Sustainability Appraisal Report for the West of England Joint Waste Core Strategy Submission Version

Final Report

September 2009

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West of England Unitary Authorities

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September 2009

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For and on behalf of
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Date: September 2009_____

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HEADLINE FINDINGS

The West of England's Joint Waste Core Strategy (JWCS) places a strong emphasis on moving waste management up the waste hierarchy. This will help to reduce emissions of greenhouse gases through greater resource efficiency and reduced landfill emissions. Energy recovery is supported as an element of the waste hierarchy and combined heat and power (CHP) is encouraged, while sites identified in the JWCS offer a high potential for the use of CHP. The JWCS explicitly requires waste facilities to minimise greenhouse gas emissions.

By enabling waste-related development in the sub-region, the JWCS will ensure the West of England takes greater responsibility for the waste it generates, and will support economic activity in the sub-region in more sustainable and innovative methods of managing waste.

The spatial strategy minimises waste transport distances and is specifically designed to site waste management facilities near to the sources of arisings. Waste transport will also be minimised by co-locating waste treatment facilities with other waste operations, and by promoting development within any adopted urban extensions. This will help to reduce the risk of adding to congestion and help to deliver savings in carbon and other emissions. However, all of the identified sites have the potential to increase congestion through development although the likely impact is unclear. Mitigation is recommended for individual sites, and development management policy requires that effects on congestion are specifically addressed. The use of rail and water to transport waste is promoted.

By enabling development of wastewater treatment facilities and requiring long-term aftercare of landfill sites, the JWCS will help to protect and to improve water quality. It specifically seeks to improve land quality and to protect the best agricultural land. Adverse cumulative effects on air quality are possible however the likelihood and significance of effects depend on the nature and scale of any proposed development. The overall likely impact on air quality is therefore uncertain although development management policy requires avoidance or minimisation of atmospheric pollution.

Waste operations have the potential for affecting biodiversity through construction and operation of facilities, and all but one of the identified sites are near to, or are within/contain, designated nature conservation areas. Mitigation is recommended for individual sites, and further protection is provided for biodiversity in development management policies.

By encouraging development of facilities on previously developed land, in both policies and strategic objectives, the JWCS is likely to help reduce the pressure for greenfield development and bring vacant and underused previously developed land back into beneficial use.

By promoting development of facilities within any adopted urban extensions, the JWCS will help to promote development on urban land, albeit newly urbanised, and to concentrate some facilities in urban areas. In addition, the JWCS has a strategic objective to give preference to previously developed land.

Some of the identified sites are near to residential areas and have the potential for impacts on communities. However, mitigation is recommended for individual sites in order to avoid or minimise the risks, and development control policy requires the risk of impacts on residential amenity to be taken into account and minimised or avoided.

The JWCS aims to promote sustainable construction methods in both waste and non-waste development, although this is not given much prominence and is only included as part of the policy on waste prevention. In order to ensure a sufficiently broad scope for sustainable construction and its benefits, the requirement for sustainable construction could be included in policy on development management.

Many of the identified sites/areas are within areas of flood risk. Mitigation is recommended for individual sites in order to avoid or to minimise the risks. In addition, development control policy requires the risk of flooding to be taken into account and minimised or avoided, and for development to be adaptable to climate change.

It is outside the scope of the JWCS to affect the generation of hazardous waste, although it promotes reduction and better management through the use of waste audits.

1 SUMMARY AND OUTCOMES

1.1 NON-TECHNICAL SUMMARY

1.1.1 Overview

This report sets out details of the process and outcomes of a Sustainability Appraisal (SA) of the West of England Joint Waste Core Strategy (JWCS) Submission Version. The Submission Version of the JWCS has been developed by the four unitary authorities in the West of England and is the culmination of an iterative process of development of the JWCS, incorporating a number of formal and informal stages. SA has been an integral part of that process from the beginning.

Under the Planning and Compulsory Purchase Act 2004 the West of England authorities are required to undertake an SA of Local Development Documents including the JWCS. The SA must also satisfy the requirements for a Strategic Environmental Assessment (SEA) arising from the authorities' obligations under the European Directive on SEA and the implementing Regulations in England and Wales.

The overall purpose of the SA is to evaluate the likely implications for sustainable development in the West of England of the proposed JWCS and reasonable alternatives to it. The aim is to inform the plan-making process to enable the JWCS to take account of the ways in which waste management might affect the economy, environment and communities of the West of England.

The SA tested the Submission version of the JWCS against a series of objectives that reflect relevant sustainable development policy objectives. The JWCS and a number of options were tested to determine their potential to give rise to significant effects, in order to enable the amendment and improvement of the JWCS in the light of knowledge of the potential impacts on relevant sustainable development policy objectives. As part of the iterative process of development of the JWCS, recommendations for amendments have been made by the SA at various stages and incorporated into the JWCS as it has developed.

The findings and recommendations reached through the SA are set out in this report, and the method by which the appraisals were undertaken is described.

1.1.2 The West of England JWCS and its Context

The overall purpose of the JWCS is to provide a policy framework by which the West of England authorities will jointly carry out their statutory duty to provide a land use plan for the management of waste. In doing this, the following strategic objectives have been identified.

Box 1.1 Strategic Objectives of the JWCS

- To move the management of waste up the waste hierarchy by increasing waste minimisation, recycling and composting then recovering further value from the remaining waste and only looking to landfill for the disposal of pre-treated waste.
- To enable communities and businesses in the West of England to take responsibility for the waste they generate.
- To continue to promote public awareness towards a shared commitment to waste prevention and reuse.
- To deliver the timely provision of an integrated network of waste management facilities to meet requirements in the West of England.
- To contribute to reducing and adapting to the impacts of climate change by driving waste up the hierarchy and encouraging the provision of waste management facilities at appropriate locations having regard for minimising and mitigating flood risk.
- To encourage sustainable construction and waste minimisation in new development.
- To ensure that waste management facilities do not harm the environment or endanger human health and where possible provide benefits.
- To locate development in accordance with land use priorities, giving preference to previously developed land and/or urban areas.

The following issues are covered by the detailed policies in the JWCS in order to achieve the aims set out above:

Box 1.2 Scope of JWCS Policies

- Promotion of waste minimisation, through awareness raising, working in partnership and the requirement for waste audits for new developments.
- Siting of facilities for recycling, composting and other non-residual waste management facilities through the adoption of criteria for the location of sites.
- Identification and safeguarding of specific sites and broad locations for residual waste treatment facilities as well as operational expectations for those facilities.
- Allowing for non-allocated sites for residual waste treatment facilities to come forward.
- Conditions for granting approval of applications for landfill, landraise or other disposal operations, including gas recovery and aftercare.
- Conditions for granting approval for wastewater treatment plant.
- Protection of planning designations and general considerations for the management of developments.

The JWCS sits within a framework of other policy documents which together influence both the content of the plan and its implementation. The most important of these are:

- European Union legislation, most importantly the *Landfill Directive*, which sets binding targets for reduction in the amount of biodegradable municipal waste sent to landfill, and the *Waste Framework Directive* which

implements the waste hierarchy and sets requirements for recycling and recovery;

- National legislation which is binding on the West of England authorities, principally the *Waste and Emissions Trading Act 2003* which implements the *Landfill Directive* in the UK and introduces a scheme of trading in landfill allowances;

- National waste policy which sets the framework of overarching policy objectives for Waste Local Development Documents (LDDs), including objectives such as promoting waste minimisation and implementing the waste hierarchy;

- National planning guidance which sets out details of the policy approaches which should be adopted by local and regional authorities;

- The draft Regional Spatial Strategy, which sets out policies for dealing with the South West region's waste, and with which local authorities should seek to align their waste LDDs;

- A *Joint Residual Municipal Waste Management Strategy* for the West of England authorities, which sets out a 20-year plan for the management of residual municipal waste, which the JWCS seeks to enable by providing the necessary planning framework;

- West of England statutory plans, including the Joint Replacement Structure Plan and individual authority Local Plans, which currently set the local framework for the content and implementation of the JWCS, particularly policies on the location and control of development; and

- West of England non-statutory strategies and plans, which guide the policy approach of the JWCS on specific issues, but are not binding.

A list of relevant policies, plans and programmes and a review and summary of their content is set out in *Annex A*.

1.1.3 The Current State of Sustainable Development in the West of England

The main issues for sustainable development in the West of England and which are relevant to the JWCS are summarised in the following table.

Table 1.1 Key Environmental, Social and Economic Issues for the West of England

Category	Key Issues
Air quality	Most of the region has good air quality although two Air Quality Management Areas have been designated where a build-up of traffic-based pollution such as NO_2 and PM_{10} may reach levels of concern. These are in Bristol covering the city centre and parts of the main radial roads, and in Bath city centre.

Category	Key Issues
Climate change	Over 7 million tonnes of carbon dioxide was emitted in the region in 2006. Methane is also a potent greenhouse gas, arising in part from waste management, although figures are not available.
Flood risk	There are very significant areas of the sub-region that are subject to flood risk, especially large parts of Bristol, South Gloucestershire and North Somerset.
Water quality & availability	The West of England generally has good water quality. There are a number of pressures on regional water resources, including housing demand, economic development and climate change, and demand is predicted to rise.
Waste	In 2007/08, the West of England generated a total of 541,000 tonnes of municipal waste. Although recycling is above the England average, the sub-region also landfills more of its municipal waste than average. Commercial/industrial and construction/demolition waste are each larger waste streams than the municipal solid waste stream. 10%of C&D waste was landfilled in 2000/01, however, no data was available for C&I waste disposal routes.
Landscape	The West of England contains parts of two Areas of Outstanding Natural Beauty. 47% of the West of England area is designated as green belt. The Forest of Avon covers approximately 57,000 ha.
Land quality	The West of England has relatively low amounts of previously developed land and derelict buildings, with most occurring in Bristol and North Somerset.
Biodiversity	The West of England contains sites of international, national and local importance. There are 8 internationally-designated sites within the sub-region and a further site outside but within 10km of potential waste sites. Sites of Special Scientific Interest (SSSIs) are in good condition compared to both the regional and the national picture but below the national target. A number of habitats and species have been prioritised for protection and enhancement in Local Biodiversity Action Plans.
Transport	In the last 10 years, the volume of traffic has grown faster than the national average. Car ownership is very high and congestion is a major issue on the motorway network and in the city centres.
Built, cultural and archaeological heritage	The West of England has 179 Scheduled Ancient Monuments, 8179 Listed Buildings, 38 Historic Parks and Gardens and Battlefields and 135 conservation areas. The city of Bath is a World Heritage Site.
Amenity	An area around Bristol has been identified as a fly-tipping 'hotspot', indicating a moderate problem. There is significant night light pollution in populous areas, particularly around Bristol. Relevant data on noise is not available.
Health	Census and other data indicates health is relatively good across the sub-region, with South Gloucestershire and Bath and North East Somerset having better health than the regional and national average.
Deprivation	Bristol has a relatively high level of deprivation whilst South Gloucestershire is relatively affluent in comparison to England as a whole.
Economy	The South West has one of the smallest economies of the English regions. The GVA per head for the West of England is higher than the regional and national average although growth has slowed recently.

Category	Key Issues
Employment	The South West has a higher than average percentage of those of working age in work. The largest sector for numbers in employment in the West of England is in the transport, storage and communication services.

1.1.4 Areas Likely to be Significantly Affected by the JWCS

The appraisal has considered the areas likely to be significantly affected by implementation of the JWCS, in order to identify the sustainability characteristics of those areas. In reality, the effects of implementation of the plan can be considered on two levels.

First, the overall effects will be spread throughout the sub-region, because waste arises almost everywhere, waste transport will occur throughout the West of England and some of the impacts of recycling, recovery and disposal activities will be widespread and borne by all. In this case, the relevant sustainability characteristics are those set out in the baseline above and in *Annex A*.

On another level, some of the effects of the management of waste will occur in the vicinity of waste management sites. There are 11 sites and two strategic areas which have been identified as appropriate for residual waste management facilities under the JWCS, and in addition the JWCS allows for development on sites which have not been identified.

As part of the site assessment work undertaken by ERM, each of these sites was assessed against a range of criteria, which cover a number of SA appraisal objectives. The results of that assessment are set out in a series of assessment reports (1) produced for the West of England Partnership by ERM. These site assessment reports were drawn on significantly in assessing the likely sustainability impacts of the JWCS. The sites were also appraised against a number of additional criteria to ensure full coverage of all relevant SA objectives.

1.1.5 Existing Problems Relevant to the JWCS

A number of problems (2) exist in the West of England which are relevant to the JWCS. These are summarised below and described in detail in the baseline in *Annex B*.

The West of England generally compares favourably to the England average for recycling municipal solid waste, although 59% of municipal solid waste was still landfilled in 2007/08. Commercial/industrial and

(1) Detailed Site Assessment Report: Final Report, ERM, January 2008; Detailed Site Assessment Final Report, ERM, June 2008; Revised Detailed Site Assessment Report Final Report, ERM, June 2009; Additional Site Assessments Following Progress Update, ERM, Aug

(2) The SEA Directive requires the report to identify relevant problems.

construction/demolition waste are each larger waste streams than the municipal solid waste stream. 10%of C&D waste was landfilled in 2000/01, but there is no reliable data on C&I waste.

In the last 10 years traffic has grown faster than the national average, with high levels of car ownership. Congestion is a major issue in the region on the motorway network and in the city centres.

Air quality is generally good throughout the sub-region, although there are some areas of poor air quality, largely due to transport emissions.

The West of England has relatively low amounts of identified previously developed land and derelict buildings, with most occurring in Bristol and North Somerset. Almost half of the sub-region is designated as green belt.

There are very significant areas of the West of England that are subject to flood risk, especially large parts of Bristol, South Gloucestershire and North Somerset.

The South West has a number of pressures on regional water resources, including housing demand, economic development and climate change. Without increases in water efficiency, the supply-demand balance is predicted to go into deficit in the West of England area by 2024/25 with the levels of housing growth planned under the draft Regional Spatial Strategy[1].

Economic productivity in the West of England is high; 15% above the average for the UK[2].

The West of England contains or is near to some areas which are designated as internationally important, including Special Protection Areas and Special Areas of Conservation designated pursuant to Directives 79/409/EEC (3) and 92/43/EEC (4). The sites are all subject to pressures, most notably physical loss and damage, disturbance from human presence and activities and changes in water table levels. All bar two of the sites or strategic areas identified as suitable for residual waste treatment are near to one or more of these designated areas. A Habitats Regulations Assessment incorporating Appropriate Assessment has been undertaken to determine the impacts that waste-related development at the sites may have on internationally-designated sites.

1.1.6 Taking Account of Relevant Sustainable Development Objectives

A long list of international, national, regional and local level policy documents was considered to assess each one's relevance to sustainable development,

(1) [1] Housing Growth and Water Supply in the South West of England 2005-2030 Supplementary Report, Environment Agency, January 2006

(2) [2] Regional GVA December 2008, National Statistics, http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14650

(3) Directive 79/409/EEC on the conservation of wild birds

(4) Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

and particularly in the context of the scope of the JWCS. The list of the documents considered and those reviewed is given in *Annex A*.
The review identified the key sustainable development policy objectives contained in each document, and *Table 5.1* sets out the environmental, economic and social objectives which were identified. These objectives set the policy context for the JWCS and with which it must conform. They were used by the SA as a framework against which to assess the likely environmental and sustainability effects of the JWCS. The review also identified any relevant targets which have been set.

The sustainability baseline data was also analysed to identify the key sustainability issues in the West of England which are relevant to the JWCS. The list of sustainable development objectives was then reviewed to ensure that all key issues would be covered by the appraisal framework and therefore that the JWCS would be appraised for its effect on these issues.

1.1.7 The Likely Significant Effects of the JWCS

The results of the assessment of the individual policies of the JWCS have been drawn together to make an assessment of the overall effects of the JWCS as a whole, in light of the appraisal of the strategic objectives for the JWCS (see *Section 6*), the appraisal of the individual sites which are identified (*Annex F*) and the appraisal of the spatial strategy (see *Section 7*). *Table 1.2* sets out the results of this synthesis, and draws conclusions about the likely significant overall effects of the JWCS taken as a whole.

Table 1.2 Summary of Likely Significant Effects of JWCS

SD policy objectives	**Likely Significant Effects**	
Health & Well-being		
To protect amenity	+	Effects on amenity, including from congestion, will be avoided or minimised. However, several of the identified sites/areas have the potential for amenity effects on nearby residents and to add to existing or predicted future congestion. Mitigation is recommended for individual sites.
Economic Development		
To promote sustainable economic development	+	Enabling waste-related development in the sub-region will support the waste sector in establishing new economic activity in the sub-region in more sustainable methods of managing waste.
Climate Change		
To increase energy efficiency	+	Energy recovery and use of CHP are promoted, and identified sites within the JWCS offer potential for use of CHP.
To increase renewable energy use	+	The JWCS supports renewable energy generation where practicable, through the capture and use of methane for energy generation and the recovery of energy from residual treatment facilities which in some cases may be renewable depending on the technology used.
To reduce greenhouse gas emissions	+	Implementation of the waste hierarchy will help to reduce emissions of greenhouse gases through greater resource efficiency, reduced landfill emissions and managing waste more locally. The spatial

SD policy objectives	Likely Significant Effects	
		strategy for residual sites minimises waste transport emissions by treating waste close to the source of arisings. The JWCS explicitly requires minimisation of greenhouse gas emissions.
To reduce the effects of climate change on development and vice versa	+	The JWCS requires the risk of flooding to be taken into account and minimised or avoided, and for development to be adaptable to climate change.
Development & Planning		
To promote community responsibility for waste	+	By enabling the development of waste management, the JWCS will allow the West of England to take greater responsibility for the waste it generates.
To minimise flood risk	+	Although many of the identified sites/areas are within areas of flood risk, mitigation is recommended to address potential effects. In addition, the JWCS requires the risk of flooding to be minimised or avoided, and sustainable drainage is promoted.
Sustainable Communities		
To promote public awareness, information and participation	+	The JWCS directly seeks to encourage the public to adopt more sustainable behaviour.
To take account of the impact of development on communities	+	The JWCS requires the risk of impacts on residential amenity to be taken into account and minimised or avoided. Some of the identified sites are near to residential areas and have the potential for impacts on communities, and mitigation is recommended for individual sites in order to avoid or minimise the risks.
Biodiversity & Landscapes		
To conserve and enhance biodiversity	?	Waste operations have potential for affecting biodiversity through construction and operation of facilities, although the significance of any impacts will depend on standards of design, construction and operation. All but one of the identified sites are near to, within or contain designated nature conservation areas and have the potential for adverse effects. Although these are required by the JWCS to be minimised or avoided, it is possible for some sites that value will be lost.
To protect landscape	?/+	Development of facilities has potential for effects on landscape, although the significance of effects depends on the exact nature of any development. Some of the identified sites are near to designated landscapes or contain designated features, although effects are required to be minimised or avoided.
To promote good design	+	The JWCS requires a high standard of design and to minimise visual impacts. Sustainable construction is promoted.
Transport		
To reduce the impact of transport	+	By enabling the development of facilities, the JWCS will help to promote the management of waste close to the source of arisings. Waste transport will also be minimised by co-locating with other waste operations, and by promoting development within any adopted urban extensions. The spatial strategy minimises waste transport distances and is specifically designed to be near to the

SD policy objectives	Likely Significant Effects	
		sources of arisings. However, all of the identified sites have the potential to increase congestion through development. The scale of the effects will vary with a number of factors which are currently uncertain and therefore their significance is unknown at this stage. The JWCS requires avoidance or minimisation of transport impacts including effects on congestion.
To promote alternatives to road transport	+	Alternatives to road transport of waste are actively promoted by the JWCS, and some of the identified sites offer potential opportunities for rail use.
Natural Resources & Waste		
To protect and improve water quality	+	By enabling development of wastewater treatment facilities and requiring long-term aftercare of landfill sites, the JWCS will help to protect and improve water quality.
To protect and improve air quality	?/+	Adverse cumulative effects on local air quality are possible from emissions from facilities and from vehicles, although the likelihood and significance of effects depend on the nature and scale of any proposed development. However, the JWCS requires avoidance or minimisation of atmospheric pollution.
To reduce the inefficient use of resources	+	The JWCS has a strong emphasis on increasing resource efficiency, through implementation of the waste hierarchy. In addition, sustainable construction in waste developments and other developments is promoted which will help to reduce resource use.
To conserve and improve land and soil quality	+	The JWCS explicitly seeks to ensure landfill/landraise facilitates the improvement of land quality including damaged and disturbed land and to protect the best quality agricultural land.
To make good use of previously developed land and buildings and minimise greenfield development	+	By encouraging development of facilities on previously developed land, the JWCS is likely to help reduce the pressure for greenfield development and bring vacant and underused previously developed land back into beneficial use. Use of previously developed land is also a priority in the JWCS strategic objectives.
To optimise use of urban land	+	By promoting development of facilities within any adopted urban extensions, the JWCS will help to concentrate facilities in urban areas. The JWCS encourages facilities to be in or near to urban areas through its strategic objectives.
To promote the waste hierarchy	+	The JWCS emphasises moving waste management up the waste hierarchy, which is a theme running through all policies where relevant.
Business and Work		
To improve local authority waste management and procurement practice	+	The JWCS explicitly commits to more sustainable procurement by local authorities to prevent the generation of waste, and will help to promote more sustainable waste management by local authorities more broadly through the commitment to lead by example in waste prevention.
Culture &		

SD policy objectives	Likely Significant Effects	
Heritage		
To protect the built and historic environment	?/+	Two of the identified sites/areas have potential to affect historic assets, although development management policy requires minimisation or avoidance of impacts.
To protect high quality or valued open spaces	+/-	The JWCS gives protection to open spaces, and safeguarding sites will help to reduce the likelihood of future loss to waste development. Two of the identified sites/areas are likely to result in loss of open space although the JWCS requires this to be compensated for.

1.1.8 Selecting Alternatives

In developing the JWCS, a number of alternative options have been considered at various stages in the process, specifically at the Issues and Options stage and Preferred Options stage. At each of these stages, the SA has appraised the options which have been proposed, and also included some additional options which could reasonably be considered.

The approach taken in the Submission JWCS has been developed from the various areas of policy for the JWCS that were set out in the Preferred Options document. This in turn was developed from the options set out in the Issues and Options consultation (1). The JWCS has also built on the outcome of public consultation exercises.

Spatial Options

In particular, the JWCS has taken a strategic approach to the selection of sites for residual waste treatment. In developing the JWCS, consideration has been given to several spatial options for such an approach, in terms of the number and distribution of facilities which could be planned in order to deliver the required capacity for residual waste treatment (a total of 800,000 tonnes per annum). The options take either a concentrated approach to the distribution of facilities, or a dispersed approach, or a combination of the two.

A preferred option for the spatial strategy, the combined approach, was selected and published in the Preferred Options consultation document and based on the sites which had been identified at that time. Since the publication of that document, a number of changes have been made to the list of identified sites, with some sites having been withdrawn and new sites added to the list. In addition, two strategic areas have been identified as suitable for accommodating a residual waste management facility although a specific site within each area is not identified. In view of these changes, it is

(1) Issues and Options: A Consultation Document to Develop a Waste Management and Planning Strategy for the West of England, West of England Unitary Authorities, January 2007

considered appropriate to re-appraise the spatial options in order to test the robustness of the choice of preferred option for the spatial strategy. The following options are considered in order to meet the capacity requirements in the longer term:

Table 1.3 Site Options

Option		No of facilities	Individual capacities (tpa)
A1	Concentrated	2	400,000
A2	Concentrated 2	2	400,000
B	Dispersed	8	100,000
C	Combination	1	390,000
		1	150,000
		2	100,000
		1	60,000
C2	Combination 2	2	195,000
		1	150,000
		2	100,000
		1	60,000

1.1.9 Outcome of Options Appraisal

The overall conclusion of the SA is that option C provides the most sustainability benefits overall. Along with options B and C2, option C minimises waste transport by having a fairly dispersed configuration of sites, which thereby enables the minimisation of energy consumption, greenhouse gas emissions and other emissions from waste transport. Option C also captures other benefits arising from economies of scale by including one large-scale facility and with C2 shows the greatest potential for use of Combined Heat and Power.

In terms of impacts which are site-specific, it can be generally concluded that the more sites that are required, the more potential there is for site-specific adverse effects. Therefore options A1 and A2 tend to perform best in relation to these types of criteria. The picture is less clear for options B, C and C2 in relation to site-specific impacts, with their relative performance varying according to the type of impact and depending on the particular combination of sites likely to be developed. However, it is not possible to be certain about the likely impacts of option B, because insufficient sites have yet been identified to deliver that option. It is possible that any as yet unidentified sites could have additional adverse impacts for some site-specific effects.

1.1.10 Mitigation of Effects

One recommendation is made for amendment to the policy to improve clarity. Sustainable design and construction is promoted in policy 1 on waste prevention. However, the issues for waste development are much broader than waste prevention, for example incorporating issues of energy and water efficiency. To ensure greater clarity and sufficient emphasis on these other

aspects of sustainable design and construction, the policy requirement should also be incorporated into policy 12.

Annex F identifies potential effects arising from development at the specific sites or strategic areas listed in policy 5. It also makes a series of recommendations for mitigation of these effects which should be taken into account in developing the sites. Some of these recommendations are reflected in the Key Development Criteria for individual sites set out in the JWCS, although others are not. Without this mitigation, the potential for adverse effects from development of the sites will be increased.

Measures are also recommended in order to deal with effects outside the scope of the JWCS, including in relation to predicted cumulative effects:

- The Partnership should take steps to improve the evidence base on future waste arisings, particularly taking into account expected levels of growth and development in sub-region and where possible improving data on C&I and C&D waste arisings.

- The Partnership authorities should press for continuous improvement in waste minimisation measures in the sub-region, particularly through the Joint Residual Municipal Waste Management Strategy, and for a strong emphasis on resource efficiency in all relevant plans and strategies including those at regional level.

1.1.11 Uncertainties and Risks

The following are key areas where the likely impacts of the JWCS cannot be assessed due to a lack of data and other information to enable an assessment to be made:

- air quality;
- waste transport;
- costs of waste management activities;
- greenhouse gas emissions;
- biodiversity; and
- water resources.

Recommendations are made for collecting data as part of the monitoring regime to fill these gaps.

1.1.12 Monitoring Recommendations

The SA makes recommendations for monitoring, with suggested indicators to enable the Partnership authorities to monitor the likely significant impacts of the JWCS. This also includes a number of indicators to allow the Partnership authorities to identify unforeseen adverse effects in order to be able to take appropriate remedial action.

In addition, the SA has concluded that there are gaps in available data which are potentially significant for assessing the impact of the JWCS, and makes recommendations for filling those gaps. These are listed above in *Section 1.1.11*.

1.2 STATEMENT ON THE DIFFERENCE THE PROCESS HAS MADE

An iterative assessment of the emerging JWCS has provided the opportunity to make amendments and improvements throughout the process. The following changes have been made to the JWCS at various stages in the process as a result of the recommendations for mitigation made by the SA:

- Option C was selected as the preferred option for the spatial strategy as a direct result of recommendations made by the SA.

- The policy approach to non-inert landfill was changed from the preferred option, reflecting recommendations made by the SA.

- An objective has been added to highlight the importance of locating development in accordance with land use priorities, giving preference to urban land and brownfield land.

- In order to take account of climate change mitigation and adaptation, developers are required to address the following issues:
  - energy efficiency and energy recovery;
  - use of CHP;
  - greenhouse gas emissions;
  - flood risk and sustainable drainage;
  - good design and sustainable construction;
  - waste transport distances;
  - alternatives to road transport;
  - water consumption.

- Developers are required to avoid adverse impacts on:
  - Communities and amenity;
  - geodiversity;
  - wildlife;
  - landscape and visual;
  - air quality;
  - the built and historic environment generally, including Conservation Areas; and
  - open spaces, particularly the countryside and valued spaces including recreational space.

- Developers are required to avoid adverse impacts of development and include appropriate mitigation or compensation.

- Waste minimisation measures include a requirement for provision of on-site recycling facilities in new developments.

- Development management policy has been amended to require developers to:
  - broaden the consideration of biodiversity impacts to include biodiversity which is at some distance from the development site;
  - consider efficient water management within plant;
  - undertake a feasibility study for use of CHP;
  - incorporate measures to minimise greenhouse gas emissions;
  - consider sustainable drainage measures;
  - consider impacts on all types of historic asset; and
  - address impacts on congestion.

- Policy has been amended to include a requirement for sustainable construction of waste facilities;

- Locations are regarded as unacceptable in the green belt and on floodplains except in very special circumstances.

- Policy in relation to protection of groundwater has been clarified.

In addition to the above, at Preferred Options stage the SA emphasised the need for a Strategic Flood Risk Assessment and a Habitats Regulations Assessment to be undertaken and the conclusions fed into the development of the JWCS. These assessments were subsequently undertaken.

1.3 HOW TO COMMENT ON THE REPORT

Comments on any aspect of the Submission JWCS or this SA Report can be made by:

- emailing to wepconsultation@westofengland.org
- writing to West of England Partnership, Floor 1,Wilder House, Bristol BS2 8PH
- visiting the website at http://www.westofengland.org/waste/planning

2 APPRAISAL METHODOLOGY

2.1 BACKGROUND

The West of England Unitary Authorities (Bath & North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council) are working together on a Joint Waste Core Strategy (JWCS) which will set the strategic direction for waste management in the West of England over the next 20 years.

The JWCS has been developed under the umbrella of the Waste Management & Planning Strategy. The aim of this strategy was to deliver both a JWCS and a Joint Residual Municipal Waste Management Strategy (JRMWMS).

The authorities proposed to carry out a joint Sustainability Appraisal (SA) and Strategic Environmental Assessment (SEA) of the JWCS and JRMWMS. A joint approach was intended to ensure consistency between the appraisals and maximise portability of material leading to efficiencies. In July 2006, the Department for Environment, Food and Rural Affairs (Defra) commissioned Environmental Resources Management Limited (ERM) to undertake work on a Sustainability Appraisal to support the development of both the JRMWMS and the JWCS.

The scoping stage for the SEA of the JRMWMS and the SA of the JWCS was undertaken as a single process with a single Scoping Report. Subsequently an initial appraisal was undertaken on both documents leading to a single Initial Appraisal Report covering the appraisal of both the JRMWMS and JWCS, and a separate Environmental Report specifically to meet the requirements for the SEA of the JRMWMS. Some time later, an SA Report was produced to meet the requirements of SA of the JWCS Preferred Options.

Following the Preferred Options consultation, the West of England Partnership has carried out further work on the JWCS in order to develop a version for submission to the Secretary of State for Communities and Local Government. An SA Report is required to accompany this submission, and this report sets out the process, findings and conclusions of the SA of the JWCS Submission Version.

2.2 PROCESS

2.2.1 Introduction

The Sustainability Appraisal (SA) of the West of England Joint Waste Core Strategy (JWCS) has been undertaken with respect to the requirements of domestic and European law.

The European Union's Directive on the environmental assessment of plans and programmes (Directive 2001/42/EC) came into force in England & Wales in July 2004 through the Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No. 1633). Plans that are concerned with the management of wastes and that set the framework for the future development consent of projects that may include those listed in Annex I or II of the EIA Directive (Directive 85/337/EEC as amended by Directive 97/11/EC) must be subjected to an **environmental assessment** before they are adopted or submitted to the legislative procedure. The West of England JWCS satisfies both those criteria and is therefore subject to the requirement for environmental assessment.

Changes to the land use planning system, enacted through the Planning and Compulsory Purchase Act 2004 have also introduced a requirement for the **sustainability appraisal** of waste, minerals and local development frameworks. Advice on the requirements of the strategic environmental assessment and sustainability appraisal processes is set out by the Government in the form of dedicated sustainability appraisal guidance (1) and the new Planning Policy Statement 12 on Local Spatial Planning.

2.2.2 Scoping

The first step in the SA/SEA work was a scoping stage, to identify the sustainability context for waste management and planning in the West of England. The scoping stage began in August 2006.

The scoping stage involved the collection of a wide range of baseline data covering economic, social and environmental issues in order to provide a picture of the current sustainability status of the West of England and to identify emerging trends where possible. The baseline data was analysed to identify the key sustainability issues for the sub-region, within the particular context of waste management and planning.

In tandem with the baseline data collection and analysis, a review was undertaken of the policy framework relevant to sustainable development in the West of England. This involved:

- reviewing key environmental, social and economic documents which set the policy framework governing activities in the sub-region, and

- identifying the sustainable development policy objectives with which waste management and planning in the sub-region must or should conform.

The review included documents at national, regional and local level. International policy documents were also identified and considered.

(1) Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents: Guidance for Regional Planning Bodies and Local Planning Authorities, ODPM, November 2005

Although the relevant policy objectives set out in international documents are also implemented in national legislation and policy, it is important nevertheless to identify, and take account of, the international policy framework within which waste management in the UK operates.

The relevant sustainable development policy objectives identified in the review were collated to form a framework of objectives and criteria against which the JWCS (and JRMWMS) could be appraised. This was structured according to the Regional Sustainable Development Framework for the South West, which at the time was the key document setting out sustainable development objectives for the region. The framework was checked to ensure that the key sustainability issues identified in the baseline data review were covered by the framework.

The results of the scoping stage were set out in a Scoping Report (1) which was issued to key stakeholders for consultation in September 2006. The stakeholder organisations listed in *Box 2.1* were consulted.

Box 2.1 Consultees on SA/SEA Scoping Report

Statutory Consultees
Environment Agency, Natural England, English Heritage

Partnership Authorities
Bath and North East Somerset Council, Bristol City Council, North Somerset Council, South Gloucestershire Council

Neighbouring Authorities
Wiltshire County Council, Gloucestershire County Council, Somerset County Council

Regional Bodies
South West Regional Assembly, Government Office for the South West

Others
Defra, The Highways Agency, The Planning Inspectorate

Three responses were received, from the Environment Agency, Government Office and the Highways Agency. The main comments related principally to the coverage of key issues (particularly climate change, water protection, flood risk, biodiversity and congestion), additional documents for the policy review, and the importance of consultation with stakeholders. Consultation comments were taken on board and further scoping work was undertaken to ensure that the relevant key issues and policies were reflected in the framework.

(1) Scoping Report for the Sustainability Appraisal of the West of England Waste Management and Planning Strategy, Environmental Resources Management, September 2006

2.2.3 *Initial Sustainability Appraisal*

A key stage in the development of both the JWCS and the JRMWMS was the publication for consultation of an Issues and Options document (1) in January 2007. As part of the SA/SEA work, an initial appraisal was undertaken of the issues and options between November 2006 and January 2007, and an Initial Appraisal Report (2) setting out the findings and recommendations was published for public consultation alongside the Issues and Options document.

The issues and options which were assessed in the initial appraisal were as listed below.

For the JWCS:

- the vision and aims of the Joint Waste Plan;
- exports of waste: whether the West of England should deal with its own waste or continue to export to other areas;
- imports of waste: whether the West of England should only plan to deal with its own waste or should take waste from other areas;
- locational strategy: a concentrated distribution of larger facilities, a dispersed distribution of smaller facilities, or a combination of the two approaches; and
- landfill: extending existing landfill sites or constructing new land-raise sites.

For the JRMWMS:

- the vision and objectives of the Joint Waste Management Strategy; and
- the options for residual treatment technology.

The appraisal determined the likely effects arising from each of the options. This was done by assessing each option against the appraisal objectives and questions in turn, using the criteria identified, and making a largely qualitative assessment, with reference also to the baseline data from the Scoping Report. However, in the case of the residual treatment options, quantitative data was available from the options appraisal carried out separately for the JRMWMS (3). The data from this report was used to inform a number of the assessments of the residual options in a quantitative way.

The results of the initial appraisal were set out in the report, along with a small number of recommendations for amendments to improve the potential sustainability impacts of the JWCS.

(1) Issues and Options: A Consultation Document to Develop and Waste Management and Planning Strategy for the West of England – Technical Document, West of England Unitary Authorities, January 2007
(2) Initial Sustainability Appraisal of Issues and Options for West of England Waste Management and Planning Strategy, Environmental Resources Management, January 2007
(3) West of England Waste Management and Planning Partnership Options Appraisal Report (Final Draft), Jacobs, November 2006

2.2.4 *Sustainability Appraisal of Preferred Options*

The next key stage in the development of the JWCS was the development of the Preferred Options for the JWCS, culminating in the publication of the Preferred Options Report for public consultation in November 2008. The Preferred Options Report was required to be subject to an SA, with the publication of an SA Report to accompany the public consultation version.

There were several elements to this work, which took place from October 2007 to October 2008:

- a review of the responses received to the informal public consultation on the issues and options for the Plan;
- identification and description of the Preferred Options for the JWCS to be examined in the course of the appraisal and assessment;
- an interim appraisal of the draft Preferred Options document in December 2007 and development of recommendations for mitigation, most of which were incorporated into the emerging Preferred Options document; and
- the full assessment and appraisal of the strategic options that were proposed for the JWCS, and production of an SA Report to accompany the formal public consultation on the Preferred Options.

2.2.5 *Progress Update Stage*

In June 2009 a Progress Update was published on the Partnership's website. This made available for public comment a range of information from the JWCS evidence base which was either new or had been updated since the Preferred Options consultation. It included updated information on sites being considered for strategic waste management facilities including some new sites, as well as new information on the Habitats Regulations Assessment and the Strategic Flood Risk Assessment.

The Progress Update also included an interim comment from the Sustainability Appraisal process. The comment explained why it was premature at that time to undertake a further appraisal of the emerging JWCS due to the known need for further evidence still to be made available on the Strategic Flood Risk Assessment which had a reasonable probability of affecting the outcome of the Sustainability Appraisal.

2.2.6 *Sustainability Appraisal of Submission JWCS*

Following the Preferred Options stage, work was undertaken to develop a Submission Version of the JWCS. This has culminated in the publication of the Submission JWCS for public consultation. The Submission JWCS must be subject to an SA, with the publication of an SA Report to accompany the public consultation.

There were several elements to this work, which took place from July to September 2009:

- a review of the responses received to the formal public consultation on the Preferred Options and the informal consultation on the Progress Update;
- an interim re-appraisal of the spatial options for the location of strategic waste management facilities;
- drafting of the Submission JWCS, including development of policies and text, to be examined in the course of the appraisal and assessment;
- first appraisal of the Submission JWCS and development of recommendations for mitigation;
- amendment of the Submission JWCS to incorporate recommendations from the first appraisal; and
- re-appraisal of the amended Submission JWCS and production of a final SA Report to accompany the submission of the JWCS to the Secretary of State.

2.3 CONSULTATIONS

Consultation with key stakeholders has been undertaken at several stages of the SA process so far:

- For the **Scoping Report on the likely environmental implications of the JWCS**, consultation was undertaken during September and October 2006 with the stakeholders identified in *Box 2.1*.
- For the **Initial Appraisal of the Issues and Options document**, consultation was undertaken from January to March 2007 with statutory and public consultees.
- A formal public consultation on the **JWCS Preferred Options** was held from January to March 2009.
- An informal public consultation on a **Progress Update** took place in June 2009. Documents updating the evidence base were sent to all stakeholders and posted on the West of England Partnership's website, a workshop was held and press releases gave public notification of the update.

A formal public consultation on the Submission JWCS will be held. In addition, the submission document will be publicly available on the Partnership's website and members of the public are free to comment on the document through the Examination in Public process.

3 BACKGROUND

3.1 PURPOSE OF THE SA AND THE SA REPORT

The overall purpose of the SA is to evaluate the likely implications of the West of England JWCS and reasonable alternatives for the sustainable development of the West of England, and to inform the plan-making process. The aim is to enable the JWCS to take account of the ways in which waste management as proposed in the Submission JWCS might affect the economy, environment and communities of the West of England.

The SA has tested the Submission JWCS against a series of objectives that reflect relevant sustainable development policy objectives. The JWCS and alternatives were tested to determine their potential to give rise to significant effects, in order to enable the identification of the most sustainable strategy in the light of knowledge of the potential significant impacts of the JWCS on relevant sustainable development policy objectives.

The findings and recommendations reached through the SA are set out in this report, and the method by which the appraisals were undertaken is described and explained.

3.2 PLAN OBJECTIVES AND OUTLINE OF CONTENTS

The overall purpose of the JWCS is to provide a strategic policy framework by which the West of England Authorities will carry out their statutory duty to manage and dispose of waste.

Reflecting the new planning framework introduced by the Planning and Compulsory Purchase Act 2004, the JWCS not only covers the normal issues relating to land use planning and development management, but also deals with other aspects of waste disposal which have spatial implications.

To reduce the sub-region's current reliance on exporting waste to landfill, the development of residual waste treatment infrastructure has been identified as critical to delivery of the JWCS. As such, strategic locations to deliver this capacity across the plan area have been identified. Policy does not prescribe the type of waste facilities at individual locations, but does expect that some value will be recovered from the wastes treated.

The JWCS also contains policies to direct the development of non-residual waste treatment development that involves the recycling, composting, storage and transfer of wastes and for the disposal of waste.

To enable consistency across the plan area, the JWCS also provides development management policy that is specifically relevant to waste

development proposals. This will be considered alongside each authority's other development management policy.

The JWCS sets out a number of strategic objectives:

Objectives

- To move the management of waste up the waste hierarchy by increasing waste minimisation, recycling and composting then recovering further value from the remaining waste and only looking to landfill for the disposal of pre-treated waste.
- To enable communities and businesses in the West of England to take responsibility for the waste they generate.
- To continue to promote public awareness towards a shared commitment to waste prevention and reuse.
- To deliver the timely provision of an integrated network of waste management facilities to meet requirements in the West of England.
- To contribute to reducing and adapting to the impacts of climate change by driving waste up the hierarchy and encouraging the provision of waste management facilities at appropriate locations having regard for minimising and mitigating flood risk.
- To encourage sustainable construction and waste minimisation in new development.
- To ensure that waste management facilities do not harm the environment or endanger human health and where possible provide benefits.
- To locate development in accordance with land use priorities, giving preference to previously developed land and/or urban areas.

The following issues are covered by the detailed policies in the JWCS in order to achieve the aims set out above:

Summary of policies

- Promotion of waste minimisation, through awareness raising, working in partnership and the requirement for waste audits for new developments.
- Siting of facilities for recycling, composting and other non-residual waste management facilities through the adoption of criteria for the location of sites.
- Identification and safeguarding of specific sites and broad locations for residual waste treatment facilities as well as operational expectations for those facilities.
- Allowing for non-allocated sites for residual waste treatment facilities to come forward.
- Conditions for granting approval of applications for landfill, landraise or other disposal operations, including gas recovery and aftercare.
- Conditions for granting approval for wastewater treatment plant.
- Protection of planning designations and general considerations for the management of developments.

3.3 *RELATIONSHIP OF JOINT WASTE CORE STRATEGY WITH OTHER POLICY DOCUMENTS*

The JWCS sits within a framework of other policy documents which together influence both the content of the plan and its implementation. The most important of these are described below:

- European Union legislation, most importantly the *Landfill Directive* which sets targets for reduction in the amount of biodegradable municipal waste sent to landfill, and the *Waste Framework Directive* which implements the waste hierarchy and sets requirements for recycling and recovery. The West of England authorities must meet the requirements imposed by the Directives.

- National legislation which is also binding on the West of England authorities, principally the *Waste and Emissions Trading Act 2003* which implements the *Landfill Directive* in the UK and introduces a scheme of trading in landfill allowances in order to reduce disposal of biodegradable municipal waste to landfill.

- National waste policy, in particular that set out in *Waste Strategy 2007* (1), sets the framework of overarching policy objectives for waste Local Development Documents (LDDs). The West of England JWCS must be aligned with these broad policy objectives such as promoting waste minimisation and implementing the waste hierarchy.

- National planning guidance which sets out details of the policy approaches which should be adopted by local and regional authorities, and which the West of England authorities should follow unless there are special circumstances and strong reasons to the contrary. The most significant of these is Planning Policy Statement 10 on *Planning for Sustainable Waste Management*, but a range of other Planning Policy Statements and Guidance notes are relevant.

- The draft Regional Spatial Strategy (2) sets out policies to deal with waste arising in the South West region. While being aligned with national waste policy objectives, the strategy has a specific focus on policy to deal with the specific circumstances and challenges of the region. Local authorities in the South West should take the strategy into consideration in developing Local Development Documents and should seek to align their policies with those in the strategy. The strategy is yet to be approved by the Secretary of State.

- The West of England Partnership, comprising the four unitary authorities, has produced a *Joint Residual Municipal Waste Management Strategy* (3), adopted in May 2008. This constitutes a 20-year plan for the management

(1) Waste Strategy for England 2007, Department for Environment, Food and Rural Affairs, May 2007
(2) Draft Revised Regional Spatial Strategy for the South West Incorporating the Secretary of State's Proposed Changes, Government Office South West, July 2008
(3) Joint Residual Municipal Waste Management Strategy, West of England Partnership, May 2008

of residual municipal waste which seeks to deliver operational municipal residual waste treatment facility capacity by 2013 while meeting financial and environmental objectives. The JWCS seeks to enable implementation of the strategy by providing the planning framework by which the facilities to do so will be delivered.

- West of England statutory plans, most importantly the Joint Replacement Structure Plan and individual authority Local Plans, set the local framework for the content and implementation of the JWCS, particularly policies on the location and control of development, and by which development under the JWCS will be bound.

- West of England non-statutory strategies and plans, such as Community Strategies and Local Agenda 21 Strategies, guide the policy approach of the JWCS on specific issues but are not binding.

A list of relevant policies, plans and programmes and a review and summary of their content is set out in *Annex A*.

3.4 COMPLIANCE WITH THE SEA DIRECTIVE/REGULATIONS

The West of England JWCS is subject to the requirements of the European Union's Directive on the Environmental Assessment of Certain Plans & Programmes (Directive 2001/42/EC) and the domestic legislation through which the Directive has been transposed into law in England and Wales (the Environmental Assessment of Plans & Programmes Regulations 2004 – Statutory Instrument 2004 No. 1633).

The SA of the Submission JWCS was designed and undertaken so as to meet the legal requirements for the environmental assessment of plans. Throughout the report the term 'sustainability appraisal' should be interpreted as encompassing the sustainability appraisal process as required under the Planning & Compulsory Purchase Act 2004 and the strategic environmental assessment process as required under the European Directive and domestic Regulations on the environmental assessment of plans and programmes.

The following table indicates the components of the Sustainability Appraisal Report that make up the Environmental Report, as required by domestic and European law on the environmental assessment of plans.

Table 3.1 Summary Requirements of SEA Directive and Compliance of SA Report

Requirements for Environmental Report	Component of SA Report
a) An outline of the contents, main objectives of the plan or programme, and relationship with other relevant plans and programmes;	Sections 3.2 and 3.3
b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Section 4.2 and Annex B
c) The environmental characteristics of areas likely to be significantly affected;	Section 4.2.1, Annex B and Annex D
d) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Section 4.2.2, Annex A and Annex D
e) The environmental protection objectives, established at international, Community or national level, which are relevant to the plan or programme and the way those objectives and any environmental, considerations have been taken into account during its preparation;	Section 5.2.1 and Annex A
f) The likely significant effects on the environment, including on 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;	Table 6.1, Table 7.3, Table 8.1, Table 9.1, Section 9.3, Section 9.4.1, Annex E, Annex F, Annex G
g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Section 9.5 and Annex F
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;	Sections 7.1 and 7.2 Section 7.3.1, Section 4.2.1 and Annex C See 'Data Limitations', 'Accuracy' and 'Methodology and Assumptions' under Section 7.3.1, and Section 9.6.
i) a description of measures envisaged concerning monitoring in accordance with Art. 10;	Section 10.2
j) a non-technical summary of the information provided under the above headings	Section 1.1

4 SUSTAINABILITY BASELINE

4.1 INTRODUCTION

This section describes the significant features and conditions within the West of England relevant to sustainable development policy and objectives. It provides an overview of the state of the environment, society and the economy in the West of England in the period preceding the development and publication of the Submission JWCS. The full baseline information which was used to compile this summary is given in *Annex B*.

The aim of this section of the report is to highlight any significant issues or problems that are affecting the West of England's economy, its people, or its environment and to outline the way in which the state of the environment, society and the economy might change in the future. The purpose is to set the context within which waste management activities arising out of the JWCS will take place, so that the significant sustainability issues and the way that waste management activities might interact with those issues can be better understood. It also enables the SA and the process of developing the JWCS to identify and focus on those issues which are significant.

This section of the report incorporates the environmental baseline information requirements that are specified in Schedule 2(6) of the Environmental Assessment of Plans & Programmes Regulations 2004.

4.1.1 *Difficulties in Collecting Data*

There are substantial amounts of data available to populate a sustainability baseline for the West of England. However, in a small number of instances data was not available. Where possible, data for the South West region as a whole has been used to indicate the likely situation in the West of England. In some cases, no data could be found to describe the baseline situation. In particular, there is little data on likely future trends for many issues.

The detailed baseline description in *Annex B* highlights where there were deficiencies in available data or where data for the South West region has been used as a substitute. Wherever trend data was available this has been included.

4.2 SUMMARY OF SIGNIFICANT ISSUES AND PROBLEMS IDENTIFIED

The significant issues which have been identified by reviewing the baseline are summarised in the following table.

Table 4.1 Significant Environmental, Social and Economic Issues for the West of England

Category	Key Issues
Air quality	Two Air Quality Management Areas (AQMAs) have been designated across the study area that represent urban areas suffering from congestion where a build up of traffic-based pollution such as NO_2 and PM10 may reach levels of concern. These are in Bristol covering the city centre and parts of the main radial roads, and in Bath city centre. Most of the rest of the region has good air quality.
Climate Change	Climate change is one of the greatest long-term challenges facing mankind. If unchecked, it will have profound impacts on our societies and way of life, affecting agriculture and food security, leading to water shortages, triggering population movements and impacting on our economies, and our security. The UK has adopted challenging targets to reduce greenhouse gas emissions. Over 7 million tonnes of carbon dioxide was emitted in the region in 2006. Methane is also a potent greenhouse gas, arising in part from waste management, although figures are not available.
Flood risk	There are very significant areas of the sub-region that are subject to flood risk, especially large parts of Bristol, South Gloucestershire and North Somerset.
Water quality & availability	In 2007 the quality of river water of was above the England average in the South West. The South West is one of the wettest regions in the UK, however it has a number of pressures on regional water resources, including housing demand, economic development and climate change. Demand in the region is predicted to rise over the next two decades and greater water efficiency is needed to ensure there are sufficient resources to meet demand.
Waste	In 2007/08, the West of England generated a total of 541,000 tonnes of municipal waste. Authorities in the West of England generally compare favourably to the England average recycling level for municipal solid waste. 59% of municipal solid waste was landfilled which is higher than the English average. Commercial/industrial and construction/demolition waste are each larger waste streams than the municipal solid waste stream. 10%of C&D waste was landfilled in 2000/01 however no data was available for C&I waste disposal routes.
Landscape	The West of England contains parts of two Areas of Outstanding Natural Beauty, the Mendip Hills and the Cotswolds. 47% of the West of England is designated as green belt. The Forest of Avon is one of 12 community forests in England covering approximately 57,000 ha.
Land quality	Compared to the rest of the South West, the four authorities within the West of England have relatively low amounts of identified previously developed land and derelict buildings. Areas of most previously developed land and vacant buildings are in Bristol and North Somerset.

Category	Key Issues
Biodiversity	The West of England has a number of significant protected sites of international, national and local designation. International designated sites include the Severn Estuary which is classed as a Ramsar Site, a Special Protection Area (SPA) and recommended as a candidate Special Area of Conservation (cSAC). Sites of Special Scientific Interest (SSSIs) are in good condition compared to the national picture but below the 2010 target. A number of habitats and species have been prioritised for protection and enhancement in Local Biodiversity Action Plans.
Transport	The volume of road traffic in the West of England has grown by 21% over the last 10 years, which is faster than the national average. Congestion is a major issue in the region - on the motorway network and in the city centres.
Built, cultural and archaeological heritage	The county has 179 Scheduled Ancient Monuments, 8179 Listed Buildings, 38 Historic Parks and Gardens and Battlefields and 135 conservation areas. The West of England contains just over 2.5% of the SAMs in the South West, and 9% of the listed buildings. The city of Bath is designated as a World Heritage Site.
Amenity	The South West region has the fewest number of reported fly tipping incidents in England, although there has been a steady increase in the last three years and an area around Bristol has been identified as a fly-tipping 'hotspot', indicating a moderate problem. Satellite data indicates that, as with other parts of the UK, there is significant night light pollution in populous areas, particularly around Bristol. Relevant data on noise in the West of England was not found.
Health	Census and data from the Office of the Deputy Prime Minister indicates health is relatively good across the sub-region compared to other regions, with South Gloucestershire and Bath and North East Somerset having an indication of better health than the regional and national average.
Population	The total populations of each of the four authorities are quite varied with Bristol having the highest population and a very high population density.
Deprivation	Bristol has a relatively high level of deprivation whilst South Gloucestershire is relatively affluent in comparison to England as a whole.
Economy	The South West has one of the smallest economies of the English regions and the pace of growth has slowed recently relative to some other regions. The GVA per head for the West of England is relatively high, being above the average for the South West and the UK.
Employment	The South West has a relatively high level of employment, with 79% of those of working age in work. This compares to 75% for the UK as a whole. The largest sector for numbers in employment in the West of England is in the transport, storage and communication services, and represents a larger than average proportion of total employment.
Access to services	Specific data on access to services in the West of England was not found.

4.2.1 Areas Likely to be Significantly Affected

The appraisal has considered the areas likely to be significantly affected by implementation of the JWCS, in order to identify the sustainability characteristics of those areas. In reality, the effects of implementation of the plan can be considered on two levels.

First, the overall effects will be spread throughout the sub-region because waste arises almost everywhere. Hence, waste transport will occur throughout the West of England and some of the impacts of recycling, recovery and disposal activities will be widespread and borne by all. In this case, the relevant sustainability characteristics are those as set out in the baseline above and in *Annex B*.

On another level, some of the effects of the management of waste will occur in the vicinity of waste management sites. There are 11 sites and two strategic areas which have been identified as appropriate for residual waste management facilities under the JWCS, and in addition the JWCS allows for development on sites which have not been identified. The identified sites and strategic areas are:

- BA19: Broadmead Lane, Keynsham, Bath and North East Somerset
- BA12: Fullers Earth Works, Odd Down, Bath and North East Somerset
- BR505: Hartcliffe Way, Bristol
- DS05: Merebank, Kings Weston Lane, Bristol
- DS06: BZL Site, Kings Weston Lane, Bristol
- DS07: Selvaco Plant (northern part), Severn Road, Bristol
- DS13: Rhodia Chemical Works, Kings Weston Lane, Bristol
- DS14: Gypsy and Traveller Site, Kings Weston Lane, Bristol
- DS15: Advanced Transport System Ltd Site, Severn Rd, Bristol
- SG39: South of Severnside Works, South Gloucestershire
- IS8: Warne Rd, Weston-super-Mare, North Somerset
- Strategic Area A: Yate industrial area, South Gloucestershire
- Strategic Area B: Weston urban extension, North Somerset

As part of the site assessment work undertaken by ERM, each of these sites was assessed against a range of criteria, which cover a number of the SA appraisal objectives. The results of that assessment are set out in a series of site assessment reports (1) produced for the West of England Partnership by ERM. These site assessment reports were drawn on significantly in assessing the likely sustainability impacts of the Submission JWCS.

The following list shows the broad headings for the criteria under which the sites were assessed:

(1) Detailed Site Assessment Report: Final Report, ERM, January 2008; Detailed Site Assessment Final Report, ERM, June 2008; Revised Detailed Site Assessment Report Final Report, ERM, June 2009; Additional Site Assessments Following Progress Update, ERM, Aug 2009

- Site Area
- Surrounding Uses
- Traffic and Transport
- Planning Policy
- Planning History
- Landscape Designations
- Landscape Character
- Ecology and Nature Conservation
- Groundwater Quality
- Surface Water Quality
- Strategic Flood Risk Assessment
- Habitats Regulations Assessment
- Historic Environment
- Recreational Activities
- Air Quality/Noise/Issues of Environmental Nuisance
- Proximity to Waste Arisings
- Proximity to Existing Waste Facilities
- Visual/Landscape Impact
- Availability

Care was taken at an early stage in the appraisal work to ensure that the site assessment criteria covered relevant SA objectives, so that the site assessment work could be reliably incorporated into the appraisal process and be used to inform the SA. The sites were also appraised against a number of additional criteria to ensure full coverage of all relevant SA objectives:

- Potential for use of CHP
- Geodiversity
- Congestion
- Potential for transport by rail/water
- Urban location
- Open space

A table which lists the SA appraisal objectives and shows how each is covered by the site assessment criteria is provided in *Annex C*.

In addition to the information in the site assessment reports, the SA drew on other available sources of information about conditions at specific sites. Key sources were the MAGIC online interactive map (1), the National Air Quality Archive (2), the Greater Bristol Strategic Transport Study (3) and the Department of Transport online interactive map on traffic flows (4).

A description of the environmental and sustainability conditions at the strategic sites and areas identified by the JWCS is given in *Annex D*.

(1) http://www.magic.gov.uk/website/magic/
(2) http://www.airquality.co.uk/laqm/tools.php?tool=background06
(3) Greater Bristol Strategic Transport Study Final Report, WS Atkins, June 2006
(4) http://www.dft.gov.uk/matrix/MapXtreme/NewMap.htm

4.2.2 *West of England Characteristics that are Relevant to the JWCS*

The West of England has a number of characteristics which are relevant to the JWCS. These are summarised below and described in detail in the baseline assessment presented in *Annex B*.

The West of England generally compares favourably to the England average for recycling municipal solid waste, although 59% of municipal solid waste was still landfilled in 2007/08. Commercial/industrial and construction/demolition waste are each larger waste streams than the municipal solid waste stream. 10%of C&D waste was landfilled in 2000/01, but there is no reliable data on C&I waste.

In the last 10 years traffic has grown by 21%, which is faster than the national average, with high levels of car ownership. Congestion is a major issue in the region, both on the motorway network and in the city centres.

Air quality is generally good throughout the sub-region, although there are some areas of poor air quality, largely due to transport emissions.

The West of England has relatively low amounts of identified previously developed land and derelict buildings, with most occurring in Bristol and North Somerset. Almost half of the sub-region is designated as green belt.

There are very significant areas of the sub-region that are subject to flood risk, especially large parts of Bristol, South Gloucestershire and North Somerset. A Strategic Flood Risk Assessment (1) of the JWCS has been undertaken and drawn on in preparing this SA Report.

The South West has a number of pressures on regional water resources, including housing demand, economic development and climate change. Without increases in water efficiency, the supply-demand balance for the West of England area is predicted to go into deficit by 2024/25 with the levels of housing growth planned under the draft Regional Spatial Strategy.

Economic productivity in the West of England is high: above the average for the UK and the South West region as a whole.

The West of England contains or is near to some areas which are designated as internationally important, including Special Protection Areas and Special Areas of Conservation designated pursuant to Directives 79/409/EEC (2) and 92/43/EEC (3). The locations of these sites are shown in *Figure 4.1*. The sites are all subject to pressures, as indicated in the following table.

(1) Strategic Flood Risk Assessment Submission Draft, ERM, June 2009; Strategic Flood Risk Assessment Addendum Submission Draft, ERM, August 2009

(2) Directive 79/409/EEC on the conservation of wild birds

(3) Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

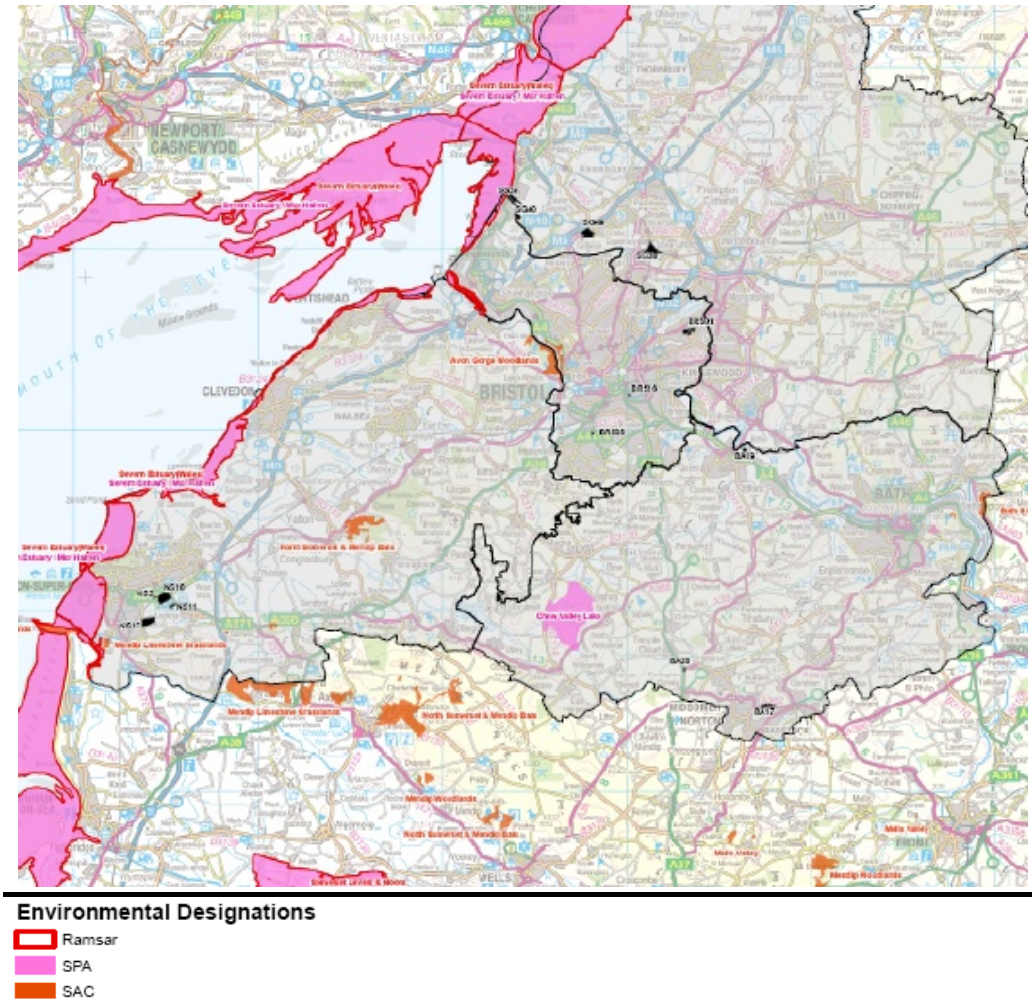
Table 4.2 Pressures on European Sites in or near to the West of England

European Site	Key Site Sensitivities
Avon Gorge Woodlands SAC	*Air Quality – woodland and grassland.* In particular eutrophication or acidification could lead to successional vegetation change. *Habitat Management.* Maintenance of woodland structure and composition. *Habitat Loss.* Habitat fragmentation.
Bath & Bradford-on-Avon Bats SAC	*Habitat Management.* Maintenance of foraging and commuting linkage habitat. *Habitat Loss.* Habitat fragmentation resulting in loss of connectivity for foraging and commuting. Direct loss of roost sites.
Chew Valley SPA	*Maintain favourable hydrology.* Site is sensitive to changes in water levels. Both increases and reductions can impact upon shoveler, due to their need for soft mud in which to feed . Also to fluctuations in water quality including eutrophication and particularly phosphate levels.
Mells Valley SAC	*Air Quality.* Eutrophication could lead to successional vegetation change *Habitat Management.* Maintenance of grassland structure and composition. *Habitat Loss.* Habitat fragmentation. *Other Management Issues.* Grazing regime.
Mendip Limestone Grasslands SAC	*Air Quality.* Eutrophication could lead to successional vegetation change *Habitat Management.* Maintenance of grassland structure and composition. *Habitat Loss.* Habitat fragmentation. *Other Management Issues.* Grazing regime.
Mendip Woodlands SAC	*Air Quality.* In particular eutrophication or acidification could lead to successional vegetation change *Habitat Management.* Maintenance of woodland structure and composition. *Habitat Loss.* Habitat fragmentation. *Other Management Issues.* Grazing regime.
North Somerset and Mendip Bats SAC	*Habitat Management.* Maintenance of foraging and commuting linkage habitat. *Habitat Loss.* Habitat fragmentation resulting in loss of connectivity for foraging and commuting. Direct loss of roost sites.
River Wye/Afon Gwy SAC	*Water Quality.* Abstraction threats, changes in water level and water quality, including eutrophication.
Severn Estuary cSAC, SPA and Ramsar	*Water Quality.* Change in tidal regime leading to successional change of shoreline habitat. *Air Quality – Saltmarsh.* Eutrophication could lead to successional vegetation change. *Habitat Disturbance – SPA.* Wintering waterfowl populations. Displacement, litter, human disturbance – noise, visual.
Somerset Levels and Moors SPA and Ramsar	*Water Quality.* Maintain favourable hydrology. Water levels and abstraction. *Air Quality.* Successional habitat change through eutrophication. *Habitat Management.* Grazing issues.
Wye Valley & Forest of Dean Bat Sites SAC	*Habitat Management.* Maintenance of foraging and commuting linkage habitat. *Habitat Loss.* Habitat fragmentation resulting in loss of connectivity for foraging and commuting. Direct loss of roost sites.
Wye Valley Woodlands SAC	*Habitat Management.* Maintenance of foraging and commuting linkage habitat. *Habitat Loss.* Habitat fragmentation resulting in loss of connectivity for foraging and commuting. Direct loss of roost sites. *Air Quality.* Eutrophication or acidification could lead to successional vegetation change

Source: Joint Waste Core Strategy *Habitats Regulations Assessment Final Report*, ERM, August 2009

All but two of the sites or strategic areas identified as suitable for residual waste treatment are near to one or more of these European sites. As a consequence, a Habitats Regulations Assessment (HRA) incorporating Appropriate Assessment has been undertaken to determine the possible impacts that waste-related development at the sites may have on SPAs, SACs or Ramsar sites. The results of the HRA (1) have been drawn on in this SA Report.

Figure 4.1 Location of SACs, SPAs and Ramsar Sites



(1) Joint Waste Core Strategy Habitats Regulations Assessment Final Report, ERM, June 2009; Joint Waste Core Strategy Habitats Regulations Assessment Final Report, ERM, August 2009

5 THE APPRAISAL FRAMEWORK

5.1 INTRODUCTION

The appraisal framework was developed in the scoping stage of the SA and updated during the appraisal stage. Two distinct strands of work were undertaken in order to identify the sustainability objectives for the framework:

- a review of policies, plans and programmes to identify sustainable development policy objectives with which the West of England JWCS must or should conform; and
- a review of the baseline data collected to identify the key sustainability issues in the West of England.

Each of these is described briefly below and supported by detail in annexes.

5.2 DEVELOPING OBJECTIVES FOR THE APPRAISAL

5.2.1 *Review of Policies, Plans and Programmes*

A long list of international, national, regional and local level policy documents was considered. Each document was assessed to determine its relevance to sustainable development, and particularly in the context of the scope of the JWCS. The list of the documents considered and those reviewed is given in *Annex A*. Each policy document was reviewed to identify and extract any policy objectives which are relevant to sustainable development within the context of waste management and which will set the policy framework with which the JWCS must conform. The review also identified any relevant targets which have been set.

5.2.2 *Key Issues from Baseline Data Review*

The baseline data was reviewed and analysed to identify the key sustainability issues in the West of England which are relevant to the JWCS. The key issues that were identified are summarised in *Table 4.1* and *Section 4.2.2* above.

The list of sustainable development objectives was then reviewed to ensure that all key issues would be covered by the appraisal framework and therefore that the JWCS would be appraised for its effect on these issues, and this was found to be the case.

5.2.3 *Appraisal Objectives*

Table 5.1 sets out the environmental, economic and social objectives which were identified in the above review. The objectives have been grouped

according to the themes and objectives set out in the Regional Sustainable Development Framework for the South West of England (RSDF) (1) which was extant at the time the objectives were developed. The RSDF was taken as a basis for the appraisal framework, and its objectives supplemented by the detailed policy objectives identified by the policy review. These objectives have been used to appraise the Submission JWCS.

Each of the appraisal objectives includes a number of related policy objectives or sub-objectives which were identified through the policy review, and these sub-objectives are shown in *Annex A* under each main policy objective with the policy sources indicated. In the appraisal framework, these sub-objectives have been turned into appraisal questions which allow a more detailed description of the specific policies which underlie the main objectives, and provide a checklist of issues to consider which can be used when appraising the Submission JWCS against the main policy objectives.

Finally, the framework lists the criteria which can be used to assess the effect of the JWCS on the appraisal objectives.

(1) A Sustainable Future for the South West: The Regional Sustainable Development Framework for the South West of England, 2001. This has since been supplemented by a new initiative, the Sustainability Shaper, which has been used to update the appraisal framework where appropriate to ensure that it reflects the latest sustainability priorities in the region.

Table 5.1 Appraisal Framework

Objectives	Does the JWCS…?	Criteria
Health & Well-being		
To protect human health	Ensure effective protection of human health? Prevent illness and reduce exposure to risks? Have regard to the impacts of proposed developments on the health of local communities?	Impacts on human health
To protect amenity	Take account of noise and light pollution? Protect residential amenity? Consider general amenity? Improve the quality of people's living environments? Cut congestion? Locate new development on sites which will not add to traffic congestion?	Impact on amenity
Economic Development		
To promote sustainable economic development	Encourage industrial and commercial development while maintaining and improving environmental quality? Encourage competitiveness? Support the sustainable development of the economy? Promote economic development and regeneration? Promote local economies? Develop a culture of enterprise?	Impact on economy • Promotion of local waste management businesses • Costs of waste management
To promote social and community enterprises	Promote involvement of NGOs and community sector? Support new social and community enterprises? Support community involvement and action?	Promotion of social and community enterprises
To promote local innovation	Stimulate the market to innovate and to produce more cost effective and sustainable options? Stimulate innovation in technologies, businesses and services? Support efficient, competitive and innovative business? Increase investment in skills, enterprise and innovation?	Promotion of local innovation

Objectives	Does the JWCS…?	Criteria
Climate Change		
To increase energy efficiency	Increase energy efficiency? Promote energy conservation? Exploit opportunities for Combined Heat and Power?	Levels of energy consumption and generation
To increase renewable energy use	Increase use of renewables?	Generation of renewable energy
To reduce greenhouse gas emissions	Reduce greenhouse gas emissions? Minimise climate change?	Emissions of greenhouse gases
To reduce the effects of climate change on development and vice versa	Avoid, or where this is not possible seek to reduce, the effects of development on climate change and vice versa? Respond to the risks, challenges and opportunities presented by climate change?	
Development & Planning		
To promote community responsibility for waste	Encourage communities to take more responsibility for their own waste?	Degree of net self-sufficiency
To minimise flood risk	Minimise flood risk? Apply a sequential approach to development? Avoid new development in areas at risk of flooding and sea-level rise? Ensure resistance/resilience where possible and accommodate hazards? Adopt a risk based approach for proposals in and affecting flood risk areas? Take account of potential effects of climate change? Make suitable provision for the drainage of surface water? Encourage sustainable drainage systems?	Impact on flooding
Inequality/Access		
To ensure access to services	Promote fair access to public services? Provide access to more convenient facilities and services?	Access to services (household collection and bring sites/HWRSs)
To support provision of rural services	Support provision of rural services?	Rural access to services
Sustainable Communities		

Objectives	Does the JWCS…?	Criteria
To promote public awareness, information and participation	Increase opportunities for communities to learn about sustainable development and volunteer in SD activities? Develop and improve skills and knowledge? Ensure people can participate in society? Provide ongoing education and advice for local people?	Promotion of public awareness, information and participation
To promote rural enterprise	Meet the economic and social needs of rural communities? Support rural enterprise?	Promotion of rural enterprise
To reduce fly-tipping	Enable people to be free from the fear of crime?	Impact on fly-tipping
To take account of the impact of development on communities	Take account of the impact of development on communities?	Impact on communities
Biodiversity & Landscapes		
To conserve and enhance biodiversity	Conserve and enhance biodiversity? Protect and enhance most valued habitats? Promote biodiversity as a part of sustainable communities, urban green space and the built environment?	Impacts on biodiversity • Designated sites • Non-designated
To protect landscape	Protect valued landscapes? Protect landscape? Protect the wider countryside and the impact of development on landscape quality? Protect diverse and distinctive heritage and landscape? Protect and enhance the quality and character of the countryside? Consider impact of development on landscape?	Impacts on landscape
To promote good design	Promote good design and sustainable construction? Address visual impact of development? Promote restoration and aftercare to preserve or enhance the overall quality of the environment?	Visual impacts, including restoration
To conserve and enhance geodiversity	Conserve and enhance geodiversity?	Impacts on geodiversity
Transport		

Objectives	Does the JWCS…?	Criteria
To reduce the impact of transport	Reduce the impact of all forms of transport? Reduce the need to travel? Enable waste to be disposed of in one of the nearest appropriate installations? Provide waste facilities as close as practicable to source? Promote the management of waste in accordance with proximity principle? Encourage energy from waste for locally-generated waste in locations close to sources? Give priority to the provision of waste management facilities that will recover value from waste at or near the PUAs/SSCTs? Deliver carbon savings and reduce the impact of other emissions which pollute the environment? Cut congestion? Locate new development on sites which will not add to traffic congestion?	Impact on waste transport
To reduce the need to travel by car	Reduce the need to travel by car? Manage the demand for travel by the private car?	Impacts on car use
To promote alternatives to road transport	Encourage freight traffic to be shifted from road to rail or water? Encourage new development in locations that can be served by more energy efficient modes of transport? Ensure that development which generates large amounts of movement is well served by sustainable transport networks?	Promotion of alternatives to road transport
Natural Resources & Waste		
To promote sustainable use of water resources	Promote water conservation and sustainable use of water resources?	Impact on consumption of water resources
To protect and improve water quality	Protect and improve water quality?	Impact on water quality
To protect and improve air quality	Protect and improve air quality? Ensure no breach of national air quality objectives? Protect and improve air quality in AQMAs? Ensure air quality outside AQMAs is better than national standard? Take account of air pollution?	Impact on air quality

Objectives	Does the JWCS…?	Criteria
To reduce the inefficient use of resources	Reduce the inefficient use of resources? Protect natural resources? Minimise consumption of new resources?	Levels of resource use
To conserve and improve land and soil quality	Take account of land contamination? Improve the sustainable management of soils? Improve soil quality? Conserve soil quality? Protect best agricultural land?	Impact on land and soil quality
To make good use of previously developed land and buildings and minimise greenfield development	Bring vacant and underused previously developed land and buildings back into beneficial use? Minimise greenfield development?	Use of previously developed land
To optimise use of urban land	Make optimum use of urban land? Concentrate facilities in the main urban areas?	Use of urban land
To promote the waste hierarchy	Promote more reduction, re-use, recycling, composting and using waste as a source of energy (as per the waste hierarchy)? Encourage recycling of wastes for mineral use? Recover value from waste including composting, recycling and energy generation? Increase locally-generated energy from waste? Reduce landfill of biodegradable waste? Reduce landfill of waste?	Compatibility with waste hierarchy • Impact on level of waste generation • Impact on re-use, recycling and composting of waste • Recovery of energy from waste • Reduction of quantity of waste going to landfill • Reduction of biodegradable waste to landfill
To improve the management of hazardous waste	Reduce the quantity and hazardousness of hazardous waste, and improve the management of that which is produced? Provide capacity for hazardous wastes?	Management of hazardous waste
Business and Work		

Objectives	Does the JWCS…?	Criteria
To increase employment opportunities	Ensure that everyone is able to access jobs? Increase employment opportunities?	Number of jobs, including skilled jobs
To improve local authority waste management and procurement practice	Promote more green procurement by public sector? Promote more local authority minimisation and recycling?	Impact on local authority waste management and procurement practice
Culture & Heritage		
To protect the built and historic environment	Improve the built environment in and around urban areas and rural settlements? Protect the built environment? Protect and enhance the historic environment?	Impact on built and historic environment
To protect high quality or valued open spaces	Ensure strict controls on development in the open countryside? Protect open spaces that are of high quality or of particular value to a local community?	Impact on open spaces
To protect green belt	Presume against inappropriate development in Green Belt unless very special circumstances are proved? Give favourable consideration to proposals for diversification in Green Belts where the development preserves the openness of the Green Belt? Protect green belts but recognise the particular locational needs of some types of waste management facilities? Maintain Green Belt while providing for changes in specific locations?	Impact on green belt

6 APPRAISAL OF THE JWCS STRATEGIC OBJECTIVES

6.1 INTRODUCTION

The Submission JWCS sets out a vision and strategic objectives. The objectives establish a set of policy objectives for the JWCS which set the framework for the more detailed policies which follow, while the vision describes a desired state arising from the implementation of the JWCS. As recommended by government guidance, the strategic objectives have been tested both against the SA objectives and each other, to ensure compatibility with sustainable development objectives and internal consistency.

6.2 OBJECTIVES OF THE JOINT WASTE CORE STRATEGY

Government guidance recommends that the SA should undertake a compatibility analysis between the objectives of the JWCS and the SA appraisal objectives. This has been undertaken and the results are set out in detail in *Table 6.1* below.

The purpose of this exercise is to determine whether the objectives of the JWCS will contribute to sustainable development, and to identify any potential incompatibilities between the objectives of the JWCS and sustainable development policy objectives. To do this, the JWCS objectives have been compared with each of the SA appraisal objectives and an assessment made of the likelihood that the JWCS will contribute to the achievement of each objective for sustainable development.

Box 6.1 Strategic Objectives of the JWCS

1. To move the management of waste up the waste hierarchy by increasing waste minimisation, recycling and composting then recovering further value from any remaining waste, and only looking to landfill for the disposal of pre treated waste.
2. To help communities and businesses in the West of England to take responsibility for the waste they generate.
3. To continue to promote public awareness towards a shared commitment to waste prevention and reuse.
4. To deliver the timely provision of an integrated network of waste management facilities to meet requirements in the West of England.
5. To contribute to reducing and adapting to the impacts of climate change by driving waste up the hierarchy and encouraging the provision of waste management facilities at appropriate locations having regard for minimising and mitigating flood risk.
6. To encourage sustainable construction and waste minimisation in new development.
7. To ensure that waste management facilities do not harm the environment or endanger human health and where possible provide benefits.
8. To locate development in accordance with land use priorities, giving preference to previously developed land and/or urban areas.

Table 6.1 below shows the results of the test against SA objectives. There are no clear incompatibilities between the aims of the Plan and the appraisal objectives, although there are a number of areas of uncertainty. The main reason for this is that the appraisal objectives are more detailed and specific than the objectives of the JWCS, which are expressed in more general terms. It is therefore not known whether there are likely to be specific sustainability impacts. It will be possible to make a meaningful appraisal through the appraisal of the more detailed policies.

However, it is noted that there are no strategic objectives which could clearly cover the following sustainable development objectives:

- promoting rural, social and community enterprise;
- promoting local innovation;
- increasing renewable energy use;
- ensuring access to services, including rural services;
- reducing fly-tipping;
- reducing the need to travel by car;
- promoting alternatives to road transport;
- improving the management of hazardous waste;
- improving local authority waste management and procurement practice.

Promoting enterprise and innovation probably constitutes an opportunity to be captured rather than a gap in strategic objectives, local authority waste management and procurement practice is largely outside the scope of the JWCS. The remaining objectives, on renewable energy, access to services, fly-tipping, car travel, alternatives to road transport and the management of hazardous waste, may be promoted by the strategic objectives but it is impossible to tell from the level of detail provided. However, these issues are more appropriately addressed in the more detailed policies of the JWCS. Therefore no recommendations are made for mitigation arising from the appraisal of strategic objectives.

The vision has not been separately appraised. The reason for this is that the vision is a high level statement of outcomes, expressed in general terms, which is at a different level of specificity from the appraisal objectives. It is therefore only possible to make a useful appraisal of the vision by appraising the more detailed objectives which are designed to deliver the vision, as above.

Table 6.1 Assessment of Strategic Objectives against SA Objectives

Key:
✓ Positive compatible
× Possible conflict
0 Neutral
? Uncertain

Plan/Srategy Objectives[1] SA Objectives	1	2	3	4	5	6	7	8	Comments
Health & Well-being									
1. To protect human health	0	0	0	0	0	0	✓	0	
2. To protect amenity	0	0	0	0	0	0	✓	0	
Economic Development									
3. To promote sustainable economic development	✓	✓	0	✓	0	0	0	0	Enabling businesses to take responsibility for waste will help to promote more sustainable economic activity. Delivering new facilities in the West of England will create new and more sustainable economic activity.
4. To promote social and community enterprises	0	0	?	0	0	0	0	0	Promoting more waste reuse could indirectly support new social and community enterprises, although this is largely outside the scope of the JWCS.
5. To promote local innovation	0	0	0	?	0	0	0	0	Delivering new facilities in the West of England could help to promote innovative technologies for managing waste, although it may not be locally generated.
Climate Change									
6. To increase energy efficiency	✓	0	0	✓	✓	✓	?	0	Delivering new facilities in the West of England will increase opportunities for energy recovery and may help to reduce transport energy use. Increased energy efficiency could be secured as an environmental benefit. This is examined in more detail in the appraisal of policies.
7. To increase renewable energy use	?	0	0	?	?	0	?	0	Delivering new facilities in the West of England will help to increase opportunities for energy recovery, although the extent to which this will be renewable is not clear. The objectives of moving waste management up the waste hierarchy and providing environmental benefits where possible should include the promotion of renewable energy. This is examined in the appraisal of policies within the JWCS.
8. To reduce greenhouse gas emissions	✓	✓	✓	?	✓	✓	?	0	Promoting the waste hierarchy will reduce emissions of greenhouse gases. Taking responsibility for waste generated will mean more waste is managed within the West of England. This will help to reduce transport emissions. Promoting minimisation and reuse will reduce emissions from waste management activities. Delivering new facilities in the West of England may help to reduce transport emissions. Reduction of greenhouse gas emissions may be implied within the objective of ensuring no harm to the environment and providing benefits, although it may not be. The achievement of reduced greenhouse gas emissions is tested in more detail in the appraisal of policies.

Plan/Srategy Objectives[1] SA Objectives	1	2	3	4	5	6	7	8	Comments
9. To reduce the effects of climate change on development and *vice versa*	✓	✓	✓	?	✓	✓	?	0	Delivering new facilities in the West of England may help to reduce transport emissions. Reducing the effects on, and of, climate change may be implied within the objective of ensuring no harm to the environment and providing benefits where possible, but may not be. The policy appraisal examines the effects in more detail.
Development & Planning									
10. To promote community responsibility for waste	✓	✓	✓	✓	0	0	0	0	
11. To minimise flood risk	0	0	0	?	✓	0	✓	0	Delivering new facilities in the West of England may increase pressure for development within areas of flood risk. This is examined in the sites appraisal. Minimisation of flood risk should be a component of measures to ensure no environmental harm and to provide benefits where possible. This is examined in more detail in the policy appraisal.
Inequality/Access									
12. To ensure access to services	?	?	?	0	0	0	0	0	Taking more responsibility for waste and promoting greater reuse of waste may mean improved access to services although this is not explicit and is examined in the more detailed policies. Promoting reuse, recycling and composting may ensure access to services, although it is not clear whether access will be considered. Commitments to providing access to services is examined in the policy appraisal.
13. To support provision of rural services	?	?	?	0	0	0	0	0	The objectives to promote reuse, recycling and composting and taking more responsibility may or may not include explicit support for rural service provision. Impacts on rural services is examined in the policy appraisal.
Sustainable Communities									
14. To promote public awareness, information and participation	0	✓	✓	0	0	0	0	0	Taking more responsibility for waste will require greater public awareness, information and participation.
15. To promote rural enterprise	0	0	0	0	0	0	0	0	
16. To reduce fly-tipping	0	?	0	0	0	0	0	0	Taking more responsibility for waste may indirectly promote less fly-tipping.
17. To take account of the impact of development on communities	0	0	0	?	✓	0	✓	?	Delivering new facilities in the West of England may have impacts on communities. This is examined in the sites appraisal. Ensuring no harm to the environment should include taking account of the impact of development on communities, although this would be made more explicit by the inclusion of a policy commitment. Giving priority to urban areas for waste facilities may increase the risk of impacts on communities. This is examined in more detail in the appraisal of sites and policies.
Biodiversity & Landscapes									
18. To conserve and enhance biodiversity	0	0	0	0	0	0	✓	?	Objective 7 seeks both to protect and enhance the environment. Previously developed land can have biodiversity value and is a target habitat within the Bristol Biodiversity Action Plan.

Plan/Srategy Objectives[1] SA Objectives	1	2	3	4	5	6	7	8	Comments
19. To protect landscape	0	0	0	0	0	0	✓	0	Protection of landscape should be one aspect of ensuring facilities do not harm the environment but will depend more strongly on commitments in policy. Potential impacts are examined in more detail in the policy appraisal.
20. To promote good design	0	0	0	0	0	✓	?	0	Providing benefits to the environment could include promoting good design, although this is not explicit in the objective. Potential effects are examined in more detail where relevant in the policy appraisal.
21. To conserve and enhance geodiversity	✓	0	0	0	0	0	✓	0	Moving waste up the hierarchy could help to conserve geodiversity through increased recycling of minerals. Ensuring that facilities do not harm the environment and providing benefits where possible could include the conservation and enhancement of geodiversity, although this is not explicit. Clearer protection in relation to sites will need to be the subject of policies in the JWCS.
Transport									
22. To reduce the impact of transport	?	✓	✓	?	✓	✓	?	0	Moving waste management up the waste hierarchy and delivering more sites in the West of England may increase or decrease the amount of waste transport by reducing export to landfill but also by requiring multiple handling of materials. Taking responsibility for waste generated will mean more waste is managed within the West of England, which will contribute to reducing transport emissions. Delivering waste in appropriate locations to reduce climate change will help to reduce waste transport distances. The objective to ensure no harm to the environment and health and to provide benefits where possible should imply a reduction in transport impacts, however the nature and significance of effects will depend on the location of sites and on more specific policies to mitigate and reduce impacts. This is examined in more detail in the sites appraisal and policy appraisal.
23. To reduce the need to travel by car	0	0	0	0	?	0	?	0	Reducing the use of the private car may be included under the objectives of provision of facilities which reduce climate change and provide environmental benefits where possible, although this is largely outside the scope of the JWCS.
24. To promote alternatives to road transport	0	0	0	?	?	0	?	0	Delivering more waste facilities in the West of England may reduce or increase opportunities for rail and water transport. This is examined in the appraisal of sites and policies. Promoting alternatives to road transport is unlikely to be achieved by the objective of reducing climate change, but can make a contribution to achieving it. Promoting alternatives to road could be provided as a benefit to the environment, although it is not clear that this will be included under objective 7. Promotion of alternatives to road is included within more detailed policy.
Natural Resources & Waste									
25. To promote sustainable use of water resources	0	0	0	0	0	✓	?	0	Sustainable use of water resources may be covered by the objective to ensure no environmental harm and to provide benefits where possible, although this is not clear. Potential effects are tested in the detailed appraisal of policies.
26. To protect and improve water quality	0	0	0	0	0	0	✓	0	Objective 7 seeks both to protect and enhance the environment.

Plan/Srategy Objectives[1] SA Objectives	1	2	3	4	5	6	7	8	Comments
27. To improve air quality	0	0	0	0	0	0	✓	0	Objective 7 seeks both to protect and enhance the environment.
28. To reduce the inefficient use of resources	✓	0	✓	0	✓	✓	0	0	Seeking to reduce the carbon footprint of facilities is likely to include promoting greater resource efficiency.
29. To conserve and improve land and soil quality	0	0	0	0	0	0	✓	✓	Objective 7 seeks both to protect and enhance the environment.
30. To make good use of previously developed land and buildings and minimise greenfield development	0	0	0	0	0	0	0	✓	
31. To optimise use of urban land	0	0	0	0	0	0	0	✓	
32. To promote the waste hierarchy	✓	0	✓	✓	✓	✓	0	0	Seeking to reduce the carbon footprint of facilities is likely to include promoting the management of waste at higher levels in the waste hierarchy, as will ensuring everyone has access to waste services.
33. To improve the management of hazardous waste	0	0	0	0	0	0	?	0	Providing benefits to the environment may also include improvements in the management of hazardous waste, although this is not clear. The potential effects are tested in more detail in the policies.
Business and Work									
34. To increase employment opportunities	✓	✓	0	✓	0	0	0	0	Taking responsibility for waste will mean more waste is managed within the West of England. This will make a small contribution to increasing employment opportunities.
35. To improve local authority waste management and procurement practice	0	0	0	0	0	0	0	0	
Culture & Heritage									
36. To protect the built and historic environment	0	0	0	0	0	0	✓	0	
37. To protect high quality or valued open spaces	0	0	0	0	0	0	✓	✓	
38. To protect green belt	0	0	0	0	0	0	✓	✓	

Note (1) Refer to *Box 6.1* for description of JWCS Objectives

Table 6.2 shows the results of the test of internal compatibility of the JWCS objectives. As before, in no case are any of the JWCS objectives clearly incompatible with each other, although there are several instances where there is a link between the objectives but it is not clear that the objectives are compatible. A comment is given to explain how the potential incompatibility is tested further by the SA. The key issues are in relation to strategic objectives 1, 4, 5, 7 and 8, which are tested further in the detailed appraisal of policies and sites.

Table 6.2 Assessment of Internal Compatibility of Strategic Objectives

Plan Objective	1	2	3	4	5	6	7	8	Comments
1		✓	✓	✓	✓	✓	?	0	Waste facilities should have no adverse effects on the environment and health and this is tested in more detail in the appraisal of sites and policies.
2			✓	✓	✓	✓	0	✓	
3				0	✓	✓	0	✓	
4					✓/?	0	?	✓	Delivering facilities in the West of England will help to drive waste management up the waste hierarchy, but may place pressure for development in flood risk areas. Development may be possible without adverse effects on the environment and human health. However, these effects are appraised in more detail in the appraisal of policies and sites.
5						✓	✓	?	Prioritising previously developed and urban land may be possible while also avoiding flood risk areas. PPS25 requires a sequential approach to identifying sites with respect to flood risk which must be followed.
6							✓	0	
7								✓	

7 APPRAISAL OF JWCS OPTIONS

7.1 IDENTIFICATION OF OPTIONS

The SA is required to appraise the impacts of the JWCS and reasonable alternatives to it. In developing the JWCS, a number of alternative options have been considered at various stages in the process, specifically at the Issues and Options stage and Preferred Options stage. At each of these stages, the SA has appraised the options which have been proposed, and also included some additional options which could reasonably be considered.

In the progression from each stage of the process to the next stage, the options under consideration have been taken forward and developed or refined, also taking into account comments made by stakeholders including members of the public in response to the consultation at each stage.

7.1.1 *Development of Options from Preferred Options Stage*

The approach taken in the Submission JWCS has been developed from the various areas of policy for the JWCS that were set out in the Preferred Options document. This in turn was developed from the options set out in the Issues and Options consultation (1). The JWCS has also built on the outcome of the public consultation exercises on the Issues and Options document, the Preferred Options document and the Progress Update, to take account of the views expressed in the consultations.

The following policy areas are carried forward from the Preferred Options stage, as per the identified preferred option in each case:

- waste minimisation;
- apportionment of capacity for recycling and composting facilities;
- locational priorities for recycling and composting facilities;
- locational criteria for waste facilities;
- strategic approach to configuration of residual treatment facilities ('spatial options');
- approach to urban extensions;
- approach to landfill of non-inert waste;
- approach to hazardous waste disposal;
- safeguarding existing waste sites.

The reasons for selecting these options, and the alternatives to them which were considered and appraised, were set out in the SA Report at Preferred Options stage (2).

(1) Issues and Options: A Consultation Document to Develop a Waste Management and Planning Strategy for the West of England, West of England Unitary Authorities, January 2007
(2) Sustainability Appraisal Report for the West of England Joint Waste Core Strategy Preferred Options, ERM, October 2008

In addition to the above policy areas, the Submission JWCS has carried forward policy on the approach to identifying locations for non-inert landfill, but not as the identified preferred option. The JWCS now takes the approach of permitting landfill within the sub-region where appropriate subject to it meeting required development management criteria, and not as in the previously preferred option which ruled out landfill in areas of constraint. Both of these options were previously tested in the SA of the Preferred Option (1) (along with an option of continuing to export waste to surrounding areas). The former avoids unnecessarily ruling out large areas of the sub-region which may be appropriate for non-inert landfill development, and provides significantly more flexibility for the Partnership and developers in being able to provide the required landfill capacity. In the medium to longer term, landfill capacity is unlikely to be available outside the sub-region, and exporting waste is not the most sustainable solution in transport terms.

7.1.2 The Spatial Options

The JWCS has taken a strategic approach to the selection of sites for residual waste treatment. In developing the JWCS, consideration has been given to several spatial options for such an approach, in terms of the number and distribution of facilities which could be planned in order to deliver the required capacity for residual waste treatment:

- Option A: a concentrated approach with a few 'large' facilities;
- Option B: a dispersed approach with a greater number of smaller facilities;
- Option C: a combined approach with both larger and smaller facilities.

The rationale for selecting these options was set out in the Issues and Options consultation document (2) as follows:

- The concentrated approach would generally involve waste travelling greater distances to treatment facilities but having less potential to impact on local communities because fewer sites would be required.

- Conversely the dispersed option would reduce travel distance but would have greater potential to impact on local communities because of the need for more sites.

- A combined approach of larger facilities serving Bristol where the majority of the waste is generated and smaller facilities serving the other areas may offer the best balance between reducing the need to travel and potential impacts on local communities.

Subsequent to the Issues and Options stage, options A and C were further developed, and two permutations of each identified. Option A could be

(1) Sustainability Appraisal Report for the West of England Joint Waste Core Strategy Preferred Options, ERM, October 2008
(2) Issues and Options: A Consultation Document to Develop a Waste Management and Planning Strategy for the West of England, West of England Partnership, January 2007

delivered by two different spatial distributions of sites, with one facility in Avonmouth and the second either near to Bath or in Weston-super-Mare. Options A1 and A2 were therefore introduced to allow for these two permutations. A variant of option C was also developed with two medium-sized facilities and four smaller facilities, in response to a perceived possible approach of delivering two facilities in the Avonmouth area. Option C2 was therefore included to allow for this possibility. The full set of all options (A1, A2, B and C2) was appraised at Preferred Options stage and the results and conclusions of the SA were used to select the preferred option.

Option C was selected as the preferred spatial option, because this is considered to be the most sustainable. Along with options B and C2, option C minimises waste transport by having a fairly dispersed configuration of sites, which thereby enables the minimisation of energy consumption, greenhouse gas emissions and other emissions from waste transport. Option C also captures other benefits arising from economies of scale by including one large-scale facility.

An ongoing process of site identification and selection has been undertaken throughout the development of the JWCS, in order to identify specific sites which could deliver the preferred spatial option. This has resulted in 11 sites and two strategic areas being identified at Submission stage as appropriate for residual waste treatment.

A series of options for a strategic approach to the location of residual treatment facilities was set out in the JWCS Preferred Options document based on the sites which had been identified at that time, and a preferred option was identified – the combined approach. Since the publication of the Preferred Options document, a number of changes have been made to the list of identified sites, with some sites having been withdrawn and new sites added to the list. In addition, two strategic areas have been identified as suitable for accommodating a residual waste facility although a specific site within each area is not identified.

In view of these changes, it is considered appropriate to re-appraise the spatial options in order to test the robustness of the choice of option C as the spatial strategy. The results of this appraisal are set out in *Section 7.3*.

7.1.3 A Strategic 'Do Nothing' Option

Currently in the West of England there is a strong reliance on the disposal of waste to landfill, with significant amounts being exported to landfill outside of the sub-region.

There are a number of key policy drivers which affect the way waste should be managed in future, but particularly significant are policies at European, national, regional and sub-regional level which require the West of England to reduce its reliance on landfill and to increase the rate of recycling of waste. Irrespective of the policy drivers influencing future waste management

methods, it is predicted that available landfill voidspace will run out within the lifetime of the JWCS, and therefore the West of England must find alternative ways of managing its waste. Furthermore, the Unitary Authorities have a statutory duty to prepare and adopt a Waste LDF. For these reasons, a 'do nothing' option is not possible and the SA has therefore not considered it as a reasonable strategic alternative.

However, 'do nothing' options were possible for some of the individual policy areas addressed by the Preferred Options document, and where relevant these were considered as part of the appraisal of Preferred Options.

7.2 *THE OPTIONS*

The JWCS addresses the issue of the distribution of residual waste treatment facilities in the West of England. This issue was raised in the Issues and Options consultation, and the Preferred Options document developed the options in more detail. The following four options have been considered in order to meet the capacity requirements in the longer term for MSW and C&I waste combined:

- A concentrated distribution of residual waste treatment sites, with two facilities each with a capacity of 400,000 tonnes per annum (tpa);
- A dispersed distribution of facilities with eight smaller facilities each with a capacity of 100,000tpa;
- A combination of the combined and dispersed approach, with one large facility with a capacity of 390,000tpa and four smaller facilities with capacities of 150,000tpa, 100,000tpa, 100,000tpa, and 60,000tpa;
- A second combination of the refined and dispersed approach, with two medium-sized facilities with a capacity of 195,000tpa each, and four smaller facilities with capacities of 150,000tpa, 100,000tpa, 100,000tpa, and 60,000tpa.

The method and rationale by which these options were developed is set out in detail in a separate report on the site options (1).

Table 7.1 summarises the configuration of sites and capacities in each of the spatial options, and shows the sites which would be appropriate to deliver the options.

(1) Spatial Options Appraisal: Final Report, ERM, September 2009

Table 7.1 Site Options

Option		No of facilities	Individual capacities (tpa)	Sites to deliver option
A1	Concentrated	2	400,000	BA12 or BA19; DS05, DS06, DS07, DS13, DS14, DS15 or SG39
A2	Concentrated 2	2	400,000	BA12 or BA19; Strategic Area B or IS8
B	Dispersed	8	100,000	BA12 or BA19; Strategic Area B or IS8; DS05, DS06, DS07, DS13, DS14, DS15 or SG39; BR505 or IS4; Strategic Area A; An unidentified site[1] in Midsomer Norton; An unidentified site[1] in East Bristol/Kingswood; An unidentified site[1] in Filton
C	Combination	1	390,000	DS05, DS06, DS07, DS13, DS14, DS15 or SG39
		1	150,000	BA12 or BA19
		2	100,000	Strategic Area B or IS8; Strategic Area A
		1	60,000	BR505 or IS4
C2	Combination 2	2	195,000	DS05, DS06, DS07, DS13, DS14, DS15 or SG39
		1	150,000	BA12 or BA19
		2	100,000	Strategic Area B or IS8; Strategic Area A
		1	60,000	BR505 or IS4

Note: [1] Insufficient sites have been identified to deliver option B.

7.3 COMPARISON OF THE SOCIAL, ENVIRONMENTAL AND ECONOMIC EFFECTS OF THE OPTIONS

7.3.1 General Methodology

Each of the options described in *Section 7.2* has been appraised against the appraisal objectives listed in *Table 5.1*. Comparisons have been made between alternatives where relevant. This section gives a summary of the results of that appraisal, highlighting the key sustainability impacts and issues identified for each option. Detailed matrices are set out in *Annex E* showing the full appraisal results.

For all appraisal tables throughout the report, the following symbols have been used to indicate the broad nature of the likely impact:

+	impact likely to be positive
-	impact likely to be negative
0	no significant impact
?	impact unknown
Ø	not applicable/not relevant

Where two different impacts are predicted, two symbols are given separated by a stroke which correspond sequentially to the impacts as described, eg +/0.

Types of Impact

The SEA Directive requires assessment of an additional level of impacts in addition to straightforward direct impacts. These are specified as "secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative". The following approach has been taken to identifying such impacts.

Certain attributes are common to all types of impact, whether direct, indirect (ie secondary) or cumulative. These are:

- timescales (ie short, medium and long-term impacts)
- probability (ie likelihood of impacts arising)
- whether impacts are primary or secondary (ie direct or indirect)
- reversibility (ie permanent or temporary impacts) and
- whether the impacts are positive or negative.

These attributes were all considered as integral aspects of impact assessment, and this is indicated in the appraisal matrices wherever relevant, particularly in *Annexes E, F* and *G* which set out the detailed appraisal results. More information is given on the methods for cumulative impact assessment in *Section 9.4*.

In considering the timeframes for effects, reference was made to *Figure 8.1* of the JWCS which indicates how the required capacity and the spatial strategy are expected to be implemented over the short term (1-5 years), the medium term (5-10 years) and the long term (10-15 years). However, this information is described as illustrative rather than prescriptive, and therefore it is not possible to predict with certainty the likely timeframes for effects.

Significance

In assessing the potential impacts of both policies and options, it is essential to take into account their likely significance. The appraisal has assessed the significance of impacts through a combination of techniques:

- *Expert judgement.* This was exercised throughout the assessments using as a checklist the criteria set out in Annex II of the SEA Directive. Group 1 criteria set the general framework for the assessment in terms of indicating the significance of the JWCS as a whole. Group 2 criteria are useful in assessing the significance of the individual effects of the JWCS.

- *Baseline conditions.* For each objective, account was taken of the particular baseline situation for the West of England. Where there are, or are likely to be, key issues or problems relevant to a particular objective, then any impacts are potentially of significance.

- *Relative scale of impact.* In some cases it was possible to assess the impact in quantitative terms, and to determine the percentage difference either from

the baseline or between options. This was helpful for considering the relative significance of impacts, particularly in the context of the wide range of other activities in addition to waste management which contribute to the impacts (eg greenhouse gas emissions).

The predicted effects were rated for their significance in terms of the importance for achieving each SA objective. Effects were rated as either high, medium or low, taking account of a number of factors. The factors taken into consideration in determining significance were:

- the expected scale of the effect or the degree to which the effects are likely to contribute to the achievement of the SA objective in the sub-region overall;
- the certainty or probability that the effect is likely to occur as a consequence of the JWCS;
- the timeframe of the effects;
- whether the effects would be permanent or reversible;
- whether the effect is a direct aim of the JWCS or not, in other words whether the JWCS is a key mechanism for achieving or controlling effects; and
- whether the effect is more strongly dependent on other interventions or other factors.

Significance is indicated in the appraisal tables as follows:

Low significance
Medium significance
High significance

Accuracy

In making the quantitative assessments, considerable care was taken to be as detailed and as accurate as possible. However, in order to make the calculations, it was often necessary to make a number of assumptions about a range of factors which are as yet unknown. In doing this, we have drawn wherever possible on information from the West of England Partnership and other sources, particularly from independent reports, from the waste industry, from other local authorities or from the Environment Agency.

It should also be noted that there is uncertainty in the data on future waste arisings. The Regional Spatial Strategy sets out figures for the capacity required for different management methods in the West of England. In addition, some analysis (1) has been undertaken by the Partnership to forecast future waste arisings and growth in the sub-region. The actual arisings in future years may prove to be different.

(1) West of England Waste Management Capacity Needs Assessment Final Report , ERM, May 2009

Because of these assumptions and uncertainties, it is inevitable that the calculations contain a degree of inaccuracy, and the quantification so derived cannot be relied upon to predict accurately the true outcome of the JWCS implementation. However, what the figures do allow us to do is to make a comparison between the different options of the estimated relative impact when measured using the same assumptions, with a reasonable degree of confidence. The effort which would be required to increase the precision in the data would be disproportionate when compared to the likely outcome for the comparison of options, although recommendations are also made in *Section 10.2.1* for filling gaps in the baseline data.

Methodology and Assumptions

The assessment of effects of the spatial options was undertaken using a combination of quantitative and qualitative methods.

Quantitative assessment was carried out using the Environment Agency's WRATE model which provides a number of calculated outputs for given types of facility and capacities. This was supplemented with a calculation of the number of tonne-kilometres which would be travelled by waste for each of the options. The waste transport distances also fed into the WRATE model.

In order to undertake the modelling, it was necessary for a number of assumptions to be made about waste transport and about the types of residual treatment facilities themselves. In particular, the type of treatment facility has a strong influence on the performance of the options, not least the waste transport distances required. Therefore in order to test the sensitivity of the outputs to treatment types, the modelling was undertaken for a solution based on energy from waste (EfW) and a solution based on mechanical-biological treatment (MBT). More detailed information on the assumptions made is given in the separate report on the spatial options (1).

The quantitative modelling was not able to provide outputs to inform some of the SA appraisal objectives. In this case, the modelling was supplemented with a more qualitative assessment of effects. This also took into account the conditions at the identified sites and the appraisal of likely impacts of development at those sites. *Annex D* contains details of the opportunities and constraints and *Annex F* sets out the detailed appraisal of the likely impacts of development at each site.

(1) Spatial Options Appraisal: Final Report, ERM, January 2008

Table 7.2 Appraisal Objectives and Assessment Methods

Appraisal objectives	Methods of assessment
Health & Well-being	
To protect human health	Quantified using WRATE, by tonnages transported to and from facilities and estimated distances
To protect amenity	Qualitative assessment of site-specific issues
Economic Development	
To promote sustainable economic development	Calculation of typical capital costs and gate fees using Defra data (1). NB does not include costs for transport, transfer stations, planning, procurement. Qualitative assessment of potential to promote competition.
To promote social and community enterprises	Not relevant
To promote local innovation	Qualitative judgement
Climate Change	
To increase energy efficiency	Qualitative judgement for transport on the basis of WRATE calculation of global warming potential. Qualitative judgement of relative generation efficiency by capacity of facility. Qualitative judgement of site potential for use of CHP.
To increase renewable energy use	Qualitative judgement of relative generation efficiency by capacity of facility.
To reduce greenhouse gas emissions	Quantified using WRATE based on tonnages of waste transported to and from facilities and estimated distances
To reduce the effects of climate change on development and vice versa	Greenhouse gas emissions quantified using WRATE. Flood risk assessed by reference to separate Strategic Flood Risk Assessment report.
Development & Planning	
To promote community responsibility for waste	Qualitative assessment of how widely burden of living near facilities will be spread.
To minimise flood risk	Assessed through reference to separate Strategic Flood Risk Assessment report.
Inequality/Access	
To ensure access to services	Not relevant
To support provision of rural services	Not relevant
Sustainable Communities	
To promote public awareness, information and participation	Not relevant
To promote rural enterprise	Qualitative judgement of nature of residual facilities and locations of identified sites.
To reduce fly-tipping	Not relevant
To take account of the impact of development on communities	Qualitative assessment of extent of communities affected and constraints affecting particular sites.
Biodiversity & Landscapes	

(1) Economies of Scale – Waste Management Optimisation Study by AEA Technology: Final Report, Defra, April 2007

To conserve and enhance biodiversity	Qualitative judgement for transport on the basis of WRATE calculation of acidification potential. Qualitative assessment based on constraints affecting particular sites, including through reference to separate Habitats Regulations Assessment report.
To protect landscape	Qualitative judgement of nature of residual facilities and assessment based on constraints at identified sites.
To promote good design	Qualitative assessment based on issues at identified sites.
To conserve and enhance geodiversity	Qualitative assessment based on number of sites required and constraints at identified sites.
Transport	
To reduce the impact of transport	Transport distances assessed in terms of tonne-km by calculating distances from arisings to residual facilities and onward transport of process outputs, and estimating tonnes requiring transport and vehicle capacities. Emissions from waste transport calculated using WRATE. Potential effects on congestion assessed on basis of existing and predicted future constraints on road network relating to identified sites.
To reduce the need to travel by car	Not relevant
To promote alternatives to road transport	Qualitative assessment on basis of potential opportunities at identified sites.
Natural Resources & Waste	
To promote sustainable use of water resources	Qualitative assessment based on professional judgement and future supply issues as predicted by water companies.
To protect and improve water quality	Eutrophication potential of transport quantified using WRATE, supplemented with qualitative assessment of risks based on number of facilities.
To improve air quality	Quantitative assessment of acidification potential of transport using WRATE. Qualitative assessment of potential for effects based on air quality constraints at identified sites.
To reduce the inefficient use of resources	Quantitative assessment of resources used in waste transport using WRATE.
To conserve and improve land and soil quality	Qualitative assessment of risks and opportunities based on conditions at identified sites.
To make good use of previously developed land and buildings and minimise greenfield development	Qualitative assessment of potential for effects based on conditions at identified sites.
To optimise use of urban land	Qualitative assessment of potential for effects based on conditions at identified sites.
To promote the waste hierarchy	Not relevant
To improve the management of hazardous waste	Not relevant
Business and Work	
To increase employment opportunities	Qualitative assessment based on professional judgement of typical numbers of jobs likely to be created by different numbers and sizes of facilities

To improve local authority waste management and procurement practice	Not relevant
Culture & Heritage	
To protect the built and historic environment	Qualitative assessment of potential for effects based on conditions at identified sites.
To protect high quality or valued open spaces	Qualitative assessment of potential for effects based on conditions at identified sites.
To protect green belt	Qualitative assessment of potential for effects based on conditions at identified sites.

Data Limitations

- Capacities

  The options drawn up by the Partnership are based on a total treatment capacity of 800ktpa, whereas the estimated tonnages requiring treatment from the Regional Spatial Strategy and from the Partnership's own need assessment is up to 775ktpa. While these differences mean that the quantification of impacts provided by the modelling does not represent accurate assessments of the expected impacts on the ground, the differences are considered to be sufficiently small that the comparison of options is still valid. It should also be noted that the capacities used for the different scales of facility are intended to be indicative only, and do not prescribe the size of facility that would be constructed.

- Timescales

  The information on which the appraisal of strategic site options is based is for the full configuration of residual waste treatment facilities to meet the long-term capacity requirements. Information is provided in the JWCS (*Figure 8.1*) as to how the required capacity and the spatial strategy are expected to be implemented over the plan period, although this is defined as illustrative rather than prescriptive. This information shows that it is only in the longer term that the spatial strategy will be implemented in full. There is no comparable information for how the alternative options for the spatial strategy might be delivered over time, although it could be inferred that options A2 and C2 would also only be deliverable in the long term but that option A1 may be deliverable in the medium term. Option B is currently undeliverable due to the lack of sufficient sites. However, the level of uncertainty surrounding all of this information regarding likely timescales for delivery makes it impossible to make any reliable assessment of the likely impacts of the options in the short or medium term that would help in comparing the relative sustainability of the options.

  Residual waste treatment facilities cannot be delivered in the very short term because of the timescales required to procure, build and commission the facilities. It is noted that the Joint Residual Municipal Waste Management Strategy sets out plans to cater for the short-term

requirements for dealing with residual municipal waste, which include programmed improvements to waste reduction, recycling and composting schemes and procuring interim residual waste treatment capacity potentially with a contract duration of 5-10 years. However, the type of treatment capacity that will be procured and where it will be located are unknown at this stage.

- C&I arisings

  No data was available on the location of C&I waste arisings, and therefore it was assumed to arise in broadly the same locations as MSW, ie the majority arising in the urban areas. Furthermore, no data was available on the composition of C&I waste, therefore it was assumed to have the same composition as MSW.

7.3.2 Appraisal Findings and Conclusions

The detailed outcome of the appraisal of spatial options is set out in *Annex E*. The results are summarised in *Table 7.3*. This sets out the conclusions on significant issues and impacts, listing the objectives which are the most important in terms of the key sustainability issues for the West of England and providing a useful differentiator between the options.

The overall conclusion is that option C provides the most sustainability benefits overall. Along with options B and C2, option C minimises waste transport by having a fairly dispersed configuration of sites, which thereby enables the minimisation of energy consumption, greenhouse gas emissions and other emissions from waste transport. Option C also captures other benefits arising from economies of scale by including one large-scale facility and with C2 shows the greatest potential for use of Combined Heat and Power.

In terms of impacts which are site-specific, it can be generally concluded that the more sites that are required, the more potential there is for site-specific adverse effects. Therefore options A1 and A2 tend to perform best in relation to these types of criteria. The picture is less clear for options B, C and C2 in relation to site-specific impacts, with their relative performance varying according to the type of impact and depending on the particular combination of sites likely to be developed. However, it is not possible to be certain about the likely impacts of option B, because insufficient sites have yet been identified to deliver that option. It is possible that any as yet unidentified sites could have additional adverse impacts for some site-specific effects.

Table 7.3 Summary of Key Issues for Spatial Options

Objective	Summary of Likely Significant Effects
Health and Wellbeing	
To protect amenity	Options A1 and A2 minimise the potential for amenity impacts, while options B, C and C2 have greater but similar potential, with possibly up to 3 sites risking impacts on residential or recreational amenity.
Economic Development	
To promote sustainable economic development	Costs of waste management will be lower with more concentrated facilities and higher with dispersed facilities due to the economies of scale effect. Option C secures some economies of scale although not as much as options A1 and A2. The development of smaller facilities through options B, C and C2 may help to encourage competition (1) .
Climate Change	
To increase energy efficiency	Options B, C and D are the most efficient in terms of transport energy consumption, and option A2 the least. However, the overall effect of the options is dominated by the treatment facilities themselves and the effect varies depending on the residual treatment technology employed. Larger energy-generating facilities are more efficient than smaller ones. All options provide some potential for use of CHP, with options C and C2 currently providing the best potential followed by A1 and A2. However, some sites are still to be identified in order to deliver option B and therefore their CHP potential is unknown.
To increase renewable energy use	If a treatment technology is chosen which generates energy which qualifies as renewable, then larger facilities are likely to have greater generation efficiency than smaller facilities and therefore will make a greater contribution to renewable energy generation and use.
To reduce greenhouse gas emissions	Options B, C and C2 are the best performers, being better than option A1 (assuming EfW is the residual treatment technology employed), and A2 performs least well because the transport effects are greatest. However, greenhouse gas emissions from waste transport contribute up to only 0.06% of total emissions in the West of England (2006 data) and the overall effect of the options is dominated by the treatment facilities themselves.
Development & Planning	
To promote community responsibility for waste	Option B will spread the community responsibility for waste most widely.
Sustainable Communities	
To take account of the impact of development on communities	More dispersed options will have impacts on greater numbers of communities, although spreading the potential impact of development could be considered more equitable. Option A1 is unlikely to have significant impacts on communities, while options B, C and C2 give greater potential for impacts with a greater number of sites.
Biodiversity & Landscapes	
To conserve and enhance biodiversity	Option A1 presents the greatest potential for avoiding sites with biodiversity sensitivities, while options B, C and C2 would involve up to 3 sites with potential for impacts on biodiversity.

(1) Economies of Scale – Waste Management Optimisation Study by AEA Technology: Final Report, Defra, April 2007. Note that the capacity at which practical optimisation begins varies with treatment technology, but for EfW is judged by the Defra report to be 400 ktpa

Objective	Summary of Likely Significant Effects
Transport	
To reduce the impact of transport	Options B, C and C2 minimise waste transport distances while option A2 requires the greatest distances of the options. Emissions from waste transport will therefore be smallest for options B, C and C2 and highest for option A2, although the difference in strategic terms compared to the levels of traffic overall in the sub-region is unlikely to be significant. The difference between options B, C and C2 is negligible. All of the sites and therefore all of the options have the potential to affect congestion.
Natural Resources & Waste	
To improve air quality	Options B, C and C2 have the lowest acidification potential from transport and option A2 the highest, although the transport would account for only 3-8% of the total acidification potential of such residual waste treatment systems. One of the sites is within an area of predicted future air quality exceeding the standards. Option A2 would avoid this site, while the other options may involve its development. The significance of impacts depends on the nature of developments and overall likely impact on air quality for the different options is therefore unclear.
To reduce the inefficient use of resources	Options B, C and C2 perform best in terms of transport resource consumption, although the overall effect is dominated by the treatment facilities themselves with transport only accounting for 1-3% of the total resource consumption.
To make good use of previously developed land and buildings and minimise greenfield development	Option C2 gives the greatest likelihood that greenfield development would be required, and options A1 and A2 the least. The likelihood of greenfield development is broadly the same with options B and C.
Culture & Heritage	
To protect high quality or valued open spaces	Options B, C and C2 provide the greatest likelihood that open spaces will be affected, and option A1 the least.

8 APPRAISAL OF JWCS POLICIES AND SITES

8.1 INTRODUCTION

The SA is required to appraise the effects of implementing the JWCS. These effects will derive substantially from the detailed policies which govern the nature of developments which will come forward under the JWCS and the particular sites which are identified for waste development. This section of the report sets out in detail the findings and recommendations of the SA from the appraisal of the JWCS policies and sites.

8.2 PROCESS

8.2.1 *Appraisal of Policies*

Each of the policies was appraised in turn using the appraisal framework, and an assessment made of the likely impacts. The method by which the appraisal was undertaken is the same as that used for the appraisal of options. This is described in *Section 7.3.1*. The policies are summarised for reference in *Box 8.1*.

However, it was not possible to give a meaningful individual appraisal for policy 7, as this states that development is required to be in accordance with relevant other policies of the JWCS, and therefore the likely effects of policy 7 are as for the other policies.

Box 8.1 Summary of JWCS Policies

1: Waste Prevention.
Promotion of waste prevention in new developments, through procurement practices, by information and awareness raising and through leading by example.

2: Non-Residual Waste Treatment Facilities Excluding Open Windrow Composting.
Types of location at which permission will be granted.

3: Open Windrow Composting.
Types of location at which permission will be granted.

4: Recycling, storage and transfer of construction, demolition & excavation waste at mineral sites.
Conditions under which permissions will be granted,

5: Residual Waste Treatment Facilities - Locations.
Locations and indicative capacities for which planning permission will be granted.

6. Residual Waste Treatment Facilities – Operational Expectations.
Requirements for materials and energy recovery.

7: Residual Waste Treatment Proposals at Unallocated Sites.
Granting of planning permission for residual waste treatment facilities at sites not identified in policy 5 where in accordance with other policies in the JWCS.

8: Landfill, Landraise, Engineering or other Operations - Principles.
Conditions for granting planning permission.

9: Landfilling, Landraising and Engineering or Other Operations - Details.
Requirements for restoration, aftercare and landfill gas management.

10: Wastewater Treatment.
Conditions for granting planning permission and requirement for energy recovery.

11: Planning Designations.
List of types of designated assets to be protected from significant adverse effects.

12: General Considerations.
List of matters to be addressed in planning applications to minimise or avoid adverse effects.

13: Safeguarding Operational and Allocated Sites.
Safeguarding sites to ensure spatial strategy can be delivered.

8.2.2 Appraisal of Sites

The SA is required to make an assessment of the effects of implementing the JWCS. Therefore, in appraising the policies, it is necessary to understand the likely effects of activities on the ground which will result from those policies. These will be significantly affected by the development of the specific sites which are identified in the policies. An appraisal was therefore carried out of the eleven sites and two strategic areas identified in policy 5, in the light of the development which is expected to take place at those sites, to assess the effects of their inclusion in the JWCS.

The results of the appraisal of sites are set out in *Annex F*. Each site was appraised in turn against the appraisal framework, and an assessment made of the likely effects of development at the site on each of the appraisal objectives. For each site or strategic area, a summary is given of the predicted positive and negative effects of development, and a series of recommendations made for mitigating the negative effects and enhancing the benefits.

8.3 FINDINGS

The detailed findings from the appraisal of policies are set out, policy by policy, in *Annex G*. The overall conclusions are summarised in *Table 8.1*. In addition to setting out information about the likely effects of the policies on each of the appraisal objectives, the tables in *Annex G* summarise the key positive and negative effects of each of the policies and provide recommendations where appropriate for mitigation of effects.

One recommendation is made for amendments to policy to improve clarity. Sustainable design and construction is promoted in policy 1 on waste prevention. However, the issues for waste development are much broader than waste prevention, for example incorporating issues of energy and water efficiency. To ensure greater clarity and sufficient emphasis on these other aspects of sustainable design and construction, this policy requirement should be incorporated into policy 12.

Table 8.1 Summary of Policy Appraisal

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
Health & Well-being													
To protect human health	+	Ø	+	0	0	Ø	0	Ø	0	Ø	+	0	The JWCS gives protection to human health where required.
To protect amenity	+	Ø	+	Ø	-	Ø	?/+	Ø	0	Ø	+	+	Several of the identified sites/areas have the potential for amenity effects on nearby residents and to add to existing or predicted future congestion. Mitigation is recommended for individual sites and in general terms affects on amenity, including from traffic, will be avoided or minimised through policy 12 on general considerations. Policy 12 specifically requires minimisation or avoidance of effects on congestion.
Economic Development													
To promote sustainable economic development	Ø	+	+	+	+	+	+	Ø	Ø	Ø	Ø	+	Enabling waste-related development in the sub-region will support the waste sector in establishing new economic activity in the sub-region in more sustainable methods of managing waste.
To promote social and community enterprises	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Promoting social and community enterprises is largely outside the scope of the JWCS.
To promote local innovation	Ø	+	0	0	+	+	0	0	0	Ø	Ø	+	Developments are likely to help promote the adoption of new technologies in waste management and to bring new investment in skills, enterprise and innovation.
Climate Change													
To increase energy efficiency	+	Ø	Ø	Ø	+	+	+	0	0	Ø	0	Ø	Energy recovery is supported as an element of the waste hierarchy and CHP is promoted. Sites within the JWCS offer a high potential for use of CHP.
To increase	Ø	Ø	Ø	Ø	Ø	?	Ø	+	+	Ø	Ø	Ø	The JWCS supports renewable energy generation

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
renewable energy use													where practicable, through the capture and use of methane for energy generation and by requiring energy recovery from residual treatment which may qualify as renewable depending on the technology used.
To reduce greenhouse gas emissions	+	+	+	?	+	+	+	+	+	Ø	+	Ø	Waste minimisation and promotion of reuse, recycling and recovery, including energy recovery, will help to reduce emissions of greenhouse gases through greater resource efficiency, reduced landfill emissions and managing waste within the sub-region. The spatial strategy for residual sites minimises waste transport emissions by treating waste close to the source of arisings. Development control policy requires minimisation of greenhouse gas emissions.
To reduce the effects of climate change on development and vice versa	0	Ø	Ø	Ø	+	Ø	?	+	+	+	+	Ø	Many of the identified sites/areas are within areas of flood risk. Mitigation is recommended for individual sites in order to avoid or minimise the risks. In addition, development control policy requires the risk of flooding to be taken into account and minimised or avoided, and for development to be adaptable to climate change.
Development & Planning													
To promote community responsibility for waste	+	+	+	+	+	Ø	+	Ø	Ø	Ø	Ø	Ø	By enabling the development of waste management, the policy will require the West of England to take greater responsibility for the waste it generates. The policy directly seeks to raise awareness among the public to take responsibility for individual behaviour.
To minimise flood risk	Ø	Ø	Ø	Ø	0	Ø	?	Ø	?	+	+	Ø	Many of the identified sites/areas are within areas of flood risk. Mitigation is recommended for individual sites in order to avoid or minimise the risks. In addition, development control policy requires the risk of flooding to be taken into account and minimised or avoided, and sustainable drainage is

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
													promoted.
Inequality/Access													
To ensure access to services	+	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Access to services is largely outside the scope of the JWCS, however the JWCS does promote provision of recycling facilities as part of new developments.
To support provision of rural services	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Access to services is largely outside the scope of the JWCS.
Sustainable Communities													
To promote public awareness, information and participation	+	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	The JWCS directly seeks to encourage the public to adopt more sustainable behaviour.
To promote rural enterprise	Ø	+	+	+	0	Ø	+	Ø	Ø	Ø	Ø	Ø	The JWCS will help to support rural enterprise by promoting some types of waste facility in rural areas where appropriate. However, this is unlikely to make a significant contribution to the strength of rural economies.
To reduce fly-tipping	Ø	Ø	Ø	Ø	Ø	Ø	0	Ø	Ø	Ø	Ø	Ø	
To take account of the impact of development on communities	Ø	?	0	0	?	Ø	?	Ø	0	Ø	+	+	Some of the identified sites are near to residential areas and have the potential for impacts on communities. Mitigation is recommended for individual sites in order to avoid or minimise the risks. In addition, development control policy requires the risk of impacts on residential amenity to be taken into account and minimised or avoided.
Biodiversity & Landscapes													
To conserve and enhance biodiversity	0	Ø	+	+	?/-	Ø	?	+	0	+	+	+	Waste operations have potential for affecting biodiversity through construction and operation of facilities, and all but one of the identified sites are near to, within or contain designated nature

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
													conservation areas. Mitigation is recommended for individual sites, and further protection is provided for biodiversity in development control policies. The significance of any impacts will depend on standards of design, construction and operation, and on more detailed assessment when more information is available on the specific nature and scale of developments proposed. Policy 12 requires minimisation or avoidance of adverse effects on biodiversity. However, for some sites it is possible that biodiversity value will be lost.
To protect landscape	0	Ø	Ø	+	?	Ø	?	+	0	+	+	+	Development of facilities has potential for effects on landscape, and some identified sites are near to designated landscapes. The significance of effects depends on the exact nature of any development, and mitigation is recommended for individual sites. Further protection for landscape and visual impacts is provided by policy 12.
To promote good design	+	Ø	Ø	Ø	0	Ø	?	+	0	Ø	+/0	Ø	The JWCS requires a high standard of design and to minimise visual impacts. Sustainable construction is promoted.
To conserve and enhance geodiversity	+	Ø	Ø	+	?	Ø	?	Ø	0	+	Ø	+	Locations designated for their geodiversity are protected in development control policy, although one of the identified sites contains a designation and therefore development has potential for adverse impacts or may provide opportunities for enhancement.
Transport													
To reduce the impact of transport	+	+	+	?	+/-	Ø	+/?	Ø	Ø	Ø	+	+	By enabling the development of facilities within the West of England, the JWCS will help to promote the management of waste close to the source of arisings. Waste transport will also be minimised by co-locating with other waste operations, and by promoting development within any adopted urban extensions. The spatial strategy minimises waste transport

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
													distances and is specifically designed to be near to the sources of arisings. This will help to reduce the risk of adding to congestion and help to deliver savings in carbon and other emissions. However, all of the identified sites have the potential to increase congestion through development. The scale of the effects will vary with the size of the facilities, and will also be dependent on the catchment area for the waste, the location and use of transfer stations and the routing of the vehicles. However, the vehicle movements which will be generated will not be additional to current levels as waste generated in the sub-region is already largely transported on the sub-region's roads. Mitigation is recommended for individual sites, and policy 12 on general considerations requires avoidance or minimisation of transport impacts including effects on congestion.
To reduce the need to travel by car	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Car travel is largely outside the scope of the JWCS
To promote alternatives to road transport	Ø	0	0	0	+	Ø	-/?	Ø	Ø	Ø	+	+	Avoiding the export of waste for disposal by facilitating the development of sub-regional facilities is likely to result in the loss of a rail-linked landfill site. It is not known whether any new landfill sites will be rail-linked, although this is promoted by development control policy for all types of site.
Natural Resources & Waste													
To promote sustainable use of water resources	0/+	Ø	Ø	Ø	?	Ø	0	Ø	Ø	Ø	+	Ø	Waste treatment sites will require water resources, although levels of consumption are unknown at this stage and there is no evidence of any constraints at particular sites. Policy 12 requires efficient water management within facilities.
To protect and improve water	+	Ø	Ø	Ø	0	Ø	?	+	+	+	+	Ø	By enabling development of wastewater treatment facilities and requiring long-term aftercare of landfill

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
quality													sites, the JWCS will help to protect and improve water quality.
To protect and improve air quality	+	0	0	0	?	Ø	+	+	0	Ø	+	Ø	Development control policy requires avoidance or minimisation of atmospheric pollution. However, one of the identified sites is within an area of predicted future poor air quality. Adverse cumulative effects on air quality are therefore possible, from emissions from the site and from vehicles accessing the site as well as emissions from other activities and traffic in the area. However, the likelihood and significance of effects depend on the nature and scale of any proposed development and is therefore uncertain.
To reduce the inefficient use of resources	+	+	+	+	+	+	+	+	+	Ø	0	Ø	The JWCS gives a strong emphasis on increasing resource efficiency, through implementation of the waste hierarchy which is a theme running through most policies where relevant. Sustainable construction in waste development is promoted.
To conserve and improve land and soil quality	0	+	+	+	+	Ø	+	+	Ø	+	+	+	The JWCS explicitly seeks to ensure landfill/landraise facilitates the improvement of land quality including damaged and disturbed land and to protect the best quality agricultural land.
To make good use of previously developed land and buildings and minimise greenfield development	Ø	+	+	+	+/-	Ø	+	Ø	?	Ø	0	+	By encouraging development of facilities on previously developed land, the JWCS is likely to help reduce the pressure for greenfield development and bring vacant and underused previously developed land back into beneficial use.
To optimise use of urban land	Ø	+	0	0	+	Ø	0	Ø	+	Ø	0	+	By promoting development of facilities within any adopted urban extensions, the policies will help to promote development on urban land, albeit newly urbanised, and to concentrate facilities in urban

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
													areas.
To promote the waste hierarchy	+	+	+	+	+	+	+	+	+	Ø	Ø	Ø	The JWCS gives a strong emphasis on moving waste management up the waste hierarchy, which is a theme running through all policies where relevant.
To improve the management of hazardous waste	+	Ø	Ø	Ø	?	-	Ø	Ø	Ø	Ø	Ø	Ø	By facilitating energy recovery, the policies may increase the generation of hazardous waste if thermal treatment facilities are developed. However, the JWCS does not specify treatment methods to be employed and therefore it is outside its scope to affect the generation of hazardous waste, except through promotion of waste audits.
Business and Work													
To increase employment opportunities	Ø	+	+	+	+	Ø	+	Ø	Ø	Ø	Ø	Ø	By enabling the development of facilities, the JWCS will help to provide new employment opportunities, although these are unlikely to be significant for the sub-regional labour force as a whole.
To improve local authority waste management and procurement practice	+	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	The JWCS explicitly commits to more sustainable procurement by local authorities to prevent the generation of waste, and will help to promote more sustainable waste management by local authorities more broadly through the commitment to lead by example in waste prevention.
Culture & Heritage													
To protect the built and historic environment	0	Ø	Ø	Ø	?	Ø	?	Ø	0	+	+	?	Developing new waste facilities in the West of England may create additional pressure on the built and historic environment, and two of the identified sites/areas have particular sensitivities. Development control policy requires minimisation or avoidance of impacts on historic assets.
To protect high quality or valued open	Ø	+	+	+	-	Ø	?	?	0	+	+	?	The JWCS gives protection to open spaces, and landfill restoration policy may also indirectly help to promote opportunities for recreational benefits. Two

Policies / SA Objectives	1	2	3	4	5	6	8	9	10	11	12	13	Comments
spaces													of the identified sites/areas are likely to result in loss of open space although compensation is required.
To protect green belt	Ø	0	0	0	-	Ø	+	Ø	0	+	Ø	0	The JWCS requires protection of the green belt except in very special circumstances.

Note: it was not possible to give a meaningful individual appraisal for policy 7, as this states that development is required to be in accordance with relevant other policies of the JWCS, and therefore the likely effects of policy 7 are as for the other policies.

9 OVERALL APPRAISAL FINDINGS

9.1 INTRODUCTION

This section sets out an assessment of the likely effects of implementing the JWCS as a whole, drawing together the appraisals of its different elements as set out in the preceding sections of this report.

9.2 PROCESS AND FINDINGS

The results of the assessment of the individual policies have been drawn together to make an assessment of the overall effects of the JWCS as a whole, in light of the appraisal of the strategic objectives for the JWCS (see *Section 6*), the appraisal of the individual sites which are identified (*Annex F*) and the appraisal of the spatial strategy (see *Section 7*). *Table 9.1* sets out the results of this synthesis, and draws conclusions about the overall effect of the JWCS taken as a whole.

Table 9.1 Summary of Overall Appraisal of JWCS

Objectives	Assessment	Comments
Health & Well-being		
To protect human health	+	The JWCS gives protection to human health where required.
To protect amenity	+	Effects on amenity, including from congestion, will be avoided or minimised. However, several of the identified sites/areas have the potential for amenity effects on nearby residents and to add to existing or predicted future congestion. Mitigation is recommended for individual sites.
Economic Development		
To promote sustainable economic development	+	Enabling waste-related development in the sub-region will support the waste sector in establishing new economic activity in the sub-region in more sustainable methods of managing waste.
To promote social and community enterprises	Ø	Promoting social and community enterprises is largely outside the scope of the JWCS.
To promote local innovation	+	The JWCS is likely to help promote the adoption of new technologies in waste management and to bring new investment in skills, enterprise and innovation.
Climate Change		
To increase energy efficiency	+	Energy recovery and use of CHP are promoted, and identified sites within the JWCS offer a high potential for use of CHP.
To increase renewable energy use	+	The JWCS supports renewable energy generation where practicable, through the capture and use of methane for energy generation and by requiring energy recovery from residual treatment which may qualify as renewable.

Objectives	Assessment	Comments
To reduce greenhouse gas emissions	+	Implementation of the waste hierarchy will help to reduce emissions of greenhouse gases through greater resource efficiency, reduced landfill emissions and managing waste more locally. The spatial strategy for residual waste management sites minimises waste transport emissions by treating waste close to the source of arisings. The JWCS explicitly requires minimisation of greenhouse gas emissions.
To reduce the effects of climate change on development and vice versa	+	The JWCS requires the risk of flooding to be taken into account and minimised or avoided, and for development to be adaptable to climate change.
Development & Planning		
To promote community responsibility for waste	+	By enabling the development of waste management, the JWCS will allow the West of England to take greater responsibility for the waste it generates.
To minimise flood risk	+	Although many of the identified sites/areas are within areas of flood risk, mitigation is recommended to address potential effects. In addition, the JWCS requires the risk of flooding to be minimised or avoided, and sustainable drainage is promoted.
Inequality/Access		
To ensure access to services	+	Access to services is largely outside the scope of the JWCS, however the JWCS does promote provision of recycling facilities as part of new developments.
To support provision of rural services	Ø	Access to services is largely outside the scope of the JWCS.
Sustainable Communities		
To promote public awareness, information and participation	+	The JWCS directly seeks to encourage the public to adopt more sustainable behaviour.
To promote rural enterprise	+	The JWCS will help to support rural enterprise by promoting some types of waste facility in rural areas where appropriate. However, this is unlikely to make a significant contribution to the strength of rural economies.
To reduce fly-tipping	0	JWCS does not address the issue of fly-tipping and its effects are uncertain.
To take account of the impact of development on communities	+	The JWCS requires the risk of impacts on residential amenity to be taken into account and minimised or avoided. Some of the identified sites are near to residential areas and have the potential for impacts on communities, and mitigation is recommended for individual sites in order to avoid or minimise the risks.
Biodiversity & Landscapes		
To conserve and enhance biodiversity	?	Waste operations have potential for affecting biodiversity through construction and operation of facilities, although the significance of any impacts will depend on standards of design, construction and operation. All but one of the

Objectives	Assessment	Comments
		identified sites are near to, within or contain designated nature conservation areas and have the potential for adverse effects. Although these are required by the JWCS to be minimised or avoided, it is possible for some sites that value will be lost.
To protect landscape	?/+	Development of facilities has potential for effects on landscape, although the significance of effects depends on the exact nature of any development. Some of the identified sites are near to designated landscapes or contain designated features, although effects are required to be minimised or avoided.
To promote good design	+	The JWCS requires a high standard of design and to minimise visual impacts. Sustainable construction is promoted.
To conserve and enhance geodiversity	+/?	Locations designated for their geodiversity are protected in development control policy. Although one of the identified sites has potential for adverse impacts, development may also provide opportunities for enhancement.
Transport		
To reduce the impact of transport	+	By enabling the development of facilities, the JWCS will help to promote the management of waste close to the source of arisings. Waste transport will also be minimised by co-locating with other waste operations, and by promoting development within any adopted urban extensions. The spatial strategy minimises waste transport distances and is specifically designed to be near to the sources of arisings. However, all of the identified sites have the potential to increase congestion through development. The scale of the effects will vary with a number of factors which are currently uncertain and therefore their significance is unknown at this stage. The JWCS requires avoidance or minimisation of transport impacts including effects on congestion.
To reduce the need to travel by car	Ø	Car travel is largely outside the scope of the JWCS
To promote alternatives to road transport	+	Alternatives to road transport are actively promoted by the JWCS, and some of the identified sites offer potential opportunities for rail use.
Natural Resources & Waste		
To promote sustainable use of water resources	+	The JWCS requires efficient water management within facilities, and there is no evidence of any constraints at particular sites.
To protect and improve water quality	+	By enabling development of wastewater treatment facilities and requiring long-term aftercare of landfill sites, the JWCS will help to protect and improve water quality.
To protect and improve air quality	?/+	Adverse cumulative effects on local air quality are possible from emissions from facilities and from vehicles, although the likelihood and significance of effects depend on the nature and scale of any proposed development. However, the JWCS requires avoidance or minimisation of atmospheric pollution.
To reduce the inefficient use of resources	+	The JWCS has a strong emphasis on increasing resource efficiency, through implementation of the waste hierarchy. In addition, sustainable construction in waste developments and other developments is promoted which will help to reduce resource use.

Objectives	Assessment	Comments
To conserve and improve land and soil quality	+	The JWCS explicitly seeks to ensure landfill/landraise facilitates the improvement of land quality including damaged and disturbed land and to protect the best quality agricultural land.
To make good use of previously developed land and buildings and minimise greenfield development	+	By encouraging development of facilities on previously developed land, the JWCS is likely to help reduce the pressure for greenfield development and bring vacant and underused previously developed land back into beneficial use. Use of previously developed land is also a priority in the JWCS strategic objectives.
To optimise use of urban land	+	By promoting development of facilities within any adopted urban extensions, the JWCS will help to concentrate facilities in urban areas. The JWCS encourages facilities more generally to be in or near to urban areas through its strategic objectives.
To promote the waste hierarchy	+	The JWCS emphasises moving waste management up the waste hierarchy, which is a theme running through all policies where relevant.
To improve the management of hazardous waste	+	The JWCS does not specify treatment methods to be employed and therefore it is outside its scope to affect the generation of hazardous waste, except through promotion of waste audits.
Business and Work		
To increase employment opportunities	+	By enabling the development of facilities, the JWCS will help to provide new employment opportunities although these are unlikely to be significant for the sub-regional labour force as a whole.
To improve local authority waste management and procurement practice	+	The JWCS explicitly commits to more sustainable procurement by local authorities to prevent the generation of waste, and will help to promote more sustainable waste management by local authorities more broadly through the commitment to lead by example in waste prevention.
Culture & Heritage		
To protect the built and historic environment	?/+	Two of the identified sites/areas have potential to affect historic assets although development management policy requires minimisation or avoidance of impacts.
To protect high quality or valued open spaces	+/-	The JWCS gives protection to open spaces and safeguarding sites will help to reduce the likelihood of future loss to waste development. Two of the identified sites/areas are likely to result in loss of open space although the JWCS requires this to be compensated for.
To protect green belt	+	The JWCS requires protection of the green belt except in very special circumstances.

9.3 CONCLUSIONS

The JWCS places a strong emphasis on moving waste management up the waste hierarchy. This will help to reduce emissions of greenhouse gases through greater resource efficiency and reduced landfill emissions. Energy recovery is supported as an element of the waste hierarchy and combined heat and power (CHP) is encouraged, while sites identified in the JWCS offer a high potential for the use of CHP. The JWCS explicitly requires waste facilities to minimise greenhouse gas emissions.

By enabling waste-related development in the sub-region, the JWCS will ensure the West of England takes greater responsibility for the waste it generates, and will support economic activity in the sub-region in more sustainable and innovative methods of managing waste.

The spatial strategy minimises waste transport distances and is specifically designed to site waste management facilities near to the sources of arisings. Waste transport will also be minimised by co-locating waste treatment facilities with other waste operations, and by promoting development within any adopted urban extensions. This will help to reduce the risk of adding to congestion and help to deliver savings in carbon and other emissions. However, all of the identified sites have the potential to adversely affect congestion through development although the likely impact is unclear. Mitigation is recommended for individual sites, and development management policy requires that effects on congestion are specifically addressed. The use of rail and water to transport waste is promoted.

By enabling development of wastewater treatment facilities and requiring long-term aftercare of landfill sites, the JWCS will help to protect and to improve water quality. It specifically seeks to improve land quality and to protect the best agricultural land. Adverse cumulative effects on air quality are possible, however the likelihood and significance of these effects depend on the nature and scale of any proposed development. The overall likely impact on air quality is therefore uncertain, although development management policy requires avoidance or minimisation of atmospheric pollution.

Waste operations have the potential for affecting biodiversity through construction and operation of facilities, and all but one of the identified sites are near to or contain designated nature conservation areas. Mitigation is recommended for individual sites, and further protection is provided for biodiversity in development management policies.

By encouraging development of facilities on previously developed land in both policies and strategic objectives, the JWCS is likely to help reduce the pressure for greenfield development and bring vacant and underused previously developed land back into beneficial use.

By promoting development of facilities within any adopted urban extensions, the JWCS will help to promote development on urban land, albeit newly urbanised, and to concentrate some facilities in urban areas. In addition, the JWCS has a strategic objective to give preference to previously developed land.

Some of the identified sites are near to residential areas and have the potential for impacts on communities. However, mitigation is recommended for individual sites in order to avoid or minimise the risks, and development management policy requires the risk of impacts on residential amenity to be taken into account and minimised or avoided.

The JWCS aims to promote sustainable construction methods in both waste and non-waste development, although this is not given much prominence and is only included as part of the policy on waste prevention. In order to ensure a sufficiently broad scope for sustainable construction and its benefits, this could be included in the section on development management.

Many of the identified sites/areas are within areas of flood risk. Mitigation is recommended for individual sites in order to avoid or to minimise the risks. In addition, development control policy requires the risk of flooding to be taken into account and minimised or avoided, and for development to be adaptable to climate change.

It is outside the scope of the JWCS to affect the generation of hazardous waste, although it promotes reduction and better management through the use of waste audits.

9.4 CUMULATIVE IMPACT ASSESSMENT

The SEA Directive requires assessment of an additional level of impacts in addition to straightforward direct impacts. These are specified as "secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative". The following approach has been taken to identifying such impacts.

A number of different types of impact are set out in European Commission guidance:

- separate developments causing the same impact – cumulative;
- different impacts acting together on a receptor eg air pollution and land take – cumulative;
- plan impacts which give rise to other indirect impacts – secondary; and
- different impacts which together give rise to yet another impact – cumulative and secondary;

There is therefore a need to consider both secondary and cumulative impacts in the appraisal. Secondary impacts were considered as an integral part of the

main appraisal work, and this is indicated in the appraisal matrices in *Annexes E, F* and *G* where impacts are either direct, or indirect ie secondary. Certain other attributes are common to all types of impact: these are timescales (ie short, medium and long-term impacts), reversibility (ie permanent or temporary impacts) and whether the impacts are positive or negative. These attributes were also all considered as integral aspects of impact assessment, and this is similarly indicated in the appraisal matrices in *Annexes E, F* and *G*. Cumulative impacts are discussed in this section of the SA Report.

There are two types of situation which could give rise to cumulative impacts:

- the same effect arising from two or more different sources; and
- different effects where there is a relationship between the effects and potentially an interaction.

Synergistic effects are a type of cumulative impact. These are effects where the cumulative impact may be greater or smaller than the sum of the separate effects.

Cumulative impacts were considered in the appraisal in two ways:

- the potential for different developments to give rise to the same type of effect; and
- the potential for interaction between different types of effect.

In order to assess the cumulative impacts arising from all potential developments under the JWCS, the appraisal considered the overall effect of the JWCS as a whole on each of the SA objectives. The results of this are set out above in *Table 9.1* and *Section 9.3*.

The appraisal then considered the potential for effects arising from other plans and programmes which in combination with effects arising from the JWCS may give rise to significant impacts. The results of the review of other plans and programmes and their potential to give rise to cumulative effects is set out in detail in *Annex H*. The findings are summarised below in *Table 9.2.* and the conclusions are set out in *Section 9.4.1*.

Table 9.2 Summary of Likely Significant Effects of JWCS and Other Plans and Programmes on Receptors

	Resource use (energy, water, minerals)	Waste generation	Climate change	Road networks	Alternatives to road	Flooding	Land use	Air quality	Ecosystems	Open space	Built and historic	Opportunities for CHP
JWCS	+	+	+	+	+	+	+	?/+	?	+/-	?/+	+
The Draft Regional Spatial Strategy for the South West: Proposed Changes	-	-	-	-	+	+(?)	-/+	-/+		?		
Regional Economic Strategy	-/+	-	-	-/+	+			-/+				+
South Gloucestershire Local Plan	-	-	-	-/+	+		-	-/+		?		
Bath & North East Somerset Local Plan	-	-	-	-	?		-	-				
North Somerset Replacement Local Plan	-	-	-	-	?	+		-				+
Weston Area Action Plan Preferred Options	-/+	-	-	?		?	-	?	?	-	?	+
Bristol Local Plan	-	-	-	-/+	+		-	-/+				+
Bristol LDF Core Strategy Preferred Options	-	-	-	-/+			-					+
Gloucestershire Waste Local Plan				?								
Gloucestershire Waste Core Strategy Preferred Options				?								
Wiltshire and Swindon Waste Local Plan				?				?				
Wiltshire and Swindon Waste Core Strategy DPD				?					?			
Somerset Waste Local Plan				?								
West of England Joint Local Transport Plan				+/-	+			+/-				
West of England Congestion Delivery Plan				+/-	+							
Regional Economic Strategy	-/+	-/+	-	-/+	+							+
Project Gwyrdd									?			

9.4.1 Conclusions of Cumulative Impact Assessment

The following receptors have been identified as the most likely to be subject to cumulative effects. It should be noted that these receptors and their effects are all interrelated, for example effects on ecosystems are strongly related to air and water quality and land use, and effects on transport networks give rise to climate change and air quality effects. However, they have been selected on the basis that they are areas where the JWCS is likely to have the impacts of greatest significance. Furthermore, all of the receptors have effects on and consequences for people.

- ***Resource use***. Several plans and strategies relevant to the West of England place a strong emphasis on economic and housing growth. This is likely to lead to increased resource use including energy, water and minerals, in order to facilitate the planned growth and development. However, the JWCS will help to reduce the pressure on resource use through its positive effects on minimisation and recycling of waste and energy recovery, although the extent to which this will be able to offset the pressures of growth are not clear.
  Mitigation: It is recommended that the Partnership improves the evidence base for future waste arisings, by undertaking regular surveys of expected developments and collecting any available information on C&I and C&D waste arisings.

- ***Waste generation***. As with resource use, the growth and development emphasised in the West of England is highly likely to lead to increased waste generation. The JWCS includes measures to reduce waste generation in new development, although this is not likely to reduce significantly the effects of other plans and programmes.
  Mitigation: The Partnership should press for continuous improvement in waste minimisation measures in the sub-region, particularly through the Joint Residual Municipal Waste Management Strategy, and for a strong emphasis on resource efficiency in all relevant plans and strategies including at regional level.

- ***Climate change***. The strong emphasis in other plans and programmes on housing and economic growth is likely to lead to increased greenhouse gas emissions and pressure for land for new development. Both of these effects are likely to have climate change consequences by increasing the risk of climate change occurring and adding to pressures from impacts such as flood risk and increased surface run-off due to land take. Although the JWCS will help to reduce the emissions from waste management activities, it will not be able to offset all of the emissions arising from sub-regional growth. However, the JWCS promotes adaptation in new development, and although it is likely to add to land pressures through the need to seek new sites in areas with flood risk constraints, the Strategic Flood Risk Assessment concludes that developments can be accommodated with appropriate flood risk mitigation.

Mitigation: As for site-specific recommendations.

- ***Transport networks.*** The planned housing and economic growth in the sub-region are likely to lead to increased road travel. A number of measures are planned to tackle the predicted increase, including demand management, promotion of public transport, support for rail and water freight and highways improvements. This will help to reduce the demand for road space and alleviate congestion, although the number of vehicles on the roads is nevertheless likely to increase. The JWCS is likely to reduce the need for waste transport, so making a positive contribution in the face of increasing road transport. It also seeks to capitalise on opportunities arising for rail and water transport, and there is likely to be synergy with other plans in this respect. The effect of waste development on local congestion is less clear, particularly in the medium and longer term when the effects of planned improvements are likely to take effect but are unknown at this stage. However, the JWCS requires assessment and avoidance or mitigation of effects on congestion prior to planning approval.
  Mitigation: None.

- ***Flooding.*** There are plans in place to improve flood risk in some parts of the sub-region, and this may reduce or remove flood risk constraints at some of the identified sites.
  Mitigation: As above under climate change.

- ***Land use.*** A number of plans and programmes relevant to the sub-region support housing growth and economic development. This is likely to lead to increased pressure for available sites with which waste developments will have to compete. The emphasis for waste development is on the use of previously developed land, but some greenfield sites are also likely to be lost to development. However, opportunities are expected to arise for waste developments with the release of land for urban extensions.
  Mitigation: None.

- ***Air quality.*** The main significant effects on air quality in the sub-region are likely to arise from the increase in road traffic expected under a number of other plans and programmes (see above under transport networks). Measures to improve congestion may help to reduce the effect of increasing traffic on emissions, although the overall effect on emissions and air quality into the medium and longer term is uncertain. The effect of the JWCS on air quality is also uncertain, mainly due to the uncertainty about likely emissions from developments but also possible effects on local congestion, and therefore these issues need to be assessed in detail when developments come forward and appropriate avoidance or mitigation incorporated. Policy in the JWCS already requires this.
  Mitigation: As for site-specific recommendations.

- ***Open space.*** Urban extensions which are planned for in other strategies are likely to lead to a loss of open space which may be of value. The JWCS also

risks losing open space of value at some of the identified sites, although this is required to be taken into account by developers and who are required to compensate for any loss.
Mitigation: None.

- ***Built and historic environment.*** No effects on the built and historic environment have been identified in other plans and programmes, although there is potential for adverse effects at two sites identified in the JWCS.
Mitigation: As for site-specific recommendations.

9.4.2 Cumulative Effects from Sites In Combination

In assessing cumulative effects, consideration has been given to the potential for cumulative effects to arise from the development of waste sites in combination with others. It is possible that if waste sites are developed sufficiently near to others, then cumulative effects can arise.

A number of sites have the potential to give rise to cumulative effects in combination with existing waste management facilities and other nearby operations. However, it is not expected that sites identified in the JWCS for development will give rise to cumulative effects in combination with other identified sites, as the spatial strategy requires only one site within each broad area to deliver the spatial strategy. Therefore the identified sites are unlikely to be sufficiently near to each other to create cumulative effects. However, it is possible that capacity within Avonmouth might be split over two sites (spatial option C2) and therefore the possibility of cumulative effects from development of more than one site in the Avonmouth area has been considered.

The potential for constraints arising from nearby existing waste facilities is identified in *Annex D*, while the potential cumulative effects arising from both existing and proposed waste sites are identified in *Annex F* in the appraisal of sites. Mitigation of cumulative effects is recommended in *Annex F*. Key effects could arise in relation to flood risk, congestion and biodiversity, but there is also potential for cumulative effects on air and water quality. These will be required to be taken into account in Environmental Impact Assessments in support of planning applications.

9.5 SUMMARY OF RECOMMENDED MITIGATION

This section sets out the mitigation which is recommended for the JWCS as a result of the findings and conclusions of the SA.

Because of the high priority given by the Partnership to an iterative and integrated process for the SA, almost all of the mitigation recommendations made throughout the process have already been taken on board and incorporated within the text of the JWCS. The following recommendations

address some residual issues which could be considered in any future amendments to the JWCS.

Amendments to Policy

One recommendation is made for amendments to policy to improve clarity. Sustainable design and construction is promoted in policy 1 on waste prevention. However, the issues for waste development are much broader than waste prevention, for example incorporating issues of energy and water efficiency. To ensure greater clarity and sufficient emphasis on these other aspects of sustainable design and construction, this policy requirement should be incorporated into policy 12.

Mitigation of Site-Specific Impacts

Annex F identifies potential effects arising from development at the specific sites or strategic areas listed in policy 5. It also makes a series of recommendations for mitigation of these effects which should be taken into account in developing the sites. Some of these recommendations are reflected in the Key Development Criteria for individual sites set out in the JWCS, although others are not. Without this mitigation, the potential for adverse effects from development of the sites which is identified in *Annex F* will be increased.

Mitigation of Effects Outside Scope of JWCS in Relation to Cumulative Effects

It is recommended that the Partnership improves the evidence base on future waste arisings, particularly taking into account expected levels of growth and development in sub-region and where possible improving data on C&I and C&D waste arisings.

The Partnership authorities should press for continuous improvement in waste minimisation measures in the sub-region, particularly through the Joint Residual Municipal Waste Management Strategy, and for a strong emphasis on resource efficiency in all relevant plans and strategies including those at regional level.

9.6 UNCERTAINTIES AND RISKS

The following are key areas where the likely impacts of the JWCS are uncertain.

Air Quality

The main impacts arise from emissions from waste facilities and from transport, although the effects of transport will be small in comparison to the facilities themselves. Although air quality must be considered in development proposals, two of the identified sites have potential air quality constraints.

The likely effect of developments on air quality is strongly dependent on the type and nature of developments which come forward and any mitigation proposed and is therefore unknown at this stage, but negative effects are possible.

Waste Transport

The location of facilities will have a strong influence over waste transport distances, as will the methods by which waste is managed. The overall balance of impacts on transport over time is unclear, particularly as the future locations of recycling, composting and landfill facilities are unknown. Monitoring is needed to better understand the amount of transport required for managing waste in the West of England and the scale of its contribution to levels of traffic overall.

All of the identified sites have the potential to add to local congestion, and there is a wider problem of congestion more generally in the greater Bristol area. The SA has drawn on available information on traffic levels (1) and congestion (2) in the area to assess the likely existing and future constraints to development at the identified sites in the JWCS from congestion along the main routes likely to be used, and to assess the potential contribution of any development to vehicle flows. However, the actual routes to be used to transport waste are not known, partly because waste may or may not be transported via transfer stations, and partly because vehicle routing strategies may be implemented for sites. Furthermore, waste which is generated in the sub-region is already largely transported by road, and therefore the vehicle movements associated with new development are not additional but will mostly replace existing waste vehicle movements. In addition, it is difficult to predict impacts particularly in the medium and longer term when the effects of planned improvements in other plans and strategies are likely to take effect but are as yet unknown. It is therefore not possible to make any reliable assessment of the effects of development on congestion. This is required to be undertaken at planning application stage.

Economic Impact (Costs)

There are cost implications arising from implementation of the JWCS. However it has not been possible to assess the likely overall economic impacts of the implementation of the JWCS as the detail which is necessary to make a meaningful assessment is not available in many instances. These include, for example, exactly what type of facilities are developed, how they are financed, gate fees, transport costs and markets for process outputs such as recyclables and energy.

(1) DfT online data on traffic flows for major roads at http://www.dft.gov.uk/matrix/MapXtreme/NewMap.htm
(2) Greater Bristol Strategic Transport Study Final Report, WS Atkins, June 2006

Greenhouse Gas Emissions

In order to estimate levels of greenhouse gas emissions, it is necessary to know precise information about waste management methods, including waste treatment, and about likely waste transport distances. Estimates have been made based on assumptions about sources, destinations and tonnages of waste arising, and taking account of different possible treatment methods. However, precise information is not known about sources and destinations of waste (other than for residual treatment facilities) and capacities set out in the spatial strategy are only indicative. There is therefore not enough information available to make a reliable quantitative assessment of greenhouse gas emissions.

Biodiversity

The effect on biodiversity is strongly dependent on site-specific circumstances, and also on the nature of developments and opportunities for mitigation. In some cases there is insufficient information available about the nature of development and the likely effects on nature conservation value. In particular, although evidence is available about the likely effects on international nature conservation sites through the Habitats Regulations Assessment and on the potential for risks to other designated assets, it has not been possible to assess the effect on biodiversity more generally. Insufficient information is available about undesignated biodiversity, existing local air quality and about the likely effects of facilities and waste transport on air quality.

Water Resources

Likely levels of water consumption are unknown, and dependent on particular technologies and design of facilities. The Water Resource Managements Plans produced by the water companies indicate where and when future supply constraints are expected. In particular, Bristol Water's draft Plan (April 2008) indicates that an available water deficit could begin to emerge at or about 2015 and is potentially extremely large by 2035 without action being taken. Bristol Water has considered a number of options to ensure available supply, including demand management, leakage reduction and resource development. There is currently no evidence to indicate development at any of the specific sites could not go ahead, and all developments are required to incorporate water efficiency measures to promote water conservation.

10 IMPLEMENTATION

10.1 LINKS TO OTHER TIERS OF PLANS AND STRATEGIES AND THE PROJECT LEVEL

10.1.1 Other Plans and Programmes

The JWCS has links to other plans and strategies, at higher levels or at sub-regional level which set the overarching policy context. These have already been described in *Section 3.3*.

The JWCS also has links with plans at unitary authority (UA) level, notably those for waste collection arrangements. Implementation of the JWCS will be strongly dependent on the nature and performance of waste collection activities by the individual UAs to enable the JWCS to deliver on some of its objectives. This is particularly the case for achievement of recycling and composting performance and meeting the capacity targets for recycling and composting, recovery and landfill. The UAs need to work in partnership to ensure that plans and actions are coordinated to ensure that targets can be met in the most cost-efficient way.

10.1.2 Projects

The JWCS sets the framework for the development consent of projects. It will achieves this in part through development management policies which list a range of issues which developers will be required to take into account when submitting planning applications for waste management facilities.

In addition, the JWCS includes Key Development Criteria which are required to be taken into account by developers prior to submitting planning applications. These aim to address particular issues and sensitivities at the sites identified in the JWCS. The SA has made a number of detailed recommendations for issues to be addressed at each specific site, which could be incorporated into the Key Development Criteria. Further information on these recommendations is given in *Annex F*.

In addition, the monitoring recommendations presented below include data to be required from site operators on an annual basis to assess the ongoing impact of waste management facilities.

10.2 PROPOSALS FOR MONITORING

As required by the SEA Directive, a number of recommendations are made for indicators to monitor the likely significant impacts of the JWCS. These are set out in *Table 10.1* corresponding to the relevant impacts identified and summarised in *Section 9.2*.

One of the aims of monitoring as specified by the SEA Directive is to identify unforeseen adverse effects in order to be able to take appropriate remedial action. To enable this to be done, recommendations are also made in *Table 10.1* for monitoring potential sustainability impacts which are not expected to occur as foreseen by the appraisal.

An Annual Monitoring Report will be produced to monitor the implementation of the JWCS, and the recommendations below for monitoring should be incorporated within this. The West of England Partnership should report annually on the following issues and suggested indicators.

Table 10.1 Monitoring Recommendations

% of waste arisings reused, recycled, composted, used for energy recovery, landfilled (potential links to NI 192 and 193)
Tonnes of hazardous waste arisings
Capacity of waste-related energy generation from: • CHP; • Landfill; • Wastewater treatment.
Facility catchments and transport: • Sources and destinations of waste, by quantity and type; • Tonne-kilometres travelled by waste; • No. of vehicle movements to and from sites; • % of waste transported by different modes.
No. of developments with climate change mitigation and adaptation measures incorporated, by type of measure
Estimated greenhouse gas emissions from waste treatment facilities
Annual water consumption by facilities
No. of developments affecting: • biodiversity or land of nature conservation value; • landscape; • geodiversity; • congestion; • historic assets.
Compliance/non-compliance with permit conditions: • Water discharges; • Air emissions: NOx; SO_2; PM10; CO_2; methane; other pollutants of public concern (dioxins and furans, PCBs) (potential links to NI 194); • Pollution episodes.
Quality of land converted to waste uses, annual no. of hectares of: • rural, urban or urban fringe; • previously developed or undeveloped; • green belt; • amenity value.
No. of fly-tipping incidences (potential links to NI 196)
No. of complaints about waste facilities or waste vehicles
Local authority performance on minimisation, reuse and recycling
Annual expenditure on waste management, by type of activity

The indicators required to support the monitoring fall into four broad categories according to their likely source:

- data which is already collected by West of England authorities;
- data which the Partnership authorities will need to collect;
- data which is collected by the Environment Agency; and
- data which needs to be collected from operators.

10.2.1 Recommendations for Filling Gaps in Sustainability Baseline

In compiling the sustainability baseline, a number of gaps in readily available data were identified. Each of these gaps is referred to in the relevant sections in *Annex B*, which describes the baseline according to the different sustainability issues.

As a result of undertaking the SA, it has emerged that some of these gaps in data relate to issues which are not significant when viewed in terms of the likely impacts of the implementation of the JWCS. However, the SA has shown that several of the issues where there are data gaps could be significant, as follows:

- air quality;
- waste transport;
- costs of waste management activities;
- greenhouse gas emissions;
- biodiversity; and
- water resources.

A description of the issues arising from the lack of available data is given in *Section 9.6*. Recommendations are made in *Table 10.1* for collecting data as part of the monitoring regime to fill these gaps in available data.