reduce the amount of waste that it produces. This is highlighted in policy at all levels. TAN 21 requires waste generation and the availability of relevant waste management facilities to be taken into account as material considerations in the determination of planning applications. Educating the public and placing incentives on the private sector to rethink product design and how developments are planned is key to achieving an overall reduction in the levels of waste produced. The extent to which planning can influence the level of reduction is limited at the regional level and is therefore not the main focus of this Review; and
- **Re-use** – the term re-use includes materials that have been used but that can be either directly re-used or require simple treatment to enable them to be re-used for the same purpose. Whilst TAN 21 requires that adequate facilities to deal with re-use should form part of the waste management network, facilities are likely to serve small communities and are more appropriately considered at a local level rather than regional level.

6.2 Recycling

6.2.1 The term ‘recycling’ means to reprocess a waste material into a usable item either in the same form as the original product or into a different product. To achieve recycling, the appropriate waste materials (recyclate) must be separated from the mixed waste stream. The separation can be achieved in a number of different ways, for example, householders can take the materials to dedicated facilities (known as bring or ‘drop-off’ sites) such as bottle or paper banks or to Civic Amenity (CA) Sites (increasingly known as Household Waste Recycling Centres). Alternatively, the materials may be collected directly from the households or recyclate may be extracted from mixed MSW by a mechanical process.

6.2.2 Mechanical sorting and processing techniques are used, to some extent, in conjunction with most of the waste treatment technologies described later in this chapter and are typically based on conveyor systems for moving the waste around the treatment facility. A complex mechanical sorting system may be used to split mixed MSW into the various fractions however, there will always be a reject fraction for disposal. It is important to note that there is also likely to be contamination of the different waste fractions sorted through mechanical

means. The degree of contamination can be mitigated by the addition of another treatment process.

6.2.3 Recycling can involve three stages: separation from other wastes and materials; 'bulking' into viable quantities for transportation; and reprocessing into useable products and materials. Facilities to recycle most types of waste would include:

- *Household Waste Recycling Centres (CA Sites)*: are reception facilities provided by the local authority for receiving household waste normally delivered by the public direct to the site. Most CA sites will become 'Designated Reception Facilities' for Waste Electrical & Electronic Equipment (WEEE), some of which will include hazardous components;
- *Transfer Stations*: are facilities receiving wastes for bulking into larger containers prior to onward transfer to a point of re-use, recycling, treatment or disposal;
- *Materials Recycling Facilities (MRF's)*: are facilities that processes waste into different component streams prior to onward transfer to a reprocessing plant, disposal or treatment facility. There are two types; a 'Clean MRF' where clean dry pre-sorted or partially sorted materials are bulked up prior to onward transfer to a reprocessing plant; and a 'Dirty MRF' where some recyclable components are separated from mixed, unsorted waste; and
- *Inert Reprocessing Facilities*: are facilities similar to MRF's for inert wastes only.

6.3 Composting

6.3.1 Composting is a biological process in which biodegradable wastes, such as garden and kitchen waste, are decomposed in the presence of air under the action of micro-organisms. The process results in elevated temperatures of the waste, the production of carbon dioxide, water and a stabilised residue. The nature and quality of the residue will depend on the input material, the composting process itself and the market into which the residue is due to be sent. The residue may be marketed as a compost, soil conditioner or mulch.

6.3.2 A *Publicly Available Specification 100* (PAS 100:2005), has been developed to improve confidence in composted materials. The Specification covers the entire process by which compost is produced: from raw materials and production methods, through to quality control. It means that certified composts are quality assured, traceable, safe and reliable.

6.3.3 In addition, it should be noted that the *Animal By-Products (Wales) Regulations 2006*[35] contain rules for the use and disposal of animal by-products. The Regulation only permits the treatment of low-risk (so-called category 3) animal by-products in approved composting or biogas plants.

6.3.4 There are a variety of applications for usage of existing compost materials. These can range from horticultural to agricultural usage, or for landfill restoration or engineering purposes. The two principal composting categories (i.e. closed 'in-vessel' systems and open systems) are described below.

[35] The Regulation classifies animal by-products into three categories based on their potential risk to animals, the public or to the environment, and sets out how each must or may be disposed of – Category 3 includes by-products derived from healthy animals slaughtered for human consumption.

6.3.5 **In-Vessel Composting (IVC)** comprises the aerobic decomposition of shredded and mixed organic waste within an enclosed container, to produce carbon dioxide and water vapour, leaving a bulk reduced and stabilised residue. IVC is a process where the control systems for material degradation can be fully automated. Moisture, temperature and odour can be regulated, and a stable output can be produced much more quickly than outdoor windrow composting.

6.3.6 **Windrow Composting** is a much simpler, aerobic composting process than IVC: long rows of usually source segregated green waste are left to aerobically decompose in the open air. The 'windrows' are turned regularly to bring new material to the surface and oxygenate the pile. There is no automation or temperature control. Windrows are sometimes used as a final maturation step for material which has been processed through IVC.

6.4 Mechanical Biological Treatment (MBT)

6.4.1 MBT is a generic term for an integration of several processes, primarily of a mechanical and biological nature, commonly found in other waste management technologies such as Materials Recovery Facilities (MRF's), sorting and composting plants.

6.4.2 An MBT plant can incorporate a number of different processes in a variety of combinations and can be built for a range of purposes. The technologies frequently included in MBT systems are:

- Mechanical sorting / processing; and
- Advanced Biological Treatment (e.g. In-Vessel Composting or Anaerobic Digestion).

6.4.3 The process recovers materials and energy from 'residual' waste (i.e. the waste left over after recycling by separation at source). The aim of the process is to further reduce environmental impacts before disposal of the residual waste and to gain additional value from the recovery of materials. Though MBT reduces waste it still leaves a significant residual waste which must go for final disposal either by landfilling or by some thermal treatment. It is not therefore, a 'stand-alone' treatment for residual waste but is an intermediate process requiring integration with a waste disposal facility.

6.4.4 The design of any MBT plant can therefore be dictated by the needs of down stream waste management practices. Numerous different configurations of the mechanical and biological technologies are possible. In terms of outputs, MBT processes may be used to prepare and sort waste for a variety of purposes including recycling (for use as a soil conditioner), use as a fuel, or for deposit into landfill as a partially stabilised residue.

6.4.5 All biological waste treatment processes involve the decomposition of biodegradable wastes by living microbes which use waste materials as a food source for growth and proliferation. These microbes excrete chemicals (enzymes) to digest organic substances in waste into simple nutrients. As the microbes grow they convert a significant proportion of the organic matter into heat, gases and water – which can account for large mass losses during biological waste treatment.

6.4.6 There are two main types of conditions in which such microbes live, and therefore two main types of biological processes used to treat biodegradable waste:

- *Aerobic* – in the presence of oxygen; and
- *Anaerobic* – in the absence of oxygen.

6.4.7 **Anaerobic Digestion (AD)** is a process where biodegradable wastes, such as source segregated garden and kitchen waste, food sludges, or the mechanically separated organic rich fraction of MSW, are converted into a 'digestate' (containing bio-solids and a liquid) and biogas[36]. The wastes are decomposed by microbes in the absence of oxygen.

6.4.8 In AD systems, biodegradable material is placed into an enclosed vessel under controlled conditions and degrades generating elevated temperatures. The decomposition of the biodegradable material leads to the release of a methane rich biogas which can be collected and burnt as a fuel to produce electricity. Such systems are often used in the treatment of sewage sludge at waste water treatment works and are widely used on farms to break down manure into slurry.

6.4.9 As with composting, a *Publicly Available Specification* (PAS 110) is also being developed for the use of Anaerobic Digestates. Furthermore, it should again be noted that the *Animal By-Products (Wales) Regulations 2006* only permits the treatment of low-risk (so-called category 3) animal by-products in approved composting or biogas plants.

6.4.10 Figure 7 summarises some of the key issues and benefits of MBT.

Figure 7: Issues & Benefits of MBT

MBT	
Issues	• Pre-treatment only – markets / outlets required; • The amount of BMW reduction yet to be clarified for different systems; • Barriers to most potential markets for fuel / soil conditioner; and • Limited track record in the UK.
Benefits	• Part of an integrated strategy; • All systems will reduce biodegradability to some level; • Flexible, non-thermal solution (in its own right); and • Reduces waste volumes.

6.5 Mechanical Heat Treatment (MHT)

6.5.1 MHT is a relatively new term. It is used to describe configurations of mechanical and thermal based technologies, including steam. **Autoclaving** is the most common type of MHT system, which is the application of steam to the wastes in a sealed pressurised vessel. The waste is generally heated to a temperature of between about 130°C and 180°C. The primary output is a floc like material often referred to as 'fibre'. This comprises the organic components of the waste stream which are broken down into a fibrous material. Metals and plastics may be recovered and recycled. The tonnage sent to landfill from the MHT process will depend on the markets / outlets found for the floc.

[36] Biogas – a combustible gas primarily consisting of a mixture of methane and carbon dioxide, and some water. It can be used for heat and/or electricity production.

6.5.2 Autoclaving is in common use for the treatment of some clinical wastes and also for certain rendering processes for animal wastes. However, its application to MSW is a recent innovation with only one facility in the UK soon to be operating on a commercial scale.

6.5.3 MHT does not involve the breakdown of organic materials through the action of biological processes. The output is therefore unlikely to be significantly reduced in biodegradability although there is likely to be some reduction. Other technologies under the heading of MHT include those which heat the waste in a continuous rotating kiln rather than a sealed (batch) autoclave process. The waste is then mechanically separated after the thermal process.

6.5.4 Different MHT systems may be configured to meet various objectives with regard to the waste outputs from the process. The fibre material may be used as a raw material for a recycled product or may be refined for composting or use as a fuel.

6.5.5 Figure 8 summarises some of the key issues and benefits of MHT.

Figure 8: Issues & Benefits of MHT

MHT	
Issues	• A variety of operational risks due to new technology; • No commercial track record; • Need to find markets for outputs from the process; and • Unlikely to significantly reduce degradability through heat process.
Benefits	• May be used to pre-treat waste to produce a number of outputs; • Sanitises the waste; • Cleans some recyclables; and • Considered to be relatively low capital cost.

6.6 Energy from Waste (EfW)

6.6.1 Conventional thermal treatment is already a mature and well established technology. EfW or 'incineration with energy recovery' involves the combustion of waste (typically unprepared raw or residual MSW) under controlled conditions, to reduce its volume and hazardous properties, and to generate electricity and/or heat.

6.6.2 The *Waste Incineration Directive* (WID) applies to most activities that involve the burning of waste, whether for disposal or when used as a fuel. The Directive aims to prevent, or limit as far as practicable, negative effects on the environment from the incineration and co-incineration of waste.

6.6.3 EfW facilities are designed to burn the waste as efficiently as possible and require process control measures for emissions and extensive flue gas cleaning equipment. There is a requirement to deal with the residues of the combustion process. There are two principal solid residues from such systems: the bottom ash, which is the solid remainder of the waste after processing; and the flue gas treatment residues from the air pollution control process. The bottom ash may be recycled into appropriate construction applications or disposed of to landfill.

6.6.4 The volume of waste needing disposal following combustion is reduced by approximately 90%, limiting the need for landfill. BMW content in the outputs is also reduced to zero.

6.6.5 Three forms of conventional incineration can be identified:

- *Mass-Burn Incineration*: where the waste is typically propelled through the furnace by a mechanically moved grate. Waste continuously enters at one end of the furnace and the ash is continuously discharged at the other;
- *Fluidised-Bed Technology*: where waste burns on a bed of inert particles. This bed is 'fluidised' by air being blown vertically through the material and wastes are moved through the furnace by the action of this fluidised bed of particles; and
- *Refuse Derived Fuel (RDF)*: which burns pellets or crumbs made from the residue of a resource recovery operation[37].

6.6.6 Use of either Mass-Burn Incineration or Fluidised-Bed Technology would mean a single technology waste management solution for residual waste following recycling and composting. This would maximise the energy recovery potential of the waste. Use of Refuse Derived Fuel would mean a two-technology approach combined with MBT. This approach would maximise recycling.

6.6.7 Figure 9 summarises the key issues and benefits of EfW.

Figure 9: Issues & Benefits of EfW

EfW (Incineration with Energy Recovery)	
Issues	• Negative public perception; • Most systems more cost effective at larger scale; and • Capital intensive.
Benefits	• Proven on MSW; • No BMW in outputs; • Reduces waste volumes – almost all outputs may be recycled; and • Small scale alternatives available.

6.6.8 Advanced Thermal Treatment (ATT) technologies are primarily those that employ pyrolysis and/or gasification to process MSW. Pyrolysis and Gasification are considered to be multi-stage processes and require additional facilities to prepare the material to a suitable standard. The gasification and pyrolysis of solid materials is not a new concept. It has been extensively used to produce fuels such as charcoal, coke and town gas. It is only in recent years that pyrolysis and gasification has been commercially applied to the treatment of MSW.

6.6.9 **Pyrolysis** is a medium temperature thermal process where organic derived materials in the waste are broken down under the action of heat and in the absence of oxygen. Pyrolysis is similar to the process which produces charcoal and only carbon based materials can be pyrolysed.

6.6.10 Where MSW is to be used it is normally pre-sorted to remove the majority of the non-organics. The pyrolysis process heats the waste, typically between 400-700°C, and breaks down plastics, paper and other organic derived materials to produce a gas (known as syngas). A solid pyrolysis char (a mixture of oils and liquid effluent) is also produced which may require specialist disposal or additional processing.

[37] The Waste Incineration Directive also applies to co-incinerators, such as combustion plants and cement works which burn waste as a fuel.

6.6.11 **Gasification** operates at a higher temperature range than pyrolysis, typically 800-1200°C. Air or oxygen is used to partially combust the waste to achieve higher temperatures. Additionally, water is added to the gasifier and at these high temperatures the water 'cracks' into hydrogen and oxygen. As with pyrolysis the syngas produced can be combusted to generate electricity and a solid residue (ash or slag) is also produced which usually requires disposal if no markets for recycling are available.

6.6.12 There are a variety of features promoted to differentiate ATT from conventional incineration technologies. These include:

- The potential smaller scale of ATT processes in comparison to incineration, which may facilitate local use of the output heat and electricity;
- Reduced emissions from ATT processes may mean that abatement costs are reduced (although all the processes must meet the same emissions standards); and
- The potential to use the syngas as a fuel could enable higher energy efficiency to be achieved through ATT.

6.6.13 Figure 10 summarises some of the key issues and benefits of ATT.

Figure 10: Issues & Benefits of ATT

ATT (Pyrolysis / Gasification)	
Issues	• A variety of operational risks due to new technology; • Require additional facilities to prepare the material; • Differentiation from EfW; • Not all systems have energy efficiency benefits over EfW; and • High capital cost.
Benefits	• Reduces waste volume, destroys BMW; • Potential benefits of small scale / integrated facilities; • Qualifies as renewable energy, receives partial incentive; and • Potential for greater energy efficiency in some circumstances.

6.7 Landfill

6.7.1 This method of waste management is the most familiar and can be described as the deposit of waste onto or into land. Growing concerns about environmental problems associated with landfill coupled with the growing awareness that landfill is wasteful of resources, has led to the current position that landfill is no longer regarded as the preferred option for the management of waste.

6.7.2 The legislation driving the need to divert BMW from landfill is in response to the European Commission (EC) Landfill Directive published in 1999. The rationale for the need to reduce levels of biodegradable materials going to landfill is based on concerns over greenhouse gas emissions and the threat of global warming. Within the Landfill Directive diversion targets have been set and these have subsequently been incorporated into the NWSW.

6.7.3 Whilst landfill is no longer the preferred management option, it nevertheless has a continuing role in both the waste management strategies of individual authorities and in the regional strategy for the following reasons:

- There will inevitably be a period of transition when alternative waste management technologies / facilities are being introduced and during this time waste will continue to be buried in existing landfill sites;
- All other waste management methods leave residual amounts of waste which will continue to be placed in landfill; and
- It is likely that for some wastes, the Best Practicable Environmental Option (BPEO) will continue to be landfill.

6.7.4 A distinction should be drawn between landfill sites taking biodegradable waste and those taking only inert waste. In the past environmental concerns about landfill have focused on leachate and gas however, proposals for inert landfill sites attract objections principally on the grounds of other issues such as noise, dust and traffic.

6.8 Treatment Facilities for Specific Wastes

6.8.1 Specific waste streams not similar to MSW need specific types of treatment facilities. Such facilities include:

- Battery recycling;
- Chemical treatment;
- Construction and Demolition waste recycling;
- End of Life Vehicle (ELV) treatment;
- Packaging recycling;
- Tyre recycling / recovery;
- WEEE treatment;
- Thermal treatment of soils;
- Vitrification; and
- High temperature incineration.

6.9 The Need for an Integrated Treatment and Disposal Strategy

6.9.1 None of the identified methods for dealing with waste should be considered in isolation. Moreover, they will have to be considered and utilised in combination in an integrated treatment and disposal strategy. The different combinations of waste management technologies that would enable the region to meet or exceed legislative targets are the subject of the next chapter.

7. DEALING WITH RESIDUAL WASTE – IDENTIFYING THE OPTIONS

7.1 Background

7.1.1 The first practical reason behind this review is the need to re-evaluate the generation and assessment of the alternative strategic waste management Options – the different combinations of waste management technologies that would enable the region to meet or exceed legislative targets. The statutory and non-statutory landfill diversion and recycling / recovery targets set out by the EU and the WAG provide the framework for identifying a future waste management strategy.

7.1.2 In practice, strategic waste management Options will comprise a combination of technologies, because the 'best' Option will vary according to the type of waste, its source and composition, and the viability of alternative methods, both generically and in the local context. A variety of different methods can also be used for the collection and transport of waste.

7.1.3 Overall, an integrated approach will be required to manage all waste arising, and this will include landfill for residual wastes for which no alternative is available, despite landfill being at the bottom of the waste hierarchy. Where possible, strategic waste management Options should seek to integrate the management of each of the principal waste streams.

7.1.4 Given the challenging nature of waste management targets, Options are intended to be 'visionary', with a planning horizon of at least 20 years. Options that fail to meet key objectives should be discounted at an early stage, to avoid unnecessary appraisal.

7.1.5 Forecasts of future waste arisings are required to underpin the Option development process. Appendix C provides detail of the principal waste growth forecasts adopted for this review.

7.2 Generating Options for the RWP 1st Review

7.2.1 As with the first RWP, the process of generating and assessing Options has been approached with the aim of producing RWP's for all of Wales that are based on comparable principles and techniques.

7.2.2 The Options were generated on the basis that in an integrated recovery and disposal strategy for all waste streams, MSW and wastes within the other principal controlled waste streams that are similar to MSW will be managed together and should therefore be modeled and assessed together. Wastes not similar to MSW require specific types of treatment facilities and were therefore considered separately.

7.2.3 The following key issues for the review of the Options were agreed by each of the three RWG's in Wales:

- For the first RWP's, all three regions agreed the 'Do More' approach of aiming to achieve the 2020 BMW Landfill Directive target in 2013[38]. **The 1st Review has**

[38] 2020 BMW Landfill Directive Target: 'to reduce the amount of biodegradable municipal waste landfilled to 35% of that produced in 1995'.

taken this decision as a starting point (i.e. does not consider Options that do not achieve the 2020 BMW Landfill Directive target in 2013)[39];

- In order to take account of better information on new technologies, the markets for their outputs and the new capabilities of the Life Cycle Assessment tool: **Energy from Waste has been sub-divided into pyrolysis, gasification and incineration with energy recovery; and autoclave has also been included in the Options**; and
- For the first RWP's, the target year used for the assessment of Options was 2013. **The 2013 target year has been retained for the review**. The advantage of this will be twofold: it focuses the minds of all concerned on the required investment in infrastructure and using 2013 provides consistency and enables comparison with the first RWP.

7.3 The Strategic Waste Management Options

7.3.1 Figure 11 presents the strategic waste management Options identified for the 1st Review.

7.3.2 The strategic waste management Options have been evaluated using the WRATE tool developed by EAW. The tool was specifically developed to model MSW, however within the other waste streams there are wastes that are similar to MSW and it is therefore possible to use the tool to model waste streams other than municipal. Within the other waste streams there are fractions that must be dealt with in a different way and these were taken out as unmodeled waste.

7.3.3 The key outcome of the assessment process is to determine the preferred Options for the treatment of residual waste. The diversion from landfill was modeled in two ways; firstly an assumption was made regarding the rate of front-end separation of wastes for recycling and composting and secondly, the method to be used to treat the residual fraction.

7.3.4 For all of the Options the diversion of MSW at the 'front end' for recycling and composting was agreed by the three RWG's and set at 50%. At that time this reflected the proposed 2020 target in the review of the English waste strategy[40]: this has now been reflected in more stringent proposed targets for the review of the Wales Waste Strategy. The maintenance of an identical front-end performance across all Options ensured the assessment identified and highlighted the differences between the residual treatment methods.

7.3.5 In addition, all of the Options ensure that targets for the management of the other principal controlled waste streams (i.e. recycling targets for C&D waste and landfill diversion for Industrial and Commercial waste) are also met.

7.3.6 Four main Options covering the main treatment technologies for residual waste were developed. Option 0 'Do Nothing' was included for assessment purposes only. Each main Option was divided into sub-Options. The 19 sub-Options were considered to represent a sufficient range of choices for dealing with waste in the region. Each Option is briefly considered in turn below.

[39] Referring back to paragraph 1.4.4, this effectively removes the 'Level 1' choice.
[40] Review of England's Waste Strategy (DEFRA, 2007).

7.3.7 **Option 0 ('Do Nothing' Strategy)** – This option was included for assessment purposes only, as a baseline to compare the other options against. The original intention was to maintain the current levels of recycling, composting, energy from waste and landfill; however, high recycling front end levels have been applied as in all the other options, but with no further treatment. This comparison highlights the effect of the residual waste management technology options.

7.3.8 **Option 1 (A landfill-led Strategy for Residual Waste)** – The generic aspiration for options 1A-1C is for high levels of source segregated recycling followed by low levels of thermal treatment of residual waste using pyrolysis, gasification or incineration with energy recovery. A "low" level of thermal treatment is interpreted to mean the amount of additional material required to be treated to increase the level of BMW landfill diversion to meet 2020 landfill directive targets. Any additional municipal and all residual commercial, industrial and agricultural wastes will be disposed of to landfill.

- **1A (Pyrolysis)** – the management of residual waste through low level thermal treatment using a pyrolysis technology;
- **1B (Gasification)** – the management of residual waste through low level thermal treatment using a gasification technology; and
- **1C (Incineration with Energy Recovery)** – the management of residual waste through low level thermal treatment using incineration technologies.

7.3.9 **Option 2 (An Energy from Waste-led Strategy for Residual Waste)** – For options 2A-2D, the generic aspiration is for high levels of recycling and composting followed by high levels of thermal or microbial treatment. A "high" level of thermal treatment is interpreted to mean that all residual waste, where feasible, will be treated using the treatment technology in that option. Any remaining residual waste will be disposed of to landfill.

- **2A (Pyrolysis)** – the management of residual waste through high level thermal treatment using a pyrolysis technology;
- **2B (Gasification)** – the management of residual waste through high level thermal treatment using a gasification technology;
- **2C (Incineration with Energy Recovery)** – the management of residual waste through high level thermal treatment using incineration technologies; and
- **2D (Anaerobic Digestion)** – the management of residual waste through high levels of biological treatment of residual waste using AD. AD facilities alone only treat source separated wastes. The anaerobic digestion of mixed waste is modeled as part of an MBT process.

7.3.10 **Option 3 (MBT / BMT-led Strategy for Residual Waste)** – For options 3A-3F, the generic aspiration is for high recycling / composting followed by high levels of MBT. A "high" level of MBT is interpreted to mean that all residual waste, where feasible, will be treated using the treatment technology in that option. Any remaining residual waste will be disposed of to landfill.

- **3A (MBT followed by Pyrolysis)** – the management of residual waste using MBT with the resultant RDF treated at a pyrolysis plant;
- **3B (MBT followed by Gasification)** – the management of residual waste using MBT with the resultant RDF treated using a gasification technology;

- **3C (MBT followed by Incineration with Energy Recovery)** – the management of residual waste using MBT with the resultant RDF thermally treated using incineration technologies;
- **3D (MBT followed by fuel to off-site energy use)** – the management of residual waste using MBT with the resultant RDF then transported off-site for co-firing in a cement kiln;
- **3E (MBT followed by Anaerobic Digestion)** – the management of residual waste using MBT including AD; and
- **3F (MBT followed by Landfill)** – the management of residual waste through MBT including aerobic composting.

7.3.11 **Option 4 (An Autoclave-led Strategy for Residual Waste)** – For options 4A-4E, the generic aspiration is for high recycling / composting followed by high levels of treatment using an autoclave (or mechanical heat treatment – MHT). A "high" level of MHT is interpreted to mean that all residual waste, where feasible, will be treated using the treatment technology in that option.

- **4A (Autoclave / MHT followed by Pyrolysis)** – the management of residual waste using autoclave with the resultant fibre thermally treated using pyrolysis;
- **4B (Autoclave / MHT followed by Gasification**) – the management of residual waste using autoclave with the resultant fibre thermally treated using gasification;
- **4C (Autoclave / MHT followed by Incineration with Energy Recovery)** – the management of residual waste using autoclave with 50% of the resultant fibre thermally treated using incineration technologies;
- **4D (Autoclave / MHT followed by fuel to offsite energy use)** – the management of residual waste using autoclave with 50% of the resultant fibre sent to a cement kiln;
- **4E (Autoclave / MHT followed by Landfill)** – the management of residual waste using autoclave with 100% of the fibre disposed of to landfill.

7.3.12 It should be noted that when considering Anaerobic Digestion, the strategic waste management options only evaluate AD as a residual waste treatment technology. The treatment of individual waste streams such as composting / treatment of separately collected kitchen / garden waste has therefore not been individually considered and assessed as part of this review. It is however accepted that this waste can be treated by an AD facility or by other means (i.e. in-vessel composting etc.) and this 1st Review does not rule out the use of such solutions.

Figure 11: Strategic Waste Management Options for the RWP 1st Review

Option	Description
Option 0 'Do Nothing Strategy'	This option is included for assessment purposes only – as a baseline to compare the other options against. Front end levels of recycling / composting have been applied as in all the other options, but with no further treatment, projected on to tonnages arising in 2013.
Option 1 'A **Landfill**-led strategy for residual waste'.	*High* recycling and composting levels followed by *low* levels of thermal treatment of residual waste using either: • Pyrolysis (**Option 1A**); or • Gasification (**Option 1B**); or • Incineration with Energy Recovery (**Option 1C**). All remaining residual waste would then be sent to landfill. (Recycling / treatment levels are those required to achieve the 2020 BMW Landfill Directive target in 2013).
Option 2 'An **Energy from Waste**-led strategy for residual waste'.	*High* recycling and composting levels with all remaining residual wastes, where possible, being treated by *high* levels of thermal treatment using either: • Pyrolysis (**Option 2A**); or • Gasification (**Option 2B**); or • Incineration with Energy Recovery (**Option 2C**); or • Anaerobic Digestion (**Option 2D**). Any remaining residual waste would then be sent to landfill. (Recycling levels are those required to achieve the 2020 BMW Landfill Directive target in 2013. Energy from Waste levels aims to minimise waste to landfill).
Option 3 'An **MBT / BMT**-led strategy for residual waste'.	*High* recycling and composting levels, all remaining residual wastes being sent to MBT / BMT with the output recovered / disposed of using either: • Pyrolysis (**Option 3A**); or • Gasification (**Option 3B**); or • Incineration with Energy Recovery (**Option 3C**); or • Fuel to off-site energy use (**Option 3D**); or • On-site Anaerobic Digestion (**Option 3E**); or • Landfill (**Option 3F**). For Options 3A-3E, any remaining residual waste would then be sent to landfill. (Recycling levels are the maximum possible – may exceed those required to achieve the 2020 BMW Landfill Directive target in 2013).
Option 4 'An **Autoclave**-led strategy for residual waste'.	High recycling and composting levels, all remaining residual wastes being sent to autoclave with the output recovered / disposed of using either: • Pyrolysis (**Option 4A**); or • Gasification (**Option 4B**); or • Incineration with Energy Recovery (**Option 4C**); or • Fuel to off-site energy use (**Option 4D**); or • Landfill (**Option 4E**). For Options 4A-4D, any remaining residual waste would then be sent to landfill.

8. DEALING WITH RESIDUAL WASTE – ASSESSING & CONSULTING ON THE OPTIONS

8.1 Background

8.1.1 Having identified the range of Options for the review, TAN 21 and the NWSW set out a number of techniques that must be used to assess the strategic waste management Options. These include:

- Life Cycle Assessment (LCA) – to determine the 'Best Practicable Environmental Option' (BPEO);
- Sustainability Appraisal (SA) – developed from BPEO and 'Sustainable Waste Management Option' (SWMO);
- Strategic Environmental Assessment (SEA); and
- Health Impact Assessment (HIA).

8.1.2 To achieve consistency across Wales, the WAG appointed EAW to complete a SA and LCA on behalf of the three RWG's. In parallel, the three regions jointly commissioned Hyder Consulting (UK) Limited and Peter Brett Associates to carry out a SEA and HIA of the Options respectively.

8.1.3 SEA is a legally required procedure that has inevitable overlaps with the other forms of assessment listed above. Some of the environmental data generated by the other assessments has been used in the SEA. The SA has used information that has been produced through the LCA and the Strategic HIA has taken account of some of the information produced for the SA.

8.1.4 Each of these assessment techniques is discussed in turn and then the results of the assessments and consultation are considered.

8.2 Life Cycle Assessment (LCA)

8.2.1 This section summarises and discusses the LCA technique and results. More detailed information is available in the LCA report[41].

8.2.2 LCA is used to assess the environmental aspects of waste management activities during their whole life. It has been defined as the "*systematic identification of all environmental benefits and disbenefits that result, both directly and indirectly from a product or process throughout its entire life, from raw materials extraction, to their eventual return to the environment*"[42]. The guidance on SA recommends the use of such a quantitative assessment for appraising the effect of the options on resource use and emissions.

8.2.3 EAW launched the WISARD[43] LCA tool in 1999 with the aim of providing an objective mechanism to assist in decision-making for waste managers and planners in regard to managing waste.

[41] EA Wales, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options*. Cardiff: EA.
[42] Paragraph 3.21 Technical Advice Note 21: Waste (WAG, 2001).
[43] WISARD – Waste: Integrated Systems Analysis for Recovery and Disposal.

8.2.4 The 'Best Practice Statement' in the first RWP stated that the WISARD tool *"…was modified to allow modeling of Mechanical Biological Treatment, a newly emerging technology. There is a need for the WISARD tool to be updated as a matter of urgency for use in the future"*. EAW has produced an updated new software tool called WRATE as a successor to the WISARD tool. WRATE allows more accurate assessment of MBT and assessment of other new waste management / resource recovery technologies.

8.2.5 WRATE is a software tool for comparing different management systems treating MSW and other similar wastes. WRATE uses life cycle assessment to identify and quantify all the emissions from managing the waste – right from collection through to final disposal or recovery and including all the transport. WRATE takes into account all the resources used and any benefits from recovering energy or materials.

8.2.6 The Options were generated on the basis that, in an integrated recovery and disposal strategy for all waste streams, MSW and wastes within the other principal controlled waste streams which are similar to MSW will be managed together. In the same way, WRATE enables the comparison of options for treating MSW and wastes within the other principal controlled waste streams that are similar to MSW. Wastes not similar to MSW were therefore excluded from the assessment as 'unmodeled waste'.

8.2.7 EAW used the WRATE tool, in accordance with government guidance[44], to assess the sub-Options in order to determine the BPEO. It transpired that there was insufficient evidence that autoclave fibre could be used as a RDF for pyrolysis or gasification and thus options 4A and 4B were excluded from the assessment.

8.2.8 The results of the LCA show that the best performing options for the BPEO are from either Option 2 or Option 3. This indicates that the preferred waste management method is to thermally treat the residual waste with energy recovery either directly or using a mechanical and biological pre-treatment. As the top six options have similar overall scores however, it is difficult to conclusively identify that one option significantly out performs the others.

8.2.9 Figure 12 shows in ranked order (a higher score is preferable) the valued and weighted BPEO performance scores for all options for South West Wales.

8.2.10 Overall, the best performing option for BPEO using weighted criteria is Option 3D. This option describes the scenario where all residual waste is treated at an MBT facility producing a Refuse Derived Fuel (RDF), material is extracted for recycling and the reject fraction is sent to landfill. The RDF is subsequently sent off-site for thermal treatment at an existing cement-kiln facility.

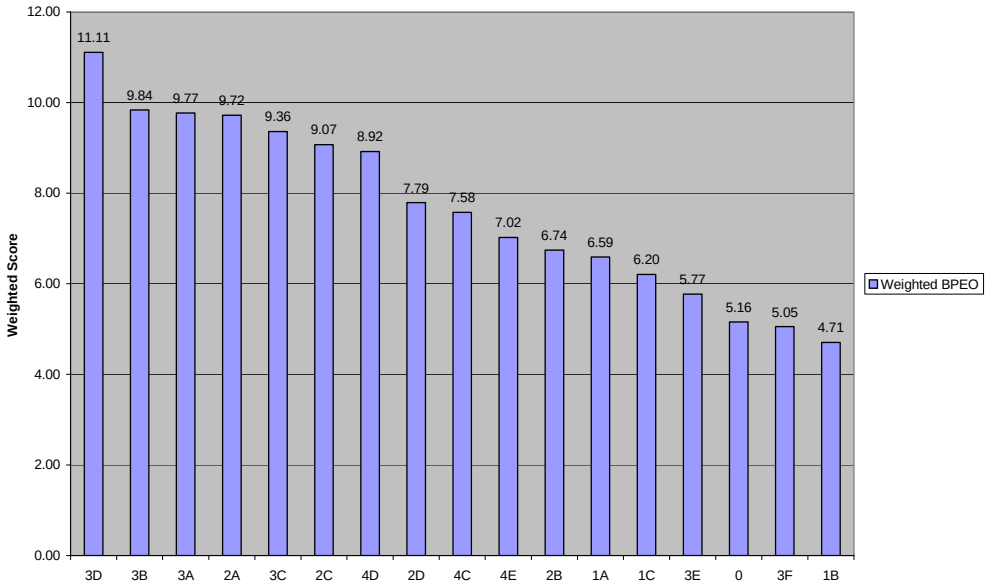
8.2.11 It is perhaps not surprising that an option that includes a facility that is already in existence should score well. From an environmental perspective, the environmental burdens are much less than for building a new facility and visual and landscape indicators score well as the facility is already in existence.

8.2.12 Caution must be exercised in relation to this technology choice, as the likely constraint in the delivery of the option is the availability of capacity. The model indicates a required

[44] The NWSW, TAN 21 and Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal (ODPM, 2002).

capacity of over 300,000 tonnes per annum and it will be very difficult to secure this capacity either within the region or further afield.

Figure 12: Ranked, Valued and Weighted BPEO Performance Scores for South West Wales[45]



8.3 Sustainability Appraisal (SA)

8.3.1 This section summarises and discusses the SA technique and results. More detailed information is available in the SA report[46].

8.3.2 SA is the process and assessment method that is at the centre of developing a Regional Waste Strategy. It is a methodology for appraising strategic waste management options that takes account of environmental, socio-economic and implementation issues through the use of indicators that are weighted by decision makers. In taking account of such a wide range of issues, and through the use of weighted indicators, the SA methodology provides a robust and comprehensive approach to identifying a 'preferred option' and transparency in decision-making.

8.3.3 EAW used the WRATE tool, in accordance with government guidance[47], to assess the sub-Options in order to determine the SWMO. It transpired that there was insufficient evidence that autoclave fibre could be used as a RDF for pyrolysis or gasification and thus options 4A and 4B were excluded from the assessment.

8.3.4 In order to **identify and agree the sustainability objectives and indicators** to be applied in this assessment, the RWG reviewed the 22 sustainability indicators used in the preparation

[45] Figure 47: EA, 2007. Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options – Part 2 Tables & Figures. Cardiff: EA.
[46] EA Wales, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options*. Cardiff: EA.
[47] The NWSW, TAN 21 and Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal (ODPM, 2002).

of the first RWP and concluded that all remained relevant for the review. The indicators can be broadly categorised as environmental and health, socio-economic, waste management service delivery and public framework objectives.

8.3.5 **Performance scores for the sustainability indicators** were generated using three methods:

- *Quantitative Assessment Tool* – WRATE output;
- *Generic Data* – scores are generated based on data available such as land take, number of jobs created etc; and
- *Professional Judgement*.

8.3.6 The **weighting of the indicators** is recommended by the ODPM guidance[48]. This is because it is accepted that decision-makers are likely to attach more importance to some indicators or criteria than to others. The guidance also shows that, by eliciting and applying 'weights' to the valued performance information, the relative importance of indicators can be taken into account.

8.3.7 All stakeholders including local authorities, government agencies and waste trade associations affiliated to the RWG were given the opportunity to provide their weighting of the indicators to capture a variety of opinions and different perspectives. Each organisation was given 22 points to divide between the 22 indicators, according to their perceived relative importance. These were used to determine the final weighting of the indicators for the region. The final weightings agreed for the region were then applied to the performance scores generated for the indicators. These were used to review the preferred strategic waste management option for all controlled wastes for the region.

8.3.8 Similarly to the results of the LCA, the best performing options for the SA are from either Option 2 or Option 3 underlining the fact that the preferred waste management method is to thermally treat the residual waste with energy recovery either directly or using a mechanical and biological pre-treatment. In addition, sub-Options 4D and 4C (Autoclave-led strategy for residual waste) also perform well.

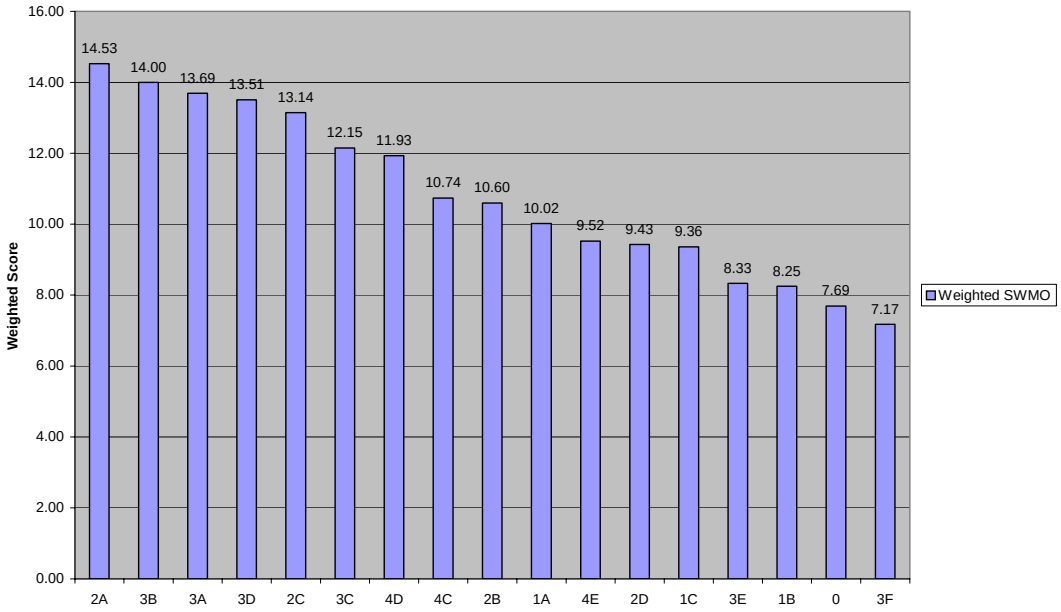
8.3.9 Figure 13 shows in ranked order (a higher score is preferable) the valued and weighted SA performance scores for all options for South West Wales.

8.3.10 In terms of an overview, all Options (except 0, 1B, 2B, 2D, 3E, 3F and 4E) deliver 2020 BMW landfill diversion targets by 2013. The difference in scores for the top performing sub-Options is very close in some cases, meaning that the order of ranking should not be considered as a fixed hierarchy.

8.3.11 Overall, the best performing option using weighted criteria is Option 2A. This is where all residual waste is sent to a pyrolysis plant. The high ranking of this specific option may be due to the technology facility used in WRATE. The modeling is based upon a facility in Germany where efficiency standards are higher than in some other European countries so its overall performance may be better than other technologies based in the UK.

[48] Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal (ODPM, 2002).

Figure 13: Ranked, Valued and Weighted SA Performance Scores for South West Wales[49]



8.3.12 The best four performing options involve pyrolysis, gasification or fuel to off-site energy use. Pyrolysis and gasification facilities do not have an established history of treating municipal waste in the UK, neither does RDF to off-site energy sites such as cement kilns. Therefore, Options 2C and 3C, ranked 5th and 6th respectively, may look more attractive and more deliverable options in this regard.

8.3.13 Option 0 was included for comparison purposes and does not score well. This reflects the situation whereby all residual waste is landfilled. As well as the poor performance scores for the SA, this option would not be followed for municipal waste due to the requirement of the Landfill Directive to divert biodegradable waste from landfill.

8.3.14 Option 1 (do minimum thermal treatment) performs less well than option 2 (energy from waste-led strategy) indicating that it is more desirable to replace all practicable landfill disposal with thermal treatment with energy recovery rather than a partial replacement.

8.3.15 Option 4 relies on a technology that is commercially unproven for municipal waste in the UK and did not perform particularly well for the region. Option 2B scores less well than 2A or 2C due to the high amount of reject from the dirty MRF process that is required to produce RDF prior to gasification. Options 2D, 3E and 3F are all MBT processes with no thermal treatment and therefore still have a high requirement for the landfill disposal of outputs.

8.3.16 Whilst it is difficult to conclusively identify that one option significantly out performs the others, the results for the region indicate that waste management systems incorporating high levels of thermal treatment, or MBT followed by thermal treatment make up the top six options. As all of these options scored well in the SA, and in order to provide flexibility in

[49] Figure 50: EA, 2007. Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options – Part 2 Tables & Figures. Cardiff: EA.

the waste planning process, the conclusion from the appraisal is that any of the highest scoring options could be considered when reviewing the RWP.

8.4 Strategic Environmental Assessment (SEA)

8.4.1 This section summarises and discusses the SEA technique and results. More detailed information is available in the Environmental Report[50].

8.4.2 The objective of the SEA Directive is *"…to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that…an environmental assessment is carried out of certain plans and programs which are likely to have significant effects on the environment."* [51]

8.4.3 The SEA Directive defines[52] *'environmental assessment'* as a process comprising:

- Preparing an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated;
- Carrying out consultation on the draft plan or programme and the accompanying Environmental Report;
- Taking into account the Environmental Report and the results of consultation in decision making; and
- Providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

8.4.4 In order to maintain alignment between the SEA and the SA, the SEA was conducted using the same set of technology assumptions. The Environmental Report concludes:

- Generally speaking, there is no clear leader amongst the Options, however, given the landfill emphasis associated with Options 0, 1 and parts of Option 4, on the whole Options 2 and 3 are more likely to ensure that the Landfill Directive and WAG targets will be met by 2013 and potentially beyond;
- Many impacts are already heavily regulated, making it difficult to determine if there are any 'real' differences between emissions from different technologies (e.g. all technologies which release atmospheric emissions are regulated to comply with common UK and European standards, meaning that they will all, as a minimum meet regulatory compliance requirements);
- All sub-Options except 0, 1B, 2B, 2D, 3E, 3F and 4E deliver 2020 BMW landfill diversion targets by 2013;
- Many of the direct effects that could be anticipated from the technologies could not be fully assessed within the context of this study because the extent of the effects are most likely to be determined by the specific qualities of the receiving environment and cannot be identified in isolation of the spatial element. Impacts identified that

[50] Environmental Report of the Strategic Waste Management Options (Hyder, 2007).
[51] Article 1.
[52] Article 2(b) and Articles 5.1 of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment.

could not be assessed include: effects on sites designated for biodiversity or ecological reasons; effects on specific local communities; effects of specific water courses; effects on the historic environment; effects on the landscape in general; and the secondary and cumulative effects associated with these effects;

- Effects that could be considered in greater detail relate primarily to the land and resource requirements, and the emissions associated with the processes;
- There remains potential for a number of cumulative and secondary impacts, largely resulting from regulated emissions and land take. These will need to be the subject of the Plan monitoring, both to inform future plans and to identify the extent of the effect;
- It is difficult to ascertain degree of impact without some indication of the siting of facilities, both relative to each other and relative to sensitive receptors; and
- Further assessment will be required as the plan is implemented – it is important that this assessment looks at / brings together the spatial element and the technologies in greater detail, regardless of which Option is promoted. This may include Habitats Directive Appropriate Assessment (AA).

8.4.5 The Environmental Report also addressed the requirements of the EU Habitats Directive. The Directive requires an AA to be undertaken where the impacts of land use plans are likely to have a significant effect on a European site (or where it cannot be demonstrated that it would not have a significant effect) to assess the implications for the European site in view of the site's conservation objectives. AA is part of the wider process of Habitat Regulation Assessment (HRA), which is an iterative process and should be undertaken throughout the plan making process.

8.4.6 The Directive states *"Any plan or project not directly connected with or necessary to the management of the site but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public"*[53].

8.4.7 The Environmental Report found that the strategic and non-spatial nature of the alternative strategic waste management Options means that it is not possible to determine how any Option might impact on the conservation status of a particular designated area. However, the Environmental Report for the RWP Technology Strategy, together with the Environmental Report for the Areas of Search, provides a starting point for identification of effects – screening – of the Options upon Natura 2000 sites. In particular the Environmental Report identifies:

- Environmental issues within the Plan area in relation to biodiversity, flora and fauna;
- Relevant plans, policies and programmes in relation to habitats and species and how they relate to the Options;
- The environmental baseline;
- Objectives which relate to biodiversity, flora and fauna; and

[53] Article 6 paragraphs (3) of Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

- Significant effects.

8.4.8 The Environmental Report, together with the Environmental Report for the Areas of Search, provides relevant information that will assist LPA's, as a Competent Authority, to undertake tests of significance at the appropriate stages when specific land use allocations and development proposals are being formulated.

8.5 Health Impact Assessment (HIA)

8.5.1 This section summarises and discusses the strategic HIA technique and results. More detailed information is available in the Strategic HIA report[54].

8.5.2 HIA is *"A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population"*[55].

8.5.3 The World Health Organisation defines health as *"the extent to which an individual or group is able to realise aspirations and satisfy needs, and to change or cope with the environment. Health is therefore a resource for everyday life, not the objective of living; it is a positive concept, emphasising social and personal resources, as well as physical capacities"*[56]. This definition builds upon and is complementary to the longer established definition that *"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*.

8.5.4 The NWSW recommends the following steps in the HIA process:

- Screening and scoping: identifying the relevance of a policy or development to people's health, and whether HIA is required;
- Profiling: establishing baseline information, and characterising the health status of the community and the environment;
- Risk assessment: identifying the hazards of contaminants and determining the health effects and exposures via different pathways;
- Risk communication: involving the public and communities who may be affected in the decision-making process;
- Risk management: setting priorities based on risk assessment, identifying and establishing risk reduction policies, taking into account the different perceptions of risk;
- Decision making: determining appropriate action based on risk assessment and involvement of stakeholders; and
- Auditing and monitoring: determining whether the commitments of the HIA have been implemented and whether risks are being properly managed.

8.5.5 The types of information used in the HIA are both quantitative (i.e. data sources from public health, epidemiological, toxicological and medical knowledge), and qualitative (i.e. public and other stakeholders' perceptions and experiences). The HIA was particularly concerned

[54] Health Impact Assessment (Peter Brett Associates, 2007).
[55] WHO European Centre for Health Policy; Health Impact Assessment: main concepts and suggested approach; Gothenburg Consensus Paper; WHO Regional Office for Europe; 1999.
[56] WHO; Health Promotion: A Discussion Document on the Concepts and Principles; WHO Regional Office for Europe; Copenhagen, 1984.

with the distribution of effects within the population, as different groups are likely to be affected in different ways. The findings of the Strategic HIA in relation to each of the Options are summarised as follows:

- Option 1 (*a Landfill-led strategy for residual waste*) has an overall minor positive health impact at the national level and each of the three regions. This is because the strategy plans for a small number of facilities to help to recover energy from some of the residual waste remaining after 50% recycling and composting. This will create jobs, education and learning opportunities; help mitigate climate change and provide a small degree of flexibility in the waste management system at the regional and national level;
- Option 2 (*an EfW-led strategy for residual waste*) has an overall moderate positive health impact at the national level and each of the three regions. This is because the strategy plans for a larger number of facilities, compared to Option 1, to help to recover energy from the majority of the residual waste remaining after 50% recycling and composting. This will create jobs, education and learning opportunities; help significantly mitigate climate change effects arising from activity in Wales and provide some flexibility in the waste management system at a regional and national level;
- Option 3 (*an MBT / BMT-led strategy for residual waste*) has an overall moderate to major positive health impact at the national level and each of the three regions. This is because the strategy plans for a large number of MBT / BMT facilities with associated thermal treatment facilities to help further recycle and recover energy from the majority of the residual waste remaining after 50% recycling and composting. This will create jobs, education and learning opportunities; help to considerably mitigate climate change effects arising from activity in Wales and provide a considerable degree of flexibility in the waste management system at a regional and national level; and
- Option 4 (*an Autoclave-led strategy for residual waste*) has an overall moderate to major positive health impact at the national level and each of the three regions. This is because the strategy plans for a large number of MHT / Autoclave facilities with associated thermal treatment facilities to help further recycle and recover energy from the majority of the residual waste remaining after 50% recycling and composting. This will create jobs, education and learning opportunities; help mitigate climate change effects arising from activity in Wales and provide a considerable degree of flexibility in the waste management system at a regional and national level.

8.5.6 The conclusions of the Strategic HIA are that:

- The technology analysis points to further residual waste recycling rather than just energy recovery as the better option (i.e. Options 3 and 4) – though Option 2 is also seen as a good option;
- The spatial analysis, because of the numbers of facilities, size of sites, and the need for more waste lorry movements, points to Option 2 (fewer sites, though larger, and less waste lorry movements overall) on balance being the better option;
- Overall, taking into account both the technology and spatial analysis, there is no single best public health strategic waste management Option. All three main options (i.e. Options 2, 3 and 4), are good Options from a public health perspective at both the regional and national levels and each of them has strengths and weaknesses; and

- It has not been possible to identify any differences between the various sub-Options within each of the main Options 1-4 except to note that due to preconceived negative perceptions about thermal treatments, there are likely to be greater potential negative mental health and social capital and cohesion effects from the potentially greater concern an element of the local population are likely to have with regard to thermal treatment facilities – particularly incineration with energy recovery that might be sited near their neighbourhoods.

8.6 Consultation

8.6.1 This section summarises the results of the consultation in relation to the strategic waste management Options. More information on the methods of consultation is set out in Chapter 15 *'Summary – The Consultation Process'* and more detailed information on the consultation results is available in the Consultation Report[57].

8.6.2 Based on the results of the LCA and SA, and given that the SEA concluded that no clear leader emerged from amongst the Options, and given that the strategic HIA concluded that while Options 2, 3 and 4 are good from a public health perspective there is no single best Option, the best performing eight sub-Options in the SA were presented in the RWP 1st Review Consultation Draft as the alternative Options that would enable South West Wales to meet or exceed legislative targets. They included:

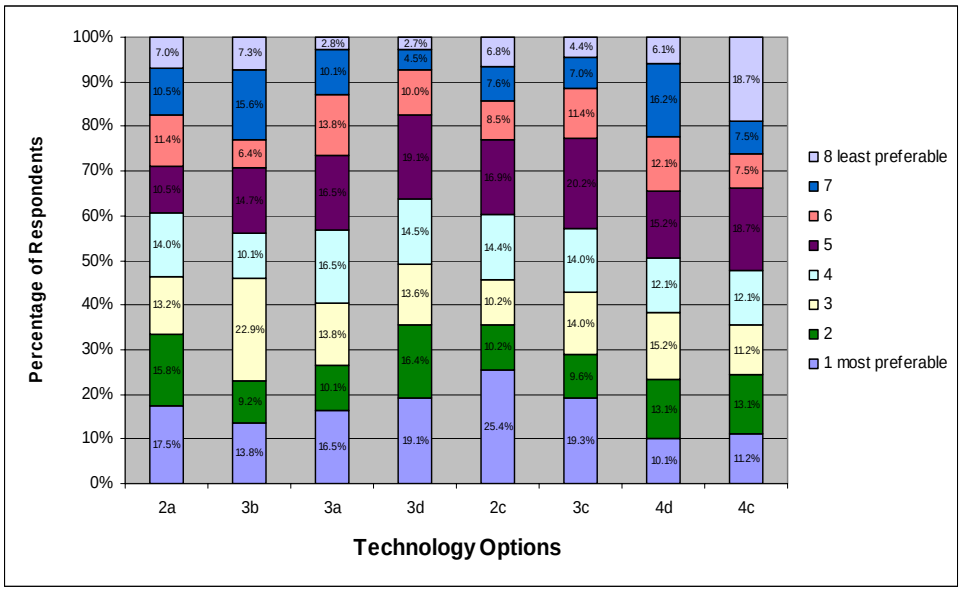
- **Sub-Option 2A** – High source segregated recycling and composting levels followed by high levels of Pyrolysis;
- **Sub-Option 3B** – High source segregated recycling and composting levels with all remaining residual waste being treated using MBT followed by Gasification;
- **Sub-Option 3A** – High source segregated recycling and composting levels with all remaining waste being treated using MBT followed by Pyrolysis;
- **Sub-Option 3D** – High source segregated recycling and composting levels with all remaining waste being treated using MBT followed by fuel to off-site energy use;
- **Sub-Option 2C** – High source segregated recycling and composting levels followed by high levels of Incineration with Energy Recovery;
- **Sub-Option 3C** – High source segregated recycling and composting levels will all remaining waste being treated using MBT followed by Incineration with Energy Recovery;
- **Sub-Option 4D** – High source segregated recycling and composting levels with all remaining waste being treated using an autoclave followed by fuel to off-site energy use; and
- **Sub-Option 4C** – High source segregated recycling and composting levels with all remaining waste being treated using an autoclave followed by Incineration with Energy Recovery.

8.6.3 The consultation survey asked respondents which of the eight sub-Options was their preferred choice. The responses to this question are shown in Figure 14. When comparing the rankings for each sub-Option, ranks 1-3 were considered to be positive; 6-8 negative; and 4-5 no particular preference.

[57] Hyder Consulting (UK) Ltd, 2008. *South West Wales Regional Waste Plan 1st Review; Consultation Report*. Cardiff: Hyder.

8.6.4 Using this methodology sub-Options 3D (*MBT followed by fuel to off-site energy use*), 2A (*Pyrolysis*), 2C (*Incineration with energy recovery*) and 3C (*MBT followed by Incineration with energy recovery*) were the more strongly favoured alternatives.

Figure 14: Responses to the Survey Question –
"Which of the options is your preferred choice?"



8.6.5 The Consultation Report concluded that:

- It is likely that *Incineration with Energy Recovery* was favoured in the consultation survey due to the notable amount of interest in the energy that would be produced. The topic of energy was probably at the forefront of people's minds as during the consultation period the future of the UK's energy supply was regularly discussed and debated in the media, with Nuclear Energy being favoured by the Government. Incineration could be seen as preferable to Nuclear power generation and was a topic of discussion at a number of the meetings;
- The opposition to sub-Options 3B (*MBT followed by Gasification*), 4D (*Autoclave followed by fuel to off-site energy use*) and 4C (*Autoclave followed by incineration with energy recovery*), is likely due to a lack of understanding of these technologies and their limited application to the treatment of residual waste in the UK; and
- The majority of stakeholders expressed the opinion that ultimately it would be inappropriate to select one preferred sub-Option and that in order to maintain choice and flexibility in the approach to waste management, all eight best performing sub-Options should be retained and presented as alternative solutions.

9. THE RWP TECHNOLOGY STRATEGY

9.1 Background

9.1.1 Having identified and assessed the alternative strategic waste management Options for the RWP 1st Review, one or more Options must be selected as the preferred RWP Technology Strategy.

9.2 The RWP Technology Strategy – Eight Preferred Options

9.2.1 The RWP Technology Strategy has been identified on the following basis:

- The LCA and SA identified eight top performing sub-Options;
- The SEA concluded that no clear leader emerged from amongst the Options;
- The strategic HIA concluded that while Options 2, 3 and 4 are good from a public health perspective there is no single best Option; and
- The Consultation Report concluded that all eight best performing sub-Options should be retained and presented as alternative solutions.

9.2.2 On this basis, and in order to provide adequate flexibility and choice, eight 'Preferred Options' have been selected as the RWP Technology Strategy in order to form the framework for the sustainable management of wastes and recovery of resources in South West Wales. The eight Preferred Options of the RWP Technology Strategy are set out in Figure 15.

Figure 15: The RWP 1st Review Technology Strategy[58]

High source segregated recycling and composting levels with all remaining residual wastes, where possible, being managed by:

- **High levels of Pyrolysis** (sub-Option 2A); and/or
- **High levels of Incineration with energy recovery** (sub-Option 2C); and/or
- **MBT followed by Pyrolysis** (sub-Option 3A); and/or
- **MBT followed by Gasification** (sub-Option 3B); and/or
- **MBT followed by Incineration with energy recovery** (sub-Option 3C); and/or
- **MBT followed by RDF to off-site energy use** (sub-Option 3D); and/or
- **Autoclave followed by Incineration with energy recovery** (sub-Option 4C); and/or
- **Autoclave followed by RDF to off-site energy use** (sub-Option 4D).

9.3 Important Caveats Regarding the RWP Technology Strategy

9.3.1 Regarding the management of Municipal waste, the RWP Technology Strategy will provide strategic direction for those UA's that require it. It will not prejudice any existing progress and facilities either where a UA has in good faith gone about its procurement process in line with the first RWP or where a UA has for sound reasons made other plans which have been developed and justified through a process of a local BPEO assessment / SA / SEA.

[58] The eight Preferred Options are presented in numerical order. This order does not indicate any order of rank or preference.

9.3.2 The process of generating and assessing the alternative strategic waste management options has only considered AD as a residual waste treatment technology. The treatment of individual waste streams such as composting / treatment of separately collected kitchen / garden waste has therefore not been individually considered and assessed as part of this review. It is however accepted that this waste can be treated by an AD facility or by other means (i.e. in-vessel composting etc.) and this 1st Review does not rule out the use of such solutions.

9.3.3 There are a great number of assumptions that underpin the modeling work used to develop the RWP Technology Strategy. As with any modeling process, the model must be based on a set of working assumptions and will be subject to practical limits. For example, the WRATE tool assessed each waste management technology on the basis of a particular facility, or range of facilities, already in existence. In practice, any new facilities that are developed in the future of any technology type will vary depending on the client, the provider, the location, the size, any specific regulatory requirements and so on. It is therefore essential that when considering the best technology option for development, the developer and / or LPA take detailed local factors into consideration.

9.3.4 The RWP Technology Strategy will be a material consideration in the planning process. However, it is only one material consideration that will need to be balanced against many other material considerations.

9.3.5 In terms of delivery, the following issues should be noted:

- Fuel to off-site energy use is likely to be constrained by the availability of capacity of off-site energy users[59];
- Those Preferred Options involving a two-stage process for managing residual waste[60] are likely to have higher land area requirements. This may mean a greater chance of difficulties at the site purchasing, planning and permitting stages; and
- The WAG[61] has indicated that it will only provide capital funding support to technologies that provide a final, rather than intermediate, solution for MSW. Therefore, those Preferred Options involving an intermediate stage in managing residual waste[62] may be less deliverable.

9.3.6 The NWSW states that one of its primary objectives is *"…to make Wales a model for sustainable waste management by adopting and implementing a sustainable, integrated approach to waste production, management and regulation (including litter and fly tipping) which minimises the production of waste and its impact on the environment, maximises the use of unavoidable waste as a resource, and minimises where practicable, the use of energy from waste and landfill"*[63].

9.3.7 The eight Preferred Options of the RWP Technology Strategy:

[59] The modelling indicates a required capacity of over 300,000 tonnes per annum and it will be very difficult to secure this capacity within the region or indeed further afield.
[60] Preferred Options 3A / 3B / 3C and 4C.
[61] At a meeting between Cllr Richard Parry Hughes (WLGA Spokesperson on Planning and Environment) and Jane Davidson AM (Minister for Sustainability and Rural Development) on the 28th June 2007 the Minister stated that she would not support intermediate technologies (MBT / MHT).
[62] Preferred Options 3A / 3B / 3C / 3D / 4C and 4D.
[63] Para. 1.10 Wise About Waste: The National Waste Strategy for Wales (WAG, June 2002).

- Are the best practicable environmental and sustainable sub-Options;
- Maximise the use of unavoidable waste as a resource through high source segregated recycling and composting levels; and therefore
- Minimise the use of EfW and Landfill.

9.4 Infrastructure Requirements for the Preferred Options

9.4.1 TAN 21 states that *"A key element in the RWP will be the agreement of the apportionment of facilities to local authorities"*[64].

9.4.2 The modeling undertaken by EAW for the SA of the Options apportioned the total capacity required at various types of waste management facilities in 2013 to each UA area on the basis of the forecast arisings.

9.4.3 Appendix E (Tables E1-E8) presents the total required waste infrastructure for each of the Preferred Options respectively. The tables show this required infrastructure by firstly, the capacity for annual tonnage throughput and secondly, the number of facilities that would be required based on agreed typical capacities[65].

9.5 Non-Landfill Facilities: Indicative New Capacity Required & Indicative Number of New Facilities Required

9.5.1 The SA apportionment of the total capacity required to deliver the Preferred Options has subsequently been used to calculate an indicative new capacity required and an indicative number of new facilities required.

9.5.2 The methodology essentially involved comparing data on what waste management facilities the region has, against data on what waste management facilities the region needs. The following issues should be noted:

- There are a great number of assumptions that underpin the modeling work used to develop the RWP Technology Strategy. As with any modeling process, the model must be based on a set of working assumptions and will be subject to practical limits; and for this reason
- Any figure produced by this methodology for the new capacity and number of new facilities required **must be treated as indicative for planning purposes only**. In practice, the capacity of the new facilities developed and the number required will depend on many interrelated factors including economics, site sizes and availability, permitted capacity and shift patterns at individual facilities etc[66].

[64] Para. 2.15 TAN 21: Waste (November, 2001).
[65] Table 1: EA, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options – Part 2 Tables & Figures*. Cardiff: EA
[66] Each LPA would have the responsibility of planning for the arisings that occur within its area regardless of whether or not a RWP existed. The RWP does not tackle the issues of the scale and distribution of facilities; instead in order to identify the 'need' that each LPA has the responsibility of planning for, it takes the equitable and simple approach of apportioning the required capacity / land area on the basis of the LPA's proportion of forecast arisings – i.e. those arisings that each LPA would have the responsibility of planning for regardless of whether or not a RWP existed.

9.5.3 By comparing the SA data on the total capacity required at waste management facilities in 2013 with data on the maximum licenced capacity at existing waste management facilities and any 'in the pipeline' capacity[67], it is possible to calculate an indicative new capacity that will be required by 2013[68].

9.5.4 By then applying the typical facility capacities used by EAW in the SA to the new capacity required, it is possible to calculate an indicative number of new facilities that will be required by 2013[69].

9.5.5 Figure 16 and Figure 17 summarises the indicative new capacity required and indicative number of new non-landfill facilities required in 2013 to deliver the Preferred Options.

Figure 16: Indicative New Non-Landfill Capacity Required in 2013 for South West Wales, by Preferred Option (Tonnes)

Technology Type	Option 2A	Option 2C	Option 3A	Option 3B	Option 3C	Option 3D	Option 4C	Option 4D
MRF + TS	891,091	891,091	891,091	891,091	891,091	891,091	891,091	891,091
IVC	211,497	211,497	211,497	211,497	211,497	211,497	211,497	211,497
Pyrolysis	534,943		300,887					
Gasification				300,887				
Incinerator		448,025			213,969		33,247	
MBT			274,743	274,743	274,743	274,743		
Autoclave							534,943	534,943
Civic Amenity								
Open Windrow	42,874	42,874	42,874	42,874	42,874	42,874	42,874	42,874
C&D Exemption	768,755	768,755	768,755	768,755	768,755	768,755	768,755	768,755
C&D Recycling	768,755	768,755	768,755	768,755	768,755	768,755	768,755	768,755
Total	**3,217,915**	**3,130,997**	**3,258,602**	**3,258,602**	**3,171,684**	**2,957,715**	**3,251,162**	**3,217,915**

Figure 17: Indicative Number of New Non-Landfill Facilities Required in 2013 for South West Wales, by Preferred Option

Technology Type	Option 2A	Option 2C	Option 3A	Option 3B	Option 3C	Option 3D	Option 4C	Option 4D
MRF + TS	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
IVC	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Pyrolysis	10.7		6.0					
Gasification				5.3				
Incinerator		4.9			2.4		0.4	
MBT			2.5	2.5	3.7	2.5		
Autoclave							3.7	3.7
Civic Amenity								
Open Windrow	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
C&D Exemption	295.7	295.7	295.7	295.7	295.7	295.7	295.7	295.7
C&D Recycling	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total	**355.1**	**349.3**	**352.9**	**352.2**	**350.5**	**346.9**	**348.5**	**348.1**

9.5.6 A further distinction was made between those facilities considered to be 'in-building' and those considered to be 'open-air'. Figure 18 shows the type of facilities identified in the SA and indicates whether they are most likely to be 'in-building' or 'open-air' facilities.

[67] *'In the pipeline'* capacity is that at proposed facilities that has planning permission & is likely to be developed.
[68] In accordance with the principle of regional self-sufficiency, any existing over-capacity in one or more UA area was used to offset the new capacity required in all other UA areas.
[69] An indicative number of new in-building facilities required for unmodelled waste were not calculated because it was not possible to specify a typical capacity for this wide range of wastes.

Figure 18: Types of In-Building and Open-Air Waste Management Facilities Identified in the Sustainability Appraisal

In-Building	Open-Air
Transfer Station	Civic Amenity
In-Vessel Composting	Open-Windrow Composting
Pyrolysis	C&D Exemption
Dirty MRF	C&D Recycling
Gasification	Non-Hazardous Waste Landfill
Incinerator	Hazardous Waste Landfill
MBT	Inert Waste Landfill
Autoclave	

9.5.7 Appendix F presents a detailed breakdown of the indicative new in-building capacity required (Table F1) and the indicative number of new in-building facilities required (Table F2)[70] together with much more detailed information on the calculations. The data is presented by UA, by Preferred Option and by facility type.

9.6 Landfill Facilities: Forecast Void in 2013

9.6.1 The modeling undertaken by EAW for the SA of the Options included apportioning the total capacity required at landfills in 2013 to each UA on the basis of the forecast arisings. In addition, EAW made forecasts of landfill void in South West Wales in 2013 and beyond for each of the sub-Options[71].

9.6.2 The starting void reflected the best-case scenario[72] from the 2005/06 EA landfill void survey for open gate landfills only. The rate of fill[73] was based on the continuation of current landfilling rates from the present until 2010/2011, then on a linear reduction / increase of landfill from then to the expected tonnage landfilled to deliver each sub-Option. The following paragraphs highlight the main issues.

9.6.3 **Non-Hazardous** – it is estimated that some void will still be available for all Preferred Options in 2012/13. Option 2A preserves the most landfill void with an estimated 2,678,653m³ remaining in 2012/13, whereas Option 4C preserves the least landfill void with an estimated 2,333,170m³. The forecast void for 2013 for all eight Preferred Options means that **South West Wales does not need any new non-hazardous waste landfill capacity by 2013**.

9.6.4 It should be noted however, that this forecast must be treated with some caution, as it was based on the assumption that facilities will be commissioned in the period between 2010/11 and 2013. Should the development of such treatment capacity be delayed, the void available in the Region's landfills will be filled sooner than forecast. Furthermore, the fact that landfill void will continue to be required for all Preferred Options beyond the assessment year, will mean that South West Wales will ultimately need new non-hazardous waste landfill capacity.

[70] The forecast and modeled waste arisings include wastes that could be reused rather than being recycled. It is therefore reasonable to assume that reuse capacity could be substituted for some of the front-end recycling capacity.
[71] Table 3: EA, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options – Part 2 Tables & Figures*. Cardiff: EA.
[72] *'Best-Case' Scenario* presumes all permits under determination are issued and all applications for future tranches are granted. It does not take into account the outcome of any refused permits being issued following appeal.
[73] The fill rate is based on an assumed density of 1t/m^3 for all wastes.

9.6.5 **Hazardous** – The RWP capacity requirement for hazardous waste landfill in 2013 ranges from 78,542 tonnes / annum (Options 3D and 4D) to 110,372 tonnes / annum for Option 2C. South West Wales does not currently have any licenced or permitted hazardous waste landfills. **South West Wales has a current need for new hazardous waste landfill capacity.**

9.6.6 **Inert** – The RWP capacity requirement for inert waste landfill for all eight Preferred Options in 2013 is 106,591 tonnes / annum. South West Wales does not currently have any licenced or permitted inert waste landfills. **South West Wales has a current need for new inert waste landfill capacity**.

9.7 Hazardous and Unmodelled Waste

9.7.1 The Options were generated and assessed on the basis that, in an integrated recovery and disposal strategy for all waste streams, MSW and wastes within the other principal controlled waste streams, which are similar to MSW, will be managed together. Wastes not similar to MSW were therefore excluded from the assessment as 'unmodeled waste'.

9.7.2 On the basis of the Regional Self-sufficiency principle, the RWP 1st Review does not plan for increased capacity at any specific types of treatment facilities for unmodelled waste because the modelling has shown that capacity at existing facilities which are counted against unmodelled waste, is far greater than the amount of unmodelled waste. The existing capacity at facilities counted against unmodelled waste (which includes Hazardous Waste) totals 1,338,805 tonnes. The amount of unmodelled waste projected for 2012/13 totals 119,512 tonnes.

9.7.3 This however must not be interpreted as indicating that no new specific types of treatment facilities for unmodelled waste or Hazardous waste are required. There are a great number of assumptions that underpin the modelling work used to develop the RWP Technology Strategy. As with any modelling process, the model must be based on a set of working assumptions and will be subject to practical limits.

PART C:

THE REGIONAL WASTE PLAN SPATIAL STRATEGY

10. DEVELOPING THE SPATIAL STRATEGY

10.1 Background

10.1.1 The second practical reason behind the RWP 1st Review is the need to develop further the spatial strategy (i.e. the influence the RWP exerts over the location of the required waste management / resource recovery facilities). There are two major drivers behind this element:

- The need to construct new infrastructure in Wales in order to be able to meet the EU Landfill Directive requirements for the diversion of Biodegradable Municipal Waste from landfill[74] (and other targets specified in the NWSW); and
- The need for Wales to meet the EU Waste Framework Directive requirement for publishing plans that include either a geographical map specifying the exact location of waste disposal sites or precise mappable criteria[75].

10.1.2 To achieve an *"integrated and adequate network of waste disposal installations"*, Member States are required to produce waste management plans, setting out their abilities and capacities to manage their own waste arisings, using such networks of facilities. Having failed to ensure that plans containing maps or precise mappable criteria are in place within the required time frame, the UK Government has negotiated a 3-year delay in infraction proceedings up to July 2010.

10.1.3 It is not likely that there will be Wales-wide coverage of adopted Local Development Plans (LDP's) containing such maps or precise mappable criteria by 2010. For this reason, the WAG is seeking to achieve an adequate level of detail in the RWP 1st Review documents across Wales in order to meet the EU requirements and avoid infraction fines.

10.1.4 The Audit Committee and EPC Committees' inquiries into waste both made recommendations in relation to the revision of the RWP's in Wales. In particular, Recommendation 3 of the Audit Committees report advised, *"Regional waste plans are revised in order to indicate the types of locations where regional facilities could be situated"*. In response, the WAG accepted the need for the RWP's to be revised to indicate the types of location where regional facilities could be located and made reference to the Geographic Information System (GIS) waste mapping model developed by the WAG to help inform the process further by defining areas of search suitable for waste facilities.

10.1.5 Recommendation 9 of the EPC Committee's inquiry into waste advised, *"…Regional Waste Plans should be revised to ensure they identify suitable geographical locations for regional facilities and that the Welsh Assembly Government provides local authorities with clearer guidance to deliver this objective"*. The WAG's response identified that *"…it is seeking greater clarity and rigour in the revised regional waste plans that will be produced in 2007. The current plans already have the status of material considerations in the planning process and the revised plans will be expected to identify with more certainty the types of sites that will be considered suitable for waste management facilities"*.

10.1.6 To this end the WAG produced a paper[76] outlining their objectives for the revision of the RWP's across Wales, which the three RWG's should seek to achieve as part of the review.

[74] Article 5 of the European Union Directive 1999/31/EC of 26th April 1999 on the landfill of waste.
[75] Articles 5 & 7 of the European Union Directive 2006/12/EC of 5th April 2006 on waste.
[76] WAG, 2006. *The Revision of the Regional Waste Plans*. Cardiff: WAG.

10.1.7 The specific spatial outcomes sought by the WAG include:

- *"The identification of a list providing a choice of locations / sites (e.g. named industrial estates, business parks etc) suitable for the location of additional "within building" waste facilities with capacity for greater than one local authority area…Each local authority should identify a list providing a choice of preferred potential locations or sites for additional waste facilities with capacity for greater than one local authority area for inclusion in the RWP. There needs to be a degree of over-provision – just because a site is identified it does not mean that it will definitely get a facility, nor does it have to be safeguarded necessarily. The degree of over provision should be agreed by the Regional Waste Group – a figure of 150%…would seem reasonable, but is not prescriptive."*[77]; and
- *"The identification of existing sites and areas of search for new "open-air" waste facilities with capacity for greater than one local authority area"*[78].

10.2 Establishing the Scope of the Spatial Strategy for the RWP 1st Review

10.2.1 The RWG agreed that it would be inappropriate, and circumventing the due and proper process, for the RWP 1st Review to state that sites other than *existing* B2 or major industry sites and B2 sites that have already been *allocated* in development plans are suitable locations for new in-building facilities; this is a policy making exercise that should only be undertaken at the local level through the LDP preparation process.

10.2.2 In order to address the requirements of TAN 21[79] and develop the RWP Spatial Strategy while retaining adequate flexibility for both LPA's and developers, the following scope of the spatial strategy was agreed by the RWG:

- In order to identify a choice of locations / sites suitable for the location of 'in-building' facilities with capacity for greater than one local authority area, **each Unitary Authority provides a list of sites for inclusion in the RWP 1st Review that either has an existing B2 or major industry land use or is allocated in Development Plans for a future B2 or major industry land use**;
- In order to ensure that there is adequate land to accommodate the required additional capacity / land area requirements for future waste management development, **wherever possible, each Unitary Authority quantifies the availability of land at each of the sites provided**;
- In order to identify areas of search for additional in-building facilities with capacity for greater than one local authority area, **an area of search map for 'in-building' facilities is published as part of the RWP 1st Review**; and
- In order to identify existing sites and areas of search for new 'open-air' waste facilities with capacity for greater than one local authority area, **an area of search map for 'open-air' facilities is published as part of the RWP 1st Review**.

[77] Para 8(ii) of WAG 2006 – *The Revision of the Regional Waste Plans*. Cardiff: WAG.
[78] Para 8(iii) of WAG 2006 – *The Revision of the Regional Waste Plans*. Cardiff: WAG.
[79] Paras 2.15 & 2.16: TAN 21 (November 2001).

11. ESTIMATING LAND AREA & IDENTIFYING SITES SUITABLE FOR NEW IN-BUILDING FACILITIES

11.1 Background

11.1.1 Advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities appear no different to any other industrial building and on the inside contain industrial processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact.

11.1.2 For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas[80], and new B2 sites allocated in Development Plans will be suitable locations for the new generation of in-building waste management facilities that will be required in accordance with the Preferred Options of the RWP Technology Strategy.

11.1.3 With this in mind, this chapter estimates the total land area required for new in-building facilities; identifies a list of sites suitable in principle for the location of in-building facilities with capacity for not only local facilities but for those with capacity for greater than one local authority area; and in order to ensure that there is adequate land available to accommodate the required new infrastructure, analyses the potentially available land area at each of the identified sites.

11.2 Estimated Total Land Area Required for New In-Building Facilities

11.2.1 Having calculated an indicative new capacity and number of new in-building facilities required to deliver the Preferred Options of the RWP Technology Strategy (see Section 9.5), by applying the typical land takes[81] used by EAW in the SA to the indicative number of new facilities, it is possible to calculate an estimate of the total land area that will be required by 2013[82].

11.2.2 This calculation is not undertaken for open-air facility types because it is considered that in practice for many open-air facilities, the size of the site available is likely to determine the size of the facility, rather than vice versa.

11.2.3 The following issues should be noted:

- There are a great number of assumptions that underpin the modeling work used to develop the RWP Technology Strategy. As with any modeling process, the model must be based on a set of working assumptions and will be subject to practical limits; and for this reason

[80] The term *'B2 employment sites and major industrial areas'* is used here to include other land uses that have similar characteristics such as existing waste management sites, ports, brownfield sites, and other similar sui generis land uses.
[81] Appendix 6 (Page 44) *EA, 2007 'Sustainability Appraisal & Life Cycle Assessment of the Strategic Waste Management Options – Part 3 Appendices. Cardiff: EA.* The data used by the EA was taken from information held about individual sites in the WRATE model. This data has been adjusted pro rata from the capacity of the site in the model to reflect the required capacity of each facility type as agreed by the RWG.
[82] Due to the inability to calculate the indicative number of facilities for unmodelled wastes, it was not subsequently possible to estimate land requirements for the facilities to deal with such wastes.

- Any figure produced by this methodology for the total land area required for new in-building facilities **must be treated as an estimate for planning purposes only**. In practice, the capacity of new facilities developed, the number required and the land area will depend on many interrelated factors including economics, site sizes and availability, permitted capacity and shift patterns at individual facilities etc.

11.2.4 Figure 19 summarises the estimate of the total land area required for new in-building facilities by 2013[83] for each of the eight Preferred Options of the RWP Technology Strategy[84] [85]. Table F3 (Appendix F) presents this data in more detail together with much more detailed information on the calculations.

Figure 19: Estimate of the Total Land Area Required for New In-building Facilities in 2013 for South West Wales, by Preferred Option (Hectares)

Technology Type	Option 2A	Option 2C	Option 3A	Option 3B	Option 3C	Option 3D	Option 4C	Option 4D
MRF + TS	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9
IVC	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
Pyrolysis	17.9		10.0					
Gasification				17.4				
Incinerator		23.7			11.4		1.8	
MBT			20.6	20.6	30.0	20.6		
Autoclave							16.2	16.2
Total	**61.7**	**67.5**	**74.4**	**81.8**	**85.2**	**64.4**	**61.8**	**60.0**

11.2.5 The following can be summarised from the figures:

- The estimated total land area required in South West Wales for new in-building facilities for the eight Preferred Options ranges from between 60 hectares to 85.2 hectares;
- With the exception of Options 4C and 3D, the Options with a single stage for managing residual waste have the lowest land area requirements (i.e. Options 4D, 2A and 2C) at 60, 61.7 and 67.5 hectares respectively; and
- The Options with two stages for managing residual waste have the highest land area requirements (i.e. Options 3A, 3B and 3C) at 74.4, 81.8 and 85.2 hectares respectively.

11.3 Identifying a List of Sites Suitable for In-Building Facilities

11.3.1 As noted earlier, many existing land use class B2 'general industrial' employment sites and existing major industrial areas will be suitable locations for new in-building waste management / resource recovery facilities.

[83] In order to provide a degree of over-provision, estimates of the total land area required for in-building facility types with potential to serve more than one LA area are increased by 50% – this figure was based on WAG guidance. This over provision is necessary in order to provide the waste management industry with choice and flexibility regarding the number and size of sites, in order to facilitate adequate minimum site sizes and because other employment uses may be developed on any identified sites.

[84] The forecast and modeled waste arisings include wastes that could be reused rather than being recycled. It is therefore reasonable to assume that reuse capacity could be substituted for some front-end recycling capacity.

[85] The term 'B2 employment sites and major industry sites' is used here to include other land uses that have similar characteristics such as existing waste management sites, ports, some brownfield sites, and other similar sui generis land uses.

11.3.2 In order to identify a choice of locations / sites suitable in principle for in-building facilities with capacity for not only local facilities but with also capacity for greater than one local authority area, a list of sites has been compiled that either has an *existing* B2 or major industry land use or is *allocated* in Development Plans for a future B2 or major industry land use.

11.3.3 Furthermore, in order to ensure that there is adequate land available to accommodate the required additional capacity / land area requirements for future waste management development, where data is available, the potentially available land area (in hectares) at each of the sites is also presented.

11.3.4 Appendix G shows the list of sites across South West Wales considered suitable in principle for the location of in-building facilities with capacity for greater than one local authority area. The list is compiled by UA, distinguishes whether the sites are *existing* or *allocated*, provides a total land area figure and where available, quantifies the potentially available land area.

11.3.5 It is estimated that the total land area required in South West Wales for new in-building facilities for the eight Preferred Options ranges from between 60 hectares to 85.2 hectares. An analysis of the potentially available land area on existing and allocated B2 or major industry sites identified in Appendix G has shown that **in each Unitary Authority for which data is available there is a clear surplus of land area available at the current time to accommodate the highest estimate of the total land area required for new waste management facilities**.

11.3.6 Regarding this analysis of the availability of land, the following should be noted:

- The capacity of existing waste management / resource recovery facilities could be increased. Such development would, in effect, serve to reduce the total land area required; and
- New in-building waste management / resource recovery facilities could also be developed within vacant existing industrial buildings. This would also, in effect, serve to reduce the total land area required.

11.3.7 The above points and analysis will assist in the process of demonstrating an adequate choice of locations for the integrated and adequate network of waste facilities as required by the EU Waste Framework Directive.

11.4 Further Planning Considerations

11.4.1 The statutory controls of land-use planning legislation operate in such a way that some developments require applications for planning permission whilst other developments are classed as *'permitted development'* in which case the developer does not need to submit a planning application. The system of *'permitted development'* recognises that certain developments can take place without increasing environmental or community impacts. The following factors are relevant when considering the need for a developer to submit a planning application:

- **The existing and proposed land-use class of the site**: The relevant business / industry use classes in the Use Classes Town and Country Planning (Use Classes)

Order 1987 are: Class B1 – business that can be undertaken in a residential area without detriment to the amenity of the area; Class B2 – general industrial; and Class B8 – Storage and Distribution. Any development that involves a new use that falls within the same land-use class as the previous use of the site would be classed as 'not development'[86]. However, any proposal that involves a change to or from a 'Sui Generis'[87] land-use would require an application for planning permission if it is considered that there would be a material change of use, which would be likely in most cases[88];

- **Any significant new built development**: Any development that involves significant new construction would require planning permission;
- **The need for an Environmental Impact Assessment (EIA)**: Any development for which an EIA is required by the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, whether automatically under Schedule 1 or after screening by a LPA under Schedule 2, would require planning permission; and
- **It is a requirement of the WML regime operated by the EAW that, before a WML can be granted, the facility must (if planning permission is required) have the necessary planning permission in place**. In certain circumstances some new in-building waste management facilities could be lawfully developed within vacant existing industrial buildings without the need to submit a planning application to the LPA. In this case the developer would need to demonstrate the lawfulness to the EAW. One way to achieve this would be to apply to the LPA for a *'Certificate of Lawfulness of Proposed Use or Development'* (CLOPUD). While the LPA may publicise and consult the wider community on the application, the CLOPUD procedure and decision relates solely to the lawful position and cannot take into account any planning merits or disbenefits arising from the proposal.

11.4.2 Potential developers should always seek clarification from the LPA on each of these factors on a site-by-site, proposal specific basis. While developers will be required to explain the processes, materials and products involved in what they propose, this could quite properly be approached for many of the new generation of in-building waste management facilities in terms of industrial processes or energy generation.

[86] In addition, Schedule 2 of the Town and County Planning General Permitted Development Order 1995 (as amended) permits the following changes between land-use classes: from Class B2 or Class B8 to Class B1 or from Class B1 or Class B2 to Class B8 both with the restriction that any change from, or to, Class B8 must not exceed 235 square metres of floor space.

[87] 'Sui Generis': a development type that is unique / 'of its own kind' and one which cannot be placed in any other Use Class.

[88] Facilities for the disposal of hazardous waste through incineration, chemical treatment or landfill are classified as 'sui generis' by the Town and Country Planning (Use Classes) Order 1987 (as amended) (Article 3(6)(j) states that *"No [use] class specified in the Schedule includes use… as a waste disposal installation for the incineration, chemical treatment (as defined in Annex 11A to Directive 75/442/EEC under heading D9), or landfill of waste to which Directive 91/689/EEC applies.")*. In addition, Regulation 31 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 states that *"A change in use of the land or buildings to… [one of these uses]…involves a material change of use in the use of the land or those buildings for the purposes of paragraph (1) of section 55 (meaning of "development" and "new development"*. Waste disposal and waste recovery operations are defined in Annex IIA and Annex IIB of the Council Directive 75/442/EEC (as amended) and Schedule IV of the Waste Management Licensing Regulations 1994 (as amended).

11.4.3 In 2005 the RWG published an addendum report to the first RWP[89] in order to assist developers and LPA's in planning for facilities to deal specifically with the range of hazardous wastes. The report examined the land use planning considerations for the range of facilities that can handle materials classified as hazardous waste and identified appropriate locational criteria for each type of facility.

11.4.4 Appendix H contains the *'Locational Criteria'* for hazardous waste facilities first published in the addendum report together with a *'Summary of Site Requirements and Considerations'* for those in-building facilities with the potential to deal with hazardous wastes.

11.5 Synergies with Industry

11.5.1 The eight Preferred Options of the RWP Technology Strategy all involve an element of EfW. This presents significant opportunities for co-locating and networking EfW facilities with energy consuming land uses such as large industrial energy users or district heating systems in industrial estates. Energy users could benefit from lower energy costs, long-term energy contracts at fixed prices and the prestige of using an innovative and environmentally friendly source of energy.

11.5.2 When considering locations that may be suitable for EfW facilities, LPA's should consider synergies between potential EfW plants and proposed large scale developments that could benefit from the heat and/or energy produced.

11.5.3 The potential for synergies to be developed between existing high energy users and potential EfW facilities should also be explored. As no database of industrial energy users currently exists, the WAG has undertaken some preliminary work in an effort to identify the largest energy users within Wales[90]. Use has been made of the EAW Pollution Inventory (2004), in order to ascertain the largest CO_2 producers within Wales – by inference, these will be the largest energy users[91].

11.5.4 Figure 20 identifies the largest industrial energy users in South West Wales and highlights that the largest energy demand in the region is located within the Neath Port Talbot – Llanelli industrial belt and Pembrokeshire refinery areas.

Figure 20: Largest Industrial Energy Users in South West Wales[92]

Operator	Site Address	Process Type	CO_2 Emission (Tonnes)
Corus UK Ltd	Port Talbot Works	Ferrous Metals	6,631,000
Texaco Ltd	Pembroke Plant	Refining	2,270,000
Total Milford Haven	Milford Haven Plant	Refining	1,170,564
Baglan Operations Ltd	Briton Ferry, Neath	Combustion	988,821
Corus Trostre	Trostre, Llanelli	Combustion	64,500
Rockwool	Pencoed, Bridgend	Other Mineral Fibres	53,507
Npower Cogen Ltd	Bridgend Paper Mill	Combustion	52,082
Huntsman Chemicals	Bynea, Llanelli	Organic Chemicals	18,557

[89] *Report on Hazardous Waste (An Addendum to the Regional Waste Plan) September 2005* – South West Wales Regional Waste Group.
[90] The WAG and The Carbon Trust have entered into discussions to build upon and develop this work in order to broaden the linkages between energy users and potential EfW solutions.
[91] Whilst the use of the Inventory is limited to a lower threshold of 10,000 tonnes / annum CO_2, it does however provide an overall guide as to the industrial areas that have the greatest energy requirements.
[92] Pollution Inventory (EA Wales, 2004).

12. IDENTIFYING AREAS OF SEARCH FOR NEW FACILITIES

12.1 Background

12.1.1 This chapter sets out the process used to generate and assess *'Areas of Search'* for use in identifying *new* sites for in-building and open-air facilities and presents the areas of search maps.

12.1.2 As with the generation and assessment of the strategic waste management Options, the process of generating and assessing areas of search has been approached with the aim of producing RWP's for all of Wales that are based on comparable principles and techniques.

12.1.3 To this end the three regions in Wales jointly commissioned *RPS Planning, Transport and Environment* to carry out a study to identify areas of search for regional waste facilities across the principality. The key aims of the study were:

- To identify areas of search for regional in-building[93] facilities across each of the three regions in Wales;
- To identify areas of search for regional open-air[94] facilities across each of the three regions in Wales;
- To ensure that the process of identifying areas of search is subject to an appraisal process that is compliant with *'The Environmental Assessment of Plans and programmes (Wales) Regulations 2004'* (referred to as the Strategic Environmental Assessment Regulations); and
- To ensure compliance with the Habitats Directive.

12.1.4 For the purpose of the study the term *'Areas of Search'* was defined as those areas in Wales, where, based on the strategic nature of the study and the geographic / location issues considered, regional in-building or open-air facilities could potentially be located.

12.2 Generating and Assessing the Areas of Search

12.2.1 The approach to the study to identify areas of search has been to undertake a SA, incorporating the requirements of SEA. This section summarises and discusses the SEA / SA technique and results. More detailed information is available in the Environmental Report / SA Report[95]. Further information on the SEA of the RWP 1st Review and how the requirements of the regulations have been fulfilled is provided in Chapter 14.

12.2.2 In summary, the study entailed identifying sustainability objectives and criteria which were weighted and applied to a mapping exercise utilising GIS to generate the areas of search.

12.2.3 The first phase of the assessment process was to identify the SA Framework in order to drive the whole appraisal process, including defining the criteria which was to be used in the GIS analysis. The key components identified for the SA Framework included:

[93] In-building facilities include In-Vessel Composting / Thermal Treatment / Mechanical & Biological Treatment / Materials Recycling Facilities.
[94] Open-air facilities include Landfill / Landraise / Windrow Composting.
[95] RPS, 2007. *Identifying Areas of Search for Regional Waste Facilities in Wales*. Bristol: RPS.

- The identification of SA Objectives;
- The identification of criteria for the GIS Analysis to enable assessment against the SA Objectives;
- The weightings applied to the criteria (allocated to the two broad types of waste management facilities); and
- Results of the analysis to be presented on composite maps.

12.2.4 The *SA Objectives* were informed by the baseline and policy review and in particular were drawn from the sustainability appraisals of the Wales Spatial Plan and the existing RWP's. In order to measure the way in which areas perform against the SA objectives, *criteria* were identified specifically for the GIS analysis. These are effectively questions that can be answered through a GIS analysis (e.g. areas with specific designations or features and/or distances from those specific designations or features).

12.2.5 *Weightings* were agreed and applied to each of the criteria and for both the broad types of waste management facilities. The definitions of the weightings applied are set out in Figure 21.

Figure 21: Weightings Applied to the SA Framework

Weighting Applied		Definition
Level of Constraint	5	Exclusion – where the development of a waste management facility is disqualified on the grounds of sustainability / policy and/or impracticality.
	4	Areas with Regional / National Constraints.
	3	Areas with Some Constraints.
	-	Areas where no significant constraints have been identified (based on appraisal criteria).
Degree of Potential	2	Area of Some Potential.
	1	Area of High Potential.

12.2.6 The whole geographical area of Wales was subjected to the complete set of criteria for the GIS analysis. As such, the selection of areas of search for waste management facilities was driven by the SA Framework from an early stage.

12.2.7 The GIS analysis addressed weightings 1 & 2 differently to 3, 4 & 5. This can be explained by the fact that weightings 1 & 2 represent *'potential'* whereas 3, 4 & 5 represent *'constraints'*. Areas associated with the highest constraints overlay those with lesser constraints (i.e. a 5 overlays a 4 & 3 and a 4 overlays a 3). Appendix I sets out the SA Framework identifying the objectives, criteria and weightings applied.

12.2.8 In order to further refine the analysis and ultimately create areas of search, the following principles were adopted:

- Areas weighted 5 were excluded due to constraining factors of regional, national or international significance;
- Areas weighted 4 were identified as being in proximity to areas of national or regional constraint;
- Areas weighted 3 or '-' in terms of level of constraint, were given different priorities [i.e. 1st, 2nd or 3rd areas of search based on the degree of potential identified by the analysis (i.e. weighting 1 or 2)]; and
- Areas identified as having a combination of either *'no constraints'* with only *'some potential'* / or *'some constraints'* with *'high potential'* were given the same priority

(both identified as 2nd areas of search) as it was not possible to draw an adequate distinction between these combinations within the scope of the study.

12.2.9 Figure 22 summarises the approach taken:

Figure 22: Combined Weightings for the Creation of Areas of Search

Combined Weightings	Resulting Areas of Search
Areas of No Constraint & High Potential	1st Area of Search
Areas of No Constraint & Some Potential / Areas of Some Constraint & High Potential	2nd Area of Search
Areas of Some Constraint & Some Potential	3rd Area of Search
Areas with National or Regional Constraint	4th Area of Search

12.3 Parameters, Limitations and Assumptions of the Study

12.3.1 Before considering the results of the analysis, the following parameters, limitations and assumptions of the study should be noted:

- The study does not address the need for, or appropriateness of, the various types of waste management facility; it simply brings together the various physical and environmental characteristics which will influence the location of waste management facilities;
- The study is not intended to provide a definitive guide against which planning applications will be judged; it merely assists LPA's in identifying appropriate locations for waste management facilities, providing the basis from which more detailed investigations can be undertaken to assess which individual sites are considered appropriate for allocations in LDP's;
- To achieve consistency across Wales, the criteria and weightings were developed and agreed at the all-Wales level. For this reason, only broad, strategic level data was included. It was impractical to include data at the local level and it is anticipated that the areas of search identified by the study would be subject to more detailed assessments through the local planning process. Examples of local issues to be considered include altitude, access, location of small areas of residential properties or individual dwellings;
- The study relates only to locational issues and therefore matters that are specific to the nature of the various types of waste management facility are outside the scope of the study. Differentiation is however made between the two broad types of waste management facilities (i.e. in-building and open-air facilities);
- The GIS data used represents a snapshot in time. For example, data on residential development is based on existing development and does not take account of allocated sites yet to be built;
- Data has not been included for minerals resources – it has been assumed that prior extraction of any resource will be considered prior to any waste development at the local level; and
- As only GIS data was used, there are limitations in terms of availability, quality and reliability of data. Where possible, data has been used that is consistent across Wales. It has been assumed that where data has been provided, the quality and suitability of the data has been assessed by the owner / provider and is considered to be 'fit for purpose'. However, due to a lack of consistent Wales-wide data sets for

certain topic areas, Development Plan data has been substituted where it was found to be robust and fit for purpose.

12.4 The Areas of Search

12.4.1 The outcome of the analysis has resulted in the identification of areas of search – those areas where, based on the strategic nature of the study and the geographic / location issues considered, regional in-building and open-air facilities could potentially be located.

12.4.2 The areas of search are presented in two hardcopy maps (Appendix J), namely areas of search maps for in-building and open-air facilities respectively. Each map comprises:

- **1st areas of search** – identified as areas appropriate for waste management development due to the presence of appropriate site characteristics and few significant environmental constraints;
- **2nd, 3rd and 4th areas of search** – identified as those areas that cannot be excluded from consideration as appropriate areas, but where a greater level of constraint or constraints exists; and
- **Exclusion Zones** – identified as those areas which, on the basis of clear planning policy, have been excluded from consideration as appropriate for waste management development.

12.4.3 The Areas of Search have been identified through the SEA / SA process using the SA objectives, criteria and weightings. As such, any significant negative effects have been minimised. The following paragraphs outline in more detail how any significant negative effects have been minimised.

12.4.4 **Biodiversity** – ecological assets in terms of flora and fauna have been identified within this study by capturing areas of statutory and non-statutory designation. The importance of these designations in terms of policy has informed the weightings allocated to each of the designations.

12.4.5 The footprint of statutory designated sites, including SAC's, RAMSAR sites, SSSI's, NNR's and SPA's have all been designated as absolute areas of constraint, constituting areas that are unsuitable for waste management facilities. These have subsequently been omitted from the search. In addition, impacts on designated sites as a result of placing waste management facilities nearby have been considered. This has been undertaken by applying buffer areas around the footprint of designated sites, which present areas of some constraint. As the distance from the designated sites increases, the level of constraint decreases as reflected by the lowering weighting. The buffer zones vary depending on the importance of the designated site; buffers have been derived from information held within current planning policy regarding siting development near such sites, the weightings are appropriate to this and reflect the distance from the designated site, as well as the type of waste facility.

12.4.6 For biodiversity issues, the areas of search subsequently reflect areas that are considered to be constrained by virtue of planning policy, reflected at the broad, national level. By excluding sites of nature conservation importance and applying buffers around them representing constraints, the permanent negative effects on biodiversity (including flora and fauna) are minimised.

12.4.7 **Population** – residential development and urban areas are excluded from the search under objectives linked to residential properties, the cost of waste management and greenhouse gas emissions associated with transport. Medium to long-term positive effects on employment are maximised by identifying areas up to 10km from residential areas as having potential.

12.4.8 The areas of search also highlight areas of local amenity as being generally unsuitable for siting waste management facilities. Therefore, negative effects on local amenity are minimised.

12.4.9 **Human Health** – negative, secondary effects on human health are minimised through siting waste facilities outside of areas of residential development[96] and buffer areas surrounding such areas ensures that health impacts from locating facilities nearby to residential developments are also acknowledged.

12.4.10 **Soil** – areas of land where soil is of high agricultural potential has been designated as a constraint, although never absolutely excluded from the search. Land that falls under grades 1 and 2 is given a weighting of 4, which is a national or regional constraint and areas under grades 4 and 5 is regarded as being an opportunity rather than a constraint. In essence, the mapping process has identified areas with poor soils as being areas of some potential, and includes these within the definitive search areas accordingly.

12.4.11 **Water** – the areas of search has identified two main objectives to secure the water environment, these include objectives to minimise the adverse effects on water quality, and to avoid increasing flood risk.

12.4.12 To avoid negative impacts on groundwater, open-air facilities is excluded in Groundwater Catchment Zones (1-3). Similarly, in-building facilities are restricted in Groundwater Catchment Zone 1. Lakes and rivers are excluded and the inclusion of sites within close proximity to rivers with water quality objectives has been limited. Furthermore, the location of both major and minor aquifers has also been included in the areas of search.

12.4.13 The search also takes account of the risk of flooding. Areas defined by EAW as TAN 15 Layer C1 and Layer C2 have been weighted appropriately to ensure that the effects on flood risk are minimised.

12.4.14 **Air** – the negative effects on air quality have been minimised by identifying areas of national and regional constraint in locations that are regarded to be sensitive to changes in air quality. These include areas that are identified to be existing Air Quality Management Areas (AQMA's), as well as areas in close proximity to residential development.

12.4.15 **Climatic Factors** – two criteria have been applied to strategically limit the greenhouse gas emissions arising from transporting waste and offer areas of potential rather than constraint. Appropriate weightings have been applied to areas within 5km of a port and locations in close proximity to urban areas that have a population greater than 10,000. Negative climatic effects have therefore been minimised.

[96] The location of small areas of residential properties / individual dwellings has not been included in this strategic study.

12.4.16 **Material Assets** – the search has minimised the negative effects on residential properties by ensuring that areas close to residential development[97] are not included within the search. In addition, the reuse of particular types of sites, including existing waste sites and quarry sites is encouraged. As such, these have been identified as having potential which enables a positive effect on the prudent use of land.

12.4.17 **Cultural Heritage** – the study minimises effects on identified aspects of cultural heritage by showing constraint in areas designated as having value relating to cultural heritage. Appropriate weightings have been applied to a range of features such as, World Heritage Sites, scheduled ancient monuments, locations of heritage coasts, historic parks and gardens, as well as various visually sensitive receptors identified from the Landscape Assessment & Decision Making process (LandMap).

12.4.18 **Landscape** – National Parks[98] and Areas of Outstanding Natural Beauty (AONB) have both been excluded from the search. In addition, locating waste management facilities around these areas has been assessed so that impacts from distant views are eliminated as far as possible.

12.4.19 **Interrelationships** – the relationship between the weightings and the criteria has formed the maps, which highlight areas of potential and areas of constraints throughout the region. The combination of all of the criteria that have formed the search fit together without conflict.

12.4.20 **The balance between human health, cost of waste management and impacts to the environment** – impacts upon population, the cost of waste management and the requirement to transport waste over as short a distance as possible may appear to overlap somewhat with regard to waste management. In one instance it is necessary to protect humans as far as possible from the health impacts associated with the management of waste. With regard to this, it would seem logical to site waste management facilities as far away possible away from centres of population. On the other hand, in areas of high population, it is reasonable to assume a greater amount of waste will be generated, indicating that facilities should be located nearby to increase the efficiency of waste management handling and storage processes, whilst minimising the impacts on air and climatic factors due to transportation. For this reason, appropriate weightings have been applied resulting in the search favouring areas surrounding urban population whilst at the same time protecting areas of residential development.

12.4.21 **Cumulative Effects** – the results of this study identify potential areas for new waste management facilities. It is possible that a number of sites within an area could be proposed for such facilities. Furthermore, proposals for waste management facilities could come forward in areas where other types of developments are also taking place. This could lead to cumulative effects on sensitive receptors. The potential for such effects will need to be considered at the local level.

12.4.22 **Habitats Directive** – the SA also addressed the requirements of the EU Habitats Directive. The Directive requires an AA to be undertaken where the impacts of land use plans are

[97] The location of small areas of residential properties / individual dwellings has not been included in this strategic study.

[98] In exceptional circumstances there may be sites adjacent to National Parks where facilities with capacity to serve more than one local authority area, especially those relating to agricultural waste, may be acceptable. See Appendix L: Section L7 National Park Issues.

likely to have a significant effect on a European site (or where it cannot be demonstrated that it would not have a significant effect) to assess the implications for the European site in view of the site's conservation objectives. AA is part of the wider process of Habitat Regulation Assessment (HRA), which is an iterative process and should be undertaken throughout the plan making process.

12.4.23 The Directive states *"Any plan or project not directly connected with or necessary to the management of the site but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public"*[99].

12.4.24 The Habitats Directive is designed to promote a hierarchy of avoidance, mitigation and compensation as a result of the potential impacts of a proposed plan or strategy. Any plan should firstly avoid any negative impacts upon European sites by identifying possible impacts early in the plan making and that any resultant policies and proposals which emerge from this process avoid such impacts. Mitigation then follows this so as any identified impacts can be controlled so that no adverse effects remain as a result of a particular proposal. If it is found that, despite applying suitably robust mitigation measures there could be impacts upon the site, then an assessment must be undertaken with the aim of identifying an alternative solution. If no alternative solution can be found, the Directive requires that compensatory measures are required for any remaining adverse effects, but they are only permitted if there are no alternative solutions and the proposals within a plan are required for imperative reasons of overriding public interest.

12.4.25 Through the use of mapped criteria to generate the Areas of Search, the distance from the boundary of a designated area of international importance has been a key consideration in establishing the level of constraint in any given area. The mapped criteria relating to the potential impact upon European sites has therefore adopted the first key stage of the requirements under the Habitats Directive; they have been derived in order to prevent the likelihood of potential impacts of waste management development on European sites of ecological importance.

12.4.26 The SA provides relevant information that will assist LPA's, as a Competent Authority, to undertake tests of significance at the appropriate stages when specific land use allocations and development proposals are being formulated.

12.5 Use of the Areas of Search Maps & GIS Data

12.5.1 The following two broad principles for the viewing and use of the Areas of Search maps and GIS data must be noted:

- **The sole purpose of the maps and GIS data is to identify Areas of Search at a strategic level for use by LPA's during the LDP preparation process** – as a

[99] Article 6 paragraphs (3) of Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

starting point for more detailed local level assessments to identify appropriate sites for waste management / resource recovery facilities in LDP's; and for this reason

- **The Areas of Search maps and GIS data must not be used by any organisation or individual to determine the appropriateness of proposals for individual waste management facilities**.

12.5.2 More specifically, when referring to the areas of search maps the following matters should be taken into consideration:

- **The purpose of the maps is to identify Areas of Search at a regional level which can then be used by LPA's to identify preferred locations or sites for new waste management facilities. The ranking of a particular area effectively establishes the issues that would need to be addressed in more detailed local level assessments during the LDP preparation process to identify appropriate sites for waste management facilities**. If a particular type or combination of waste management facility / facilities is proposed for a particular site, these more detailed assessments may require the quantification of this risk, based on the nature of the waste management facility / facilities. In identifying a location or site it is recommended that there is a need to consider the Areas of Search maps together with other relevant information before a LPA can be satisfied that the location or site is appropriate;
- The areas of search maps have been developed at a Wales wide, strategic level, and as a result there may be local circumstances which it has not been possible to assess (for example, the location of small areas of residential properties or individual dwellings that have not been included in this strategic study). **Waste management facilities are only one aspect of development which LPA's must consider in their LDP's, and as a result other pressures and priorities may justify selecting 2nd, 3rd or 4th Areas of Search over a 1st area**. It is recommended that the Sustainability Appraisal process, which must be undertaken on all LDP's, is an appropriate mechanism for justifying any such approach;
- **The locations that have been identified as 2nd, 3rd or 4th areas of search cannot be excluded from consideration as appropriate areas**. However, in instances where a greater level of constraint or constraints exists, it must be acknowledged that in turn a greater level of operational mitigation may adequately control potential environmental impacts. Waste management facilities have the potential to be sited in a range of locations if they are appropriately designed, managed and regulated to control any potential impacts;
- **The Area of Search map for in-building facilities does not prejudice the development of new in-building waste management facilities on any existing land use class B2 'general industrial' employment sites, existing major industrial areas, or new B2 sites allocated in development plans** whether or not they fall within an Area of Search – because the principle of B2 or major industry use is already established at these sites; and
- **Within the areas of search maps there are a number of existing waste management facilities that have been identified to be in areas that are, by virtue of the surrounding constraints, shown to be excluded. It should be acknowledged that in some circumstances the associated impacts of a waste management facility are being appropriately mitigated against at these sites**. As a result they may not present an unacceptable risk to the constraining designations or land use characteristics. In these instances it will be for LPA's to assess whether the

expansion of operations at these locations is appropriate and that any potential adverse effects can be effectively controlled.

12.5.3 In summary, the key principles for the use of the maps and GIS data are as follows:

- **The maps and GIS data will not be used in isolation by LPA's as a definitive guide against which planning applications are judged** (i.e. it will not be used as a Development Control tool to determine the appropriateness of any proposal for waste management facilities);
- **The maps and GIS data will not be used in isolation by LPA's as a definitive guide to site selection** (i.e. it will not be used in isolation to determine the suitability of sites for inclusion within LDP's) – a range of other material considerations will need to be assessed and numerous other factors will need to be considered when planning for waste management. These more detailed local assessments must for each site:
  - Address each of the strategic level spatial issues that determined the Area of Search ranking – and in so doing may conclude that, regardless of the ranking, a particular site could be developed for waste management facilities with no potential impacts; or that adequate mitigation measures will control any potential impacts; or that a particular site should not be developed for waste management facilities;
  - Assess a range of other considerations that need to be addressed when planning for new waste management facilities – including site availability, access, altitude, topography, existing land uses and so on; and
  - Assess any potential cumulative effects on sensitive receptors of a number of sites within an area being developed for new facilities; and
- In identifying suitable sites, **LPA's will be required to investigate the potential of all areas within their administrative boundary**.

PART D:

SUMMARIES & NEXT STEPS

13. SUMMARY – THE RWP 1ST REVIEW

13.1 Overview of the RWP 1st Review

13.1.1 The RWP 1st Review relates to the following principal 'controlled' waste streams:

- MSW;
- Industrial Waste;
- Commercial Waste;
- C&D Waste;
- Hazardous Waste; and
- Agricultural Waste (the proportion requiring external management only).

13.1.2 The RWP 1st Review will assist the region in developing an integrated and adequate network of waste management facilities by providing strategic information on the types of waste facilities required and the types of locations likely to be acceptable. It will become a strategic framework for the preparation of LDP's and a material consideration in the development control process. It is made up of two distinct elements:

- The **RWP Technology Strategy** – which provides strategic information on the types of waste management / resource recovery facilities required in South West Wales; and
- The **RWP Spatial Strategy** – which provides strategic information on the types of locations likely to be acceptable.

13.1.3 The RWP Technology Strategy and RWP Spatial Strategy have been developed through different processes; they tackle different issues and have been presented separately. **This RWP 1st Review does not bring the two elements together in order to identify which technologies should be located at which site or in which area of search**. The process of combining the two elements is a policy making exercise which can only be undertaken at the local level though the LDP preparation process.

13.2 The RWP Technology Strategy

13.2.1 Four main alternative strategic waste management Options covering the main treatment technologies for residual waste were generated for the RWP Technology Strategy. These were:

- **Option 1 – A landfill-led strategy for residual waste**: This Option is for high levels of source separated recycling followed by low levels of energy from residual waste – where 'low' is interpreted to mean the minimum amount of additional material required to increase the level of BMW diversion to meet 2020 landfill directive targets. All residual commercial, industrial and agricultural wastes will be disposed of to landfill;
- **Option 2 – An EfW-led strategy for residual waste**: This Option is for high levels of recycling and composting followed by high levels of energy from residual waste – where 'high' is interpreted to mean the maximum feasible amount of residual waste will go to EfW;

- **Option 3 – An MBT-led strategy for residual waste**: This Option is for high levels of recycling and composting followed by high levels of MBT – where 'high' is interpreted to mean the maximum feasible amount of residual waste will go to MBT;
- **Option 4 – An Autoclave-led strategy for residual waste**: This Option is for high levels of recycling and composting followed by high levels of treatment using an Autoclave – where 'high' is interpreted to mean the maximum feasible amount of residual waste will go to Autoclave.

13.2.2 Each main Option was divided into sub-Options. The 19 sub-Options were considered to represent a sufficient range of choices for dealing with waste in the region.

13.2.3 The Options were assessed using the following techniques:

- Life Cycle Assessment (LCA) – to determine the 'Best Practicable Environmental Option' (BPEO);
- Sustainability Appraisal (SA) – developed from BPEO and 'Sustainable Waste Management Option' (SWMO);
- Strategic Environmental Assessment (SEA); and
- Strategic Health Impact Assessment (HIA).

13.2.4 Based on the results of the LCA and SA, and given that the SEA concluded that no clear leader emerged from amongst the Options, and given that the Strategic HIA concluded that while Options 2, 3 and 4 are good from a public health perspective there is no single best Option; the best performing eight sub-Options as identified in the SA report were presented for consultation. They included:

- **Sub-Option 2A** – High source segregated recycling and composting levels followed by high levels of Pyrolysis;
- **Sub-Option 3B** – High source segregated recycling and composting levels with all remaining residual waste being treated using MBT followed by Gasification;
- **Sub-Option 3A** – High source segregated recycling and composting levels with all remaining waste being treated using MBT followed by Pyrolysis;
- **Sub-Option 3D** – High source segregated recycling and composting levels with all remaining waste being treated using MBT followed by fuel to off-site energy use;
- **Sub-Option 2C** – High source segregated recycling and composting levels followed by high levels of Incineration with Energy Recovery;
- **Sub-Option 3C** – High source segregated recycling and composting levels will all remaining waste being treated using MBT followed by Incineration with Energy Recovery;
- **Sub-Option 4D** – High source segregated recycling and composting levels with all remaining waste being treated using an autoclave followed by fuel to off-site energy use; and
- **Sub-Option 4C** – High source segregated recycling and composting levels with all remaining waste being treated using an autoclave followed by Incineration with Energy Recovery.

13.2.5 The RWP Technology Strategy has been identified on the following basis:

- The LCA and SA identified eight top performing sub-Options;

- The SEA concluded that no clear leader emerged from amongst the Options;
- The strategic HIA concluded that while Options 2, 3 and 4 are good from a public health perspective there is no single best Option; and
- The Consultation Report concluded that all eight best performing sub-Options should be retained and presented as alternative solutions.

13.2.6 On this basis, and in order to provide adequate flexibility and choice, eight 'Preferred Options' have been selected as the RWP Technology Strategy in order to form the framework for the sustainable management of wastes and recovery of resources in South West Wales.

The RWP 1st Review Technology Strategy

High source segregated recycling and composting levels with all remaining residual wastes, where possible, being managed by:

- **High levels of Pyrolysis** (sub-Option 2A); and/or
- **High levels of Incineration with energy recovery** (sub-Option 2C); and/or
- **MBT followed by Pyrolysis** (sub-Option 3A); and/or
- **MBT followed by Gasification** (sub-Option 3B); and/or
- **MBT followed by Incineration with energy recovery** (sub-Option 3C); and/or
- **MBT followed by RDF to off-site energy use** (sub-Option 3D); and/or
- **Autoclave followed by Incineration with energy recovery** (sub-Option 4C); and/or
- **Autoclave followed by RDF to off-site energy use** (sub-Option 4D).

13.2.7 All eight Preferred Options of the RWP Technology Strategy:

- Have a 'front end' recycling and composting rate for MSW set at 50% in 2013 – this exceeds the current maximum NWSW target of achieving at least 40% recycling and composting of Municipal Waste by 2009/10;
- Are designed to achieve the 2020 BMW Landfill Directive target by 2013; and
- Ensure that targets for the management of the other principal controlled waste streams are also met – i.e. recycling targets for C&D waste and landfill diversion for Industrial and Commercial Waste.

13.2.8 The NWSW states that one of its primary objectives is *"…to make Wales a model for sustainable waste management by adopting and implementing a sustainable, integrated approach to waste production, management and regulation (including litter and fly tipping) which minimises the production of waste and its impact on the environment, maximises the use of unavoidable waste as a resource, and minimises where practicable, the use of energy from waste and landfill"*. The eight Preferred Options of the RWP Technology Strategy:

- Are the best practicable environmental and sustainable sub-Options;
- Maximise the use of unavoidable waste as a resource through high source segregated recycling and composting levels; and therefore
- Minimise the use of EfW and Landfill.

13.2.9 The RWP 1st Review also presents the apportionment of infrastructure to UA's in order to deliver the Preferred Options of the RWP Technology Strategy. It presents:

- The **total required waste infrastructure** for each of the Preferred Options respectively (i.e. the total capacity and number of facilities required); and
- Based on a comparison between the total capacity required at waste management facilities in 2013 and data on the maximum licenced capacity at existing waste management facilities, **calculates the indicative new capacity required and indicative number of new in-building facilities required**.

13.3 The RWP Spatial Strategy

13.3.1 In order to address the requirements of the EU Waste Framework Directive and TAN 21 while retaining adequate flexibility for LPA's and developers, the RWP Spatial Strategy:

- Estimates the total land area required in each UA for new in-building facilities;
- Identifies a list of sites suitable in principle for in-building facilities with the capacity to serve more than one UA area;
- Analyses the potentially available land area on the identified sites; and
- Generates areas of search for use in identifying *new* sites for both in-building and open-air facilities.

13.3.2 Advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities appear no different to any other industrial building and on the inside contain industrial processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact.

13.3.3 For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas, and new B2 sites allocated in Development Plans will be suitable locations for the new generation of in-building waste management facilities that will be required in accordance with the Preferred Options of the RWP Technology Strategy.

13.3.4 The estimated total land area required in South West Wales for new in-building facilities for the eight Preferred Options ranges from between 60 hectares to 85.2 hectares. An analysis of the potentially available land area on existing and allocated B2 or major industry sites identified that **in each Unitary Authority for which data is available there is a clear surplus of land area available at the current time to accommodate the highest estimate of the total land area required for new waste management facilities.**

13.3.5 The generation and assessment of Areas of Search has been undertaken through a SA process that incorporated the requirements of SEA, using a GIS tool to produce Areas of Search maps. The following two broad principles for the viewing and use of the Areas of Search maps and GIS data must be noted:

- **The sole purpose of the maps and GIS data is to identify Areas of Search at a strategic level for use by LPA's during the LDP preparation process** – as a starting point for more detailed local level assessments to identify appropriate sites for waste management / resource recovery facilities in LDP's; and for this reason
- **The Areas of Search maps and GIS data must not be used by any organisation or individual to determine the appropriateness of proposals for individual waste management facilities.**

13.3.6 The areas of search are presented in two hardcopy maps (Appendix J), namely areas of search maps for in-building and open-air facilities respectively. Each map comprises:

- **1st areas of search** – identified as areas appropriate for waste management development due to the presence of appropriate site characteristics and few significant environmental constraints;
- **2nd, 3rd and 4th areas of search** – identified as those areas that cannot be excluded from consideration as appropriate areas, but where a greater level of constraint or constraints exists; and
- **Exclusion Zones** – identified as those areas, which, on the basis of clear planning policy, have been excluded from consideration as appropriate for waste management development.

13.3.7 Article 7(4) of the EU Waste Framework Directive requires Member States to publish waste management plans containing either a geographical map specifying the exact location of waste disposal sites or precise mappable criteria. Appendix B provides further details on the requirements of the Waste Framework Directive.

13.3.8 TAN 21 states that while it would be for individual local authorities to determine actual locations of facilities and make provisions in their development plans, the RWP should specify the approximate location or type of location of new facilities: *"The identification of areas or types of location for future facilities will be of particular importance. The RWP would not allocate sites for facilities, but it will indicate areas of need and search for potential sites for future facilities, and where possible, a choice of locations that once agreed in the due local political process and in recognition of existing contractual arrangements, would serve the region"*.

13.3.9 The RWP Spatial Strategy addresses and fulfils these requirements in the following two ways:

- It demonstrates an adequate supply of *existing* sites for new *in-building facilities* on existing B2 or major industry sites and B2 sites that have already been allocated in development plans to meet the demand for sites for new in-building waste management facilities; and
- It identifies Areas of Search for use in identifying *new* sites for both *in-building and open-air* waste management facilities, based on precise mapped criteria relating to strategic level spatial issues.

14. SUMMARY – STRATEGIC ENVIRONMENTAL ASSESSMENT

14.1 What is Strategic Environmental Assessment (SEA)?

14.1.1 The *'EU Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment'* is commonly known as the SEA Directive.

14.1.2 The objective of the SEA Directive is *"…to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that…an environmental assessment is carried out of certain plans and programs which are likely to have significant effects on the environment."* [100]

14.1.3 The SEA Directive defines[101] *'environmental assessment'* as a process comprising:

- Preparing an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated;
- Carrying out consultation on the draft plan or programme and the accompanying Environmental Report;
- Taking into account the Environmental Report and the results of consultation in decision making; and
- Providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

14.1.4 The Directive is implemented in Wales through The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.

14.2 Why Undertake SEA?

14.2.1 Focusing on the requirements relevant to the RWP, the SEA Directive[102] requires an environmental assessment of plans or programmes if:

- They are subject to preparation by local authorities;
- They are required by administrative provisions; or
- They are prepared for waste management, *or* town and country planning, *or* land use, *and* they set the framework for future development consents of projects listed in Annexes I and II of the EU Environmental Impact Assessment Directive.

14.2.2 The RWP Technology Strategy is prepared by local authorities; is required by TAN 21; is prepared for waste management / town and country planning / land use; and it sets the framework for future development consents by setting out a combination of waste management technologies that would enable the region to meet or exceed legislative targets

[100] Article 1.
[101] Article 2(b) and Articles 5.1 of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment.
[102] Article 2(a) & Article 3 2(a).

and by apportioning the total capacity required at various types of waste management facilities in 2013 to each UA area.

14.2.3 The RWP Spatial Strategy is prepared by local authorities; is required by TAN 21; is prepared for waste management / town and country planning / land use; and it sets *part* of the framework for future development consents[103] by identifying Areas of Search at a strategic level for use by LPA's during the LDP preparation process as a starting point for more detailed local level assessments to identify appropriate sites for waste management facilities in LDP's.

14.2.4 TAN 21[104] states that RWP's should be subject to SEA. For these reasons the SEA process was applied to the RWP 1st Review process.

14.3 The Approach to SEA

14.3.1 Government guidance advises[105] that there are a number of stages in the SEA process:

- Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope;
- Stage B: Developing and refining alternatives and assessing effects;
- Stage C: Preparing the Environmental Report;
- Stage D: Consulting on the draft plan or programme and the Environmental Report;
- Stage E: Monitoring the significant effects of implementing the plan or programme on the environment.

14.3.2 The approach taken to SEA has been to undertake Stages A-C separately for the two separate substantive policy elements – the RWP Technology Strategy and the RWP Spatial Strategy. This approach was considered appropriate, adequate and proper for the following reasons:

- The two elements tackle different issues;
- The two elements have been developed through two different processes;
- The RWP 1st Review presents these two elements separately;
- The RWP 1st Review does not bring the two elements together in order to identify which technologies should be located at which site or in which Area of Search; and
- The process of combining the two elements together in order to identify which technologies should be located at which site or in which Area of Search is a policy making exercise that should only be undertaken at the local level through the LDP preparation process – a process which would be subject to a further SEA.

[103] The European Commission guidance document 'Implementation of Directive 2001/42/EC on the Assessment of the Effect of Certain Plans and Programmes on the Environment' (EC, 2004, Para 3.23) states that "*The meaning of 'set the framework for future development consent' is crucial to the interpretation of the Directive, although there is no definition in the text. The words would normally mean that the plan or programme contains criteria or conditions, which guide the way the consenting authority decides an application for development consent. Such criteria could place limits on the type of activity or development which is to be permitted in a given area; or they could contain conditions which must be met by the applicant if permission is to be granted; or they could be designed to preserve certain characteristics of the area concerned (such as the mixture of land uses which promotes the economic vitality of the area)*".

[104] Paras 2.10, 2.14 and 2.17 of TAN 21: Waste (WAG, 2001).

[105] Figure 5 of 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM, 2005).

14.3.3 For Stage D the approach has been to publish the RWP Technology Strategy and RWP Spatial Strategy in one document – the Consultation Draft RWP 1st Review – for formal consultation alongside the two Environmental Reports.

14.3.4 Finally, Stage E for both the RWP Technology Strategy and RWP Spatial Strategy will become an integral part of the continued, wider, monitoring of the RWP.

14.4 The Level of Detail in the SEA

14.4.1 Government guidance states that an SEA need not be done in any more detail, or using any more resources, than is useful for its purpose[106].

14.4.2 The SEA Directive lists[107] the following factors to be considered in deciding what information to include in the Environmental Report:

- Information that may reasonably be required, taking into account current knowledge and methods of assessment;
- The contents and level of detail of the plan;
- The objectives and geographical scope of the plan;
- The stage reached in the decision making process; and
- The extent to which it would be more appropriate to assess certain matters elsewhere in the decision-making process.

14.4.3 Accordingly, the approach taken to environmental assessment recognises the following factors:

- The RWP 1st Review is a strategic-level non-statutory plan with a regional geographical scope;
- The RWP 1st Review sits below the NWSW and above LDP's in a hierarchy of plans;
- The RWP Technology Strategy sets the framework for development consents;
- The RWP Spatial Strategy sets part of the framework for future development consents;
- Later stages in the decision making process will include bringing the RWP Technology Strategy and RWP Spatial Strategy together through the LDP preparation process in individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities. The LDP preparation process will include a SEA;
- Later stages in the decision making process may include the development control process for any proposed facilities. Proposed facilities may be subject to a detail EIA; and
- Later stages in the decision making process may include regulation through the WML or PPC system.

[106] Para 2.22 of 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM, 2005).
[107] Article 5.2.

14.5 Meeting the Requirements of the SEA Directive

14.5.1 Appendix K (Table K1) provides an extensive list that signposts where, or details how, all of the requirements of the SEA Directive have been fulfilled during the RWP 1st Review process.

14.5.2 The rest of this section provides an overview of how a number of the requirements of the SEA Directive have been fulfilled. Much more detailed information is available in the two Environmental Reports[108].

14.5.3 **Objectives and indicators**: the two Environmental Reports have been produced within the context of the same plans / programs / environmental objectives, the same baseline, the same environmental problems and they address the same topics required by the SEA Directive[109]. For this reason they contain similar objectives and use similar indicators / mapped criteria.

14.5.4 The RWP Objectives and the objectives and indicators / mapped criteria used in the Environmental Reports have been developed through an iterative process:

- Based on a review of the policy context, government guidance on SA[110] recommends a set of 12 objectives and 21 indicators. At the outset of the review in 2006 the RMF agreed[111] to proceed by using: the set of 12 objectives recommended by the government guidance as the initial objectives of the RWP 1st Review process; the set of 21 indicators recommended by government guidance as the indicators for the SA; and 7 of the recommended objectives and 15 of the recommended indicators as the SEA objectives and indicators for the RWP Technology Strategy;
- During the production of the Environmental Report for the RWP Technology Strategy the SEA objectives and indicators were reviewed and expanded to address potential for indirect and cumulative impacts; modified to address comments from statutory consultees; and as a result of work undertaken to establish the baseline;
- During the production of the Environmental Report for the Areas of Search the initial objectives of the RWP 1st Review process were reviewed and amended as appropriate in light of: the review of relevant plans / programs / environmental objectives; the baseline and environmental issues; and the availability and nature of GIS data; and
- The initial objectives of the RWP 1st Review process have been reviewed in light of the two Environmental Reports and developed into the objectives for the RWP 1st Review that is set out in Figure 4.

14.5.5 Appendix K (Table K2) shows the strong correlation between the SEA topics[112], the RWP Objectives, the indicators used in the Environmental Report for the RWP Technology Strategy and the mapped criteria used in the Environmental Report for Areas of Search.

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[108] *'Environmental Report of the Strategic Waste Management Options'* (Hyder, 2007). *Identifying Areas of Search for Regional Waste Facilities in Wales*. (RPS, 2007).
[109] The SEA topics are set out in Annex 1(f).
[110] Para 2.11 of: ODPM, 2002. Strategic Planning for Sustainable Waste Management: Guidance on Option Development and Appraisal.
[111] South West Wales Regional Waste Plan 1st Review: Content & Approach (January, 2006).
[112] The SEA topics are set out in Annex 1(f).

14.5.6 **Reasonable alternatives**: Government guidance states that only reasonable, realistic and relevant alternatives need to be put forward[113]. It was considered that the 19 alternative strategic waste management sub-Options were reasonable alternatives for the Environmental Report for the RWP Technology Strategy. The aim of the Areas of Search is to provide alternatives – this situation arises because the RWP Spatial Strategy sets *part*, not all, of the framework for future development consents. One reasonable alternative is the 'no plan' alternative (i.e. no Areas of Search) – this alternative would not allow for any strategic, regional level, consideration of the environmental issues before individual UA's identify appropriate sites for waste management / resource recovery facilities through the LDP preparation process.

14.5.7 **Assessing effects**: any likely significant effects on the environment of the 19 sub-Options were identified, described and assessed by forming a judgment on whether or not a predicted effect would be environmentally significant when compared against the baseline conditions. Any likely significant effects on the environment of the Areas of Search were identified, described and assessed in terms of how significant receptors will be avoided as part of the SEA process.

14.5.8 **Mitigation**: The measures envisaged to prevent, reduce and as fully as possible off-set any significant adverse effects on the environment of implementing the alternative strategic waste management Options were set out in the Environmental Report and referenced in Section 9.3 *'Important Caveats Regarding the RWP Technology Strategy'* and Appendix L *'Guidance on Actions for Local Planning Authorities'*. Mitigation measures have been built into the process of identifying Areas of Search through the avoidance of highly constrained areas.

14.5.9 **Consultation**: The two Environmental Reports were informed by scoping consultations. The RWP 1st Review Consultation Draft document, the two Environmental Reports and the draft strategic HIA were published for consultation in October 2007. The consultation period ran for 10 weeks from 15 October 2007 to 24 December 2007[114].

14.5.10 **Decision-making**: Environmental considerations have been integrated into the RWP 1st Review in the following ways:

- By assessing the alternative strategic waste management Options through a LCA, SA and SEA;
- By referencing the mitigation measures identified for the Preferred Options[115];
- By generating and assessing Areas of Search through a SA process that incorporated the requirements of SEA, using a GIS[116];
- The Environmental Reports have been taken into account in identifying the RWP Technology Strategy by referencing the mitigation measures identified for the Preferred Options[117] and in generating, assessing and publishing the Areas of Search[118];

[113] Pg 68 of 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM, 2005).
[114] See Section 17: Consultation Provisions of 'Hyder Consulting Ltd, 2007. *Strategic Waste Management Options: Strategic Environmental Assessment*. Cardiff: Hyder Consulting Ltd.' and Chapter 3: Scoping of 'RPS, 2007. *Identifying Areas of Search for Regional Waste Facilities in Wales*. Bristol: RPS.'
[115] See Para. 14.5.8.
[116] See Section 12.2.
[117] See Para. 14.5.8.
[118] See Section 9.2 & Chapter 12.

- The results of the SEA scoping consultations were taken into account in preparing the Environmental Reports[119];
- The results of the consultation on the RWP 1st Review Consultation Draft document and the two Environmental Reports have been reviewed by the RWG and used to inform changes to the Plan[120];
- The reasons for choosing the eight Preferred Options of the RWP Technology Strategy in the light of the other reasonable alternatives have been outlined[121]; and
- It has been explained that the reason for identifying the Areas of Search is to provide alternatives[122].

14.6 Monitoring

14.6.1 The SEA Directive states "*Member States shall monitor the significant environmental effects of the implementation of plans and programmes in order, inter alia, to identify at an early stage unforeseen adverse effects and to be able to undertake appropriate remedial action.*" [123]

14.6.2 The two elements of the Plan; The RWP Technology Strategy and RWP Spatial Strategy; will be brought together through the LDP preparation process in individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities. However, this alone will not achieve the implementation of the RWP 1st Review and the development of an integrated and adequate network of facilities on the ground. A range of actions and circumstances will be necessary to achieve this. In particular, the RWP 1st Review will be implemented through:

- The LDP land use policies and development control decisions of individual LPA's;
- The proactive engagement of economic development bodies – especially in the sale or release of appropriate land for new facilities;
- The actions of individual Waste Disposal Authorities (WDA's) in the development and operation of Municipal Waste management / resource recovery facilities; and
- The actions of private and voluntary sector organisations in the development and operation of waste management / resource recovery facilities.

14.6.3 The SEA Directive states that existing monitoring arrangements may be used if appropriate[124]. However, given that TAN 21 requires that RWP's are reviewed every 3 years, rather than extending the scope of the AMR's to include SEA monitoring it would be more appropriate for an SEA Monitoring Report to be produced at the outset of the RWP 2nd Review to inform the review. This is further supported by the lengthy timescales inherent in implementing the RWP 1st Review:

- The target and assessment year used for this RWP 1st Review is 2013;

[119] See Section 17: Consultation Provisions of 'Hyder Consulting Ltd, 2007. *Strategic Waste Management Options: Strategic Environmental Assessment*. Cardiff: Hyder Consulting Ltd.' and Chapter 3: Scoping of 'RPS, 2007. *Identifying Areas of Search for Regional Waste Facilities in Wales*. Bristol: RPS.'
[120] See Para. 9.2.1 & Chapter 15.
[121] See Para. 14.5.6, 9.2.1 & 9.2.2.
[122] See Para. 14.5.6 & Chapter 12.
[123] Article 10.1 of '*Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment*'.
[124] Article 10.2 of '*Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment*'.

- LDP's must be reviewed every 4 years[125]; and
- The process of planning and developing individual facilities can take a number of years.

14.6.4 Appendix K (Table K3) sets out an *Outline Monitoring Framework* for the SEA Monitoring Report based upon recommendations in the two Environmental Reports. The SEA Monitoring Report should identify any significant effects of implementing the RWP 1st Review by analysing the data gathered for the indicators identified in the outline monitoring framework.

14.6.5 When the SEA Monitoring Report is produced at the outset of the RWP 2nd Review the outline monitoring framework should be reviewed in light of how the implementation of the RWP 1st Review has progressed. It may be appropriate at the time to rationalise the outline monitoring framework to focus on any significant environmental effects arising from the implementation of the Plan. This could include a review of sources of existing data and refining the monitoring indicators to focus on key issues.

14.6.6 A monitoring framework will typically use the SEA objectives and indicators as its basis, as these are developed to be representative of the significant environmental effects anticipated of the Plan. For the outline monitoring framework:

- Indicators have been proposed which provide a possible measurement for each of the SEA objectives. The indicators identified at this stage have been developed on the basis that, when the SEA Monitoring Report is produced, they can be refined and used to establish a causal link between implementation of the RWP 1st Review and the likely significant effects to be monitored;
- The potential influence of external factors has also been considered. This has been difficult for some indicators in that there is a lack of existing data for the potential effects of certain waste management operations; and
- In order to set the scene for monitoring the implementation of the RWP 1st Review, it is also proposed that contextual monitoring of environmental change is also continued based on the aspects that were considered within the baseline assessment for the SEA. To avoid excessive data collection, this should also be focused once any significant environmental effects have been identified.

14.6.7 The SEA Monitoring Report is expected to draw heavily on existing or proposed monitoring programmes undertaken centrally by organisations such as the WAG, CCW and EAW[126], rather than set out to collect a full set of plan-specific data.

14.6.8 Future AMR's will provide monitoring information on the how the RWP 1st Review is being implemented through policies in development plans, planning permissions for new facilities and capacity at facilities. This information used in conjunction[127] with the outline monitoring framework will allow monitoring of any significant environmental effects arising from the implementation of the RWP 1st Review. In particular:

[125] Para 4.45 of 'WAG, 2005. *Local Development Plans Wales*. Cardiff: WAG.
[126] These include monitoring under the Environment Strategy for Wales and its associated Action Plans, the National Assembly for Wales Statistics Programme and Key Environmental Statistics for Wales and WasteDataFlow. In addition, information published in the RWP AMR's should be utilised where appropriate.
[127] Either directly, or indirectly to access further information in associated EIA's or SEA's.

- The Environmental Report for the RWP Technology Strategy found that many of the direct effects that could be anticipated from the technologies could not be fully assessed because the extent of the effects are most likely to be determined by the specific qualities of the receiving environment[128]; and
- The Environmental Report for the Areas of Search recommended monitoring the usefulness of the Areas of Search and monitoring detailed individual sites and their land use suitability for regional waste facilities[129].

14.6.9 In addition to identifying any significant effects of implementing the RWP 1st Review by analysing the data gathered for the indicators identified in the outline monitoring framework, the SEA Monitoring Report should also consider issues such as:

- Any gaps in the existing monitoring information and proposals for filling any identified gaps;
- Whether indicators are still relevant;
- Reviewing the relevance of data gathered based on the monitoring information gathered to date;
- Any new sources of monitoring information or additional parameters;
- The status of monitoring and any problems encountered;
- Criteria or thresholds for remedial action (e.g. what are the conditions that would be regarded as environmentally undesirable or unacceptable);
- Steps to be taken for any adverse effects found; and
- Any recommendations for the RWP 2nd Review.

[128] Impacts identified that could not be assessed included: effects on sites designated for biodiversity or ecological reasons; effects on specific local communities; effects of specific water courses; effects on the historic environment (including townscapes and the wider historic landscape); effects on the landscape in general; the secondary and cumulative effects likely upon these issues. In addition it was found that: it was difficult to ascertain degree of impact without some indication of the siting of facilities, both relative to each other and relative to sensitive receptors; effects that could be considered in greater detail relate primarily to the land and resource requirements, and the emissions associated with the processes; and there remains potential for a number of cumulative and secondary impacts, largely resulting from regulated emissions and land take.

[129] Para 8.7.1 of 'RPS, 2007. *Identifying Areas of Search for Regional Waste Facilities in Wales*. Bristol: RPS.'

15. SUMMARY – THE CONSULTATION PROCESS

15.1 Background – Why Consult?

15.1.1 The need for a new generation of waste management / resource recovery facilities is of interest and concern to everyone. The implementation of the RWP 1st Review will have a significant impact upon individuals, communities and businesses for many years to come and it was therefore imperative that all those interests had an opportunity to take part in a dialogue about the content of the Plan.

15.1.2 TAN 21 states *"Public consultation on planning issues of public concern, including proposed waste management facilities, is essential at an early stage to raise awareness, public confidence and responsibility in the planning process. Such consultation helps waste planning officers to make good quality decisions that reflect public opinion and absorb public expertise and knowledge"*[130].

15.1.3 Furthermore, the SEA Directive[131] requires that the SEA Consultation Bodies and the public be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan and the accompanying environmental report before the adoption of the plan and that the opinions expressed are taken into account during the preparation of the plan before its adoption. Legislation requires that the SEA Environmental Reports must be made available together with the Draft Plan to the SEA Consultation Bodies for a period of not less than 28 days.

15.1.4 As such, the three regions in Wales jointly commissioned *Hyder Consulting (UK) Limited* to carry out a comprehensive publicity and consultation programme in order to communicate the regional level issues; to explore stakeholder and public opinion on the alternative choices at this strategic level; and to meet the statutory requirements.

15.1.5 This section summarises the consultation methods and the changes made to the Plan in response to the consultation. Much more detailed information is available in the Consultation Report[132] and the Consultation Addendum Report[133].

15.2 The Consultation Process

15.2.1 The RWP 1st Review Consultation Draft document, the two Environmental Reports and the draft strategic HIA were published for consultation in October 2007. The consultation period ran for 10 weeks from 15th October 2007 to 24th December 2007.

15.2.2 Regional consultation activities during the formal period included:

- An **official launch and press conference** during the Cylch (Wales Community Recycling Network) Conference in Cardiff – including a speech by Jane Davidson AM, Minister for Environment, Sustainability and Housing;

[130] F12: Annex F: Planning Policy Wales Technical Advice Note 21: Waste (November 2001).
[131] Articles 6.2 & 8 of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment.
[132] Hyder Consulting (UK) Ltd, 2008. *South West Wales Regional Waste Plan 1st Review; Consultation Report*. Cardiff: Hyder.
[133] The South West Wales Consultation Addendum Report is available on www.walesregionalwasteplans.gov.uk

- **Four press releases** – 108 media outlets were contacted and media coverage included a BBC Wales Today News headline story, a BBC Radio Wales interview and a BBC Politics Show interview;
- A further **press conference at an Anaerobic Digestion plant**;
- Availability of a ***'Themes Document'*** summarising the main themes of the Plan;
- A **website** with an on-line survey and consultation documents for download;
- A random **postal survey** of 3,700 households in the region;
- An **industry day** for major waste producers and the waste management industry;
- A **strategic stakeholder day** for representatives of public, private and not-for-profit sector bodies primarily involved in waste, the environment and planning;
- A series of three **focus group meetings** to which a large number of organisations were invited to send a representative;
- Partner organisations were asked to publicise the consultation through their websites and other media; and
- The offer of a **community group meeting** to each Unitary Authority within their area with a group of their choosing – where Hyder attended to make a presentation and receive feedback. Six meetings were conducted.

15.2.3 These activities amounted to the largest consultation and debate in the region to date on the way forward for selecting and siting the future network of waste management facilities.

15.3 The Consultation Report and Consultation Addendum Report

15.3.1 The *Consultation Report* produced by Hyder Consulting contained recommendations structured in accordance with the 5 key themes of the 'Themes Document':

- Theme 1: The Regional Waste Plan 1st Review;
- Theme 2: The Need for Waste Facilities;
- Theme 3: Technology Options;
- Theme 4: The Appraisal Process; and
- Theme 5: The Implications for Planning.

15.3.2 The subsequent *Consultation Addendum Report* produced by the RWG contained agreed responses to the consultation feedback – including each of the recommendations in the Consultation Report – together with the changes to be made to the Plan in light of the feedback and responses.

15.3.3 The *Consultation Addendum Report* summarised that the main changes to be made to the Plan in response to the consultation were:

- More references to reuse of waste through the document;
- More references to / increased clarity on Hazardous Waste – including incorporating some of the Addendum 'Report on Hazardous Waste' to the first RWP;
- More references to / increased clarity on the issue of 'unmodelled waste';
- Clarity on the approach to SEA monitoring; and
- Additions to the *'Best Practice Statement'* to underline the need for monitoring waste arisings, and recycling and composting rates.

16. NEXT STEPS

16.1 Background

16.1.1 The RWP Technology Strategy and RWP Spatial Strategy will be brought together through the LDP preparation process in individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities. However, this alone will not achieve the implementation of the RWP 1st Review and the development of an integrated and adequate network of facilities on the ground. A range of actions and circumstances will be necessary to achieve this. In particular, the RWP 1st Review will be implemented through:

- The LDP land use policies and development control decisions of individual LPA's;
- The proactive engagement of economic development bodies – especially in the sale or release of appropriate land for new facilities;
- The actions of individual Waste Disposal Authorities (WDA's) in the development and operation of Municipal waste management / resource recovery facilities; and
- The actions of private and voluntary sector organisations in the development and operation of waste management / resource recovery facilities.

16.2 Actions for Local Planning Authorities

16.2.1 **Each LPA should include in its Development Plan elements of the RWP that are germane to its area**[134] and **individual LPA's should determine actual locations of facilities and make provisions in their development plans**[135]. The RWP Technology Strategy and RWP Spatial Strategy will be brought together through the LDP preparation process in individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities.

16.2.2 **A high standard of public consultation will be essential**. The Community Engagement Guidance on Waste Infrastructure[136] will be a valuable tool for LPA's during the process of identifying appropriate sites for waste management / resource recovery facilities. This toolkit, produced as a result of a partnership between the WLGA, the WAG, the EAW and Waste Awareness Wales (WAW) contains extensive guidance on how and when to consult key stakeholders in the planning and delivery of new waste management facilities.

16.2.3 **Appendix L sets out guidelines that individual UA's may wish to follow** in bringing together the RWP Technology Strategy and the RWP Spatial Strategy through the LDP preparation process in their individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities.

16.3 Actions for Economic Development Bodies

16.3.1 Economic development bodies should note the following points:

[134] TAN 21 Para 2.12.
[135] TAN 21 Para 2.15.
[136] Hyder Consulting 2007. Community Engagement Guidance; Waste Infrastructure.

- **The RWP Spatial Strategy estimates that the total demand for land area for new in-building waste management / resource recovery facilities in South West Wales ranges from between 60 hectares to 85.2 hectares**;
- **The waste management / resource recovery sector provides job and wealth creation opportunities** – both directly in upstream resource recovery facilities and in downstream industries that reprocess the recovered materials (recyclates);
- **As the resource recovery sector grows, so too will the markets and competition for the recovered materials** – those regions with the best developed network of upstream resource recovery facilities will have a competitive advantage;
- The eight Preferred Options of the RWP Technology Strategy all involve EfW. This presents significant **opportunities for co-locating and networking EfW facilities with energy consuming land uses such as large industrial energy users or district heating systems in industrial estates** – energy users would benefit from lower energy costs, long term energy contracts at fixed prices and the prestige of using an innovative and environmentally friendly source of energy;
- Advances in technology and the introduction of new legislation, policies and practices mean that **many modern waste management / resource recovery facilities appear no different to any other industrial building and on the inside contain industrial processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact**. For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas, and new B2 sites allocated in development plans will be suitable locations for the new generation of in-building waste management facilities that will be required in accordance with the RWP Technology Strategy;
- Enabling an integrated and adequate network of waste management / resource recovery facilities must be viewed as **an issue of enabling the development of an element of infrastructure that is required by all businesses in the region**; and
- **Economic development bodies have an important role to play in order that South West Wales meets the requirements set out in EU and national legislation and policy.**

16.3.2 **Economic development bodies must proactively engage with the waste management / resource recovery sector in order to enable the sale or release of appropriate land for new facilities**.

16.3.3 An analysis of the potentially available land area on existing B2 or major industry sites and B2 sites that have already been allocated in development plans has shown that in each UA for which data is available, there is a clear surplus of land area available at the current time to accommodate the highest estimate of the total land area required for new waste management facilities. **The WAG and UA's own equal amounts of developable land with a B2 planning permission or proposed use and therefore the WAG and UA's equally share the responsibility of enabling the sale or release of appropriate land from within their portfolios for new waste management / resource recovery facilities**.

16.4 Actions for Waste Disposal Authorities

16.4.1 **There is an urgent need for new Municipal waste management / resource recovery facilities to enable South West Wales to meet the EU Landfill Directive requirements for the diversion of BMW from landfill.**

16.4.2 **WDA's will most likely need to work in cooperation to make provision for the new capacity required for Municipal waste by jointly planning for facilities that serve more than one local authority area due to the efficiencies associated with larger facilities**. Some WDA's may wish, and be able to, make provision within their boundaries for the new capacity required for Municipal waste. This cooperative working is already underway with the establishment of the South West Wales Consortia.

16.4.3 **If a WDA is pursuing a local strategy that is different to the RWP Technology Strategy, it is likely that the local strategy would need to be robustly justified at the planning application stage of new facilities by reference to a local BPEO assessment / SA / SEA** – because the RWP 1st Review will be a material consideration in the planning process.

16.4.4 **A high standard of public consultation will be essential**. The Community Engagement Guidance on Waste Infrastructure[137] will be a valuable tool for WDA's during the process of planning and procuring new waste management / resource recovery facilities. This toolkit, produced as a result of a partnership between the WLGA, the WAG, the EAW and WAW contains extensive guidance on how and when to consult key stakeholders.

16.4.5 The eight Preferred Options of the RWP Technology Strategy all involve EfW. Developers should consider **opportunities for co-locating and networking EfW facilities with proposed or existing energy consuming land uses** that could benefit from the heat and/or electricity produced – such as large industrial energy users or district heating systems in industrial estates.

16.5 Actions for the Waste Management Industry

16.5.1 **Individual waste management companies and industry bodies must proactively engage with individual LPA's during the LDP preparation process in order to communicate their needs and interests**. The RWP Technology Strategy and RWP Spatial Strategy will be brought together through the LDP preparation process in individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities – engagement in this process will assist in identifying appropriate sites while taking account of local circumstances.

16.5.2 Advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities appear no different to any other industrial building and on the inside contain industrial processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact. For this reason, many existing land use class B2 'general industrial' employment sites, existing major industrial areas, and new B2 sites allocated in development plans will be suitable locations for the new generation of in-building waste management facilities that will be required in accordance with the RWP Technology Strategy. It should be noted that:

- **At the current time there is a clear surplus of land on existing land use class B2 'general industrial' employment sites, existing major industrial areas, and new**

[137] Hyder Consulting 2007. Community Engagement Guidance; Waste Infrastructure.

B2 sites allocated in development plans to accommodate the highest estimate of the total land area required for new in-building waste management facilities;

- **Some new in-building waste management facilities could be developed within vacant existing industrial buildings and, in certain circumstances, some of these may be lawfully developed without the need to submit a planning application to the LPA**.

16.5.3 **A high standard of public consultation will be essential**. The Community Engagement Guidance on Waste Infrastructure[138] will be a valuable tool for waste management companies during the process of planning and developing new waste management / resource recovery facilities. This toolkit, produced as a result of a partnership between the WLGA, the WAG, the EAW and WAW contains extensive guidance on how and when to consult key stakeholders.

16.5.4 The eight Preferred Options of the RWP Technology Strategy all involve EfW. Developers should consider **opportunities for co-locating and networking EfW facilities with proposed or existing energy consuming land uses** that could benefit from the heat and/or electricity produced – such as large industrial energy users or district heating systems in industrial estates.

[138] Hyder Consulting 2007. Community Engagement Guidance; Waste Infrastructure.

APPENDICES

APPENDIX A: MEMBERSHIP OF THE REGIONAL WASTE GROUP

A1 Membership of the Regional Member Forum:

Bridgend County Borough Council
Brecon Beacons National Park Authority
Carmarthenshire County Council
Ceredigion County Council
Pembrokeshire County Council
Pembrokeshire Coast National Park Authority
Neath Port Talbot County Borough Council
City & County of Swansea

A2 Membership of the Regional Technical Officers Group:

A Planning Officer and a Waste Management Officer representative of each of:

Bridgend County Borough Council
Brecon Beacons National Park Authority
Carmarthenshire County Council
Ceredigion County Council
Pembrokeshire County Council
Pembrokeshire Coast National Park Authority
Neath Port Talbot County Borough Council
City & County of Swansea

Representatives of:

Countryside Council for Wales (CCW)
Environment Agency Wales
South West Wales Economic Forum
The Wales Environment Trust (WET)
Wales Community Recycling Network (Cylch)
Waste and Resources Action Programme (WRAP)
Welsh Assembly Government (WAG) – Planning Division
WAG Waste Strategy and Implementation Unit
WAG Department for Economy & Transport

APPENDIX B: EU WASTE FRAMEWORK DIRECTIVE REQUIREMENTS

B1 The need to construct new infrastructure in Wales in order to be able to meet the EU Landfill Directive (Directive 1999/31/EC) requirements for the diversion of Biodegradable Municipal Waste from landfill – and other targets specified in the National Waste Strategy for Wales – is one of the major drivers behind the current work to develop both the spatial strategy of the RWP 1st Review document and the implementation guidelines.

B2 The need for Wales to meet the requirements of the Waste Framework Directive is another major driver.

B3 Article 5 of the Waste Framework Directive (Directive 2006/12/EC) states:

"*Member States shall take appropriate measures, in cooperation with other Member States where this is necessary or advisable, to establish an integrated and adequate network of disposal installations, taking account of the best available technology not involving excessive costs*".

B4 Article 7 of the Waste Framework Directive states:

"*In order to attain the objectives referred to in Articles 3, 4 and 5, the competent authority or authorities referred to in Article 6 shall be required to draw up as soon as possible one or more waste management plans. Such plans shall relate in particular to:*

(a) the type, quantity and origin of waste to be recovered or disposed of;

(b) general technical requirements;

(c) any special arrangements for particular wastes;

(d) suitable disposal sites or installations".

B5 Directive 2006/12/EC on waste is a codified version of Directive 75/442/EEC as amended. The European Court of Justice has ruled[139] that:

"*Article 7 of Council Directive 75/442/EEC of 15 July 1975 on waste, as amended by Council Directive 91/156/EEC of 18 March 1991, must be interpreted to mean that the management plan or plans which the competent authorities of the Member States are required to draw up under that provision must include either a geographical map specifying the exact location of waste disposal sites or location criteria which are sufficiently precise to enable the competent authority responsible for issuing a permit under Article 9 of the Directive to determine whether the site or installation in question falls within the management framework provided for by the plan".*

B6 Having failed to ensure that plans containing such maps or precise mappable criteria are in place within the required time frame, the UK government has negotiated a 3-year delay in infraction proceedings up to July 2010.

B7 It is not likely that there will be Wales-wide coverage of adopted LDPs containing such maps or precise mappable criteria by July 2010. For this reason it is hoped that the three RWP 1st Review documents can contain an adequate level of detail to meet the EU requirements and avoid infraction fines.

[139] On 1 April 2004 in the joined cases of Commune de Braine-le-Château (case C-53/02) and Michel Tillieut and Others (case C-217/02) v Région wallonne, and BIFFA Waste Services SA and Others. See European Court reports 2004 Page I-03251.

APPENDIX C: CURRENT & PROJECTED WASTE ARISINGS

TABLE C1: Principal Waste Growth Projections for South West Wales

Waste Stream	Adopted Growth Scenario		Based on:
Municipal Solid Waste	2005/06 to 2014/15	+ 4% per annum	• Forecast all-Wales population change (+0.4% per annum); • Actual change in arisings of Household Waste per household & non-Household waste; • Impact of impending changes in waste definitions; and • Likely impact of waste reduction measures in the future.
	2015/16 to 2019/20	Linear change towards + 1% per annum	
	2020/21 to 2024/25	+ 1% per annum	
Industrial Waste	2003/04 to 2009/10	- 4% per annum	• Past reductions in arisings; • Likely future economic growth and waste growth due to regulatory and economic measures and cultural factors; and • The decline[140], and likely further decline, in the industrial / manufacturing sector.
	2010/11 to 2013/14	Linear change towards – 1% per annum	
	2014/15 to 2024/25	- 1% per annum	
Commercial Waste	2003/04 to 2009/10	+ 2% per annum	• The growth[141], and likely further growth, in the service sector; • The DEFRA forecasts of commercial waste arisings in England; and • Likely future economic growth and waste growth due to regulatory and economic measures and cultural factors.
	2010/11 to 2013/14	Linear change towards + 1% per annum	
	2014/15 to 2024/25	Linear change towards 0% per annum	
Construction & Demolition Waste	2003/04 to 2009/10	+ 2% per annum	• Latest figures from the DTi reflect a growing construction industry.
	2010/11 to 2013/14	Linear change towards 0% per annum	
	2014/15 to 2024/25	0% per annum	
Agricultural Waste	1998 to 2025	- 1% per annum	• No time-series data on past arisings and forecasts of future change in the agricultural sector is available. Same forecast as the first RWP utilised.
Hazardous Waste	2003 to 2004	+ 5%	• The change of definition / classification from 'Special' to 'Hazardous'; • The introduction of the WEEE producer responsibility regulations; and • Waste minimisation / better segregation of hazardous & non-hazardous wastes.
	2005 to 2015	Linear change from +5% towards -1% per annum	
	2015 to 2025	- 1% per annum	

[140] Welsh Economy Research Unit, 2005. *The Welsh Economic Review*. 17.2. Cardiff University.
[141] Welsh Economy Research Unit, 2005. *The Welsh Economic Review*. 17.2. Cardiff University.

TABLE C2: Current and Projected Waste Arisings for South West Wales 2003-2025 (Tonnes)

Year	Municipal Solid Waste	Industrial Waste	Commercial Waste	Construction & Demolition	Agricultural (Requiring External Management)	Hazardous	Total
2002/03	534,464	**1,616,200**[142]	**296,600**[143]	**1,754,920**[144]	**16,404**[145]	**122,313**[146]	**4,340,901**
2003/04	551,156	1,551,552	302,532	1,790,018	16,240	128,429	**4,339,927**
2004/05	**580,736**[147]	1,489,490	308,583	1,825,819	16,078	134,150	**4,354,856**
2005/06	603,965	1,429,910	314,754	1,862,335	15,917	139,394	**4,366,276**
2006/07	628,124	1,372,714	321,049	1,899,582	15,758	144,082	**4,381,309**
2007/08	653,249	1,317,805	327,470	1,937,573	15,600	148,143	**4,399,841**
2008/09	679,379	1,265,093	334,020	1,976,325	15,444	151,510	**4,421,771**
2009/10	706,554	1,214,489	340,700	2,015,851	15,290	154,127	**4,447,012**
2010/11	734,816	1,175,019	346,662	2,046,089	15,137	155,948	**4,473,672**
2011/12	764,209	1,145,643	351,862	2,066,550	14,985	156,941	**4,500,190**
2012/13	794,777	1,125,594	356,261	2,076,883	14,836	157,083	**4,525,434**
2013/14	826,568	1,114,338	359,823	2,076,883	14,687	156,369	**4,548,669**
2014/15	859,631	1,103,195	363,094	2,076,883	14,540	154,806	**4,572,149**
2015/16	888,859	1,092,163	366,065	2,076,883	14,395	153,257	**4,591,622**
2016/17	913,747	1,081,241	368,727	2,076,883	14,251	151,725	**4,606,574**
2017/18	933,849	1,070,429	371,074	2,076,883	14,108	150,208	**4,616,550**
2018/19	948,791	1,059,725	373,098	2,076,883	13,967	148,706	**4,621,169**
2019/20	958,279	1,049,127	374,794	2,076,883	13,828	147,219	**4,620,130**
2020/21	967,861	1,038,636	376,157	2,076,883	13,689	145,746	**4,618,972**
2021/22	977,540	1,028,250	377,183	2,076,883	13,553	144,289	**4,617,697**
2022/23	987,315	1,017,967	377,868	2,076,883	13,417	142,846	**4,616,297**
2023/24	997,189	1,007,788	378,212	2,076,883	13,283	141,418	**4,614,771**
2024/25	1,007,160	997,710	378,212	2,076,883	13,150	140,003	**4,613,118**

Note: Figures in bold provided the updated baseline for forecasting. (Annual Monitoring Report, April'06).

[142] EA Wales, 2003. *'Industrial &Commercial Waste Survey 2003'*.
[143] EA Wales, 2003. *'Industrial &Commercial Waste Survey 2003'*.
[144] Total based on 2003 mid-year population estimates and applied to total C&D waste arisings in Wales. *'Survey of the Arisings and Use of Construction, Demolition and Excavation Waste, Quarry Waste and Dredging Waste in Wales in 2003'*. Smiths Gore, 2005).
[145] Table 2.7 *'Developing A Regional Waste Management Strategy for the South West Wales Region – Strategic Assessment Report'* (SLR, 2002).
[146] Data supplied by Environment Agency Wales.
[147] WAG Municipal Waste Management Survey.

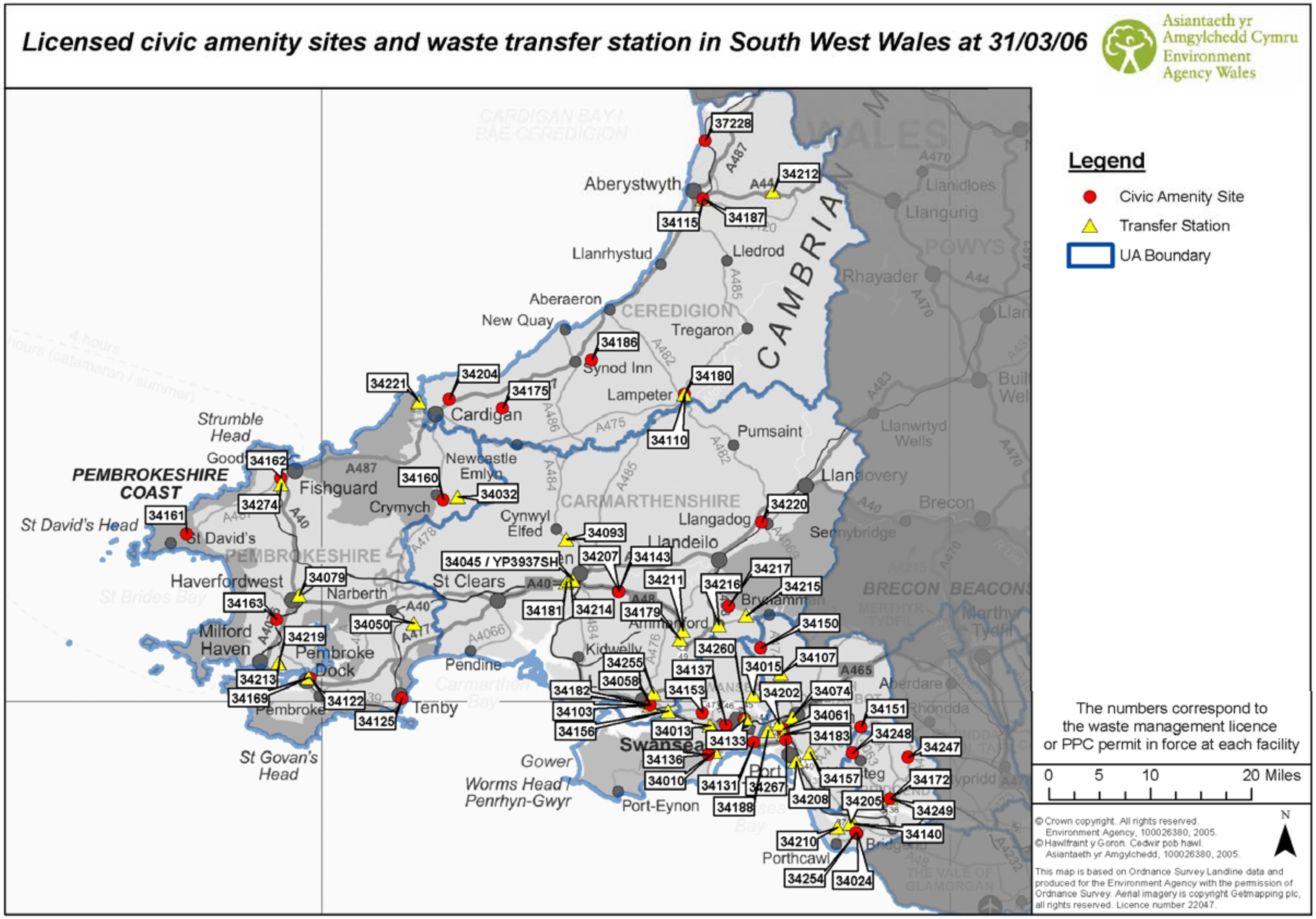
APPENDIX D: EXISTING WASTE MANAGEMENT INFRASTRUCTURE
TABLE D1: Estimated Capacity of Existing Infrastructure[148] in South West Wales

Local Authority	MRF	Open Windrow Composting	In Vessel Composting	MBT	Thermal treatment	Mobile Plants	Physico-Chemical Treatment Facility	Physical Treatment	ELV / Scrap yard / Metal re-processing	Chemical Treatment Facility	Sewage Treatment Landfarm	Civic Amenity	Transfer	Total by LA
LICENSED ANNUAL NON-LANDFILL CAPACITY (Tonnes)														
Bridgend	74,999	0	0	0	219	24,999	138,198	8,760	39,997	0	0	64,995	129,997	**482,164**
Carmarthenshire	4,999	10,000	0	0	0	75,000	0	0	42,744	0	0	109,994	407,858	**650,595**
Ceredigion	0	0	0	0	0	0	0	0	7,497	0	0	29,995	139,998	**177,490**
Neath Port Talbot	4,999	0	0	260,200	85,177	74,999	0	0	387,493	0	0	59,996	183,994	**1,056,858**
Pembrokeshire	0	0	0	0	0	0	205,085	0	44,993	0	124,374	109,994	90,337	**574,783**
Swansea	0	0	0	0	1,522	0	0	100,000	64,988	0	0	84,996	89,996	**341,502**
SWW Total	**84,997**	**10,000**	**0**	**260,200**	**86,918**	**174,998**	**343,283**	**108,760**	**587,712**	**0**	**124,374**	**459,970**	**1,042,180**	**3,283,392**
NUMBER OF LICENSED NON-LANDFILL FACILITIES														
Bridgend	1	0	0	0	1	1	2	1	5	0	0	5	4	**20**
Carmarthenshire	1	1	0	0	0	1	0	0	7	0	0	6	11	**27**
Ceredigion	0	0	0	0	0	0	0	0	3	0	0	6	3	**12**
Neath Port Talbot	1	0	0	1	1	1	0	0	11	0	0	4	7	**26**
Pembrokeshire	0	0	0	0	0	0	1	0	8	0	2	6	8	**25**
Swansea	0	0	0	0	1	0	0	1	13	0	0	5	4	**24**
SWW Total	**3**	**1**	**0**	**1**	**3**	**3**	**3**	**2**	**47**	**0**	**2**	**32**	**37**	**134**

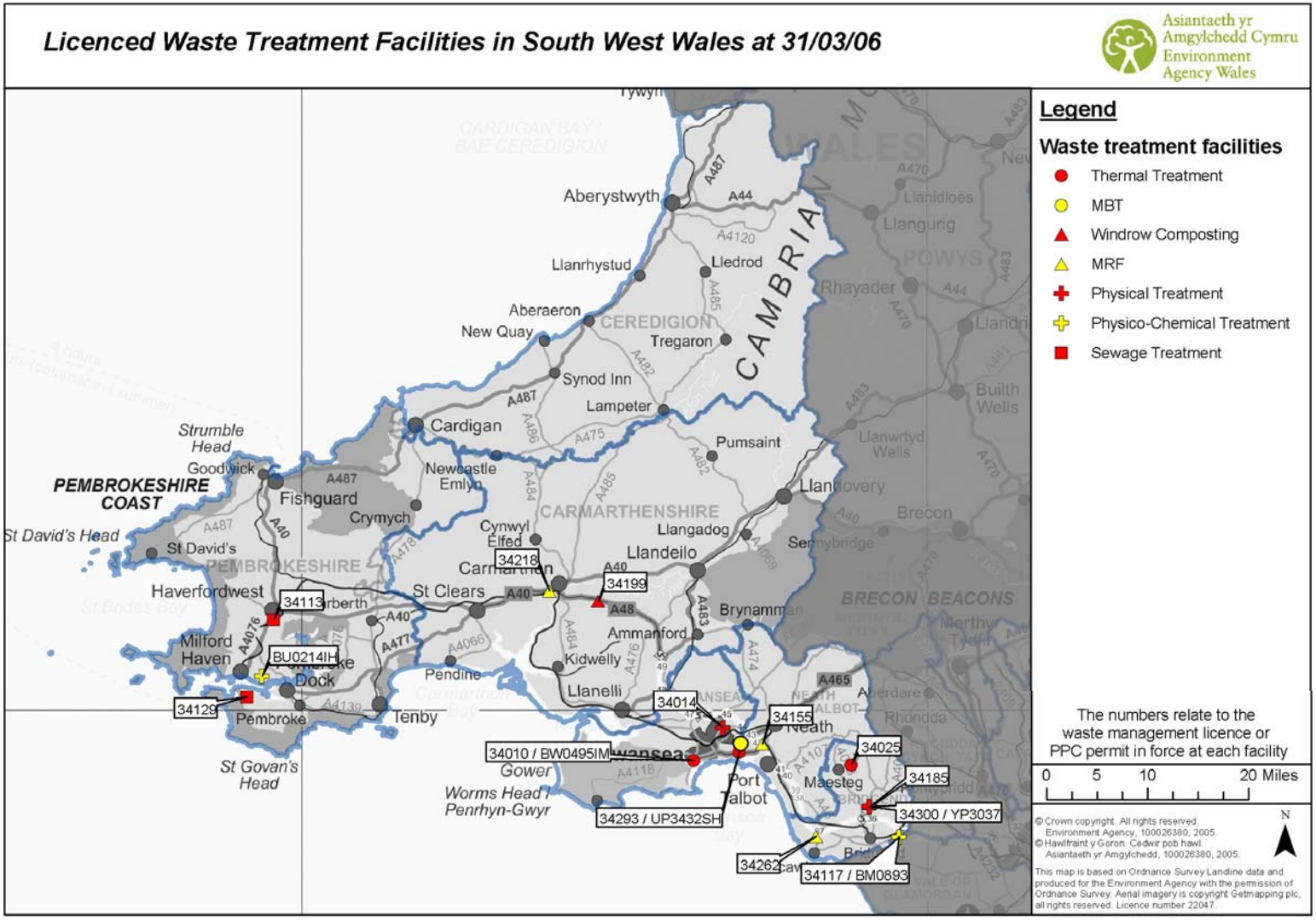
Local Authority	VOID SPACE OF LICENSED LANDFILL FACILITIES (m^3)				
	INERT	**NON-HAZARDOUS**	**IN-HOUSE INDUSTRIAL**	**HAZARDOUS**	
Bridgend	0	DNA	DNA	0	**DNA**
Carmarthenshire	0	DNA	DNA	0	**DNA**
Ceredigion	0	DNA	DNA	0	**DNA**
Neath Port Talbot	0	DNA	DNA	0	**DNA**
Pembrokeshire	0	DNA	DNA	0	**DNA**
Swansea	0	DNA	DNA	0	**DNA**
SWW Total	**0**	**7,046,718**	**224,052**	**0**	**7,270,770**

[148] *Non-landfill facilities* – the figures are based on the maximum licensed or permitted capacity for facilities which held either a waste management license or PPC permit at 31st March 2006. *Landfill facilities* – the void space reflects the best-case scenario from the 2005/06 EA landfill void survey.

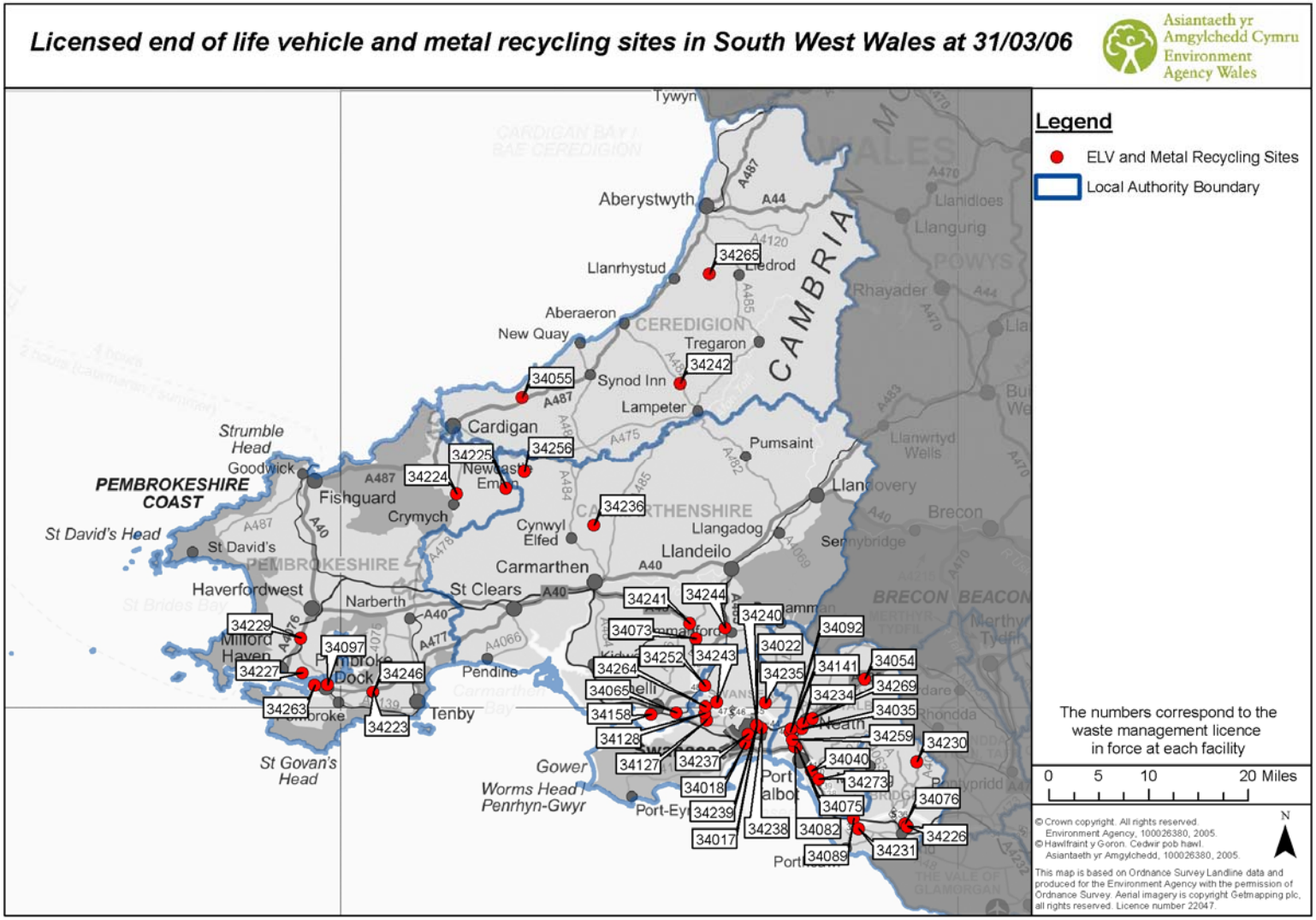
MAP D2: Licenced Civic Amenity Sites and Waste Transfer Stations in South West Wales



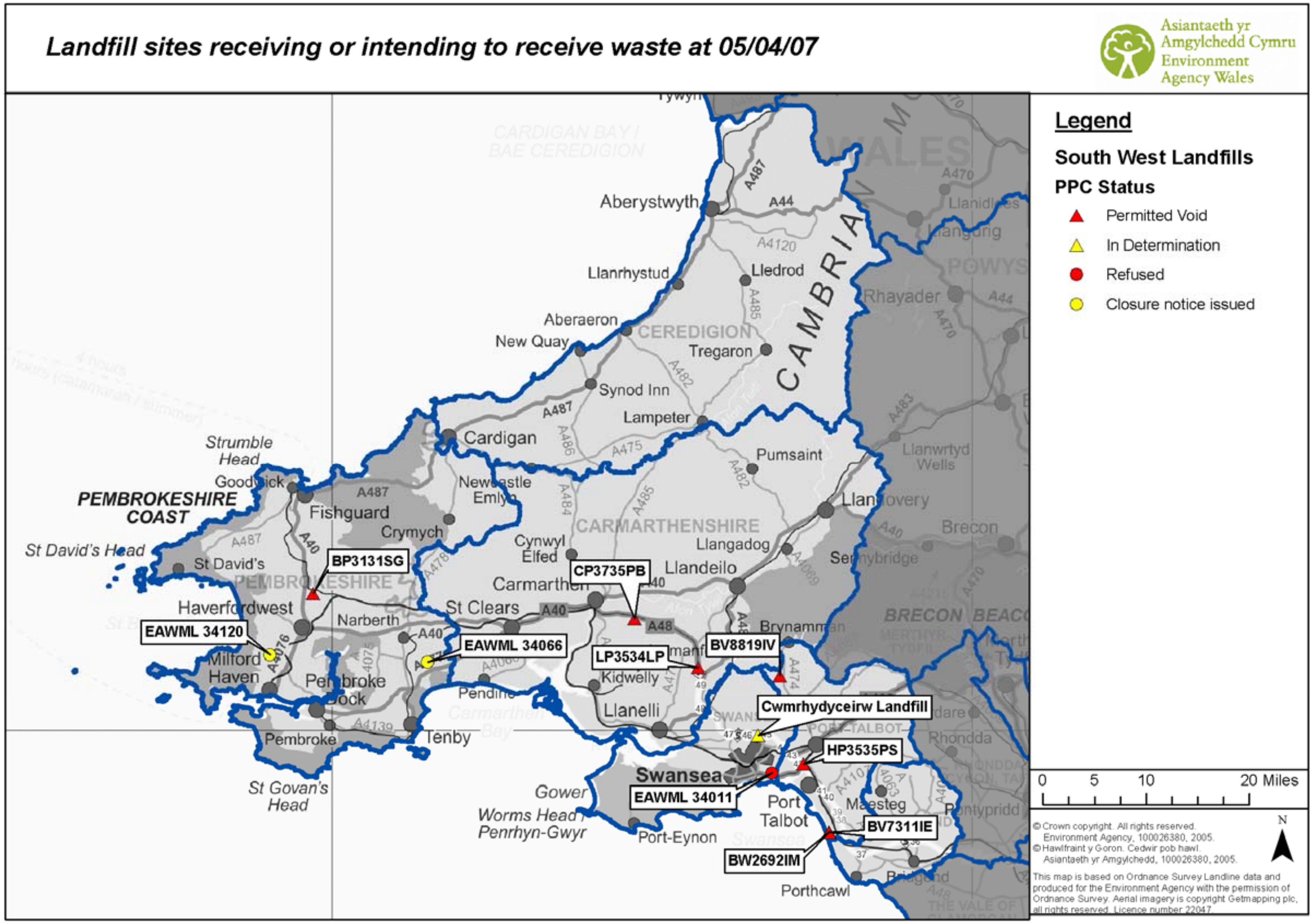
MAP D3: Licenced Waste Treatment Facilities in South West Wales



MAP D4: Licenced End of Life Vehicle and Metal Recycling Sites in South West Wales



MAP D5: Landfill Sites Receiving or Intending to Receive Waste in South West Wales



APPENDIX E: TOTAL CAPACITY / INFRASTRUCTURE REQUIRED IN 2013 FOR THE EIGHT PREFERRED OPTIONS

TABLE E1: Capacity / Infrastructure Required for Option 2A in 2013 (Source: Table 32: EA, 2007. SA&LCA Report)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend Pyrolysis	**90,000**	50,595	6,127	19,711	73	0	**76,506**	0.6	0.1	0.2	0.0	0.0	**0.9**
NPT Pyrolysis	**90,000**	62,135	15,047	15,902	62	0	**93,145**	0.7	0.2	0.2	0.0	0.0	**1.0**
Swansea Pyrolysis	**90,000**	104,110	9,580	37,782	133	0	**151,604**	1.2	0.1	0.4	0.0	0.0	**1.7**
Carmarthenshire Pyrolysis	**30,000**	61,387	11,443	23,908	1,710	0	**98,447**	2.0	0.4	0.8	0.1	0.0	**3.3**
Ceredigion Pyrolysis	**30,000**	29,017	2,088	13,442	945	0	**45,493**	1.0	0.1	0.4	0.0	0.0	**1.5**
Pembrokeshire Pyrolysis	**30,000**	46,402	1,778	20,085	1,484	0	**69,748**	1.5	0.1	0.7	0.0	0.0	**2.3**
Total Pyrolysis		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**7.0**	**0.9**	**2.7**	**0.1**	**0.0**	**10.7**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	0	0	0	0	37,752	**37,752**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	0	0	0	0	39,315	**39,315**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	0	0	0	0	65,284	**65,284**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	0	0	0	0	51,417	**51,417**	0.0	0.0	0.0	0.0	0.5	**0.5**
Ceredigion Non Haz Landfill	**112,500**	0	0	0	0	22,611	**22,611**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	0	0	0	0	33,959	**33,959**	0.0	0.0	0.0	0.0	0.3	**0.3**
Total Non Haz Landfill		**0**	**0**	**0**	**0**	**250,339**	**250,339**	**0.0**	**0.0**	**0.0**	**0.0**	**1.5**	**1.5**
Hazardous landfill	**50,000**	**6,365**	**829**	**2,355**	**79**	**0**	**9,629**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,174,131**	**289,807**	**414,168**	**11,622**	**3,108,295**	**4,998,024**	**75.6**	**13.0**	**13.4**	**0.2**	**322.0**	**424.2**

TABLE E2: Capacity / Infrastructure Required for Option 2C in 2013 (Source: Table 34: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend EfW	**216,000**	50,595	6,127	19,711	73	0	**76,506**	0.2	0.0	0.1	0.0	0.0	**0.4**
NPT EfW	**216,000**	62,135	15,047	15,902	62	0	**93,145**	0.3	0.1	0.1	0.0	0.0	**0.4**
Swansea EfW	**216,000**	104,110	9,580	37,782	133	0	**151,604**	0.5	0.0	0.2	0.0	0.0	**0.7**
Carmarthenshire EfW	**56,000**	61,387	11,443	23,908	1,710	0	**98,447**	1.1	0.2	0.4	0.0	0.0	**1.8**
Ceredigion EfW	**56,000**	29,017	2,088	13,442	945	0	**45,493**	0.5	0.0	0.2	0.0	0.0	**0.8**
Pembrokeshire EfW	**56,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.8	0.0	0.4	0.0	0.0	**1.2**
Total EfW		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**3.4**	**0.4**	**1.4**	**0.1**	**0.0**	**5.3**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	0	0	0	0	37,752	**37,752**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	0	0	0	0	39,315	**39,315**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	0	0	0	0	65,284	**65,284**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	0	0	0	0	51,417	**51,417**	0.0	0.0	0.0	0.0	0.5	**0.5**
Ceredigion Non Haz Landfill	**112,500**	0	0	0	0	22,611	**22,611**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	0	0	0	0	33,959	**33,959**	0.0	0.0	0.0	0.0	0.3	**0.3**
Total Non Haz Landfill		**0**	**0**	**0**	**0**	**250,339**	**250,339**	**0.0**	**0.0**	**0.0**	**0.0**	**1.5**	**1.5**
Hazardous landfill	**50,000**	**21,042**	**2,741**	**7,784**	**262**	**0**	**31,830**	**0.4**	**0.1**	**0.2**	**0.0**	**0.0**	**0.6**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	15,907	0.0	0.0	0.0	0.0	0.3	0.3
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	18,149	0.0	0.1	0.0	0.0	0.3	0.4
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	27,445	0.0	0.0	0.0	0.0	0.5	0.5
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	22,180	0.0	0.1	0.0	0.0	0.8	0.9
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	9,269	0.0	0.0	0.0	0.0	0.3	0.4
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	13,641	0.0	0.0	0.0	0.0	0.5	0.5
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,188,808**	**291,719**	**419,598**	**11,805**	**3,108,295**	**5,020,225**	**72.4**	**12.6**	**12.1**	**0.2**	**322.0**	**419.2**

TABLE E3: Capacity / Infrastructure Required for Option 3A in 2013 (Source: Table 36: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend MBT	**180,000**	50,595	6,127	19,711	73	0	**76,506**	0.3	0.0	0.1	0.0	0.0	**0.4**
NPT MBT	**180,000**	62,135	15,047	15,902	62	0	**93,145**	0.3	0.1	0.1	0.0	0.0	**0.5**
Swansea MBT	**180,000**	104,110	9,580	37,782	133	0	**151,604**	0.6	0.1	0.2	0.0	0.0	**0.8**
Carmarthenshire MBT	**60,000**	61,387	11,443	23,908	1,710	0	**98,447**	1.0	0.2	0.4	0.0	0.0	**1.6**
Ceredigion MBT	**60,000**	29,017	2,088	13,442	945	0	**45,493**	0.5	0.0	0.2	0.0	0.0	**0.8**
Pembrokeshire MBT	**60,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.8	0.0	0.3	0.0	0.0	**1.2**
Total MBT		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**3.5**	**0.4**	**1.4**	**0.1**	**0.0**	**5.3**
Bridgend Pyrolysis	**90,000**	28,458	3,446	11,087	41	0	**43,032**	0.3	0.0	0.1	0.0	0.0	**0.5**
NPT Pyrolysis	**90,000**	34,949	8,463	8,944	35	0	**52,391**	0.4	0.1	0.1	0.0	0.0	**0.6**
Swansea Pyrolysis	**90,000**	58,558	5,388	21,251	75	0	**85,272**	0.7	0.1	0.2	0.0	0.0	**0.9**
Carmarthenshire Pyrolysis	**30,000**	34,528	6,436	13,447	962	0	**55,373**	1.2	0.2	0.4	0.0	0.0	**1.8**
Ceredigion Pyrolysis	**30,000**	16,321	1,175	7,561	532	0	**25,588**	0.5	0.0	0.3	0.0	0.0	**0.9**
Pembrokeshire Pyrolysis	**30,000**	26,099	1,000	11,297	835	0	**39,231**	0.9	0.0	0.4	0.0	0.0	**1.3**
Total Pyrolysis		**198,912**	**25,909**	**73,586**	**2,478**	**0**	**300,886**	**3.9**	**0.5**	**1.5**	**0.1**	**0.0**	**6.0**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	5,902	715	2,299	9	37,752	**46,677**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	7,248	1,755	1,855	7	39,315	**50,181**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	12,145	1,118	4,407	15	65,284	**82,970**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	7,161	1,335	2,789	199	51,417	**62,901**	0.1	0.0	0.0	0.0	0.5	**0.6**
Ceredigion Non Haz Landfill	**112,500**	3,385	244	1,568	110	22,611	**27,918**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	5,413	207	2,343	173	33,959	**42,096**	0.0	0.0	0.0	0.0	0.3	**0.4**
Total Non Haz Landfill		**41,255**	**5,373**	**15,262**	**514**	**250,339**	**312,743**	**0.2**	**0.0**	**0.1**	**0.0**	**1.5**	**1.9**
Hazardous landfill	**50,000**	**3,898**	**508**	**1,442**	**49**	**0**	**5,896**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,411,830**	**320,768**	**502,104**	**14,584**	**3,108,295**	**5,357,581**	**76.2**	**13.1**	**13.6**	**0.3**	**322.0**	**425.1**

TABLE E4: Capacity / Infrastructure Required for Option 3B in 2013 (Source: Table 37: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	*7,000*	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	*7,000*	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	*7,000*	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	*2,250*	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	*2,250*	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	*2,250*	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend MBT	**160,000**	50,595	6,127	19,711	73	0	**76,506**	0.3	0.0	0.1	0.0	0.0	**0.5**
NPT MBT	**160,000**	62,135	15,047	15,902	62	0	**93,145**	0.4	0.1	0.1	0.0	0.0	**0.6**
Swansea MBT	**160,000**	104,110	9,580	37,782	133	0	**151,604**	0.7	0.1	0.2	0.0	0.0	**0.9**
Carmarthenshire MBT	**80,000**	61,387	11,443	23,908	1,710	0	**98,447**	0.8	0.1	0.3	0.0	0.0	**1.2**
Ceredigion MBT	**80,000**	29,017	2,088	13,442	945	0	**45,493**	0.4	0.0	0.2	0.0	0.0	**0.6**
Pembrokeshire MBT	**80,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.6	0.0	0.3	0.0	0.0	**0.9**
Total MBT		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**3.1**	**0.4**	**1.2**	**0.1**	**0.0**	**4.7**
Bridgend Gasification	**80,000**	28,458	3,446	11,087	41	0	**43,032**	0.4	0.0	0.1	0.0	0.0	**0.5**
NPT Gasification	**80,000**	34,949	8,463	8,944	35	0	**52,391**	0.4	0.1	0.1	0.0	0.0	**0.7**
Swansea Gasification	**80,000**	58,558	5,388	21,251	75	0	**85,272**	0.7	0.1	0.3	0.0	0.0	**1.1**
Carmarthenshire Gasification	**40,000**	34,528	6,436	13,447	962	0	**55,373**	0.9	0.2	0.3	0.0	0.0	**1.4**
Ceredigion Gasification	**40,000**	16,321	1,175	7,561	532	0	**25,588**	0.4	0.0	0.2	0.0	0.0	**0.6**
Pembrokeshire Gasification	**40,000**	26,099	1,000	11,297	835	0	**39,231**	0.7	0.0	0.3	0.0	0.0	**1.0**
Total Gasification		**198,912**	**25,909**	**73,586**	**2,478**	**0**	**300,886**	**3.4**	**0.4**	**1.3**	**0.1**	**0.0**	**5.3**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	5,902	715	2,299	9	37,752	**46,677**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	7,248	1,755	1,855	7	39,315	**50,181**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	12,145	1,118	4,407	15	65,284	**82,970**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	7,161	1,335	2,789	199	51,417	**62,901**	0.1	0.0	0.0	0.0	0.5	**0.6**
Ceredigion Non Haz Landfill	**112,500**	3,385	244	1,568	110	22,611	**27,918**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	5,413	207	2,343	173	33,959	**42,096**	0.0	0.0	0.0	0.0	0.3	**0.4**
Total Non Haz Landfill		**41,255**	**5,373**	**15,262**	**514**	**250,339**	**312,743**	**0.2**	**0.0**	**0.1**	**0.0**	**1.5**	**1.9**
Hazardous landfill	**50,000**	**12,243**	**1,595**	**4,529**	**153**	**0**	**18,520**	**0.2**	**0.0**	**0.1**	**0.0**	**0.0**	**0.4**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,420,175**	**321,855**	**505,191**	**14,688**	**3,108,295**	**5,370,204**	**75.5**	**13.0**	**13.3**	**0.2**	**322.0**	**424.0**

TABLE E5: Capacity / Infrastructure Required for Option 3C in 2013 (Source: Table 38: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend MBT	**108,000**	50,595	6,127	19,711	73	0	**76,506**	0.5	0.1	0.2	0.0	0.0	**0.7**
NPT MBT	**108,000**	62,135	15,047	15,902	62	0	**93,145**	0.6	0.1	0.1	0.0	0.0	**0.9**
Swansea MBT	**108,000**	104,110	9,580	37,782	133	0	**151,604**	1.0	0.1	0.3	0.0	0.0	**1.4**
Carmarthenshire MBT	**56,000**	61,387	11,443	23,908	1,710	0	**98,447**	1.1	0.2	0.4	0.0	0.0	**1.8**
Ceredigion MBT	**56,000**	29,017	2,088	13,442	945	0	**45,493**	0.5	0.0	0.2	0.0	0.0	**0.8**
Pembrokeshire MBT	**56,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.8	0.0	0.4	0.0	0.0	**1.2**
Total MBT		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**4.5**	**0.6**	**1.7**	**0.1**	**0.0**	**6.8**
Bridgend EfW	**216,000**	28,458	3,446	11,087	41	0	**43,032**	0.1	0.0	0.1	0.0	0.0	**0.2**
NPT EfW	**216,000**	34,949	8,463	8,944	35	0	**52,391**	0.2	0.0	0.0	0.0	0.0	**0.2**
Swansea EfW	**216,000**	58,558	5,388	21,251	75	0	**85,272**	0.3	0.0	0.1	0.0	0.0	**0.4**
Carmarthenshire EfW	**56,000**	34,528	6,436	13,447	962	0	**55,373**	0.6	0.1	0.2	0.0	0.0	**1.0**
Ceredigion EfW	**56,000**	16,321	1,175	7,561	532	0	**25,588**	0.3	0.0	0.1	0.0	0.0	**0.5**
Pembrokeshire EfW	**56,000**	26,099	1,000	11,297	835	0	**39,231**	0.5	0.0	0.2	0.0	0.0	**0.7**
Total EfW		**198,912**	**25,909**	**73,586**	**2,478**	**0**	**300,886**	**1.9**	**0.2**	**0.8**	**0.0**	**0.0**	**3.0**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	5,902	715	2,299	9	37,752	**46,677**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	7,248	1,755	1,855	7	39,315	**50,181**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	12,145	1,118	4,407	15	65,284	**82,970**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	7,161	1,335	2,789	199	51,417	**62,901**	0.1	0.0	0.0	0.0	0.5	**0.6**
Ceredigion Non Haz Landfill	**112,500**	3,385	244	1,568	110	22,611	**27,918**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	5,413	207	2,343	173	33,959	**42,096**	0.0	0.0	0.0	0.0	0.3	**0.4**
Total Non Haz Landfill		**41,255**	**5,373**	**15,262**	**514**	**250,339**	**312,743**	**0.2**	**0.0**	**0.1**	**0.0**	**1.5**	**1.9**
Hazardous landfill	**50,000**	**12,898**	**1,680**	**4,771**	**161**	**0**	**19,510**	**0.3**	**0.0**	**0.1**	**0.0**	**0.0**	**0.4**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	15,907	0.0	0.0	0.0	0.0	0.3	0.3
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	18,149	0.0	0.1	0.0	0.0	0.3	0.4
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	27,445	0.0	0.0	0.0	0.0	0.5	0.5
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	22,180	0.0	0.1	0.0	0.0	0.8	0.9
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	9,269	0.0	0.0	0.0	0.0	0.3	0.4
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	13,641	0.0	0.0	0.0	0.0	0.5	0.5
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,413,396**	**320,972**	**502,683**	**14,603**	**3,108,295**	**5,359,950**	**75.3**	**12.9**	**13.2**	**0.2**	**322.0**	**423.6**

TABLE E6: Capacity / Infrastructure Required for Option 3D in 2013 (Source: Table 39: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend MBT	**160,000**	50,595	6,127	19,711	73	0	**76,506**	0.3	0.0	0.1	0.0	0.0	**0.5**
NPT MBT	**160,000**	62,135	15,047	15,902	62	0	**93,145**	0.4	0.1	0.1	0.0	0.0	**0.6**
Swansea MBT	**160,000**	104,110	9,580	37,782	133	0	**151,604**	0.7	0.1	0.2	0.0	0.0	**0.9**
Carmarthenshire MBT	**80,000**	61,387	11,443	23,908	1,710	0	**98,447**	0.8	0.1	0.3	0.0	0.0	**1.2**
Ceredigion MBT	**80,000**	29,017	2,088	13,442	945	0	**45,493**	0.4	0.0	0.2	0.0	0.0	**0.6**
Pembrokeshire MBT	**80,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.6	0.0	0.3	0.0	0.0	**0.9**
Total MBT		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**3.1**	**0.4**	**1.2**	**0.1**	**0.0**	**4.7**
Bridgend Cement Kiln	**n/a**	28,458	3,446	11,087	41	0	**43,032**	N/A	N/A	N/A	N/A	N/A	**N/A**
NPT Cement Kiln	**n/a**	34,949	8,463	8,944	35	0	**52,391**	N/A	N/A	N/A	N/A	N/A	**N/A**
Swansea Cement Kiln	**n/a**	58,558	5,388	21,251	75	0	**85,272**	N/A	N/A	N/A	N/A	N/A	**N/A**
Carmarthenshire Cement Kiln	**n/a**	34,528	6,436	13,447	962	0	**55,373**	N/A	N/A	N/A	N/A	N/A	**N/A**
Ceredigion Cement Kiln	**n/a**	16,321	1,175	7,561	532	0	**25,588**	N/A	N/A	N/A	N/A	N/A	**N/A**
Pembrokeshire Cement Kiln	**n/a**	26,099	1,000	11,297	835	0	**39,231**	N/A	N/A	N/A	N/A	N/A	**N/A**
Total Cement Kiln		**198,912**	**25,909**	**73,586**	**2,478**	**0**	**300,886**	N/A	N/A	N/A	N/A	N/A	**N/A**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	5,902	715	2,299	9	37,752	**46,677**	0.0	0.0	0.0	0.0	0.2	**0.2**
NPT Non Haz Landfill	**250,000**	7,248	1,755	1,855	7	39,315	**50,181**	0.0	0.0	0.0	0.0	0.2	**0.2**
Swansea Non Haz Landfill	**250,000**	12,145	1,118	4,407	15	65,284	**82,970**	0.0	0.0	0.0	0.0	0.3	**0.3**
Carmarthenshire Non Haz Landfill	**112,500**	7,161	1,335	2,789	199	51,417	**62,901**	0.1	0.0	0.0	0.0	0.5	**0.6**
Ceredigion Non Haz Landfill	**112,500**	3,385	244	1,568	110	22,611	**27,918**	0.0	0.0	0.0	0.0	0.2	**0.2**
Pembrokeshire Non Haz Landfill	**112,500**	5,413	207	2,343	173	33,959	**42,096**	0.0	0.0	0.0	0.0	0.3	**0.4**
Total Non Haz Landfill		**41,255**	**5,373**	**15,262**	**514**	**250,339**	**312,743**	**0.2**	**0.0**	**0.1**	**0.0**	**1.5**	**1.9**
Hazardous landfill	**50,000**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,407,932**	**320,260**	**500,662**	**14,535**	**3,108,295**	**5,351,685**	**71.8**	**12.5**	**11.8**	**0.2**	**322.0**	**418.3**

TABLE E7: Capacity / Infrastructure Required for Option 4C in 2013 (Source: Table 42: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend Autoclave	**200,000**	50,595	6,127	19,711	73	0	**76,506**	0.3	0.0	0.1	0.0	0.0	**0.4**
NPT Autoclave	**200,000**	62,135	15,047	15,902	62	0	**93,145**	0.3	0.1	0.1	0.0	0.0	**0.5**
Swansea Autoclave	**200,000**	104,110	9,580	37,782	133	0	**151,604**	0.5	0.0	0.2	0.0	0.0	**0.8**
Carmarthenshire Autoclave	**100,000**	61,387	11,443	23,908	1,710	0	**98,447**	0.6	0.1	0.2	0.0	0.0	**1.0**
Ceredigion Autoclave	**100,000**	29,017	2,088	13,442	945	0	**45,493**	0.3	0.0	0.1	0.0	0.0	**0.5**
Pembrokeshire Autoclave	**100,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.5	0.0	0.2	0.0	0.0	**0.7**
Total Autoclave		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**2.5**	**0.3**	**0.9**	**0.0**	**0.0**	**3.7**
Bridgend EfW	**216,000**	11,365	1,376	4,428	16	0	**17,186**	0.1	0.0	0.0	0.0	0.0	**0.1**
NPT EfW	**216,000**	13,958	3,380	3,572	14	0	**20,923**	0.1	0.0	0.0	0.0	0.0	**0.1**
Swansea EfW	**216,000**	23,386	2,152	8,487	30	0	**34,055**	0.1	0.0	0.0	0.0	0.0	**0.2**
Carmarthenshire EfW	**56,000**	13,789	2,571	5,370	384	0	**22,114**	0.2	0.0	0.1	0.0	0.0	**0.4**
Ceredigion EfW	**56,000**	6,518	469	3,020	212	0	**10,219**	0.1	0.0	0.1	0.0	0.0	**0.2**
Pembrokeshire EfW	**56,000**	10,423	399	4,512	333	0	**15,668**	0.2	0.0	0.1	0.0	0.0	**0.3**
Total EfW		**79,440**	**10,347**	**29,388**	**990**	**0**	**120,166**	**0.8**	**0.1**	**0.3**	**0.0**	**0.0**	**1.2**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	20,351	2,464	7,928	29	37,752	**68,525**	0.1	0.0	0.0	0.0	0.2	**0.3**
NPT Non Haz Landfill	**250,000**	24,992	6,052	6,396	25	39,315	**76,781**	0.1	0.0	0.0	0.0	0.2	**0.3**
Swansea Non Haz Landfill	**250,000**	41,876	3,853	15,197	53	65,284	**126,264**	0.2	0.0	0.1	0.0	0.3	**0.5**
Carmarthenshire Non Haz Landfill	**112,500**	24,691	4,603	9,616	688	51,417	**91,015**	0.2	0.0	0.1	0.0	0.5	**0.8**
Ceredigion Non Haz Landfill	**112,500**	11,671	840	5,407	380	22,611	**40,909**	0.1	0.0	0.0	0.0	0.2	**0.4**
Pembrokeshire Non Haz Landfill	**112,500**	18,664	715	8,079	597	33,959	**62,014**	0.2	0.0	0.1	0.0	0.3	**0.6**
Total Non Haz Landfill		**142,246**	**18,528**	**52,623**	**1,772**	**250,339**	**465,508**	**0.8**	**0.1**	**0.3**	**0.0**	**1.5**	**2.8**
Hazardous landfill	**50,000**	**3,490**	**455**	**1,291**	**43**	**0**	**5,279**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,392,941**	**318,308**	**495,116**	**14,349**	**3,108,295**	**5,329,009**	**72.6**	**12.6**	**12.2**	**0.2**	**322.0**	**419.6**

TABLE E8: Capacity / Infrastructure Required for Option 4D in 2013 (Source: Table 43: EA, 2007. SA&LCA Report – Part 2)

Facility	Capacity	MSW Throughput	Industrial Throughput	Commercial Throughput	Agricultural Throughput	C&D Throughput	All Throughput	Number of facilities for MSW	Number for Industrial	Number for commercial	Number for Agricultural	Number of facilities for C&D	Facilities for all streams
Bridgend CA	**7,000**	25,233	0	0	0	0	**25,233**	3.6	0.0	0.0	0.0	0.0	**3.6**
NPT CA	**7,000**	30,988	0	0	0	0	**30,988**	4.4	0.0	0.0	0.0	0.0	**4.4**
Swansea CA	**7,000**	51,922	0	0	0	0	**51,922**	7.4	0.0	0.0	0.0	0.0	**7.4**
Carmarthenshire CA	**2,250**	30,615	0	0	0	0	**30,615**	13.6	0.0	0.0	0.0	0.0	**13.6**
Ceredigion CA	**2,250**	14,471	0	0	0	0	**14,471**	6.4	0.0	0.0	0.0	0.0	**6.4**
Pembrokeshire CA	**2,250**	23,142	0	0	0	0	**23,142**	10.3	0.0	0.0	0.0	0.0	**10.3**
Total CA		**176,371**	**0**	**0**	**0**	**0**	**176,371**	**45.8**	**0.0**	**0.0**	**0.0**	**0.0**	**45.8**
Bridgend HIC Transfer	**70,000**	56,642	15,839	25,959	118	0	**98,558**	0.8	0.2	0.4	0.0	0.0	**1.4**
NPT HIC Transfer	**70,000**	69,562	38,899	20,942	100	0	**129,503**	1.0	0.6	0.3	0.0	0.0	**1.9**
Swansea HIC Transfer	**70,000**	116,554	24,765	49,756	215	0	**191,290**	1.7	0.4	0.7	0.0	0.0	**2.7**
Carmarthenshire HIC Transfer	**70,000**	68,724	29,583	31,485	2,769	0	**132,561**	1.0	0.4	0.4	0.0	0.0	**1.9**
Ceredigion HIC Transfer	**70,000**	32,485	5,399	17,703	1,531	0	**57,117**	0.5	0.1	0.3	0.0	0.0	**0.8**
Pembrokeshire HIC Transfer	**70,000**	51,948	4,596	26,450	2,404	0	**85,398**	0.7	0.1	0.4	0.0	0.0	**1.2**
HIC Transfer Station		**395,914**	**119,081**	**172,295**	**7,137**	**0**	**694,427**	**5.7**	**1.7**	**2.5**	**0.1**	**0.0**	**9.9**
Bridgend C&D Transfer	**70,000**	4,252	6,479	4,002	0	198,887	**213,620**	0.1	0.1	0.1	0.0	2.8	**3.1**
NPT C&D Transfer	**70,000**	5,222	15,913	3,228	0	207,123	**231,486**	0.1	0.2	0.0	0.0	3.0	**3.3**
Swansea C&D Transfer	**70,000**	8,749	10,131	7,670	0	343,934	**370,485**	0.1	0.1	0.1	0.0	4.9	**5.3**
Carmarthenshire C&D Transfer	**70,000**	5,159	12,101	4,854	0	270,877	**292,991**	0.1	0.2	0.1	0.0	3.9	**4.2**
Ceredigion C&D Transfer	**70,000**	2,439	2,208	2,729	0	119,119	**126,495**	0.0	0.0	0.0	0.0	1.7	**1.8**
Pembrokeshire C&D Transfer	**70,000**	3,900	1,880	4,077	0	178,907	**188,764**	0.1	0.0	0.1	0.0	2.6	**2.7**
C & D Transfer Station		**29,720**	**48,713**	**26,560**	**0**	**1,318,847**	**1,423,840**	**0.4**	**0.7**	**0.4**	**0.0**	**18.8**	**20.3**
Bridgend Autoclave	**200,000**	50,595	6,127	19,711	73	0	**76,506**	0.3	0.0	0.1	0.0	0.0	**0.4**
NPT Autoclave	**200,000**	62,135	15,047	15,902	62	0	**93,145**	0.3	0.1	0.1	0.0	0.0	**0.5**
Swansea Autoclave	**200,000**	104,110	9,580	37,782	133	0	**151,604**	0.5	0.0	0.2	0.0	0.0	**0.8**
Carmarthenshire Autoclave	**100,000**	61,387	11,443	23,908	1,710	0	**98,447**	0.6	0.1	0.2	0.0	0.0	**1.0**
Ceredigion Autoclave	**100,000**	29,017	2,088	13,442	945	0	**45,493**	0.3	0.0	0.1	0.0	0.0	**0.5**
Pembrokeshire Autoclave	**100,000**	46,402	1,778	20,085	1,484	0	**69,748**	0.5	0.0	0.2	0.0	0.0	**0.7**
Total Autoclave		**353,645**	**46,063**	**130,829**	**4,406**	**0**	**534,943**	**2.5**	**0.3**	**0.9**	**0.0**	**0.0**	**3.7**
Bridgend Cement Kiln	**n/a**	11,365	1,376	4,428	16	0	**17,186**	N/A	N/A	N/A	N/A	N/A	**N/A**
NPT Cement Kiln	**n/a**	13,958	3,380	3,572	14	0	**20,923**	N/A	N/A	N/A	N/A	N/A	**N/A**
Swansea Cement Kiln	**n/a**	23,386	2,152	8,487	30	0	**34,055**	N/A	N/A	N/A	N/A	N/A	**N/A**
Carmarthenshire Cement Kiln	**n/a**	13,789	2,571	5,370	384	0	**22,114**	N/A	N/A	N/A	N/A	N/A	**N/A**
Ceredigion Cement Kiln	**n/a**	6,518	469	3,020	212	0	**10,219**	N/A	N/A	N/A	N/A	N/A	**N/A**
Pembrokeshire Cement Kiln	**n/a**	10,423	399	4,512	333	0	**15,668**	N/A	N/A	N/A	N/A	N/A	**N/A**
Total Cement Kiln		**79,440**	**10,347**	**29,388**	**990**	**0**	**120,166**	N/A	N/A	N/A	N/A	N/A	**N/A**
Bridgend IVC	**26,000**	19,321	3,382	7,688	0	0	**30,390**	0.7	0.1	0.3	0.0	0.0	**1.2**
NPT IVC	**26,000**	23,727	8,305	6,202	0	0	**38,235**	0.9	0.3	0.2	0.0	0.0	**1.5**
Swansea IVC	**26,000**	39,756	5,288	14,736	0	0	**59,780**	1.5	0.2	0.6	0.0	0.0	**2.3**
Carmarthenshire IVC	**13,000**	23,442	6,316	9,325	0	0	**39,082**	1.8	0.5	0.7	0.0	0.0	**3.0**
Ceredigion IVC	**13,000**	11,081	1,153	5,243	0	0	**17,476**	0.9	0.1	0.4	0.0	0.0	**1.3**
Pembrokeshire IVC	**13,000**	17,719	981	7,834	0	0	**26,534**	1.4	0.1	0.6	0.0	0.0	**2.0**
Total IVC		**135,046**	**25,424**	**51,028**	**0**	**0**	**211,498**	**7.2**	**1.3**	**2.8**	**0.0**	**0.0**	**11.3**
Bridgend Open Windrow	**19,743**	6,774	131	684	0	0	**7,589**	0.3	0.0	0.0	0.0	0.0	**0.4**
NPT Open Windrow	**19,743**	8,319	321	552	0	0	**9,193**	0.4	0.0	0.0	0.0	0.0	**0.5**
Swansea Open Windrow	**19,743**	13,939	205	1,312	0	0	**15,455**	0.7	0.0	0.1	0.0	0.0	**0.8**
Carmarthenshire Open Windrow	**9,872**	8,219	244	830	0	0	**9,293**	0.8	0.0	0.1	0.0	0.0	**0.9**
Ceredigion Open Windrow	**9,872**	3,885	45	467	0	0	**4,396**	0.4	0.0	0.0	0.0	0.0	**0.4**
Pembrokeshire Open Windrow	**9,872**	6,213	38	697	0	0	**6,948**	0.6	0.0	0.1	0.0	0.0	**0.7**
Total Open Windrow		**47,349**	**984**	**4,542**	**0**	**0**	**52,874**	**3.3**	**0.1**	**0.3**	**0.0**	**0.0**	**3.7**
Bridgend C&D Exemption	**2,600**	2,126	2,616	1,616	0	109,107	**115,465**	0.8	1.0	0.6	0.0	42.0	**44.4**
NPT C&D Exemption	**2,600**	2,611	6,425	1,303	0	113,625	**123,964**	1.0	2.5	0.5	0.0	43.7	**47.7**
Swansea C&D Exemption	**2,600**	4,375	4,090	3,097	0	188,678	**200,240**	1.7	1.6	1.2	0.0	72.6	**77.0**
Carmarthenshire C&D Exemption	**2,600**	2,579	4,886	1,960	0	148,600	**158,025**	1.0	1.9	0.8	0.0	57.2	**60.8**
Ceredigion C&D Exemption	**2,600**	1,219	892	1,102	0	65,347	**68,560**	0.5	0.3	0.4	0.0	25.1	**26.4**
Pembrokeshire C&D Exemption	**2,600**	1,950	759	1,646	0	98,146	**102,501**	0.7	0.3	0.6	0.0	37.7	**39.4**
C&D Exemption		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**5.7**	**7.6**	**4.1**	**0.0**	**278.3**	**295.7**
Bridgend C&D Recycling	**50,000**	2,126	2,616	1,616	0	109,107	**115,465**	0.0	0.1	0.0	0.0	2.2	**2.3**
NPT C&D Recycling	**50,000**	2,611	6,425	1,303	0	113,625	**123,964**	0.1	0.1	0.0	0.0	2.3	**2.5**
Swansea C&D Recycling	**50,000**	4,375	4,090	3,097	0	188,678	**200,240**	0.1	0.1	0.1	0.0	3.8	**4.0**
Carmarthenshire C&D Recycling	**25,000**	2,579	4,886	1,960	0	148,600	**158,025**	0.1	0.2	0.1	0.0	5.9	**6.3**
Ceredigion C&D Recycling	**25,000**	1,219	892	1,102	0	65,347	**68,560**	0.0	0.0	0.0	0.0	2.6	**2.7**
Pembrokeshire C&D Recycling	**25,000**	1,950	759	1,646	0	98,146	**102,501**	0.1	0.0	0.1	0.0	3.9	**4.1**
C & D recycling		**14,860**	**19,668**	**10,724**	**0**	**723,504**	**768,756**	**0.4**	**0.5**	**0.3**	**0.0**	**20.7**	**22.0**
Bridgend Non Haz Landfill	**250,000**	20,351	2,464	7,928	29	37,752	**68,525**	0.1	0.0	0.0	0.0	0.2	**0.3**
NPT Non Haz Landfill	**250,000**	24,992	6,052	6,396	25	39,315	**76,781**	0.1	0.0	0.0	0.0	0.2	**0.3**
Swansea Non Haz Landfill	**250,000**	41,876	3,853	15,197	53	65,284	**126,264**	0.2	0.0	0.1	0.0	0.3	**0.5**
Carmarthenshire Non Haz Landfill	**112,500**	24,691	4,603	9,616	688	51,417	**91,015**	0.2	0.0	0.1	0.0	0.5	**0.8**
Ceredigion Non Haz Landfill	**112,500**	11,671	840	5,407	380	22,611	**40,909**	0.1	0.0	0.0	0.0	0.2	**0.4**
Pembrokeshire Non Haz Landfill	**112,500**	18,664	715	8,079	597	33,959	**62,014**	0.2	0.0	0.1	0.0	0.3	**0.6**
Total Non Haz Landfill		**142,246**	**18,528**	**52,623**	**1,772**	**250,339**	**465,508**	**0.8**	**0.1**	**0.3**	**0.0**	**1.5**	**2.8**
Hazardous landfill	**50,000**						**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Bridgend Inert Landfill	**50,000**	0	1,247	770	0	13,889	**15,907**	0.0	0.0	0.0	0.0	0.3	**0.3**
NPT Non Inert Landfill	**50,000**	0	3,063	621	0	14,464	**18,149**	0.0	0.1	0.0	0.0	0.3	**0.4**
Swansea Inert Landfill	**50,000**	0	1,950	1,477	0	24,018	**27,445**	0.0	0.0	0.0	0.0	0.5	**0.5**
Carmarthenshire Inert Landfill	**25,000**	0	2,330	934	0	18,916	**22,180**	0.0	0.1	0.0	0.0	0.8	**0.9**
Ceredigion Inert Landfill	**25,000**	0	425	525	0	8,319	**9,269**	0.0	0.0	0.0	0.0	0.3	**0.4**
Pembrokeshire Inert Landfill	**25,000**	0	362	785	0	12,494	**13,641**	0.0	0.0	0.0	0.0	0.5	**0.5**
Total Inert Landfill		**0**	**9,377**	**5,113**	**0**	**92,101**	**106,591**	**0.0**	**0.2**	**0.1**	**0.0**	**2.6**	**3.0**
All Facilities		**1,389,451**	**317,853**	**493,825**	**14,305**	**3,108,295**	**5,323,729**	**71.8**	**12.5**	**11.8**	**0.2**	**322.0**	**418.3**

APPENDIX F: INDICATIVE NEW CAPACITY / NUMBER OF NEW IN-BUILDING FACILITIES & ESTIMATED TOTAL LAND AREA REQUIRED IN 2013 FOR THE EIGHT PREFERRED OPTIONS

Table F1: Indicative New In-building Capacity Required in 2013 by Sub-Option & Unitary Authority (Tonnes)

	Clean Material Recovery Facilities & Transfer Stations	In-Vessel Composting	Pyrolysis	Dirty Materials Recovery Facilities	Gasification	Incinerator	Mechanical Biological Treatment	Autoclave	Total Indicative New Capacity
BRIDGEND COUNTY BROUGH COUNCIL									
2A: Pyrolysis	107,182	30,390	76,506						**214,078**
2C: Incineration with Energy Recovery	107,182	30,390				76,287			**213,859**
3A: MBT followed by Pyrolysis	107,182	30,390	43,032				47,577		**228,181**
3B: MBT followed by Gasification	107,182	30,390			43,032		47,577		**228,181**
3C: MBT followed by Incineration with Energy Recovery	107,182	30,390				37,124	47,577		**222,273**
3D: MBT followed by fuel to off-site energy use	107,182	30,390					47,577		**185,149**
4C: Autoclave followed by Incineration with Energy Recovery	107,182	30,390				5,786		76,506	**219,864**
4D: Autoclave followed by fuel to off-site energy use	107,182	30,390						76,506	**214,078**
CARMARTHENSHIRE COUNTY COUNCIL									
2A: Pyrolysis	12,695	39,082	98,447						**150,224**
2C: Incineration with Energy Recovery	12,695	39,082				98,447			**150,224**
3A: MBT followed by Pyrolysis	12,695	39,082	55,373				61,222		**168,372**
3B: MBT followed by Gasification	12,695	39,082			55,373		61,222		**168,372**
3C: MBT followed by Incineration with Energy Recovery	12,695	39,082				48,016	61,222		**161,015**
3D: MBT followed by fuel to off-site energy use	12,695	39,082					61,222		**112,999**
4C: Autoclave followed by Incineration with Energy Recovery	12,695	39,082				7,541		98,447	**157,765**
4D: Autoclave followed by fuel to off-site energy use	12,695	39,082						98,447	**150,224**
CEREDIGION COUNTY COUNCIL									
2A: Pyrolysis	43,614	17,476	45,493						**106,583**
2C: Incineration with Energy Recovery	43,614	17,476				45,493			**106,583**
3A: MBT followed by Pyrolysis	43,614	17,476	25,588				28,291		**114,969**
3B: MBT followed by Gasification	43,614	17,476			25,588		28,291		**114,969**
3C: MBT followed by Incineration with Energy Recovery	43,614	17,476				22,188	28,291		**111,569**
3D: MBT followed by fuel to off-site energy use	43,614	17,476					28,291		**89,381**
4C: Autoclave followed by Incineration with Energy Recovery	43,614	17,476				3,485		45,493	**110,068**
4D: Autoclave followed by fuel to off-site energy use	43,614	17,476						45,493	**106,583**
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL									
2A: Pyrolysis	171,996	38,235	93,145						**303,376**
2C: Incineration with Energy Recovery	171,996	38,235				7,968			**218,199**
3A: MBT followed by Pyrolysis	171,996	38,235	52,391				0		**262,622**
3B: MBT followed by Gasification	171,996	38,235			52,391		0		**262,622**
3C: MBT followed by Incineration with Energy Recovery	171,996	38,235				0	0		**210,231**
3D: MBT followed by fuel to off-site energy use	171,996	38,235					0		**210,231**
4C: Autoclave followed by Incineration with Energy Recovery	171,996	38,235				0		93,145	**303,376**
4D: Autoclave followed by fuel to off-site energy use	171,996	38,235						93,145	**303,376**
PEMBROKESHIRE COUNTY COUNCIL									
2A: Pyrolysis	183,825	26,534	69,748						**280,107**
2C: Incineration with Energy Recovery	183,825	26,534				69,748			**280,107**
3A: MBT followed by Pyrolysis	183,825	26,534	39,231				43,375		**292,965**
3B: MBT followed by Gasification	183,825	26,534			39,231		43,375		**292,965**
3C: MBT followed by Incineration with Energy Recovery	183,825	26,534				34,018	43,375		**287,752**
3D: MBT followed by fuel to off-site energy use	183,825	26,534					43,375		**253,734**
4C: Autoclave followed by Incineration with Energy Recovery	183,825	26,534				5,343		69,748	**285,450**
4D: Autoclave followed by fuel to off-site energy use	183,825	26,534						69,748	**280,107**
CITY & COUNTY OF SWANSEA									
2A: Pyrolysis	371,779	59,780	151,604						**583,163**
2C: Incineration with Energy Recovery	371,779	59,780				150,082			**581,641**
3A: MBT followed by Pyrolysis	371,779	59,780	85,272				94,279		**611,110**
3B: MBT followed by Gasification	371,779	59,780			85,272		94,279		**611,110**
3C: MBT followed by Incineration with Energy Recovery	371,779	59,780				72,622	94,279		**598,460**
3D: MBT followed by fuel to off-site energy use	371,779	59,780					94,279		**525,838**
4C: Autoclave followed by Incineration with Energy Recovery	371,779	59,780				11,093		151,604	**594,256**
4D: Autoclave followed by fuel to off-site energy use	371,779	59,780						151,604	**583,163**
SOUTH WEST WALES									
2A: Pyrolysis	891,091	211,497	534,943						**1,637,531**
2C: Incineration with Energy Recovery	891,091	211,497				448,025			**1,550,613**
3A: MBT followed by Pyrolysis	891,091	211,497	300,887				274,743		**1,678,218**
3B: MBT followed by Gasification	891,091	211,497			300,887		274,743		**1,678,218**
3C: MBT followed by Incineration with Energy Recovery	891,091	211,497				213,969	274,743		**1,591,300**
3D: MBT followed by fuel to off-site energy use	891,091	211,497					274,743		**1,377,331**
4C: Autoclave followed by Incineration with Energy Recovery	891,091	211,497				33,247		534,943	**1,670,778**
4D: Autoclave followed by fuel to off-site energy use	891,091	211,497						534,943	**1,637,531**

Table F2: Indicative Number of New In-Building Facilities Required in 2013 by Sub-Option & Unitary Authority

	Clean Material Recovery Facilities & Transfer Stations	In-Vessel Composting	Pyrolysis	Dirty Materials Recovery Facilities	Gasification	Incinerator	Mechanical Biological Treatment	Autoclave	Total Indicative Number of New Facilities
BRIDGEND COUNTY BROUGH COUNCIL									
2A: Pyrolysis	1.5	1.2	0.9						**3.6**
2C: Incineration with Energy Recovery	1.5	1.2				0.4			**3.1**
3A: MBT followed by Pyrolysis	1.5	1.2	0.5				0.3		**3.5**
3B: MBT followed by Gasification	1.5	1.2			0.5		0.3		**3.5**
3C: MBT followed by Incineration with Energy Recovery	1.5	1.2				0.2	0.4		**3.3**
3D: MBT followed by fuel to off-site energy use	1.5	1.2					0.3		**3.0**
4C: Autoclave followed by Incineration with Energy Recovery	1.5	1.2				0.0		0.4	**3.1**
4D: Autoclave followed by fuel to off-site energy use	1.5	1.2						0.4	**3.1**
CARMARTHENSHIRE COUNTY COUNCIL									
2A: Pyrolysis	0.2	3.0	3.3						**6.5**
2C: Incineration with Energy Recovery	0.2	3.0				1.8			**5.0**
3A: MBT followed by Pyrolysis	0.2	3.0	1.8				0.8		**5.8**
3B: MBT followed by Gasification	0.2	3.0			1.4		0.8		**5.4**
3C: MBT followed by Incineration with Energy Recovery	0.2	3.0				0.9	1.1		**5.2**
3D: MBT followed by fuel to off-site energy use	0.2	3.0					0.8		**4.0**
4C: Autoclave followed by Incineration with Energy Recovery	0.2	3.0				0.1		1.0	**4.3**
4D: Autoclave followed by fuel to off-site energy use	0.2	3.0						1.0	**4.2**
CEREDIGION COUNTY COUNCIL									
2A: Pyrolysis	0.6	1.3	1.5						**3.4**
2C: Incineration with Energy Recovery	0.6	1.3				0.8			**2.7**
3A: MBT followed by Pyrolysis	0.6	1.3	0.9				0.4		**3.2**
3B: MBT followed by Gasification	0.6	1.3			0.6		0.4		**2.9**
3C: MBT followed by Incineration with Energy Recovery	0.6	1.3				0.4	0.5		**2.8**
3D: MBT followed by fuel to off-site energy use	0.6	1.3					0.4		**2.3**
4C: Autoclave followed by Incineration with Energy Recovery	0.6	1.3				0.1		0.5	**2.5**
4D: Autoclave followed by fuel to off-site energy use	0.6	1.3						0.5	**2.4**
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL									
2A: Pyrolysis	2.5	1.5	1.0						**5.0**
2C: Incineration with Energy Recovery	2.5	1.5				0.0			**4.0**
3A: MBT followed by Pyrolysis	2.5	1.5	0.6				0.0		**4.6**
3B: MBT followed by Gasification	2.5	1.5			0.7		0.0		**4.7**
3C: MBT followed by Incineration with Energy Recovery	2.5	1.5				0.0	0.0		**4.0**
3D: MBT followed by fuel to off-site energy use	2.5	1.5					0.0		**4.0**
4C: Autoclave followed by Incineration with Energy Recovery	2.5	1.5				0.0		0.5	**4.5**
4D: Autoclave followed by fuel to off-site energy use	2.5	1.5						0.5	**4.5**
PEMBROKESHIRE COUNTY COUNCIL									
2A: Pyrolysis	2.6	2.0	2.3						**6.9**
2C: Incineration with Energy Recovery	2.6	2.0				1.2			**5.8**
3A: MBT followed by Pyrolysis	2.6	2.0	1.3				0.5		**6.4**
3B: MBT followed by Gasification	2.6	2.0			1.0		0.5		**6.1**
3C: MBT followed by Incineration with Energy Recovery	2.6	2.0				0.6	0.8		**6.0**
3D: MBT followed by fuel to off-site energy use	2.6	2.0					0.5		**5.1**
4C: Autoclave followed by Incineration with Energy Recovery	2.6	2.0				0.1		0.7	**5.4**
4D: Autoclave followed by fuel to off-site energy use	2.6	2.0						0.7	**5.3**
CITY & COUNTY OF SWANSEA									
2A: Pyrolysis	5.3	2.3	1.7						**9.3**
2C: Incineration with Energy Recovery	5.3	2.3				0.7			**8.3**
3A: MBT followed by Pyrolysis	5.3	2.3	0.9				0.6		**9.1**
3B: MBT followed by Gasification	5.3	2.3			1.1		0.6		**9.3**
3C: MBT followed by Incineration with Energy Recovery	5.3	2.3				0.3	0.9		**8.8**
3D: MBT followed by fuel to off-site energy use	5.3	2.3					0.6		**8.2**
4C: Autoclave followed by Incineration with Energy Recovery	5.3	2.3				0.1		0.8	**8.5**
4D: Autoclave followed by fuel to off-site energy use	5.3	2.3						0.8	**8.4**
SOUTH WEST WALES									
2A: Pyrolysis	12.7	11.3	10.7						**34.7**
2C: Incineration with Energy Recovery	12.7	11.3				4.9			**28.9**
3A: MBT followed by Pyrolysis	12.7	11.3	6.0				2.5		**32.5**
3B: MBT followed by Gasification	12.7	11.3			5.3		2.5		**31.8**
3C: MBT followed by Incineration with Energy Recovery	12.7	11.3				2.4	3.7		**30.1**
3D: MBT followed by fuel to off-site energy use	12.7	11.3					2.5		**26.5**
4C: Autoclave followed by Incineration with Energy Recovery	12.7	11.3				0.4		3.7	**28.1**
4D: Autoclave followed by fuel to off-site energy use	12.7	11.3						3.7	**27.7**

Table F3: Estimated Total Land Area Required in 2013 by Sub-Option & Unitary Authority (Hectares)

	Clean Material Recovery Facilities & Transfer Stations	In-Vessel Composting	Pyrolysis	Dirty Materials Recovery Facilities	Gasification	Incinerator	Mechanical Biological Treatment	Autoclave	Total Estimated Land Area (Hectares)
BRIDGEND COUNTY BROUGH COUNCIL									
2A: Pyrolysis	3.7	1.8	2.6						**8.1**
2C: Incineration with Energy Recovery	3.7	1.8				2.1			**7.7**
3A: MBT followed by Pyrolysis	3.7	1.8	1.4				3.6		**10.5**
3B: MBT followed by Gasification	3.7	1.8			2.5		3.6		**11.6**
3C: MBT followed by Incineration with Energy Recovery	3.7	1.8				1.0	5.3		**11.9**
3D: MBT followed by fuel to off-site energy use	3.7	1.8					3.6		**9.1**
4C: Autoclave followed by Incineration with Energy Recovery	3.7	1.8				0.2		2.3	**8.0**
4D: Autoclave followed by fuel to off-site energy use	3.7	1.8						2.3	**7.9**
CARMARTHENSHIRE COUNTY COUNCIL									
2A: Pyrolysis	0.4	2.4	3.3						**6.1**
2C: Incineration with Energy Recovery	0.4	2.4				7.9			**10.7**
3A: MBT followed by Pyrolysis	0.4	2.4	1.9				4.6		**9.2**
3B: MBT followed by Gasification	0.4	2.4			3.2		4.6		**10.6**
3C: MBT followed by Incineration with Energy Recovery	0.4	2.4				3.9	6.6		**13.2**
3D: MBT followed by fuel to off-site energy use	0.4	2.4					4.6		**7.4**
4C: Autoclave followed by Incineration with Energy Recovery	0.4	2.4				0.6		3.0	**6.4**
4D: Autoclave followed by fuel to off-site energy use	0.4	2.4						3.0	**5.8**
CEREDIGION COUNTY COUNCIL									
2A: Pyrolysis	1.5	1.1	1.5						**4.1**
2C: Incineration with Energy Recovery	1.5	1.1				3.7			**6.2**
3A: MBT followed by Pyrolysis	1.5	1.1	0.9				2.1		**5.5**
3B: MBT followed by Gasification	1.5	1.1			1.5		2.1		**6.2**
3C: MBT followed by Incineration with Energy Recovery	1.5	1.1				1.8	3.0		**7.4**
3D: MBT followed by fuel to off-site energy use	1.5	1.1					2.1		**4.7**
4C: Autoclave followed by Incineration with Energy Recovery	1.5	1.1				0.3		1.4	**4.2**
4D: Autoclave followed by fuel to off-site energy use	1.5	1.1						1.4	**3.9**
NEATH PORT TALBOT COUNTY BOROUGH COUNCIL									
2A: Pyrolysis	6.0	2.3	3.1						**11.4**
2C: Incineration with Energy Recovery	6.0	2.3				0.2			**8.5**
3A: MBT followed by Pyrolysis	6.0	2.3	1.7				0.0		**10.1**
3B: MBT followed by Gasification	6.0	2.3			3.0		0.0		**11.3**
3C: MBT followed by Incineration with Energy Recovery	6.0	2.3				0.0	0.0		**8.3**
3D: MBT followed by fuel to off-site energy use	6.0	2.3					0.0		**8.3**
4C: Autoclave followed by Incineration with Energy Recovery	6.0	2.3				0.0		2.8	**11.1**
4D: Autoclave followed by fuel to off-site energy use	6.0	2.3						2.8	**11.1**
PEMBROKESHIRE COUNTY COUNCIL									
2A: Pyrolysis	6.4	1.6	2.3						**10.4**
2C: Incineration with Energy Recovery	6.4	1.6				5.6			**13.6**
3A: MBT followed by Pyrolysis	6.4	1.6	1.3				3.3		**12.6**
3B: MBT followed by Gasification	6.4	1.6			2.3		3.3		**13.5**
3C: MBT followed by Incineration with Energy Recovery	6.4	1.6				2.7	4.6		**15.4**
3D: MBT followed by fuel to off-site energy use	6.4	1.6					3.3		**11.3**
4C: Autoclave followed by Incineration with Energy Recovery	6.4	1.6				0.4		2.1	**10.6**
4D: Autoclave followed by fuel to off-site energy use	6.4	1.6						2.1	**10.1**
CITY & COUNTY OF SWANSEA									
2A: Pyrolysis	12.9	3.6	5.1						**21.6**
2C: Incineration with Energy Recovery	12.9	3.6				4.2			**20.7**
3A: MBT followed by Pyrolysis	12.9	3.6	2.8				7.1		**26.4**
3B: MBT followed by Gasification	12.9	3.6			4.9		7.1		**28.5**
3C: MBT followed by Incineration with Energy Recovery	12.9	3.6				2.0	10.5		**29.0**
3D: MBT followed by fuel to off-site energy use	12.9	3.6					7.1		**23.6**
4C: Autoclave followed by Incineration with Energy Recovery	12.9	3.6				0.3		4.6	**21.4**
4D: Autoclave followed by fuel to off-site energy use	12.9	3.6						4.6	**21.1**
SOUTH WEST WALES									
2A: Pyrolysis	30.9	12.9	17.9						**61.6**
2C: Incineration with Energy Recovery	30.9	12.9				23.7			**67.4**
3A: MBT followed by Pyrolysis	30.9	12.9	10.0				20.6		**74.4**
3B: MBT followed by Gasification	30.9	12.9			17.4		20.6		**81.7**
3C: MBT followed by Incineration with Energy Recovery	30.9	12.9				11.4	30.0		**85.2**
3D: MBT followed by fuel to off-site energy use	30.9	12.9					20.6		**64.4**
4C: Autoclave followed by Incineration with Energy Recovery	30.9	12.9				1.8		16.2	**61.8**
4D: Autoclave followed by fuel to off-site energy use	30.9	12.9						16.2	**60.0**

F1 Calculations – The Methodology

F1.1 The following sections set out in detail the methodology used to calculate:

- The indicative new capacity required and indicative number of new in-building facilities required by 2013 in each UA area for each of the Preferred Options; and
- The estimate of the total land area required for new in-building facilities by 2013 in each UA area for each of the Preferred Options.

F2 Step 1 – Identify RWP Capacity Requirements

F2.1 Identify, for each UA area, the RWP Technology Strategy capacity requirements for each in-building and open-air facility type.

F2.2 Detailed notes:

- Data source: Tables 4 / 32 / 34 / 36 / 37 / 38 / 39 / 42 & 43 of the SA report;
- Capacity requirements for the following facility types are common between sub-Options: Household, Industrial & Commercial Transfer Station; Construction & Demolition Transfer Station; In-Vessel Composting; Civic Amenity; Open-Windrow Composting; Construction & Demolition Exemption; Construction & Demolition Recycling; and Inert Waste Landfill;
- The SA specifies capacity requirements for 'Hazardous Waste Landfill' at the regional level only;
- To avoid false accuracy, the quantity of unmodelled waste is specified at the regional level only;
- The quantity of unmodelled waste is common between sub-Options;
- The quantity of unmodelled waste is split 157,083 tonnes hazardous / 907,268 tonnes non-hazardous. This step assumed that 50% of the hazardous unmodelled waste is sent to landfill and therefore 78,542 tonnes is subtracted from the total capacity requirement for unmodelled waste specified in the SA report and is added to the capacity requirement for 'Hazardous Waste Landfill';
- On the basis of current practice, this step assumes that in 2013 the 'Slag from Steel Production' in Table 4 of the SA report (866,297 tonnes) will be sent to Restricted User Landfills and therefore 866,297 tonnes is subtracted from the quantity of unmodelled waste.

F3 Step 2 – Identify any Existing Capacity

F3.1 Identify, for each UA area, for each in-building and open-air facility type required any existing capacity.

F3.2 Detailed notes:

- Data source: Table 1 (Appendix 5) of the AMR 2007;
- Capacity of licensed and permitted non-landfill facilities is the maximum licensed annual capacity from the licence, working plan or licence application;
- To avoid false accuracy, the existing capacity for unmodelled waste is given at the regional level only here;

- The AMR categories of 'Physical Treatment', 'Physico-Chemical Treatment' and 'Mobile Plants' are difficult to count against the categories used for the RWP capacity requirements. The following split has been agreed in discussion with the EAW:
  - Licence / Permit Numbers 34014 is counted with MRF + Transfer;
  - Licence / Permit Numbers 34300/YP3037 / 34185 / 34117/BM0893 / BU02141H / 34222 / 34261 / 34253 are counted against unmodelled waste;
  - Licence / Permit Numbers 34113 / 34129 (Non-operational) are not counted.
- To avoid false accuracy, the forecasts of landfill void are given at the regional level only here.

F4 Step 3 – Identify any 'in the pipeline' Capacity

F4.1 Identify, for each UA area, for each in-building and open-air facility type required any 'in the pipeline' capacity. Only capacity at proposed facilities that have planning permission and are likely to be developed should be counted.

F4.2 Detailed notes:

- For transparency, any information regarding 'in the pipeline' capacity has been reviewed and agreed by the RTG as a note alongside the calculations.

F5 Step 4 – Calculate the Indicative New Capacity Required

F5.1 Calculate for each UA area, for each in-building and open-air facility type required, any new capacity required by subtracting any existing capacity and any 'in the pipeline' capacity from the RWP capacity requirements for each UA area.

F5.2 Detailed notes:

- In accordance with the principle of regional self sufficiency, any existing spare capacity in one or more UA areas, in facility types with potential to serve more than one LA Area, is used to offset any new capacity required in all other UA areas. The spare capacity is apportioned to UA areas on the basis of each UA area's proportion of the total new capacity required in the region;
- The following facility types are treated as 'local' facilities and therefore spare capacity in one LA area does not offset the new capacity required in other LA areas: Clean Materials Recovery Facilities, Transfer Stations, Civic Amenity, and Construction & Demolition Exemption.

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F6 Step 5 – Calculate an Indicative Number of New Facilities Required

F6.1 Calculate, for each UA area, an indicative number of new facilities required by dividing the new capacity required by the typical facility capacity.

F6.2 Detailed notes:

- Data source: Typical facility capacities from Table 32 of the SA report;
- Different typical facility capacities are used for urban and rural local authority areas. Figure A10 of the SA report identifies Bridgend, Neath Port Talbot and Swansea as

urban authorities and Carmarthenshire, Ceredigion and Pembrokeshire as rural authorities;

- An indicative number of new in-building facilities required for unmodelled waste is not calculated because it is not possible to specify a typical facility capacity for this wide range of wastes;
- Because landfills are dealt with at the regional level, the typical facility capacities for Non-Hazardous Waste Landfill and Inert Waste Landfill are assumed to be half way between the typical facility capacities specified by the EA for urban and rural areas.

F7 Step 6 – Calculate an Estimate of the Total Land Area Required for New In-building Facilities

F7.1 Calculate, for each UA area, for all in-building facility types required, distinguishing between facility types likely and not likely to serve more than one local authority area, the total land area required:

a) Calculate, for each UA area, for each in-building facility type required, distinguishing between facility types likely and not likely to serve more than one local authority area, an estimate of the land area required by multiplying the indicative number of new facilities required by the typical land take;
b) In order to provide a degree of over-provision, estimates of the total land area required for in-building facility types with potential to serve more than one LA area are increased by 50%;
c) Calculate, for each UA area, for all in-building facility types required, for facility types with potential to serve more than one local authority area, an estimate of the total land area required by totaling the results of 'b)' above.

F7.2 A degree of over-provision is necessary for the following reasons:

- To provide the waste management industry with choice and flexibility regarding the number and size of sites;
- Other employment uses may be developed on the identified sites; and
- To facilitate adequate minimum site sizes.

F7.3 This calculation is not undertaken for open-air facility types because it is considered that in practice for many open-air facilities the size of the site available is likely to determine the size of the facility, rather than vice versa.

F7.4 Detailed notes:

- Data source: Typical land takes from Appendix 6 of the SA report;
- The following types of facilities identified in the SA are considered most likely to be 'in-building' facilities: Transfer Station, In-Vessel Composting, Pyrolysis, Dirty MRF, Gasification, Incinerator, MBT, and Autoclave;
- The following types of facilities identified in the SA are considered most likely to be 'open-air' facilities: Civic Amenity, Open-Windrow Composting, C&D Exemption, C&D Recycling, Non-Hazardous Waste Landfill, Hazardous Waste Landfill, and Inert Waste Landfill;
- Different typical facility capacities are used for urban and rural local authority areas. Figure A10 of the SA report identifies Bridgend, Neath Port Talbot and Swansea as

urban authorities and Carmarthenshire, Ceredigion and Pembrokeshire as rural authorities;

- Over provision is only applied to in-building facility types with potential to serve more than one LA area;
- Amount of over provision: 50%.

APPENDIX G: LIST OF B2 AND MAJOR INDUSTRY LAND USE SITES & POTENTIALLY AVAILABLE LAND AREA BY UNITARY AUTHORITY

Authority	Site	Allocated (A) / Existing (E)	Total Land Area (Hectares)	Available Land Area (Hectares)
Bridgend County Borough Council	Brackla Industrial Estate	E	59.1	**24.35**
	Brynmenyn Industrial Estate	E	34.72	**7.45**
	Llynfi Power Station	E	18.5	**18.5**
	Village Farm Industrial Estate Pyle	E	45.8	**5.15**
	Litchard Industrial Estate	E	5.95	**0**
		TOTAL:	**164.07**	**55.45**
Carmarthenshire County Council	Cillefwr, Carmarthen	A	6.35	DNA
	Pibwrlwyd, Carmarthen	A	27.40	DNA
	Dafen, Llanelli	A	76	DNA
	Berwick / Bynea, Llanelli	A	64.34	DNA
	Crosshands West	A	38.35	DNA
	Parc Menter, Crosshands	A	6.70	DNA
	Crosshands Business Park	A	8.16	DNA
	Median Farm, Penygroes	A	6	DNA
	Parc Hendre, Ammanford	A	30.41	DNA
	Burry Port East, Burry Port	A	13	DNA
	Cillefwr Industrial Estate, Carmarthen	E	9.24	DNA
	Trostre Works, Llanelli	E	72.65	DNA
	Dafen, Llanelli	E	41.24	DNA
	Berwick / Bynea, Llanelli	E	15.74	DNA
	Trosserch Road, Llangennech	E	21.87	DNA
	Capel Hendre Industrial Estate, Ammanford	E	15	DNA
	Crosshands Business Park, Crosshands	E	10.36	DNA
		TOTAL:	**462.81**	**DNA**
Ceredigion County Council[149]	Capel Bangor	A	13.4	**13.4**
	Croessffordd, Llandysul	A (E)	6.7	**5.1**
	Cardigan Parc, Teifi	A (E)	20.5	**13.2**
	Blaenannerch, Aberporth	A (E)	23.0	**17.4**
		TOTAL:	**63.6**	**49.1**
Neath Port Talbot County Borough Council	Port Talbot Docklands	A	140	**82**
	Neath Abbey Wharf	A	24	**3.7**
	Kenfig Industrial Estate	A	37.4	**2.9**
	Vale of Neath Supplier Park	A	5.2	**5.2**
	Former Blaenant Colliery	A	2.4	**2.4**
	Junction 38, Margam	A	27.2	**23.7**
	Abernant Colliery Site	A	9.2	**9.2**
		TOTAL:	**245.4**	**129.1**
Pembrokeshire County Council	Pembrokeshire Power Station	A	195.1	**195.1**
	Trecwn (former RNAD)	A	21.11	**21.11**
	Dale Road, Hubberston, Milford Haven	A	4.64	**4.64**
	Withybush (East of Business Park)	A	12.28	**8.02**
	Withybush (North of Business Park)	A	6.09	**5.76**
	Withybush Industrial Estate	E	12.47	**2.08**
	Thornton Industrial Estate, Milford Haven	E	22.07	**5.26**
	Waterston Industrial Estate	E	9.48	**2.66**
	Former RNAD, Milford Haven	E	5.96	**5.96**
		TOTAL:	**289.2**	**250.59**
City & County of Swansea	Felindre	A	190	DNA
	SA1	A	18	DNA
	Swansea Vale	A	25	DNA
	Swansea West Industrial Park	A	60	DNA
	Docks	A	34	DNA
	Swansea Enterprise Park	A	14.2	DNA
	Bryngwyn Works, Gorseinon	A	3	DNA
	Players Estate, Clydach	A	2.5	DNA
	Garngoch Industrial Estate	A	5	DNA
	Land at Bryntywood, Felindre	A	15.8	DNA
	Crofty Industrial Estate	A	4	DNA
	Penllergaer Business Park	A	8.2	DNA
		TOTAL:	**379.7**	**DNA**

[149] In the Ceredigion UDP 'allocated' employment sites include existing developed employment land as well as greenfield land. Accordingly, all sites are listed 'A' but added an (E) for those sites that are existing.

APPENDIX H: LOCATIONAL CRITERIA FOR THE SITING OF HAZARDOUS WASTE MANAGEMENT FACILITIES & A SUMMARY OF SITE REQUIREMENTS AND CONSIDERATIONS

H1 Locational Criteria for the Siting of Hazardous Waste Management Facilities

H1.1 The following locational criteria were first published in the Addendum *'Report on Hazardous Waste'* to the first RWP (September 2005).

H1.2 The location of facilities can and should be assessed against a range of agreed criteria that are common to all types of waste management facility. As facilities for managing hazardous wastes are very varied in both type and size, the potential impacts vary widely in both nature and degree. Therefore, potential impacts cannot be generalised to any purpose.

H1.3 Locational criteria are of two kinds, positive and negative and each is dealt with in turn. These locational criteria should be considered alongside the policy and guidance given in TAN 21 and the policies and guidance contained in each LPA's Development Plan.

H1.4 **Positive criteria** are those which are favourable to a development and which represent opportunities. Hazardous waste facilities should be located to take positive advantage of the following:

Criteria	Guidance
Proximity / Accessibility	Sites should not be remote from settlements but should be close enough to be easily reached by employees and to allow 'casual monitoring'.
Geology	In the case of facilities where there is any possibility of contamination of soils or groundwater, sites with natural geological advantages such as clay deposits are to be preferred, as are sites which are inherently seismologicaly and geologically stable.
Existing Land Uses	Advantage should be taken of the location of existing land uses, which can minimise adverse impacts. For example, sites of heavy industry, sewage works and existing landfill sites.

H1.5 **Negative criteria** are those which should be avoided in making decisions on the siting of facilities. Hazardous waste facilities should not be located where they would have an adverse effect on, or be adversely affected by, any of the following:

Criteria	Guidance
The Amenity of Sensitive Uses / Proposed Sensitive Uses	Sensitive uses / proposed sensitive uses, including housing, medical facilities, recreation or tourist facilities, should not be so close as to suffer adverse amenity including pollution, dust, noise, gases or smells or prejudice the development of those sites.
Nature Conservation / Ecology / Archaeology	Facilities should not be located in, or sufficiently near that they would have an adverse impact on areas or sites designated for local, national or international protection such as SINCs, SSSIs, SACs or RAMSAR sites, nor should they impact adversely on protected species (flora and fauna) or on archaeological remains.
Hydrology / Hydrogeology	There should be no possibility of run off, spillage or leachate polluting surface or ground waters, whether or not they are used as a potable, agricultural or industrial water supply.
Geology	Facilities should not be located where there may be adverse geological impacts, avoiding for example, areas of potential subsidence, faultlines and other areas of instability.
Landscape	Facilities should not be located where they will have an adverse impact upon statutorily protected landscapes.
Flood Plains	Facilities should not impact on the performance of any flood plain and neither the facility nor its access is liable to flooding.
Existing Land Uses	There should be no adverse impacts on existing land uses which cannot be mitigated.

H1.6 These are criteria which relate generically to all categories of hazardous waste facilities. It is essential that each site is assessed on its merits in relation to the nature and scale of the proposed operation and the criteria serve as a checklist. In addition, *'general planning criteria'* will also apply including visual and landscape impacts, accessibility and traffic impacts, and the requirement for good design.

H1.7 The choice of location of the majority of hazardous waste facilities should be advised by a full EIA, examining the possible consequences of failure of either procedures or materials. It should take account of both operations and arrangements on the site and movements to the site. The environmental assessment will advise decision-making in respect of potential consequences beyond the confines of the site in the event of structural or process failure.

H1.8 Subject to considerations of practicality, all facilities for managing materials classified as hazardous waste should have a recovery / retrieval plan for managing any pollution problems that may manifest themselves in the future.

H2 Summary of Site Requirements & Considerations for Hazardous Waste In-building Facilities

Type of Facility	Typical Capacity Range	Land Requirements m2 if < 80,000 tpa	Land Requirements m2 if > 80,000 tpa	Examples of Wastes	Environmental and Public Health Issues	Visual Considerations	Locational Considerations
Transfer Station	No info available	Up to 10,000	10,000 upwards depending on throughput	Various	• Potential for water pollution. • Potential for odour should be eliminated through process controls if undertaken within a building. • Potential for noise pollution. Should be minimised if undertaken within a building. • Potential for traffic pollution from heavy vehicles. • Safe storage of chemical wastes, depending on size may require COMAH and/or hazardous substances planning regulations.	• For liquid wastes: stacked and palletised drums, and bulk tanks – could be housed in standard industrial type building. • For solid wastes: industrial units with external storage of some segregated waste fractions. Storage arrangements dependant on material type.	• Location should take account of possible odour pollution. • Location should take account of possible noise pollution. • Would increase heavy vehicle traffic movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles. • Where possible, major facilities should be served by alternative modes of transport.
Electronic goods disassembly / refurbishing	No info available	Up to 14,000	14,000 upwards	Everyday household and office items such as TVs, fridges	• Potential for ground and water pollution. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles.	• Industrial units with external storage of some segregated waste fractions. Storage arrangements dependant on material type.	• Impacts/considerations common to any manufacturing or demanufacturing operation.
End of Life Vehicle disassembly and recycling	No info available	Up to 10,000	10,000 upwards	Waste motor vehicles and residual wastes such as oils, petrol, antifreeze, tyres, batteries, airbags.	• Potential for ground and water pollution. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles.	• Modern facilities require industrial buildings to accommodate workshops and storage space in addition to metal processing and sorting equipment. • Vehicle de-pollution sites under ELV Directive likely to look like a modern garage. • Industrial character – could include open crushing, chopping, and stacking of metals.	• Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.

Other physical treatment to reduce volume	No info available	10,000	No info available	Inorganic chemical process wastes, thermal process wastes, waste packaging, equipment containing asbestos oily wastes, construction and demolition wastes	• Potential for water pollution. • Risk of odour but should be eliminated through process controls. • Potential for noise pollution. • Potential for traffic pollution from heavy vehicles. • Possible COMAH requirement depending on quantities stored and/or hazardous substances planning regulations.	• Industrial process plant with palletised drums in stacks and bulk storage tanks.	• Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Soil remediation and recycling	No info available	No info available	No info available	Contaminated soils	• Potential for ground and water pollution. • Risk of odour but, if undertaken within a building, should be eliminated through process controls. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles.	• Could include either/both: industrial buildings, silos and plant; and/or external bunded concrete pads.	• May need large areas of land. • Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution. • Would increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles. • Where possible, major facilities should be served by alternative modes of transport.
Other biological treatment to reduce volume and/or hazardous	No info available	10,000	No info available	Liquid, sludge or solid wastes. Oily water	• Potential for water pollution. • Risk of odour but should be eliminated through process controls.	• Sewage works type installation, tanks both enclosed and open, could be housed in an industrial type building.	• Location would need to take account of potential odour pollution. • Location would need to take

nature				mixtures, other organic compounds	• Potential for noise pollution. • Potential for traffic pollution from heavy vehicles. • Possible COMAH requirement depending on quantities stored and/or hazardous substances planning regulations.		account of potential noise pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Battery recycling	No info available	No info available	No info available	Used batteries	• Potential emissions to air. • Potential for ground and water pollution. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles.	• Industrial unit with external storage of some materials.	• Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Oil reprocessing	No info available	No info available	No info available	Used oils	• Potential for ground and water pollution. • Potential for noise pollution. • Potential for traffic pollution from heavy vehicles. • Risk of odour but should be eliminated through process controls.	• Industrial process plant.	• Location would need to take account of potential noise and odour pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Metal reprocessing	No info available	No info available	No info available	Used metals	• Potential emissions to air. • Potential for ground and water pollution. • Potential for noise pollution. • Potential for dust pollution.	• Industrial process plant.	• Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution.

					• Potential for traffic pollution from heavy vehicles.		• Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Other chemical treatment to reduce volume and/or hazardous nature	No info available	10,000	No info available	Mineral oils and oily water mixtures, kerosene, diesel, petrol, interceptor wastes, acids, alkalis, and other inorganic chemical wastes.	• Potential for ground and water pollution. • Risk of odour but should be eliminated through process controls. • Potential for noise pollution. • Potential for traffic pollution from heavy vehicles • Possible COMAH requirement depending on quantities stored and/or hazardous substances planning regulations.	• Industrial process plant with palletised drums in stacks and bulk storage tanks.	• Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Could increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Thermal treatment of soils	No info available	No info available	No info available	Contaminated soil	• Potential emissions to air. • Potential for ground and water pollution. • Risk of odour but should be eliminated through process controls. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles	• Industrial building with stack	• Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution. • Would increase vehicle movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles.
Vitrification	No info available	No info available	No info available	Materials with high	• Potential emissions to air. • Risk of odour but should be	• Industrial building with stack.	• Location would need to take account of potential odour

				mineral content such as asbestos, sludges, sediments and soils.	eliminated through process controls. • Potential for noise pollution. • Potential for dust pollution. • Potential for traffic pollution from heavy vehicles. • Potential for water pollution.		pollution. • Location would need to take account of potential noise pollution. • Location would need to take account of potential dust pollution. • Could increase heavy vehicle traffic movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled. • Should be located to maximise Combined Heat and Power opportunities
Gasification / Pyrolysis	< 100,000 tpa	4,500 – 7,500	15,000 upwards	No info available	• Air emissions well inside Waste Incineration Directive standards. • Risk of odour but should be eliminated through process controls. • Potential for noise pollution, though good design and noise reduction features should ensure that noise levels can be kept to acceptable levels. • Potential for traffic pollution from heavy vehicles. • Potential for water pollution. • Residuals can be treated as aggregate.	• Small/medium industrial buildings with stack (of a notably smaller scale than Mass Burn Incineration). • If the site is prominent and visually sensitive, the applicant should consider the overall design concept as a landmark building and be sensitive to the local vernacular and local architectural and cultural styles.	• Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Could increase heavy vehicle traffic movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles. • Should be located to maximise Combined Heat and Power opportunities.
Secondary blended fuel combustion plant powering another industrial process	No info available	No info available	No info available	Oils, solvents	• Emissions to air are treated by the Environment Agency in the same way as incineration and therefore the same criteria apply. • Potential for ground and water pollution. • Potential for noise pollution. • Potential for traffic pollution	• Would be ancillary to another industrial use.	• Would be ancillary to another industrial use.

					from heavy vehicles.		
High temperature incineration with energy recovery	No info available	10,000	No info available	Hazardous healthcare wastes (e.g. cytotoxic medicines), oils, solvents.	• Air emissions well inside Waste Incineration Directive standards. • Controlled releases: Waste Incineration Directive requires most stringent EU control of releases to air and water. • Risk of odour but should be eliminated through process controls. • Potential for water pollution. • Potential for noise pollution, though good design and noise reduction features should ensure that noise levels can be kept to acceptable levels. • Potential for traffic pollution from vehicles. • Possible COMAH requirement depending on quantities stored and/or hazardous substances planning regulations.	• Industrial plant, either looks like a chemical plant or can be housed in industrial type building, with stack. • If the site is prominent and visually sensitive, the applicant should consider the overall design concept as a landmark building and be sensitive to the local vernacular and local architectural and cultural styles.	• Location would need to take account of potential odour pollution. • Location would need to take account of potential noise pollution. • Would increase heavy vehicle traffic movements in the locality. Should have good access by road to minimise congestion and reduce risk of accidents and should be located so as to minimise the overall distance travelled by vehicles. • Should be located to maximise Combined Heat and Power opportunities. • Where possible, major plants should be served by alternative modes of transport.

Adapted from:
South West Wales Regional Waste Plan 2004

Using Information from:
Environment Agency 2002; Waste Pre-Treatment: A Review. Bristol: EA.
Information supplied by the WAG Waste Strategy & Implementation Unit.

APPENDIX I: AREAS OF SEARCH – SUSTAINABILITY APPRAISAL FRAMEWORK

Sustainability Appraisal Objectives	GIS Analysis Criteria	Weighting Open-Air facility	Weighting In-Building facility
Ensure prudent use of land & resources	Landfill Site – Receiving / intending to receive waste	1	1
	Quarry site	1	1
	Agricultural Land Classification Grade 4-5	2	2
	Landfill Site – Ceased receiving waste / not reached definitive closure	3	2
	Green Wedges	3	3
	Agricultural Land Classification Grade 3	3	3
	Industrial Site (classified as B2)	4	1
	Agricultural Land Classification Grade 1-2	4	4
	Existing Waste Management Facility (non-landfill) (REGIS)	n/a	1
Minimise greenhouse gas emissions	Ports / Docks <5km	2	2
	Urban Area: <10km (i.e.>10,000 pop)	2	2
	Urban Area: 10-50km (i.e. <10,000 pop)	2	2
	Urban Area: >50km (i.e. <10,000 pop)	3	3
Minimise adverse effects on air quality	Air Quality Management Area	4	4
	Residential Development: <250m	4	3
Protect & enhance the landscape, townscape & cultural heritage of Wales	National Parks: <1km	3	3
	AONB: <1km	3	3
	LandMap: Visually Outstanding	3	3
	LandMap: High Quality	3	3
	Special Landscape Area (or equivalent)	3	3
	Historic Landscape: Special	3	3
	World Heritage Sites: arc of view	4	4
	Scheduled Ancient Monuments: 100-500m (to accommodate setting)	4	4
	Heritage Coast	4	4
	Historic Landscape: Outstanding	4	4
	World Heritage Sites	5	5
	National Parks	5	5
	Areas of Outstanding Natural Beauty (AONB)	5	5
	Scheduled Ancient Monuments & within 100m	5	5
	Historic Park and Garden and within 100m	5	5
	Historic Park and Garden: 100-250m	5	4
Minimise adverse effects on water quality	Minor Aquifer	3	n/a
	River Quality Objectives RE 1 & 2: 250-500m	3	3
	River Quality Objectives RE 3 & 4: 100-250m	3	3
	Surface Water Protection Zone: <500m	4	4
	River Quality Objectives RE 1 & 2: <250m	4	3
	River Quality Objectives RE 3 & 4: <100m	4	3
	Groundwater Source Catchment Area Zones I	5	5
	Groundwater Source Catchment Area Zones II	5	4
	Groundwater Source Catchment Area Zones III	5	3
	Major Aquifer	5	3
	Lakes and Rivers: Exclude	5	5
Avoid increasing flood risk	TAN 15 Layer C1	3	3
	TAN 15 Layer C2	4	4
Protect biodiversity	SAC: 1-2km	3	3
	SAC: 2-10km	3	n/a
	SPA: 1-2km	3	3
	SPA: 2-10km	3	n/a
	Ramsar Site: 1-2km	3	3
	Ramsar Site: 2-10km	3	n/a
	SSSI: 500m-1km	3	3
	SSSI: 1-2km	3	3
	NNR: 1-2km	3	3
	Local Nature Reserve	3	3
	SAC: <100m	4	4
	SAC: 100m-1km	4	3
	SPA: <100m	4	4
	SPA: 100m-1km	4	3
	Ramsar Site: <100m	4	4
	Ramsar Site: 100m-1km	4	3
	SSSI: <100m	4	4
	SSSI: 100-500m	4	3
	NNR: <100m	4	4
	NNR: 100m-1km	4	3
	Ancient Woodland: <250m	4	4
	Special Area of Conservation (SAC)	5	5
	Special Protection Area (SPA)	5	5
	Ramsar Site	5	5
	Site of Special Scientific Interest (SSSI)5	5	5
	National Nature Reserve (NNR)	5	5
	Ancient Woodland	5	5
Provide employment opportunities & support long term jobs / skills	Urban Area: <10km (i.e. >10,000 pop)	2	2
Minimise adverse effects on residential properties	Residential Development: 251-500m	3	n/a
	Residential Development: <250m	4	3
	Residential Development	5	5
Minimise the increased cost of waste management	Primary Road Network (A road / Motorway): <1km & <10km from Urban Area (i.e. >10,000 pop)	1	1
	Urban Area: <10km (i.e. >10,000 pop)	2	2
	Urban Area: 10-50km (i.e. >10,000 pop)	2	2
	Primary Road Network (A road / Motorway): <1km	2	2
	Urban Area: >50km (i.e. >10,000 pop)	3	3
	Slope 1:3 – 1:4	3	3
	Slope >1:3	4	4
Protect local amenity	Common Land / Open Country	3	3
	Public Forests	3	3
	Country Parks	4	4
Minimise adverse effects on public health and avoid increasing health inequalities	Residential Development: 251-500m	3	n/a
	Residential Development: <250m	4	3
	Residential Development	5	5

APPENDIX J: AREAS OF SEARCH – MAPS FOR NEW FACILITIES

J1 The following two broad principles for the viewing and use of the Areas of Search maps and GIS data must be noted:

- **The sole purpose of the maps and GIS data is to identify Areas of Search at a strategic level for use by LPA's during the LDP preparation process** – as a starting point for more detailed local level assessments to identify appropriate sites for waste management / resource recovery facilities in LDP's; and for this reason
- **The Areas of Search maps and GIS data must not be used by any organisation or individual to determine the appropriateness of proposals for individual waste management facilities**.

J2 More detail on the above principles is set out in Section **12.5 'Use of the Areas of Search Maps & GIS Data'**.

APPENDIX K: SEA ISSUES

Table K1: Fulfillment of SEA Directive Requirements

SEA Directive Requirements	Where / How Fulfilled
Preparation of an environmental report in which the likely significant effects on the environment of implementing the plan, and reasonable alternatives taking into account the objectives and geographical scope of the plan, are identified, described and evaluated.	
a) An outline of the contents, main objectives of the plan, and the relationship with other relevant plans and programmes;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 2: The RWP 1st Review. • Section 4: Links to other relevant Policies, Plans and Programmes. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 2.1: Preamble. • Section 2.2: Overview of the Project. • Section 4.1: Background. • Section 5.2: Review of other plans and programmes. • Section 5.3: Sustainability Issues.
b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 5: SEA Objectives, Baseline and Context. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 5.1: Baseline Information. • Section 5.3: Sustainability Issues.
c) The environmental characteristics of the areas likely to be significantly affected;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 5: SEA Objectives, Baseline and Context. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 5.1: Baseline Information. • Section 5.3: Sustainability Issues. • Section 7.1: Data sources and Explanation. • Section 8.3: Description of Environmental Effects.
d) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 5: SEA Objectives, Baseline and Context. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 5.1: Baseline Information. • Section 5.3: Sustainability Issues.
e) The environmental protection objectives, established at International, Community, or National level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 4: Links to other relevant Policies, Plans and Programmes. • Section 5: SEA Objectives, Baseline and Context. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 5.2: Review of other plans and programmes. • Section 5.3: Sustainability Issues. • Section 6.2: Key Components of the SA Framework. • Section 6.3: The SA Framework.
f) The likely significant effects on the environment, including issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 6: Plan Options and Assessment. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 8.3: Description of Environmental Effects.
g) The measures envisaged to prevent, reduce and as fully as possible off-set any significant adverse effects on the environment of implementing the plan or programme;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 6: Plan Options and Assessment. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Outline Mitigation for Detailed Stage. • Areas of Search Maps.

h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 3: SEA Appraisal Methodology. • Section 6: Plan Options and Assessment. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 2.4: Sustainability Appraisal Process. • Section 4.2: Options / Alternatives. • Section 6.1: Overall Approach. • Section 6.2: Key Components of the SA Framework. • Section 6.3: The SA Framework. • Section 6.4: Limitations and Assumptions. • Section 8.1: Detailed Results. • Section 8.2: Definitive Areas of Search.
i) A description of measures envisaged concerning monitoring in accordance with Article 10;	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 7: Monitoring Framework. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Section 8.7: Monitoring.
j) A non-technical summary of the information provided under the above headings.	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Provided at the beginning of the document. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Provided at the beginning of the document.

Consultation

Consultation with authorities with environmental responsibility, when deciding on the scope and level of detail of the information to be included in the environmental report.	**SEA of the Strategic Waste Management Options** (Hyder, 2007) • Section 17: Consultation Provisions. **Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) • Chapter 3: Scoping.
Consultation with authorities with environmental responsibility and the public shall be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan or programme and the accompanying Environmental Report before the adoption of the plan or programme.	The Consultation Draft RWP 1st Review and the two Environmental Reports was the subject of consultation from 15th October 2007 to 24th December 2007 and were available for download from the website.

Decision Making

Taking the environmental report and the results of the consultations into account in decision-making.	Sections 9.2 & 12.2 & 15.3 summarise how the Environmental Report and the results of consultations have been taken into account in decision making.

Provision of Information on the Decision

When the plan or programme is adopted, the public and any countries consulted shall be informed and the following made available to those so informed: • The plan or programme as adopted; • A statement summarising how environmental considerations have been integrated into the plan or programme and how the Environmental Report and the results of consultations have been taken into account in decision making, and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and • The measures decided concerning monitoring.	Paragraph 14.5.10 of the RWP 1st Review document contains a statement summarising how environmental considerations have been integrated into the plan or programme; how the Environmental Report and the results of consultations have been taken into account in decision making; and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with. Section 14.6 of the RWP 1st Review sets out the measures decided concerning Monitoring. The public has been informed through the RWP website at www.walesregionalwasteplans.gov.uk

Table K2: SEA Objectives & Indicators / Criteria

SEA topic	RWP Objective	**SEA of the Strategic Waste Management Options** (Hyder, 2007) **Indicators**	**Identifying Areas of Search for Regional Waste Facilities** (RPS, 2007) **Mapped Criteria**
Biodiversity, Fauna and Flora	Protect biodiversity and valuable sites.	• Number of sites in favourable condition. • Number of sites in unfavourable condition as a result of waste management. • Number of priority species/habitats stable or increasing. • Number of priority species / habitats declining as a result of waste management operations.	• Special Area of Conservation (SAC). • Special Protection Area (SPA). • Ramsar site. • Site of Special Scientific Interest (SSSI). • National Nature Reserve (NNR). • Local Nature Reserve (LNR). • Ancient woodland.
Population and human health	Minimise adverse impacts on air quality and public health. Minimise local transport impacts. Provide employment opportunities. Protect local amenity.	• Emissions which are injurious to public health. • Dioxin emissions. • Total waste kilometres. • Transport along roads other than motorways. • Number of jobs likely to be created. • Extent of noise, litter and vermin problems. • Extent of odour problems. • No. of odour complaints recorded by the EAW and local authorities. • Extent of dust problems.	• AQMA. • Residential area. • Locations up to 10km from residential areas. • Residential development. • Common land / open country. • Country parks. • Public forests.
Soil	Ensure prudent use of land and other resources. Safeguard soil quality.	• Land take. • Emissions contributing to soil acidification. • Percentage of new facilities on brownfield sites. • Percentage of geological SSSI and RIGS in favourable condition. • Number of geological SSSI and RIGS in unfavourable condition as a result of waste management operations.	• Location of existing waste management facility (non landfill). • Location of active landfill site. • Location of industrial site (classified as B2). • Degraded, contaminated or derelict land. • Quarry site. • Agricultural land classification. • Green wedges.
Water	Minimise adverse effects on water quality. Minimise requirements for water use.	• Emissions contributing to eutrophication. • Extent of water pollution. • Water requirements. • Amount of water recycled within processes.	• Groundwater catchment Area Zones. • Zone of special interest. • Surface water protection zone. • Major aquifer. • Minor aquifer. • Lakes and rivers. • River with water quality objectives RE 1, 2, 3 & 4.
Air	Minimise adverse impacts on air quality and public health.	• Emissions which are injurious to human health. • Emissions contributing to air acidification. • Emissions contributing to the depletion of the Ozone layer. • Dioxin emissions. • Extent of odour problems.	• AQMA. • Residential area.

Climatic Factors	Minimise greenhouse gas emissions. Adapt to the effects of climate change. Avoid increasing flood risk.	• Greenhouse gases emitted. • Number of new facilities constructed on Indicative Flood Zone areas or other areas identified as vulnerable to inundation by EAW.	• Distance from port. • Distance from urban area. • TAN 15 'Development and Flood Risk' Zone C1. • TAN 15 'Development and Flood Risk' Zone C2.
Material Assets – use of resources	Ensure prudent use of land and other resources. Conform to waste legislation and policy.	• Depletion of resources such as wood, water, fuels and ores. • Percentage of waste composted. • Percentage of waste recycled. • Percentage of waste landfilled. • Energy generated / source of energy supply. • Percentage of construction materials from sustainable sources.	• Distance from port. • Distance from urban area. • Distance from an urban area. • Distance from primary road network.
Cultural heritage	Conserve landscapes, townscapes and cultural heritage.	• Extent of visual and landscape impacts.	• World heritage sites. • Scheduled Ancient Monuments. • Heritage Coast. • Locations within a historic landscape (outstanding or special). • Historic Parks and Gardens.
Landscape	Conserve landscapes, townscapes and cultural heritage.	• Extent of visual and landscape impacts.	• National Parks. • AONB. • Locations within a landscape identified on LandMap (high quality or visually outstanding). • Locations within a Special Landscape Area (or equivalent). • Slope.

Table K3: Outline SEA Monitoring Framework

Theme/Objectives	Indicator	Effect / Issue to be Monitored	Remarks
Biodiversity			
To protect and enhance protected or valuable sites. To protect and enhance BAP habitats.	Number of sites in favourable condition. Number of sites in unfavourable condition as a result of waste management operations. Number of priority species/habitats stable or increasing. Number of priority species/habitats declining as a result of waste management operations.	Condition of designated sites potentially affected by waste facilities. Possible data source: CCW	Evaluation of condition data should: • Consider the impact of waste facilities on SAC, SPA, SSSI, Nature Reserves and protected species. • Consider the cumulative and secondary effects of waste management facilities associated with atmospheric emissions and deposition to soil and water. • Consider any positive contributions towards achievements of BAP targets.
Population & Human Health			
To minimise adverse effects on public health	Emissions which are injurious to public health Dioxin Emissions	Emission monitoring data from waste facilities, where available, in relation to achievement of air quality standards (e.g. monitoring required for Pollution, Prevention, Control (PPC) permits). Possible data sources: Facility operator, local authority, Environment Agency. Number of areas containing waste facilities where the levels of identified pollutants breach Air Quality Standards.	Evaluation of emission data should consider the cumulative and secondary effects of waste management facilities associated with atmospheric emissions.
To protect local amenity	Number of odour complaints recorded by Local Authorities. Extent of dust problems. Extent of noise, litter and vermin problems	Number of complaints resulting from waste management facility operation at local level. Possible data source: local authority.	-
To minimise local transport impacts	Total waste km Transport along roads other than motorways	Any available data for km travelled in the movement of waste; the mode of transport used and transportation routes (e.g. from waste disposal licences or permits, waste transfer notes, special waste consignment notes, waste management licences). Possible data sources: facility operator, local authority.	-
To provide employment opportunities	Number of jobs likely to be created	Employment generated during construction and operation of facilities	Facility construction company and operator
Soil			
To ensure prudent use of land	Land take	Land take associated with new waste management	-

Theme/Objectives	Indicator	Effect / Issue to be Monitored	Remarks
		facilities. Possible data sources: planning consents.	
To safeguard soil quality	Emissions contributing to soil acidification	Emission monitoring data from waste facilities, where available, relating to achievement of relevant air quality standards (e.g. monitoring required for Pollution, Prevention, Control (PPC) permits). Possible data sources: Facility operator, local authority, Environment Agency.	Review to consider cumulative & secondary effects of waste management facilities associated with atmospheric emissions and deposition to soil and water.
To promote appropriate re-use of brownfield land	Percentage of new facilities on brownfield sites	Percentage of treatment facilities on brownfield sites. Possible data source: planning consents, local authority, Environment Agency.	
To protect and enhance geological SSSI and RIGS.	Percentage of geological SSSI and RIGS in favourable condition Number of geological SSSI and RIGS in unfavourable condition as a result of waste management operations	N/A	Review of available condition data in relation to location of waste management facilities. Possible data source: CCW.
Water			
To minimise adverse effects on water quality	Emissions contributing to eutrophication. Extent of water pollution.	Monitoring data for discharges to water from waste management facilities in relation to water quality standards (e.g. monitoring undertaken for discharge consents, PPC permits). Possible data sources: Environment Agency, local authority, facility operator.	Review of General Quality Assessment data for main rivers potentially affected by waste management facilities. Review should consider cumulative & secondary effects of waste management facilities associated with atmospheric emissions and deposition to soil & water.
To minimise requirements for water use	Water requirements Amount of water recycled within process.	Water usage requirements for construction and operation of facilities. Review of water meter records, abstraction licences in relation to demand requirements. Possible data sources: facility operator, Environment Agency.	Review to consider water recycling opportunities for construction and operation.
Air			
To minimise adverse effects on air quality	Emissions which are injurious to human health Emissions contributing to air acidification Emissions contributing to the depletion of the ozone layer Extent of odour problems Dioxin emissions	Number of AQMA potentially affected by emissions from waste management facilities. Number of areas containing waste facilities where the levels of identified pollutants breach Air Quality Standards Emission monitoring data from waste facilities, where available, relating to achievement of relevant air	Local Authorities/ Review should consider cumulative & secondary effects of waste management facilities associated with atmospheric emissions.

Theme/Objectives	Indicator	Effect / Issue to be Monitored	Remarks
		quality standards (e.g. monitoring required for Pollution, Prevention, Control (PPC) permits). Possible data sources: facility operator, local authority, Environment Agency.	
Climatic Factors			
To reduce greenhouse gas emissions	Greenhouse gases emitted	Number of areas containing waste facilities where the levels of identified pollutants breach Air Quality Standards. Emission monitoring data from waste facilities, where available, relating to achievement of relevant air quality standards (e.g. monitoring required for Pollution, Prevention, Control (PPC) permits). Possible data sources: facility operator, local authority, Environment Agency.	Facility Operator
To adapt to the effects of climate change.	Number of new facilities constructed on Indicative Flood Zones or other areas identified as vulnerable to inundation.	Number of new waste facilities constructed within flood risk areas. Possible data source: planning consents, Environment Agency.	-
Material Assets (Use of Resources)			
To ensure prudent use of resources	Depletion of resources such as wood, water, fuels and ores Energy generated/ source of energy supply	Available records for resources used in operating facilities (e.g. fuel, water consumption – meters, abstraction licences) Amount of recycled/ recovered materials produced. Amount of energy generated from thermal treatment facilities and collection from landfill gas. Possible data source: facility operator.	-
To conform with waste policy	Percentage composted Percentage recycled Percentage of waste landfilled	Percentage of waste composted/recycled/to landfill. Possible data source: local authority (WasteDataFlow)	-
To promote use of recycled aggregates and sustainable resources	Percentage of construction materials from sustainable sources	Promotion of sourcing construction materials from sustainable sources. Possible data source: facility operator.	-
Cultural Heritage			
To conserve townscapes and historic	Extent of visual and landscape impacts	Number of planning consents for waste management	-

Theme/Objectives	Indicator	Effect / Issue to be Monitored	Remarks
landscape context		facilities containing conditions associated with protection of townscapes and historic landscapes. Possible data source: planning consents.	

Landscape			
To conserve landscapes	Extent of visual and landscape impacts	Number of planning consents for waste management facilities in designated landscape areas. Possible data source: planning consents.	-

APPENDIX L: GUIDANCE ON ACTION FOR LOCAL PLANNING AUTHORITIES

L1 Background

L1.1 In the preparation of LDP's, the WAG seeks the following outcome:

- "*…each local authority identifies in their Unitary or Local Development Plans several choices of locations or sites suitable for facilities with capacity for greater than one local authority area ensuring that there is an over-provision of locations / sites to provide market flexibility for the private sector"*[150].

L1.2 To this end the WAG is seeking the following specific outcomes for this review:

- "*The inclusion of an implementation plan within the RWP that includes the steps that will be taken by each local authority to ensure that the necessary land is identified in their Unitary and Local Development Plans for all types of waste facilities, including those that only serve an individual local authority"*[151]; and
- "*The inclusion of a set of detailed criteria for the identification of suitable locations or sites that can be used by each constituent Local Planning Authority when identifying a choice of locations and sites for waste facilities in their local developments plans. The detailed criteria can be devised at an all Wales level in consultation with the Welsh Assembly Government"*[152].

L1.3 This appendix therefore sets out guidelines that individual UA's may wish to follow in bringing together the RWP Technology Strategy and the RWP Spatial Strategy through the LDP preparation process in their individual UA areas in order to identify appropriate sites for waste management / resource recovery facilities.

L1.4 For development plan preparation purposes, it should be noted that while the capacity requirements in the RWP Technology Strategy are for 2013, the performance provided by RWP Technology Strategy will satisfy all current targets until 2020.

L2 Guidance from the WAG

L2.1 The WAG has given the following advice and example text for documents produced as part of the LDP preparation process.

LDP Stage	LDP Regulations	Content	WAG Advice
Preferred Strategy Document	14 / 15	Objective	An example objective: *"To ensure that the LPA has adequate provision for facilities to meet its waste management needs for X types of waste for a range of sites in accord with the in-principle preferred locations identified in the RWP 1st Review".*
Preferred Strategy Document	14 / 15	Strategic Policy	A strategic policy will need to: • Set out how much additional capacity or additional waste sites will be required within the local authority area during the plan period; and • Include a clear indication of how locational choices will be made.

[150] Para 9 of WAG 2006 – *The Revision of the Regional Waste Plans*. Cardiff: WAG.
[151] Para 8(vi) of WAG 2006 – *The Revision of the Regional Waste Plans*. Cardiff: WAG.
[152] Para 8(iv) of WAG 2006 – *The Revision of the Regional Waste Plans*. Cardiff: WAG.

			An example policy: *"A range of facilities are proposed at Y types of locations to ensure adequate provision of Z capacity"*. This policy gives a range of potential sites to fulfill the capacity requirements, gives flexibility to industry and is supported by clear assessment criteria identified in the RWP 1st Review. It would need to be clarified that there are likely to be more sites allocated than required to facilitate the implementation of the RWP. Over-provision is necessary in order to give flexibility to the industry to ensure the level of investment facilities required to meet needs and achieve targets.
Preferred Strategy Document	14 / 15	Spatial Option	Potential locations for strategic facilities (i.e. those with capacity to serve more than one authority area) should be informed by reference to the RWP and could be identified on a key diagram and/or list. If spatial options are not considered as part of the Preferred Strategy Document than there will need to be a fall-back reference to the RWP and the Strategic Policy.
Deposit LDP	17 – 21	Deposit Policy	Deposit policies should include site specific allocations for both facilities with capacity to serve more than one authority area and for local facilities where possible. These will be allocated with reference to a local assessment using criteria identified in the RWP 1st Review and should demonstrate adequate provision or choices.

L3 Guidance on Identifying a Choice of Location or Sites

L3.1 Taking account of the RWP Technology Strategy and the RWP Spatial Strategy:

- Identify a choice of locations or sites for in-building facilities suitable for all waste streams (including hazardous waste), and both facilities with capacity to serve only the local area and with capacity to serve more than one local authority area; and
- Identify a choice of locations or sites for open-air facilities suitable for landfills for inert, non-inert and hazardous waste, and both facilities with capacity to serve only the local area and with capacity to serve more than one local authority area.

L3.2 Advances in technology and the introduction of new legislation, policies and practices mean that many modern waste management / resource recovery facilities appear no different to any other industrial building and on the inside contain industrial processes or energy generation activities that are no different to many other modern industrial processes in terms of their operation or impact. For this reason, many B2 employment sites and major industrial areas will be suitable locations for the new generation of in-building waste management facilities that will be required in accordance with the RWP Technology Strategy.

L3.3 Given that B2 employment sites and major industrial areas are likely to be suitable locations for most new in-building facilities, and given that PPW[153] requires that development plans should *"identify a range and choice of sites to meet different economic and employment needs"* and *"contain appropriate policies in support of the development of innovative*

[153] Para 7.5.2 of 'WAG, 2006. *Planning Policy Wales Companion Guide*. Cardiff: WAG'.

business or technology clusters and eco-industrial networks", the following sequential approach could be used to identify a choice of locations or sites for in-building facilities:

1. First, examine whether the B2 and major industry sites within the area could adequately accommodate all new employment uses including the new in-building waste management facilities; and
2. If there is found to be a shortfall in B2 and major industry sites suitable for accommodating new in-building waste management facilities, then having regard to the Areas of Search maps and having considered the issues listed in Para. L.3.6, search for other suitable locations or sites.

L3.4 The following two broad principles for the viewing and use of the Areas of Search maps and GIS data must be noted:

- **The sole purpose of the maps and GIS data is to identify Areas of Search at a strategic level for use by LPA's during the LDP preparation process** – as a starting point for more detailed local level assessments to identify appropriate sites for waste management / resource recovery facilities in LDP's; and for this reason
- **The Areas of Search maps and GIS data must not be used by any organisation or individual to determine the appropriateness of proposals for individual waste management facilities**.

L3.5 More specifically, when referring to the areas of search maps the following matters should be taken into consideration:

- **The purpose of the maps is to identify Areas of Search at a regional level which can then be used by LPA's to identify preferred locations or sites for new waste management facilities. The ranking of a particular area effectively establishes the issues that would need to be addressed in more detailed local level assessments during the LDP preparation process to identify appropriate sites for waste management facilities**. If a particular type or combination of waste management facility / facilities is proposed for a particular site, these more detailed assessments may require the quantification of this risk, based on the nature of the waste management facility / facilities. In identifying a location or site it is recommended that there is a need to consider the Areas of Search maps together with other relevant information before a LPA can be satisfied that the location or site is appropriate;
- The areas of search maps have been developed at a Wales wide, strategic level, and as a result there may be local circumstances which it has not been possible to assess (for example, the location of small areas of residential properties or individual dwellings that have not been included in this strategic study). **Waste management facilities are only one aspect of development which LPA's must consider in their LDP's, and as a result other pressures and priorities may justify selecting 2nd, 3rd or 4th Areas of Search over a 1st area**. It is recommended that the SA process, which must be undertaken on all LDP's, is an appropriate mechanism for justifying any such approach;
- **The locations that have been identified as 2nd, 3rd or 4th areas of search cannot be excluded from consideration as appropriate areas**. However, in instances where a greater level of constraint or constraints exists, it must be acknowledged that in turn a greater level of operational mitigation may adequately control potential

environmental impacts. Waste management facilities have the potential to be sited in a range of locations if they are appropriately designed, managed and regulated to control any potential impacts;

- **The Area of Search map for in-building facilities does not prejudice the development of new in-building waste management facilities on any existing land use class B2 'general industrial' employment sites, existing major industrial areas, or new B2 sites allocated in development plans** whether or not they fall within an Area of Search – because the principle of B2 or major industry use is already established at these sites; and
- **Within the areas of search maps there are a number of existing waste management facilities that have been identified to be in areas that are, by virtue of the surrounding constraints, shown to be excluded. It should be acknowledged that in some circumstances the associated impacts of a waste management facility are being appropriately mitigated against at these sites**. As a result they may not present an unacceptable risk to the constraining designations or land use characteristics. In these instances it will be for LPA's to assess whether the expansion of operations at these locations is appropriate and that any potential adverse effects can be effectively controlled.

L3.6 It may be appropriate to take into consideration the following issues when identifying a choice of locations or sites for in-building facilities:

- Site suitability;
- Site / building vacancy and availability – including opportunities for re-using vacant industrial sheds and quarries and for redeveloping brownfield sites, industrial areas and ports;
- Site infrastructure (including electricity grid connections for energy from waste facilities);
- Site ownership;
- Existing and proposed neighbouring land uses;
- The nature of existing businesses / waste facilities on the location / site;
- The need for sites for smaller-scale community based reuse and recycling activities[154];
- The presence of existing planning permissions / Waste Management Licences / Pollution Prevention & Control permits;
- Opportunities to expand existing in-building and open-air facilities or to site a new type of facility alongside an existing facility;
- Opportunities for co-locating and networking energy from waste facilities with energy consuming land uses such as district heating systems or large industrial energy users;
- Planning-in opportunities for the future expansion of facilities;
- Existing and proposed transport infrastructure – including opportunities for integrated multi-modal road, train, canal and sea connections;
- Opportunities for co-locating waste management / resource recovery / reprocessing / re-manufacturing facilities to form environmental technology clusters. The concept

[154] The forecast and modeled waste arisings include wastes that could be reused rather than being recycled. It is therefore reasonable to assume that reuse capacity could be substituted for some of the front-end recycling capacity.

of such Eco-parks is endorsed by TAN 21[155], further information can be obtained from the Wales Environment Trust;

- The cumulative effect of waste management facilities and other development on sensitive environmental receptors;
- The cumulative effect of waste management facilities and other development on the well-being of the local community, including any significant adverse impacts on environmental quality, social cohesion and inclusion or economic potential; and
- The EU Habitats Directive requirements for Habitat Regulation Assessment (HRA) – the two Environmental Reports produced during the RWP 1st Review process, provide relevant information that will assist LPA's, as a Competent Authority, to undertake tests of significance at the appropriate stages when specific land use allocations and development proposals are being formulated. If is cannot be demonstrated that proposals will not have a significant effect (alone and in combination) the local authority will be required to make an appropriate assessment of the implications for the European site in view of its conservation objectives.

L3.7 When identifying a choice of locations or sites for both in-building and open-air facilities, it may be desirable to allocate specific sites for specific municipal waste management facilities. Planning officers should liaise with UA waste managers regarding any site requirements arising from collaborative arrangements for procuring municipal waste management facilities. On this issue, the following points should be noted:

- The RWP Technology Strategy provides strategic direction for those UA's that require it. It does not prejudice any existing progress and facilities either where a UA has in good faith gone about its procurement process in line with the first RWP or where a UA has for sound reasons made other plans which have been developed and justified through a process of a local BPEO assessment / SA / SEA;
- Some authorities may wish, and be able to, make provision within their boundaries for the new capacity required for municipal waste. Some authorities may wish to work in cooperation with neighbouring authorities to make provision for the new capacity required for municipal waste; and
- Whether authorities make provision within their boundaries or jointly, the procurement arrangements for municipal waste facilities will be at different stages.

L3.8 A great number of assumptions underpin the modeling work that was used to develop the RWP Technology Strategy. As with any modeling process, the model must be based on a set of working assumptions and will be subject to practical limits. The figures for the new capacity required and the number of new facilities required must be treated as indicative, for planning purposes only; and the figures for the total land area required for new in-building facilities must be treated as an estimate for planning purposes only. In practice the capacity of new facilities, the number required and the land take will depend on many interrelated factors including economics, site sizes and availability, permitted capacity and shift patterns at individual facilities, etc. For these reasons, individual UA's may justify differing from the regional apportionment by undertaking more detailed modeling to take account of more detailed information on local circumstances and cross boundary arrangements, etc.

L3.9 As a general guide to typical site sizes, LPA's may wish to note that the following mean typical facility capacities and mean typical land takes for in-building facility types likely to

[155] Para 4.14 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG'.

serve more than one local authority area can be calculated from data used by the EA in their 'Sustainability Appraisal and Life Cycle Assessment of Strategic Waste Management Options' report:

- Urban authorities[156] – mean typical facility capacity of 180,000tpa and mean typical land take of 6ha;
- Rural authorities[157] – mean typical facility capacity of 80,000tpa and mean typical land take of 3ha.

L4 Guidance on Drafting LDP Policies

L4.1 TAN 21 states that development plans should include a balance of site-specific and criteria-based policies to provide as much information as possible on the locations likely to be acceptable for development of waste treatment and disposal facilities[158].

L4.2 LDP's should include a policy identifying a choice of locations / sites for new in-building and for new open-air facilities. The spatial extent of these locations / sites should be shown on the proposals maps. LDP's may also include a policy making specific allocations of land for specific new waste management / resource recovery facilities. Local Development Plans Wales[159] states that "*the identification of sites for specific uses…should be founded on a robust and credible assessment of the suitability and availability of land for particular uses or a mix of uses and the probability that it will be developed*".

L4.3 LDP's are also likely to include topic-based policies that set out the general criteria against which planning applications for new waste management / resource recovery facilities will be considered.

L4.4 It should be noted that, in regard to the strategic level issues tackled by the RWP, the PPW Companion Guide[160] states that national development control policy on the following matters is set out in PPW and should therefore only be referenced in LDP's rather than repeated as local policy:

- The waste hierarchy, the proximity principle and regional self-sufficiency[161];
- Ensuring that waste is recovered or disposed of without harming the environment, without endangering human health, without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours and without adversely affecting the countryside or places of special interest, including areas of acknowledged importance in relation to the natural and cultural heritage[162]; and

[156] The EA identify Swansea, Neath Port Talbot and Bridgend as urban authorities in Figure A10 of 'Environment Agency, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options*. Cardiff: EA.
[157] The EA identify Ceredigion, Carmarthenshire and Pembrokeshire as rural authorities in Figure A10 of 'Environment Agency, 2007. *Sustainability Appraisal and Life Cycle Assessment of the Strategic Waste Management Options*. Cardiff: EA.
[158] Para 5.1 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG'.
[159] Para 2.16 of 'WAG, 2005. *Development Plans Wales*. Cardiff: WAG.'
[160] Para 12.16 of 'WAG, 2006. *Planning Policy Wales Companion Guide*. Cardiff: WAG.'
[161] Para 12.5.3 of 'WAG, 2002. *Planning Policy Wales*. Cardiff: WAG.'
[162] Para 12.5.1 of 'WAG, 2002. *Planning Policy Wales*. Cardiff: WAG.'

- Encouraging any necessary movement of waste by rail and water rather than by road wherever economically feasible[163].

L4.5 In drafting policies, LPA's may consider it appropriate to address the following issues[164]:

- Planning applications for facilities within the identified choice of locations / sites;
- Planning applications for facilities that fall outside the identified choice of locations / sites;
- Planning applications for smaller-scale community based reuse and recycling activities;
- The suitability of B2 and major industry sites for in-building facilities;
- Opportunities for re-using vacant industrial sheds and quarries and for redeveloping brownfield sites, industrial areas and ports;
- The suitability of farm / countryside locations for open-air composting and in-building anaerobic digestion facilities;
- Opportunities to expand existing in-building and open-air facilities or to site a new type of facility alongside an existing facility;
- The different land use impacts of in-building facilities and open-air facilities;
- The need for inert, non-inert and hazardous waste landfills;
- The need for facilities to manage different waste streams (including hazardous waste);
- Transport infrastructure, including minimising road traffic impacts and maximising opportunities for integrated multi-modal road, train, canal and sea connections;
- Opportunities for co-locating and networking energy from waste facilities with energy consuming land uses such as district heating systems or large industrial energy users;
- Opportunities for co-locating waste management / resource recovery / reprocessing / remanufacturing facilities to form environmental technology clusters. The concept of such Eco-parks is endorsed by TAN 21[165], further information can be obtained form the Wales Environment Trust;
- Opportunities for new facilities to deliver community benefits; and
- Minimising visual impact and local concerns through high quality design (architectural / landscaping).

L5 Guidance on Drafting LDP Supporting Text

L5.1 In regard to the strategic level issues tackled by the RWP, TAN 21 states that development plans should include text which:

- Demonstrates that proper account has been taken of the RWP[166];
- Explains how the RWP impacts upon the development plan policies and proposals and how the proposals and policies in the development plan help to facilitate implementation of the RWP[167];

[163] Para 12.5.4 of 'WAG, 2002. *Planning Policy Wales.* Cardiff: WAG.'
[164] There is no requirement for policies to be drafted on each of the issues highlighted. The list is simply intended to provide a checklist for local authorities.
[165] Para 4.14 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[166] Para 5.2 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[167] Para 5.4 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'

- Demonstrates the authority's place in the development of regional networks of waste management facilities, and will need to consider future needs and potential new demands within the regional framework[168];
- Demonstrates the waste hierarchy, proximity and self-sufficiency principles in all strategic waste planning[169];
- Makes explicit the capacity of the area to deal with waste, and also make accurate and quantified assessments about their own waste arisings, with reference to EA data that is available at the time of plan preparation[170]; and
- Demonstrates that there is adequate provision for waste management facilities to meet the targets in EU Directives[171].

L5.2 This supporting text should be drafted in such a way that is mindful of the need to demonstrate the soundness of the LDP against the 10 criteria set out in Local Development Plans Wales[172] for assessing soundness, particularly in regard to the following criteria:

- Consistency Test C1: "*It is a land use plan that has regard to other relevant plans, policies and strategies relating to the area or to adjoining areas*";
- Consistency Test C2: "*It has regard to national policy*";
- Coherence & Effectiveness Test CE2: "*The strategy, policies and allocations are realistic and appropriate having considered the relevant alternatives and are founded on a robust evidence base*"; and
- Coherence & Effectiveness Test CE4: "*It is reasonably flexible to enable it to deal with changing circumstances*".

L6 Guidance on Consultation

L6.1 The Community Engagement Guidance on Waste Infrastructure[173], produced as a result of a partnership between the WLGA, the WAG, the EAW and WAW contains extensive guidance on how and when to consult key stakeholders in the planning and delivery of new waste management facilities. This toolkit considers the different stages of consultation; from awareness raising and strategic evaluation, through to the understanding of the need for change; to choice of technology; decisions on site search criteria and ultimately planning and licensing applications for specific facilities. The toolkit provides indicative timings and costs for running campaigns, along with detailed facts and images of all types of waste treatment technologies to help explain these issues to the widest of stakeholder groups.

L6.2 LPA's should consider approaching the following organisations for information / assistance / contact details in consulting with the waste management / resource recovery industry in their area:

- The Chartered Institution of Wastes Management (CIWM) Cymru Wales Centre;
- The Welsh Environmental Services Association (WESA);
- The WAG Waste Strategy and Implementation Unit;

[168] Para 5.4 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[169] Para 5.3 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[170] Para 5.5 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[171] Para 5.5 of 'WAG, 2001. Planning Policy Wales Technical Advice Note 21: Waste. Cardiff: WAG.'
[172] Para 4.35 of 'WAG, 2005. *Development Plans Wales*. Cardiff: WAG.'
[173] Hyder Consulting 2007. Community Engagement Guidance; Waste Infrastructure.

- The EA Wales Waste Policy and Regulatory teams;
- The RWP Coordinating Authority; and
- Environmental health and waste management colleagues within the authority.

L7 National Park Issues

L7.1 UA's and National Park Authorities (NPA's) are Waste Planning Authorities. However, only UA's are Waste Collection Authorities and Waste Disposal Authorities for municipal waste.

L7.2 In the course of the RWP 1st Review process the following situation has emerged regarding National Parks and the two principal elements of the RWP:

- For the RWP Technology Strategy the capacity requirements are broken down by UA area and therefore no capacity requirements are presented for NPA's; and
- National Parks are automatically identified as exclusion areas in the maps showing Areas of Search for facilities serving more than one local authority area.

L7.3 Given this situation, NPA's have the following two options for planning for new facilities for the management of National Park waste arisings:

- NPA's may plan for new facilities serving only the National Park area to be sited within the National Park area[174]; and/or
- NPA's and UA's that cover the same area may work closely together to plan for new facilities serving both the NPA and UA areas to be sited outside the National Park. The provision of data on capacity requirements broken down by UA area facilitates this arrangement.

L7.4 In exceptional circumstances there may be sites adjacent to National Parks where facilities with capacity to serve more than one local authority area, especially those relating to agricultural waste, may be acceptable.

L8 Sources of Further Information on Planning for Waste Management Facilities

L8.1 The following documents give further information and guidance about planning for waste management facilities:

- Department for Environment, Transport and the Regions, 2000. *Controlling Environmental Effects – Recycled & Secondary Aggregate Production*. London: DETR;
- Department of Communities and Local Government, 2006. *Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10*. London: DCLG;

[174] This may be approached by undertaking a rough set of calculations to split the calculated requirements for the UA areas by proportion of population falling within the National Park area. In terms of the RWP Technology Strategy capacity requirements, the following facility types are likely to be 'local' facilities serving only the National Park area: Clean Materials Recovery Facilities, Transfer Stations, Civic Amenity, and Construction & Demolition Exemption (see Para. F5.2).

- Office of the Deputy Prime Minister, 2004. *Planning for Waste Management Facilities: A Research Study*. London: ODPM;
- Office of the Deputy Prime Minister, 2005. *PPS 10: Planning for Sustainable Waste Management*. London: ODPM;
- Sustainable Transport for Resources and Waste, 2006. *Spatial Planning for Integrated Waste Transport*. Glasgow: EnviroCentre Ltd;
- Welsh Assembly Government, 2001. *Planning Policy Wales Technical Advice Note 21: Waste*. Cardiff: WAG;
- Welsh Assembly Government, 2004. *Policy Clarification Note Unitary Development Plans – Waste Policies Hazardous Waste Planning Applications*. Cardiff: WAG; and
- Welsh Assembly Government, 2006. *The Revision of the Regional Waste Plans*. Cardiff: WAG.

APPENDIX M: CONTRIBUTION STATEMENT

M1 Background

M1.1 TAN 21 requires the RWP to contain a statement setting out how the plan contributes to efforts to meet UK and European targets including the general waste management targets in the Landfill Directive and the Wales Waste Strategy.

M2 Contribution Statement: The RWP Technology Strategy

M2.1 The RWP Technology Strategy sits between the NWSW and LDP's in a hierarchy of plans. From this position in the hierarchy, the RWP Technology Strategy contributes to establishing the integrated and adequate network of waste management facilities required by Article 5 of the EU Waste Framework Directive and contributes to the waste management plan required by Article 7 of the Directive by setting out the type, quantity and origin of waste to managed and the technical requirements for managing this waste.

M2.2 All eight Preferred Options of the RWP Technology Strategy:

- Have a 'front end' recycling and composting rate for MSW set at 50% in 2013 – this exceeds the current maximum NWSW target of achieving at least 40% recycling and composting of municipal waste by 2009/10;
- Are designed to achieve the 2020 BMW Landfill Directive target by 2013; and
- Ensure that targets for the management of the other principal controlled waste streams are also met (i.e. recycling targets for C&D waste and landfill diversion for Industrial and Commercial waste).

M2.3 The NWSW[175] states that one of its primary objectives is *"…to make Wales a model for sustainable waste management by adopting and implementing a sustainable, integrated approach to waste production, management and regulation (including litter and fly tipping) which minimises the production of waste and its impact on the environment, maximises the use of unavoidable waste as a resource, and minimises where practicable, the use of energy from waste and landfill"*.

M2.4 The Preferred Options of the RWP Technology Strategy are the best practicable environmental Options. Even though all eight Preferred Options involve EfW, the use of unavoidable waste as a resource is maximised and the use of EfW and landfill is minimised because all eight Options involve high source segregated recycling and composting levels.

M2.5 TAN 21[176] states that "*A key element in the RWP will be agreement of the apportionment of facilities to local authorities"*.

M2.6 The modeling undertaken by the EAW for the SA of the Options apportioned the total capacity required at various types of waste management facilities in 2013 to each UA area on the basis of forecast arisings. This apportionment for each of the Preferred Options is detailed in Appendix E. In addition, the RWP 1st Review calculates the indicative new

[175] Para 1.10 NWSW.
[176] TAN 21 Para 2.15.

capacity required and indicative number of new facilities required in 2013 in each UA area for each of the eight Preferred Options.

M3 Contribution Statement: The RWP Spatial Strategy

M3.1 Article 7(4) of the EU Waste Framework Directive requires Member States to publish waste management plans containing either a geographical map specifying the exact location of waste disposal sites or precise mappable criteria. Appendix B provides further details on the requirements of the Waste Framework Directive.

M3.2 TAN 21[177] states that while it would be for individual local authorities to determine actual locations of facilities and make provisions in their development plans, the RWP should specify the approximate location or type of location of new facilities: "*The identification of areas or types of location for future facilities will be of particular importance. The RWP would not allocate sites for facilities, but it will indicate areas of need and search for potential sites for future facilities, and where possible, a choice of locations that once agreed in the due local political process and in recognition of existing contractual arrangements, would serve the region"*.

M3.3 The RWP Spatial Strategy addresses and fulfils these requirements in the following two ways:

- It demonstrates an adequate supply of *existing* sites for new *in-building facilities* on existing B2 or major industry sites and B2 sites that have already been allocated in development plans to meet the demand for sites for new in-building waste management facilities; and
- It identifies Areas of Search for use in identifying *new* sites for both *in-building and open-air* waste management facilities, based on precise mapped criteria relating to strategic level spatial issues.

[177] TAN 21 Paras 2.15 & 2.16

APPENDIX N: BEST PRACTICE STATEMENT

N1 Background

N1.1 TAN 21 requires the RWP to contain any relevant statements of best practice, to share experiences, successes, challenges and opportunities for future revisions, or for other decision making in LPA's.

N2 Successes

N2.1 **Partnership**: The RWP 1st Review is the outcome of an ambitious three-year program of partnership working. The eight local planning authorities in South West Wales have worked jointly to develop and steer the project, all the time benefiting from the close collaboration, and invaluable input, of a wider range of stakeholder organisations. For consistency across Wales, the three lead authorities have pursued common project management and technical approaches and have let four all-Wales contracts for consultancy services. This partnership working has delivered the following benefits:

- Building mutual understanding of the different positions that partners hold;
- Outcomes that all partners can sign up to;
- Collaboration between local authority planning departments and waste management departments; and
- Partnership between the three lead authorities has strengthened the plans and shared the workload.

N2.2 **The RWP Technology Strategy** has been reviewed by conducting a wider range of more detailed assessments of more technologies.

N2.3 **The RWP Spatial Strategy** has been developed by demonstrating an adequate supply of existing sites for new in-building facilities and identifying robust Areas of Search for new sites. This will assist in the process of demonstrating an adequate choice of locations for the integrated and adequate network of waste facilities as required by the EU Waste Framework Directive.

N2.4 **Consultation**: The 25 local planning authorities in Wales, together with the WAG and Hyder, worked together to run the largest consultation to date on the way forward for selecting and siting the future network of waste management facilities. This is a significant step forward for Wales. All consultation documents were made available to anyone in Wales via the website, high-level media interest was generated and the industry day was possibly the largest such waste planning workshop ever run in Wales.

N2.5 **Councillor training**: In partnership with the WAG and the WLGA, the Lead Authorities organised the delivery of training workshops on *'Waste Management Technologies and their Land-Use Planning Issues'* to Councillors in 21 of the 22 Unitary Authorities in Wales. Developing a new generation of waste management facilities is one of the most important and contentious issues that Councillors in Wales currently face. These high quality and impartial training workshops aimed to enable Councillors to feel confident in making difficult decisions on this sensitive issue.

N3 Challenges

N3.1 **Time**: Partnership working requires dialogue – dialogue takes time.

N3.2 **Commitment by partners**: In a partnership focused process, partners need to be prepared to allocate appropriate resources and take the appropriate actions in a timely manner. Delays and misunderstandings can occur when partners do not take appropriate actions or take them too late.

N3.3 **Governance**: The RWP's are the product of an odd governance arrangement. Waste is a very sensitive issue and the consequences of not meeting the requirements of various EU Directives are great, yet the RWP's are non-statutory plans prepared through a voluntary joint arrangement of Local Planning Authorities. Meanwhile the WAG is the policy maker, paymaster, partner and final judge.

N3.4 **Lack of robust capacity data**: The challenge of planning for waste management and resource recovery facilities should be undertaken with a sound information base; it is important to have comprehensive, accurate, timely, and consistent information. However, data on the capacity of existing waste management / resource recovery infrastructure is drawn from Waste Management Licences (WML's) / Pollution Prevention & Control (PPC) permits. This data has to be treated with some caution as the capacities identified are the legislative maximum throughput allowed under the terms of the license or permit. In reality there may be other limiting factors that restrict the site from operating up to the licensed maximum and therefore the capacity information obtained from the WML may be an overestimate.

N3.5 **Lack of Hazardous Waste data**: In July 2005 the Hazardous Waste (England and Wales) Regulations and the List of Wastes (Wales) Regulations came into force, replacing the Special Waste Regulations. These new regulations had the effect of increasing the number of wastes classified as 'hazardous' – they include waste televisions, computer monitors and some other waste electrical and electronic equipment, fluorescent tubes, and pesticides. While the term 'Special Waste' effectively became obsolete in July 2005, all data about the arisings and management of Special / Hazardous Waste available at the time of Plan preparation was collected before July 2005 and therefore only actually referred to Special Waste. It therefore did not indicate any change in arisings or management that may have occurred as a result of the new regulations.

N3.6 **Focus on Municipal Waste**: The alternative strategic waste management Options were generated on the basis that, in an integrated recovery and disposal strategy for all waste streams, MSW and wastes within the other principal controlled waste streams which are similar to MSW will be managed together and should therefore be modelled and assessed together. In any future reviews it may be desirable or necessary to develop the modelling and assessment of Industrial and Commercial waste in more detail.

N3.7 **The relationship between SWMO and SEA**: TAN 21 requires that the alternative strategic waste management Options are assessed using the techniques of: LCA / BPEO, SWMO / SA, SEA and strategic HIA. The government guidance '*Strategic Planning for Sustainable Waste Management*' (ODPM, 2002) on LCA / BPEO and SWMO / SA was published before the SEA Directive was implemented in Wales through 'The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004'. Detailed discussions

between Hyder Consulting and the EAW concluded that the output of the LCA was not suitable for use as part of the SEA. This resulted in delay in the RWP 1st Review process and the duplication of effort.

N3.8 **Use of different categories**: EAW data on the capacity of existing facilities is presented using quite different categories to the data on the capacity requirements from the EAW WRATE tool. This presented significant challenges in 'mapping' between categories.

N3.9 **Identifying sites for new facilities**: The RWG agreed that it would be inappropriate, and circumventing the due and proper process, for the RWP 1st Review to state that sites other than existing B2 or major industry sites and B2 sites that have already been allocated in development plans are suitable locations for new in-building facilities; this is a policy making exercise that should only be undertaken at the local level through the LDP preparation process.

N4 Recommendations

N4.1 In order to inform the RWP 2nd Review, future AMR's should:

- Monitor the rates of growth / reduction of the individual waste streams;
- Monitor growth in reuse, recycling and composting, monitoring the reduction in residual waste and its change in composition, and monitoring policy changes regarding future reuse, recycling and composting levels; and
- Compare these with the forecasts of arisings and modelling of reuse, recycling, composting and residual waste used in the RWP 1st Review.

N4.2 The WAG and EAW should work together to ensure that adequate statutory reporting mechanisms and/or surveys supply comprehensive, accurate, timely, and consistent capacity data on the full range of permitted, licenced and exempt facilities.

N4.3 In order to allow the RWP 2nd Review to specify the capacity and land take requirements for National Park Authorities as Local Planning Authorities, the EAW and WAG must supply data on waste arisings, waste management and waste facilities and any future modelling / assessment data *'cookie cut'* on the basis of LPA's rather than UA's – i.e. to include National Parks.

N4.4 It is recommended that prior to the commencement of the RWP 2nd Review a significant amount of time, consideration and consultation is given to reviewing the process to be used, in particular to:

- Avoid an undue focus on Municipal waste in any modelling and assessment;
- Ensure Hazardous Wastes are adequately modelled and assessed;
- Minimise any 'unmodelled' wastes;
- Maximise the compatibility of categories between data on waste arisings, waste management facilities and modelled waste flows; and
- Enable the suite of assessments (WRATE / SA / SEA / HIA / GIS) to be undertaken concurrently and overseen by a joint working party to facilitate dialogue and disseminate ongoing findings.

N4.5 At the outset of the RWP 2nd Review the SEA Monitoring Report should be produced.

N4.6 It is recommended that at the outset of the RWP 2nd Review a full 'issues and options' analysis and consultation is undertaken in order to scope the *policy* content of the review – particularly that which would be over and above the requirements of TAN 21 or beyond a simple refinement of the RWP 1st Review. Such issues might include:

- Policies on the scale and distribution of facilities;
- Policies on co-locating and networking EfW facilities with proposed or existing energy consuming land uses such as district heating systems or large industrial energy users;
- Policies on minimum efficiencies for EfW facilities in the production of heat and electricity; and
- Policies on Actions for Local Planning Authorities – i.e. to elevate the guidance in Appendix L to policy in the main body of the Plan, and consequently to subject it to SEA.

N4.7 The WAG must acknowledge there is a limit to what can be achieved by a non-statutory plan prepared by a body without statutory duties and powers – particularly regarding the identification of sites for highly sensitive land uses.

N4.8 The RWP 2nd Review should take account of any new technologies and refinement of, or new available data for, technologies assessed in the RWP 1st Review. This should include assessing AD as an alternative to IVC for front end recycling composting – rather than only as a residual waste treatment technology.

N4.9 The Strategic HIA process for the RWP 2nd Review should give consideration to how weighting of health impacts could be undertaken and which stakeholders should feed into such a process.

N4.10 The RWP 2nd Review should include a detailed assessment of the requirements for the disposal of VLLW including SOLA.

N4.11 Any future Areas of Search maps should include more information including the location of existing waste facilities, proximity to the National Grid / grid capacity / substation proximity and capacity / local energy users, transport links and any areas identified by LDP's as being suitable or allocated for waste facilities.

N4.12 As part of the RWP 2nd Review process, consideration should be given to whether to continue double counting dioxin emissions by including it as a separate indictor – particularly in light of the limits now imposed on dioxin releases under the WID.

N4.13 So as to ensure that Wales does not miss any energy supply / sustainability opportunities provided by the current drive to develop infrastructure for residual waste, the WAG should give consideration to publishing national policies on:

- Co-locating and networking EfW facilities with proposed or existing energy consuming land uses such as district heating systems or large industrial energy users;
- Minimum efficiencies for EfW facilities in the production of heat and electricity.

GLOSSARY OF TERMS

Agricultural Waste	Waste produced at agricultural premises as a result of an agricultural activity.
Anaerobic	In the absence of oxygen.
Anaerobic Digestion	A process where biodegradable material is encouraged to break down in the absence of oxygen. Material is placed into an enclosed vessel and in controlled conditions the waste breaks down typically into a digestate, liquor and biogas.
Autoclave	A pressurised steam treatment process.
Best Practicable Environmental Option (BPEO)	For a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable cost in the long term as well as in the short term.
Biodegradable Waste	Waste that is capable of being degraded by plants and animals. Biodegradable municipal waste includes paper and card, food and garden waste, and a proportion of other wastes, such as textiles.
Biogas	Gas resulting from the fermentation of waste in the absence of air (methane / carbon dioxide).
Biological Treatment	Any biological process that changes the properties of waste (e.g. anaerobic digestion, composting). Biological treatment includes landspreading activities that are licensed.
Biodegradable Municipal Waste (BMW)	The component of Municipal Solid Waste capable of being degraded by plants and animals.
Bottom Ash	The ash that arises from a combustion process in a furnace.
Bring Recycling	Recycling schemes where the public bring material for recycling to centralised collection points (e.g. bottle and can banks) at civic amenity sites, supermarket car parks and similar locations.
Char / Slag	Material remaining following partial or complete combustion or other thermal treatment process such as Pyrolysis and Gasification.
Civic Amenity Site (CA) / Household Waste Recycling Centre (HWRC)	A facility provided by the local authority where the public can bring household waste to be recycled or disposed of. Wastes handled include bulky items such as furniture, white goods, garden waste and general household wastes as well as recyclables.
Clinical Waste	Healthcare waste such as blood, tissue, needles, soiled dressings, drugs etc. that is infectious or could cause harm in some other way. It may be produced from hospitals, medical, nursing, dental, veterinary, pharmaceutical or similar practices or from home treatment (e.g. diabetes).
Combined Heat and Power	The use of a power station to simultaneously generate both heat and electricity. The steam or hot water generated in the process is utilised either in industrial processes or in community heating.
Commercial Waste	Waste arising from premises which are used wholly or mainly for trade, business, sport, recreation or entertainment, excluding industrial and waste from municipal facilities.
Composting	A resource recovery process where biodegradable waste (such as garden and kitchen waste) is converted, in the presence of oxygen from the air, into a stable granular material which, applied to land, improves soil structure and enriches the nutrient

	content.
Construction and Demolition (C&D) Waste	Waste arising from the construction, repair, maintenance and demolition of buildings and structures. It mostly includes brick, concrete, hardcore, subsoil and topsoil, but it can also contain quantities of timber, metal, plastics and occasionally special (hazardous) waste materials.
Controlled Waste	The UK term for waste controlled under the Waste Framework Directive. Controlled waste includes household, commercial, industrial and certain agricultural wastes.
Development Plan	A land-use planning document required by Act of Parliament to set the policies and framework for making decisions on planning applications.
Digestate	Solid and/or liquid product resulting from Anaerobic Digestion.
Dioxins	A family of chemicals produced by, among other ways, the burning of PVC plastics at low temperatures (less than 700ºC). Some are known to be carcinogenic.
Disposal	According to the waste hierarchy the final disposal of waste through landfill, Landraise or incineration without energy recovery.
Diversion	A term used to refer to avoiding disposal of waste in landfill and instead diverting it into other waste management methods.
Doorstep Collection	Waste collected from the householder or business doorstep for the purposes of reuse, recycling and composting.
End of Life Vehicles (ELV)	Scrap cars and other vehicles.
Energy from Waste (EfW)	Includes a number of established and emerging technologies to recover energy from waste. Some of these are direct through 'mass burn' incineration (where waste is directly combusted without pre-treatment) whereas others are indirect where the waste is processed into a fuel before energy is recovered (e.g. conversion into refuse derived fuel, or gasification or pyrolysis).
Environment Agency (EA)	The principal environmental regulator in England and Wales. Established in April 1996 to combine the functions of former waste regulation authorities, the National Rivers Authority and Her Majesty's Inspectorate of Pollution. Intended to promote improved waste management and consistency in waste regulation across England and Wales.
Environmental Impact Assessment (EIA)	A procedure for considering the potential environmental effects of land use change. EIA helps to inform decision-making and enables decisions on land use change to be taken with full knowledge of the likely environmental consequences.
EU Directive	A European Union legal instruction, binding on all Member States but which must be implemented through national legislation within a prescribed time-scale.
Exempt Facility	A waste management / resource recovery facility registered with, but not licensed by, the Environment Agency. Exempt facilities are subject to general rules (e.g. on the types and quantities of wastes received).
Floc	A small loosely aggregated mass of flocculent material.
Fluidised Bed Combustion	A combustion technology system in which a sand bed (or similar inert material) is fluidised by air jets, heated to temperatures high enough to support combustion, combustible wastes are then added.
Fly Ash	The fine dust that is removed from the flue gas cleaning process of thermal

	treatment operations.
Fly-tipping	The illegal disposal of waste on land.
Gasification	A process whereby carbon based wastes are heated in the presence of air or steam to produce fuel-rich gases.
Greenhouse Gas	A term given to those gas compounds in the atmosphere that reflect heat back toward earth rather than letting it escape freely into space. Gases include carbon dioxide / methane / nitrous oxide / ozone / water vapour / and some of the chlorofluorocarbons.
Global Warming	The progressive gradual increase of the earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in climate patterns.
Geographical Information System (GIS)	A computer system for collecting, managing, analysing and displaying geographically referenced information.
Hazardous Waste	Defined by EU legislation as the most harmful wastes to people and the environment.
Household Waste	Includes wastes from household collection rounds, from services such as street sweepings, bulky waste collection, litter collection, hazardous household waste collection and separate garden waste collection. Also includes waste from civic amenity sites and source segregated wastes collected for recycling or composting through bring or drop-off schemes and kerbside schemes.
Incineration	The controlled thermal treatment of waste by burning, either to reduce its volume or toxicity. Energy recovery from incineration can be made by utilising the calorific value of the waste to produce heat and / or power.
Industrial Waste	Waste from any factory and from any premises occupied by an industry (excluding mines and quarries).
Inert Waste	Innocuous, undamaging, non-toxic. Something that is not detrimental to health or the environment.
Integrated Pollution Prevention & Control (IPPC)	The European Integrated Pollution Prevention and Control applies an integrated environmental approach to the regulation of certain activities. Emissions to air, water and land, plus a range of other environmental effects, must be considered together. Regulators must set permit conditions so as to achieve a high level of protection for the environment as a whole. These conditions are based on the use of the 'best available techniques' that balances the costs to the operator against the benefits to the environment. IPPC aims to prevent emissions and waste production and where that is not practicable, reduce them to acceptable levels.
In-vessel Composting	The aerobic decomposition of shredded and mixed organic waste within an enclosed container, where the control systems for material degradation are fully automated. Moisture, temperature and odour can be regulated, and a stable compost can be produced much more quickly than outdoor windrow composting.
Kerbside Collection	Any regular collection of recyclables or waste from premises, including collections from commercial and industrial premises as well as households.
Landfill	Licensed facilities where waste is permanently deposited for disposal.
Landfill Allowance Scheme (LAS)	The Landfill Allowances Scheme (Wales) Regulations were made by the National Assembly for Wales on 8th June 2004. They were made under powers conferred by the Waste Emissions Trading Act 2003. This Act implements in the UK Article 5 of the EU Directive on the landfill of waste (1999/31/EC). The purpose of the LAS is

	to require waste disposal authorities to limit the quantities of BMW that they landfill in accordance with an allowance allocated to them by the WAG in accordance with Section 4 of the Act.
Landfill Tax	A tax that applies to inert and non-inert waste, disposed at a licensed landfill site. The aim of the tax is to send a tough signal to waste managers to switch to less environmentally damaging alternatives to disposal.
Landfill Tax Credit Scheme	A way of reducing tax liability whilst benefiting 'good causes'. If landfill operators give 20% of their tax liability to environmental projects the Inland Revenue will refund 90% of that amount to the company.
Landraise	Licensed facilities where waste is permanently deposited for disposal on to land.
Land-use Planning	The development planning system that regulates the development and use of land in the public interest.
Liquor / Leachate	Concentrated liquid, produced as a result of the decomposition of organic waste. If from a landfill site, it is referred to as leachate.
Life Cycle Assessment (LCA)	The systematic identification and evaluation of all the environmental benefits and disbenefits that result, both directly and indirectly from a product or function throughout its entire life from extraction of raw materials to its eventual disposal and assimilation into the environment. It can make an important contribution to assessing the environmental impacts of waste management operations. It can provide part of the input into strategic decision making on the ways in which particular wastes in a given set of circumstances can be most effectively managed, in line with the principles of BPEO, the waste hierarchy and the proximity principle.
Mass Burn Incineration	Incineration of the complete waste stream without any further sorting, treatment or removal of materials for recycling and composting. Most modern incinerators area a resource recovery process where energy in the form of heat and/or power is recovered from burning waste – see Energy from Waste (EfW).
Materials Recycling / Recovery Facility (MRF)	A dedicated facility for the sorting / separation of recyclable materials.
Mechanical Biological Treatment (MBT)	A generic term for a resource recovery process which integrates several processes commonly found in other waste management facilities such as MRF's and composting facilities. MBT / BMT can incorporate a number of different processes in a variety of combinations and can be built for a range of purposes. A common aspect of all MBT / BMT plant used for MSW management is to sort mixed waste into different fractions using mechanical means and to recover materials for recycling.
Mechanical Heat Treatment (MHT)	A term used to describe configurations of mechanical and thermal, including steam, based technologies. The most common system being autoclave.
Municipal Solid Waste (MSW)	Household waste and any other wastes collected by the Waste Collection Authority, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste for which the collection authority takes responsibility, and waste resulting from the clearance of fly-tipped materials.
Open-gate Landfill	A landfill run as a commercial operation that receives waste from many waste producers.
Packaging Wastes	All products made of any materials to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer.

Permitted Development	Permission to carry out certain limited forms of development without the need to submit a planning application to the local planning authority, as granted under the terms of the Town and Country Planning (General Permitted Development) Order.
Pollution Prevention & Control (PPC)	A regime for controlling pollution from certain industrial activities. Operators must use the best available techniques to control pollution from their industrial activities. The aim of the best available techniques is to prevent, and where practicable, to reduce to acceptable levels, pollution to air, land and water from industrial activities while balancing the cost to the operator against benefits to the environment.
Precautionary Principle	This principle states that 'where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.
Proximity Principle	This principle suggests that waste should generally be disposed of as near to its place of production as possible.
Pyrolysis	During Pyrolysis organic waste is heated in the absence of air to produce a mixture of gaseous and liquid fuels and a solid, inert residue (mainly carbon).
Recovery	The recovery of valuable materials and energy from waste. The waste hierarchy states that the recovery of resources is more favourable than their final disposal. Reduces the need for primary resources and thus also reduces cost.
Recyclate / Recyclable Materials	Post-use materials that can be recycled for the original purpose, or for different purposes.
Recycling	Involves the processing of wastes, into either the same product or a different one. Many non-hazardous wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Hazardous wastes such as solvents can also be recycled by specialist companies.
Reduction	Reducing the quantity or the hazard of a waste produced from a process. Reduces the need for primary resources and thus also reduces cost.
Refuse Derived Fuel (RDF)	A fuel produced from combustible waste that can be stored and transported, or used directly on site to produce heat and/or power.
Regional Waste Group (RWG)	The WAG has given the responsibility of preparing, monitoring and revising the RWP to the South West Wales Regional Waste Group. The group is led by a Member Forum of councillors from the 8 local planning authorities in the region, supported by a Technical Group of officers from local government, the Welsh Assembly Government, Environment Agency Wales and other government bodies, and representatives from the waste industry and environmental groups.
Residual Waste	Waste remaining to be disposed of after reuse, recycling, composting and recovery of materials and energy.
Restricted-User Landfill	Sometimes known as "factory-curtilage landfill". Sites within ownership of the waste producer or restricted to specific users.
Reuse	Can be practiced by the commercial sector with the use of products designed to be used a number of times, such as reusable packaging. The processes contribute to sustainable development and can save raw materials, energy and transport costs.
Self Sufficiency Principle	Dealing with wastes within the region or country where they arise.
Source-segregated / Source-separated	Usually applies to household waste collection systems where recyclable and/or organic fractions of the waste stream are separated by the householder and are often collected separately.

Special Waste	Defined by the Environmental Protection (Special Waste) Regulations 1996 (as amended). In July 2005 the Hazardous Waste (England and Wales) Regulations and the List of Wastes (Wales) Regulations came into force, replacing the Special Waste Regulations.
Stabilised Waste	Waste that has been treated so that it is chemically stable.
Strategic Environmental Assessment (SEA)	A procedure which centres around the production of an 'Environmental Report' in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated.
Sustainable Development	Development which is sustainable is that which can meet the needs of the present without compromising the ability of future generations to meet their own needs.
Sustainable Waste Management	Requires that waste management should be carried out in a way that does not place undue social, economic or environmental burdens on either present or future generations and that ensures social equity, effective protection of the environment, the prudent use of natural resources and the maintenance of high and stable economic growth and employment. The aim is to de-couple waste production from economic growth.
Sustainable Waste Management Option	An assessment technique that supplements the technique of the Best Practicable Environmental Option (BPEO) to ensure that social and economic issues, as well as environmental, are taken into account in the consideration of waste management options.
Strategic Waste Management Option	The different combinations of waste management technologies which would enable the ability to meet or exceed legislative targets.
Technical Advice Note 21 (TAN21)	Planning Policy Wales published in November 2001, providing guidance on how the land use planning system should contribute to sustainable waste management.
Thermal Treatment	The treatment of waste using elevated temperatures as the primary means to change the chemical, physical or biological character or composition of the waste. Examples of thermal treatment processes are gasification, incineration and pyrolysis.
Transfer Station	A facility to which waste is delivered for separation or bulking up before being removed for recovery and/or disposal.
Treatment	A catch-all term for physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume and hazardous nature, facilitate its handling or enhance recovery.
Unitary Authority (UA)	A local authority which has the responsibilities for waste planning, collection and disposal.
Unitary Development Plan (UDP) / Local Development Plan (LDP)	A land use planning document which sets out the policies and framework for making decisions on planning applications.
Unmodelled Waste	Fractions of other waste streams that must be dealt with in a different way to MSW. These fractions were taken out of the assessment process and classed as 'unmodelled waste'.
Wales Spatial Plan	One of the high-level strategic guidance 'building blocks' of the WAG. It aims to make sure: that decisions are taken with regard to their impact beyond the

	immediate sectoral or administrative boundaries; that there is coordination of investment and services through understanding the roles of and interactions between places; and that sustainable development is a core value in every WAG activity.
Waste Arisings	The amount of waste generated in a given locality over a given period of time.
Waste Collection Authority	A local authority responsible for the collection of MSW in its area.
Waste Disposal Authority	A local authority responsible for the management of the waste collected and delivered to it by constituent collection authorities. The processing and/or final disposal of the waste is usually contracted to the private sector waste management industry.
Waste Electrical & Electronic Equipment (WEEE)	Electrical or electronic equipment that is waste, including all components, subassemblies and consumables that are part of the product at the time of discarding.
Waste Hierarchy	This concept suggests that the most effective environmental option may often be to reduce the amount of waste generated (reduction); where further reduction is not practicable, products and materials can sometimes be used again, either for the same or a different purpose (reuse); failing that value should be recovered from waste (through recycling, composting or energy recovery); only if none of the above offer an appropriate solution should waste be disposed of.
Waste Management Licence	A waste management / resource recovery facility licenced under the Environmental Protection Act.
Waste Management Licensing	The system of permits operated by the Environment Agency under the Environmental Protection Act to ensure that activities authorised to recover or dispose of waste are carried out in a way which protects the environment and human health.
Waste Stream	A way of classifying waste according to its source and nature.
Windrow Composting	The aerobic decomposition of appropriate shredded biodegradable waste using open linear heaps known as ‘windrows’. The process involves mechanical turning of the waste until the desired temperature and residence times are achieved to enable effective degradation.

GLOSSARY OF ACRONYMS

AA	Appropriate Assessment
AD	Anaerobic Digestion
AMR	Annual Monitoring Report
ATF	Authorised Treatment Facility
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
ATT	Advanced Thermal Treatment
BPEO	Best Practicable Environmental Option
BMT	Biological Mechanical Treatment
BMW	Biodegradable Municipal Waste
CA	Civic Amenity
C&I	Commercial & Industrial
C&D	Construction & Demolition
CHP	Combined Heat and Power
CLOPUD	Certificate of Lawfulness of Proposed Use or Development
CP	Conditioning Plan
DEFRA	Department for Environment, Food and Rural Affairs
DNA	Data Not Available
EA / EAW	Environment Agency Wales
EC	European Commission
EfW	Energy from Waste
EIA	Environmental Impact Assessment
ELV	End of Life Vehicle
EU	European Union
EWC	European Waste Catalogue
GIS	Geographical Information System
HIA	Health Impact Assessment
HRA	Habitat Regulation Assessment
HWRC	Household Waste Recycling Centre
IPPC	Integrated Pollution Prevention and Control
IVC	In-Vessel Composting
LAS	Landfill Allowance Scheme
LCA	Life Cycle Assessment
LDP	Local Development Plan
LPA	Local Planning Authority
MBT	Mechanical Biological Treatment
MHT	Mechanical Heat Treatment
MRF	Materials Recycling Facility
MSW	Municipal Solid Waste
NAW	National Assembly for Wales
NNR	National Nature Reserve
NPA	National Park Authority
NWSW	National Waste Strategy for Wales
ODPM	Office of the Deputy Prime Minister
OWC	Open Windrow Composting
PA	Per Annum
PAS	Publicly Available Specification
PCN	Policy Clarification Note

PPC	Pollution Prevention and Control
RDF	Refuse Derived Fuel
RJC	Regional Joint Committee
RMF	Regional Member Forum
RRR	Recycling, Reuse & Recovery
RWA	Regional Waste Assessment
RWG	Regional Waste Group
RWP	Regional Waste Plan
RTG	Regional Technical Group
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SOLA	Substances of Low Activity
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMA	Strategic Waste Management Assessment
SWMO	Strategic Waste Management Option
TAN	Technical Advice Note
TPA	Tonnes Per Annum
TS	Transfer Station
UA	Unitary Authority
UDP	Unitary Development Plan
VLLW	Very Low Level Waste (Radioactive)
WAG	Welsh Assembly Government
WAW	Waste Awareness Wales
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment
WID	Waste Incineration Directive
WISARD	Waste: Integrated Systems Analysis for Recovery and Disposal
WLGA	Welsh Local Government Association
WML	Waste Management Licence
WRATE	Waste and Resources Assessment Tool for the Environment
WSP	Wales Spatial Plan

South West Wales Regional Waste Plan 1st Review

Bridgend County Borough Council

Brecon Beacons National Park Authority

Carmarthenshire County Council

Ceredigion County Council

Pembrokeshire County Council

Pembrokeshire Coast National Park Authority

Neath Port Talbot County Borough Council

City & County of Swansea

Countryside Council for Wales

Environment Agency Wales

South West Wales Economic Forum

The Wales Environment Trust

Wales Community Recycling Network

Waste and Resources Action Programme

Welsh Assembly Government – Planning Division

Welsh Assembly Government – Waste Strategy & Implementation Unit

Welsh Assembly Government – Department for Economy & Transport

www.walesregionalwasteplans.gov.uk