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KENT COUNTY COUNCIL, SCOTT WILSON & LEVETT-THERIVEL

Sustainability Appraisal (SA) of Kent Joint Municipal Waste Management Strategy

FINAL SA REPORT – TECHNICAL APPENDIX 1

May 2006

Scott Wilson Business Consultancy
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Sustainability Appraisal (SA) of Kent Joint Municipal Waste Management Strategy

Final SA Report - Technical Appendix 1

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Collated and edited by:	Patrick Feehily Principal Strategy Officer / Steven Smith Scott Wilson Senior Consultant	
Reviewed by:	Riki Therivel Consultant	
Approved by:	Andrew McNab Scott Wilson Director	
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Scott Wilson Business Consultancy
Greencoat House
15 Francis Street
London
SW1P 1DH

Tel: +44 (0)20 7798 5200
Fax: +44 (0)20 7798 5201
Email: consultancy@scottwilson.com

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1 INTRODUCTION

1.1 This appendix

1.1.1 This Technical Appendix sets out the detailed findings of the Sustainability Appraisal (SA) of the strategic options for the Kent Joint Municipal Waste Management Strategy (JMWMS). This appendix should be read in conjunction with the Final SA Report for the JMWMS which is available on Kent County Council's website.

1.1.2 In developing the JMWMS, the Kent Waste Forum (KWF) generated a series of strategic options for dealing with the County's municipal waste. Options were generated at each level in the waste hierarchy – for reduction and re-use; recycling and composting; and energy recovery and disposal. The appraisal of these options is set out in Sections 2, 3 and 4, respectively. The options were appraised against the 12 sustainable development objectives in Table 1.

Table 1. ***SA objectives used to appraise the JMWMS***

Flood risk	
Objective 1	To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment
Air pollution and climate change	
Objective 2	To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Water quality and water resources	
Objective 3	To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management
Biodiversity	
Objective 4	To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity
Countryside and the historic environment	
Objective 5	To protect, enhance and make accessible for enjoyment, Kent's countryside and coast, and its historic environment
Efficient use of land and buildings	
Objective 6	To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings
Road traffic and sustainable transport	
Objective 7	To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car/lorry
Waste management	
Objective 8	To reduce waste generation and disposal, and achieve the sustainable management of waste
Energy efficiency and renewable energy	
Objective 9	To increase energy efficiency and the proportion of energy generated from renewable sources in Kent
Sustainable production and local products and services	
Objective 10	To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services
Health and well-being	
Objective 11	To improve the health and well-being of the population and reduce inequalities in health
Economy	
Objective 12	To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised

2 OPTIONS FOR WASTE REDUCTION AND RE-USE

Option 1	Do nothing (do not further advance the various waste prevention and re-use initiatives currently in place)
Option 2	Implement programmes that do not require any capital expenditure: • trade waste diversion; • re-usable nappies; • waste aware (SMART) shopping; and • unwanted mail.
Option 3	Implement programmes that divert more than 2.5% of MSW arisings: • home composting; • waste aware (SMART) shopping; and • re-use – unwanted goods
Option 4	Implement all programmes offered identified by the KWF – home composting, waste aware (SMART) shopping, unwanted mail, re-usable nappies, trade waste diversion, product service businesses, and re-use – unwanted goods.

Sustainability Appraisal objectives	Option 1 – Do nothing (do not further advance the various waste prevention and re-use initiatives currently in place)	Option 2 – Implement programmes that do not require any capital expenditure	Option 3 – Implement programmes that divert more than 2.5% of MSW arisings	Option 4– Implement all programmes offered in the assessment
1. To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment	Not considered relevant			
2. To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts	In general, reducing waste generation leads to a corresponding reduction in the transport impacts that are often significant in overall environmental impact terms. Transport impacts include impacts on local air quality (through emissions of NO_x and PM_{10}) and also impacts on climate change (transport is the fastest growing source of greenhouse gas emissions in the UK). On the basis of this, it can generally be assumed that implementing more waste prevention and reuse initiatives will lead to a reduction in transport impacts. However, this is difficult to quantify and there are a considerable number of caveats to apply, not least the fact that initiatives such as product service businesses obviously involve transporting goods. Generally speaking Option 4 would perform the best given that it has the most potential to reduce MSW arisings and therefore transport impacts. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to the objective			
3. To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management	Reducing MSW arisings and thus reducing the level of waste going to waste management facilities (e.g. landfill or incinerators) could have indirect benefits for water quality (since it could reduce the risk of pollution impacts associated with these facilities). This is based on the assumption that the absolute tonnage of waste to be dealt with is actually reduced and leads to a decline in the need for facilities. On the basis of this, Option 4 would perform the best with Option 3 and Option 2 the next best performers, respectively. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to the objective			

4.	To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity	Reducing MSW arisings and thus reducing the level of waste going to waste management facilities (e.g. landfill or incinerators) could have indirect benefits for biodiversity (since it could reduce the need for land take and the risk of pollution impacts associated with these facilities). This is based on the assumption that the absolute tonnage of waste to be dealt with is actually reduced and leads to a decline in the need for facilities. On the basis of this, Option 4 would perform the best with Option 3 and Option 2 the next best performers, respectively. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to objective
5.	To protect, enhance and make accessible for enjoyment, Kent's countryside and coast, and its historic environment	Reducing MSW arisings and thus reducing the level of waste going to waste management facilities (e.g. landfill or incinerators) could have indirect benefits for landscape and the historic environment (since it could reduce the need for land take and the amenity impacts associated with these facilities). This is based on the assumption that the absolute tonnage of waste to be dealt with is actually reduced and leads to a decline in the need for facilities. On the basis of this, Option 4 would perform the best with Option 3 and Option 2 the next best performers, respectively. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to objective
6.	To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings.	Not considered relevant

7.	To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry	In general, reducing waste generation leads to a corresponding reduction in the transport impacts that are often significant in overall environmental impact terms (through reducing the need to transport waste and residual waste to / from waste management facilities by road). Transport impacts include impacts on local air quality (through emissions of NO_x and PM_{10}) and also impacts on climate change (transport is the fastest growing source of greenhouse gas emissions in the UK). On the basis of this, it can generally be assumed that implementing more waste prevention and reuse initiatives will lead to a reduction in road traffic and transport impacts. However, this is difficult to quantify and there are a considerable number of caveats to apply, not least the fact that initiatives such as product service businesses obviously involve transporting goods (most likely by road). Generally speaking Option 4 would perform the best given that it has the most potential to reduce MSW arisings and therefore transport impacts with Option 3 and Option 2 the next best performers, respectively. It is unclear the extent to which certain initiatives such as reuse initiatives could be encouraged to utilise more sustainable modes of transport. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to objective
8.	To reduce waste generation and disposal, and achieve the sustainable management of waste	Reducing MSW arisings and thus reducing the level of waste being dealt with lower down the waste hierarchy (e.g. through landfill or incineration) would directly support the objective to reduce waste generation and disposal and would contribute to the sustainable management of Kent's waste. This is based on the assumption that the absolute tonnage of waste to be dealt with is actually reduced. On the basis of this, Option 4 would perform the best with Option 3 and Option 2 the next best performers, respectively. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to objective
9.	To increase energy efficiency and the proportion of energy generated from renewable sources in Kent	Not generally considered relevant. However, reducing MSW arisings could yield energy efficiency gains through reducing the need to transport waste for example. It should be noted that potentially reducing the level of waste for incineration would not levels of renewable energy provision since incineration is not classified as renewable.

10. To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services	Several of the initiatives to reduce MSW arisings potentially concentrate on using sustainably produced and local products and services. In particular, these include product services businesses and the reuse of unwanted goods (assuming the schemes operate on a local basis, e.g. public libraries and bottle return). Option 2, which does not include the reuse of unwanted goods would perform less well in respect of this objective. Aspects of SMART shopping could contribute to this objective, for example the purchase of local produce.
11. To improve the health and well-being of the population and reduce inequalities in health	Reducing MSW arisings and thus reducing the level of waste going to waste management facilities (e.g. landfill or incinerators) could have indirect benefits for health and wellbeing (since it could reduce the pollution and amenity impacts associated with these facilities). This is based on the assumption that the absolute tonnage of waste to be dealt with is actually reduced and leads to a decline in the need for facilities. On the basis of this, Option 4 would perform the best with Option 3 and Option 2 the next best performers, respectively. It should be noted that the uptake of waste prevention and reuse initiatives such as home composting and SMART shopping may be concentrated in certain socio-economic groups and the wellbeing benefits that could be derived (relating to community spirit etc.) would be similarly concentrated. There is a need to ensure that harder to reach groups are appropriately targeted. It should be noted that the difference between the performances of the options hinges on whether or not they actually lead to an overall *reduction* in municipal waste arisings. This 'tipping point' is the point at which an option is effective in reducing waste despite year-on-year increases in waste arisings.  Increasingly positive performance in relation to objective

12. To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised	Unclear links. Several of the initiatives to reduce MSW arisings clearly help to incentivise efficient resource use, for example reusable nappies, SMART shopping, and unwanted mail. Generally speaking, the initiatives do not promote the polluter pays principle and are unlikely to provide significant opportunities for learning and skills. However, generally speaking promoting these initiatives could strengthen Kent's 'green economy' although this is difficult to quantify.

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

Notes on options

In general, the options that promise the greatest reduction in municipal waste arisings – Options 3 and 4 – perform best in the appraisal. Through reducing waste and increasing its re-use, they have are likely to have positive implications for air quality, water quality, climate change, biodiversity, landscape and health. This is because Options 3 and 4 could lead to a reduction in municipal waste arisings such that there would be a corresponding reduction in the need for waste treatment facilities and the impacts associated with these.

Option 1 - Option 1 is the least compatible with sustainability principles since it essentially represents business-as-usual and will result in relatively little reduction in municipal waste arisings.

Option 2 - focuses on initiatives that do not require any capital expenditure (and relatively little action on the part of Kent's local authorities) and will result in comparatively less waste reduction than Options 3 and 4.

Option 3 – Results in greater reduction in waste than Options 1 and 2 and therefore scores well against the majority of the sustainability objectives. However, a key issue is the 'tipping point' at which actual reductions in waste become apparent – see below.

Option 4 – Generally the most sustainable option and the option most likely to achieve real reductions in waste arisings, particularly when considering the likely increases in waste arisings that will occur in Kent, particularly in the two growth areas (Ashford and Kent Thameside).

Conclusions

It is acknowledged that some scepticism exists as to the effectiveness of waste prevention and re-use schemes. Nevertheless, work done on behalf of the KWF indicates that reductions in municipal waste arisings can be made, particularly under Options 3 and 4. However, the KWF's background work indicates that any waste reduction achieved by 2019 / 20 is likely to be limited, particularly in light of planned housing growth for Kent. Achieving real reductions in waste arisings may require more radical measures such as charging households for every kilogram of waste produced, as recommended by the Policy Studies Institute[1].

In terms of mitigation, the design of new dwellings could include measures to encourage householders to prevent MSW arisings particularly through the standard incorporation of home composting facilities. Home composting could be particularly encouraged in the growth areas of Ashford and Kent Thameside where considerable housing development will take place in the future. Reference to home composting facilities is included in the Kent Design Guide - *"The provision of allotments and gardens that allow for the composting and growing of food produce should be encouraged"* (p. 81) – and this should be rigorously pursued by Kent's constituent authorities in granting permissions for new housing developments.

[1] Policy Studies Institute (2006). *A Green Living Initiative* available at: http://www.psi.org.uk/pdf/2006/GreenLivingInitiative.pdf

3 OPTIONS FOR RECYCLING AND COMPOSTING

Option A	Raise participation and capture rates of current recycling collections to 80%
Option B	Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.
Option C	Expand glass collections to all households.
Option D	Introduce compostable kitchen waste collections to all households.
Option E	Expand garden waste collections to all relevant households.
Option F	Expand the current cardboard collections to all households.
Option G	Collect dense and film plastics from 100% of households.
Option H	Collect tins and cans from 100% of households.
Option I	Add kitchen and cardboard to current garden waste collections.
Option J	Collect commingled plastics and tins and cans from 100% of households.
Option K	Increase recycling at bring sites by 15%.
Option L	Increase recycling at bring sites by 20%.
Option M	Expand the range of bring sites to include dense and film plastics.
Option N	Increase recycling at the Household Waste Recycling Centres (HWRCs) to 60%.
Option O	Increase recycling at the HWRCs to 75%.

Key to the appraisal matrices

Symbol	Likely effect on the SA Objective
+	Positive
?	Uncertain or insufficient information on which to determine impact
-	Negative
0	No significant effect / no clear link

Sustainability Appraisal objective	1) To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment
Baseline During the scoping stage the following indicators were identified as a priority for action: Properties at risk from flooding in Kent 56,000 homes in Kent are at risk of flooding and the fact that houses are still being built in flood risk areas was identified as a key sustainability issue. Increasing potential for flooding was also identified as a sustainability issue. Targets By 2010, to increase the number of properties protected in the South East by 15,000 – South East Integrated Regional Framework To prevent all inappropriate development in the floodplain – South East Integrated Regional Framework	
Option A Raise participation and capture rates of current recycling collections to 80%	0
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	0
Option C Expand glass collections to all households.	0
Option D Introduce compostable kitchen waste collections to all households.	0
Option E Expand garden waste collections to all relevant households.	0
Option F Expand the current cardboard collections to all households.	0
Option G Collect dense and film plastics from 100% of households.	0
Option H Collect tins and cans from 100% of households.	0
Option I Add kitchen and cardboard to current garden waste collections.	0

Sustainability Appraisal objective	1) To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment
Option J Collect commingled plastics and tins and cans from 100% of households.	0
Option K Increase recycling at bring sites by 15%.	0
Option L Increase recycling at bring sites by 20%.	0
Option M Expand the range of bring sites to include dense and film plastics.	0
Option N Increase recycling at the HWRCs to 60%.	0
Option O Increase recycling at the HWRCs to 75%.	0
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) The options are not generally considered to have an impact on flood risk.	

Sustainability Appraisal objective	2) To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Baseline During the scoping stage the following indicators were identified as a priority for action: Number of days when air pollution is high – ozone and PM10. Poor air quality was identified as a sustainability issue. Targets Annual reduction in number of days when air pollution is high – Kent Environment Strategy: PM10 – 50 μg/m^3 not to be exceeded more than 35 days per year Ozone - 100μm/m^3 not to be exceeded more than 10 times a year Nitrogen dioxide concentration 200 μm^3 not to be exceeded more than 18 times per year - National Air Quality Strategy Carbon dioxide emissions – By 2050 reduce greenhouse gas emissions from activities in the region by 60% - South East Integrated Regional Framework	
Option A Raise participation and capture rates of current recycling collections to 80%	+ Ranks 5th (lowest) in technical appraisal process measuring air pollution Ranks 5th (lowest) in technical appraisal process measuring GHG emissions
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	++ Ranks 1st (lowest) in technical appraisal process measuring air pollution Ranks 1st (lowest) in technical appraisal process measuring GHG emissions
Option C Expand glass collections to all households.	+ Ranks 9th (lowest) in technical appraisal process measuring air pollution Ranks 12th (lowest) in technical appraisal process measuring GHG emissions
Option D Introduce compostable kitchen waste collections to all households.	+ Ranks 13th (lowest) in technical appraisal process measuring air pollution Ranks 10th (lowest) in technical appraisal process measuring GHG emissions
Option E Expand garden waste collections to all relevant households.	+ Ranks 14th (lowest) in technical appraisal process measuring air pollution Ranks 11th (lowest) in technical appraisal process measuring GHG emissions

Sustainability Appraisal objective	2) To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Option F Expand the current cardboard collections to all households.	+ / - Ranks 15th (lowest) in technical appraisal process measuring air pollution Ranks 15th (lowest) in technical appraisal process measuring GHG emissions
Option G Collect dense and film plastics from 100% of households.	+ Ranks 7th (lowest) in technical appraisal process measuring air pollution Ranks 7th (lowest) in technical appraisal process measuring GHG emissions
Option H Collect tins and cans from 100% of households.	+ Ranks 6th (lowest) in technical appraisal process measuring air pollution Ranks 6th (lowest) in technical appraisal process measuring GHG emissions
Option I Add kitchen and cardboard to current garden waste collections.	+ Ranks 10th (lowest) in technical appraisal process measuring air pollution Ranks 9th (lowest) in technical appraisal process measuring GHG emissions
Option J Collect commingled plastics and tins and cans from 100% of households.	+ Ranks 2nd (lowest) in technical appraisal process measuring air pollution Ranks 2nd (lowest) in technical appraisal process measuring GHG emissions
Option K Increase recycling at bring sites by 15%.	+ Ranks 12th (lowest) in technical appraisal process measuring air pollution Ranks 14th (lowest) in technical appraisal process measuring GHG emissions
Option L Increase recycling at bring sites by 20%.	+ Ranks 11th (lowest) in technical appraisal process measuring air pollution Ranks 13th (lowest) in technical appraisal process measuring GHG emissions

Sustainability Appraisal objective	2) To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Option M Expand the range of bring sites to include dense and film plastics.	+ Ranks 3rd (lowest) in technical appraisal process measuring air pollution Ranks 4th (lowest) in technical appraisal process measuring GHG emissions
Option N Increase recycling at the HWRCs to 60%.	+ Ranks 8th (lowest) in technical appraisal process measuring air pollution Ranks 8th (lowest) in technical appraisal process measuring GHG emissions
Option O Increase recycling at the HWRCs to 75%.	+ Ranks 4th (lowest) in technical appraisal process measuring air pollution Ranks 3rd (lowest) in technical appraisal process measuring air pollution

Sustainability Appraisal objective	2)	To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

All the options result in a net reduction in air pollution.

All the options result in a net reduction in greenhouse gas (GHG) emissions with the exception of option F – this has therefore been scored potentially negatively.

Results show that the avoidance of air pollution (acidification) costs and GHG emissions through materials recycling outweigh the air pollution and GHG costs of waste processing and transportation.

Option B involves the greatest recovery of materials and hence has the most benefits in terms of reducing air pollution and GHG emissions.

The degree of benefit generally depends on the type of material targeted for recovery.

In terms of air quality, those options that displace the use of virgin non-ferrous metals and plastics – Options J, M and O perform well.

In terms of GHG emissions those that displace the use of virgin metal perform particularly well.

Option F, which diverts small quantities of cardboard, performs the worst in relation to both air quality and GHG emissions although Options D and E score better in terms of GHG emissions than air quality because they divert biodegradable waste away from landfill.

It is important to note that the benefits in terms of reducing air pollution and GHG emissions associated with resource extraction and processing (in the short term at least) are only likely to be felt outside of Kent. Climate change however is a global problem and therefore overseas emissions of GHGs associated with products consumed in Kent are likely to have long-term consequences for Kent.

As indicated in the SA Scoping Report, the impacts of air pollution of concern to Kent's residents relate to the transportation of municipal waste. Therefore mitigation measures will be required which minimise waste transportation. More sustainable modes of transport should be developed and utilised where possible – river, sea and rail rather than road transportation.

See objective 7 for further information on the relative transportation impacts of each option.

Sustainability Appraisal objective	3) To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: Rivers of Good or Fair chemical and biological water quality *(See objective 10 regarding water consumption figures)* Targets By 2005, for 91% of river length to achieve compliance with Environment Agency River Quality Objectives – South East Integrated Regional Framework 85% compliance with Bathing water directive guideline standard by 2010	
Option A Raise participation and capture rates of current recycling collections to 80%	0
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	0
Option C Expand glass collections to all households.	0
Option D Introduce compostable kitchen waste collections to all households.	0
Option E Expand garden waste collections to all relevant households.	0
Option F Expand the current cardboard collections to all households.	0
Option G Collect dense and film plastics from 100% of households.	0
Option H Collect tins and cans from 100% of households.	0
Option I Add kitchen and cardboard to current garden waste collections.	0
Option J Collect commingled plastics and tins and cans from 100% of households.	0

Sustainability Appraisal objective	3) To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management
Option K Increase recycling at bring sites by 15%.	0
Option L Increase recycling at bring sites by 20%.	0
Option M Expand the range of bring sites to include dense and film plastics.	0
Option N Increase recycling at the HWRCs to 60%.	0
Option O Increase recycling at the HWRCs to 75%.	0
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) The options are not generally considered to have an impact on water quality and water resource management.	

Sustainability Appraisal objective	4) To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: % of Sites of Special Scientific Interest (SSSIs) in favourable condition Population of wild birds Extent of UK BAP priority habitats Decline in the quality and extent of countryside and biodiversity was identified as a sustainability issue. Targets 95% of the SSSI area favourable or recovering by 2010 – English Nature target By 2010, achieve a sustained increase in the wild bird population index (including reversing the historical declines in indices for the farmland and woodland species) - South East Integrated Regional Framework. To maintain the condition and extent of all key regional habitats which are judged to be at a favourable conservation status - South East Integrated Regional Framework To restore and / or re-create key regional habitats so these reach a favourable conservation status - South East Integrated Regional Framework Kent BAP targets / objectives - To retain and maintain all ancient semi-natural woodland; to increase the area of semi-natural woodland by 1,500 ha by 2007; to increase the area of plantation woodland by 350 ha by 2007.	
Option A Raise participation and capture rates of current recycling collections to 80%	0
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	0
Option C Expand glass collections to all households.	0
Option D Introduce compostable kitchen waste collections to all households.	0
Option E Expand garden waste collections to all relevant households.	0
Option F Expand the current cardboard collections to all households.	0
Option G Collect dense and film plastics from 100% of households.	0

Sustainability Appraisal objective	4) To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity
Option H Collect tins and cans from 100% of households.	0
Option I Add kitchen and cardboard to current garden waste collections.	0
Option J Collect commingled plastics and tins and cans from 100% of households.	0
Option K Increase recycling at bring sites by 15%.	0
Option L Increase recycling at bring sites by 20%.	0
Option M Expand the range of bring sites to include dense and film plastics.	0
Option N Increase recycling at the HWRCs to 60%.	0
Option O Increase recycling at the HWRCs to 75%.	0
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) The options are not generally considered to have an impact on biodiversity.	

Sustainability Appraisal objective	5) To protect, enhance and make accessible for enjoyment, Kent's countryside and coast, and its historic environment
Baseline During the scoping stage the baseline identified data gaps particularly with regard to heritage. The decline of the marine environment and loss of countryside were both identified as sustainability issues. Targets Remove 40% of the entries on the 1999 'at risk' list [2006]	
Option A Raise participation and capture rates of current recycling collections to 80%	0
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	0
Option C Expand glass collections to all households.	0
Option D Introduce compostable kitchen waste collections to all households.	0
Option E Expand garden waste collections to all relevant households.	0
Option F Expand the current cardboard collections to all households.	0
Option G Collect dense and film plastics from 100% of households.	0
Option H Collect tins and cans from 100% of households.	0
Option I Add kitchen and cardboard to current garden waste collections.	0
Option J Collect commingled plastics and tins and cans from 100% of households.	0

Sustainability Appraisal objective	5) To protect, enhance and make accessible for enjoyment, Kent's countryside and coast, and its historic environment
Option K Increase recycling at bring sites by 15%.	0
Option L Increase recycling at bring sites by 20%.	0
Option M Expand the range of bring sites to include dense and film plastics.	0
Option N Increase recycling at the HWRCs to 60%.	0
Option O Increase recycling at the HWRCs to 75%.	0
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) The options are not generally considered to have an impact on the countryside, coast or historic environment.	

Sustainability Appraisal objective	6) To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: (Number of) New homes built on previously developed land The decline in the quality and extent of countryside and biodiversity was identified as a sustainability issue. Targets Kent Environment Strategy - 80% of new homes on previously developed land (PDL), UK Target - 60% of houses in England on PDL	
Option A Raise participation and capture rates of current recycling collections to 80%	0
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	0
Option C Expand glass collections to all households.	0
Option D Introduce compostable kitchen waste collections to all households.	0
Option E Expand garden waste collections to all relevant households.	0
Option F Expand the current cardboard collections to all households.	0
Option G Collect dense and film plastics from 100% of households.	0
Option H Collect tins and cans from 100% of households.	0
Option I Add kitchen and cardboard to current garden waste collections.	0

Sustainability Appraisal objective	6) To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings
Option J Collect commingled plastics and tins and cans from 100% of households.	0
Option K Increase recycling at bring sites by 15%.	0
Option L Increase recycling at bring sites by 20%.	0
Option M Expand the range of bring sites to include dense and film plastics.	0
Option N Increase recycling at the HWRCs to 60%.	0
Option O Increase recycling at the HWRCs to 75%.	0
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) The options are not generally considered to have an impact on the efficient use of land.	

Sustainability Appraisal objective	7) To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry
Baseline During the scoping stage the following indicators were identified as a priority for action: Travel to work Road traffic Average daily motor vehicle flows The following indicators were identified as performing reasonably but still needing action: Heavy goods vehicles High and growing traffic levels were identified as a sustainability issue. Targets Car use no greater than the 1991 census To reduce regional road traffic in the short to medium term, in line with the Government's national 10 Year Plan (that is, improving the ratio of traffic growth to GDP by 0.8:1 to 0.6:1 by 2010) - South East Integrated Regional Framework To reduce 'private vehicle kilometres travelled' - South East Integrated Regional Framework Number of people killed or seriously injured on roads in the authority - 604 by 2010 (DFT) PSA Target 40% of 1994 / 98 average	
Option A Raise participation and capture rates of current recycling collections to 80%	- Ranks 7th (lowest) in technical appraisal measuring road transportation impacts
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	- Ranks 15th (lowest) in technical appraisal measuring road transportation impacts
Option C Expand glass collections to all households.	- Ranks 5th (lowest) in technical appraisal measuring road transportation impacts
Option D Introduce compostable kitchen waste collections to all households.	- Ranks 12th (lowest) in technical appraisal measuring road transportation impacts
Option E Expand garden waste collections to all relevant households.	- Ranks 13th (lowest) in technical appraisal measuring road transportation impacts
Option F Expand the current cardboard collections to all households.	- Ranks 2nd (lowest) in technical appraisal measuring road transportation impacts
Option G Collect dense and film plastics from 100% of households.	- Ranks 10th (lowest) in technical appraisal measuring road transportation impacts
Option H Collect tins and cans from 100% of households.	- Ranks 4h (lowest) in technical appraisal measuring road transportation impacts

Sustainability Appraisal objective	7) To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry
Option I Add kitchen and cardboard to current garden waste collections.	- Ranks 8th (lowest) in technical appraisal measuring road transportation impacts
Option J Collect commingled plastics and tins and cans from 100% of households.	- Ranks 11th (lowest) in technical appraisal measuring road transportation impacts
Option K Increase recycling at bring sites by 15%.	- Ranks 1st (lowest) in technical appraisal measuring road transportation impacts
Option L Increase recycling at bring sites by 20%.	- Ranks 3rd (lowest) in technical appraisal measuring road transportation impacts
Option M Expand the range of bring sites to include dense and film plastics.	- Ranks 14th (lowest) in technical appraisal measuring road transportation impacts
Option N Increase recycling at the HWRCs to 60%.	- Ranks 6th (lowest) in technical appraisal measuring road transportation impacts
Option O Increase recycling at the HWRCs to 75%.	- Ranks 9th (lowest) in technical appraisal measuring road transportation impacts

Sustainability Appraisal objective	7) To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The requirement to reduce road traffic and the need to travel by car and lorry was identified as a priority for action during the scoping stage of the SA process.

As it is assumed that none of the options will result in a net decrease in waste associated traffic, all the options score a negative against the sustainability objective.

Generally the negative impacts associated with each of the options increases with an increase in the quantity of material recycled and the distance each material has to travel to reprocessing sites.

Option B would, by far, result in the most transportation impacts as it delivers the highest levels of recycling / composting and along with option M which requires transportation of plastic to St Helens in Merseyside.

Option K is the most compatible with the sustainability objective, although expanding the capacity of bring sites will bring some disbenefits in terms of increased associated private trips to these sites.

Mitigation measures include investment in more sustainable refuse collection vehicles (RCVs) in order to minimise pollution. Waste transfer stations and processing facilities should be located close to rail, river and sea connections where possible to facilitate more sustainable transportation of waste.

All waste sites, including bring sites should be designed appropriately so as to minimise transportation impacts.

An important additional mitigation measure would be to encourage the development of local community based recycling schemes which could reduce the transportation impacts of the collection and potentially the disposal of waste.

Sustainability Appraisal objective	8) To reduce waste generation and disposal, and achieve the sustainable management of waste
Baseline During the scoping stage the following indicators were identified as a priority for action: Household waste arisings Growth in waste and lack of landfill capacity was identified as a sustainability issue. Targets To reduce the growth in volume of waste to zero by 2012 - Kent Environment Strategy Target To recover value from 45 per cent of municipal waste and to recycle 30 per cent of household waste by 2010 - 2000 Waste Strategy To reduce landfill for industrial and commercial waste to 85 per cent of the 1998 level by 2005. To increase recovery of all waste in the region by 71% by 2010 - South East Integrated Regional Framework To increase recycling and composting of waste in the region by 50% by 2010 - South East Integrated Regional Framework	
Option A Raise participation and capture rates of current recycling collections to 80%	+ 1.00% BVPI Recycling increase over baseline, ranks 12th (highest) in technical appraisal of compatibility with the waste hierarchy
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	+ 9.95% BVPI Recycling increase over baseline, ranks 1st (highest) in technical appraisal of compatibility with the waste hierarchy.
Option C Expand glass collections to all households.	+ 1.29% BVPI Recycling increase over baseline, ranks 11th (highest) in technical appraisal of compatibility with the waste hierarchy
Option D Introduce compostable kitchen waste collections to all households.	+ 5.42% BVPI Recycling increase over baseline, ranks 4th (highest) in technical appraisal of compatibility with the waste hierarchy
Option E Expand garden waste collections to all relevant households.	+ 5.51% BVPI Recycling increase over baseline, ranks 3rd (highest) in technical appraisal of compatibility with the waste hierarchy
Option F Expand the current cardboard collections to all households.	+ 0.14% BVPI Recycling increase over baseline, ranks 15th (highest) in technical appraisal of compatibility with the waste hierarchy
Option G Collect dense and film plastics from 100% of households.	+ 1.32% BVPI Recycling increase over baseline, ranks 8th (highest) in technical appraisal of compatibility with the waste hierarchy

Option H Collect tins and cans from 100% of households.	+ 1.08% BVPI Recycling increase over baseline, ranks 10th (highest) in technical appraisal of compatibility with the waste hierarchy
Option I Add kitchen and cardboard to current garden waste collections.	+ 3.11% BVPI Recycling increase over baseline, ranks 5th (highest) in technical appraisal of compatibility with the waste hierarchy
Option J Collect commingled plastics and tins and cans from 100% of households.	+ 1.51% BVPI Recycling increase over baseline, ranks 7th (highest) in technical appraisal of compatibility with the waste hierarchy
Option K Increase recycling at bring sites by 15%.	+ 0.53% BVPI Recycling increase over baseline, ranks 14th (highest) in technical appraisal of compatibility with the waste hierarchy
Option L Increase recycling at bring sites by 20%.	+ 0.71% BVPI Recycling increase over baseline, ranks 13th (highest) in technical appraisal of compatibility with the waste hierarchy
Option M Expand the range of bring sites to include dense and film plastics.	+ 1.10% BVPI Recycling increase over baseline, ranks 9th (highest) in technical appraisal of compatibility with the waste hierarchy
Option N Increase recycling at the HWRCs to 60%.	+ 3.63% BVPI Recycling increase over baseline, ranks 6th (highest) in technical appraisal of compatibility with the waste hierarchy
Option O Increase recycling at the HWRCs to 75%.	+ 6.73% BVPI Recycling increase over baseline, ranks 2nd (highest) in technical appraisal of compatibility with the waste hierarchy

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

It should be noted that the figures for recycling and composting are for the County level, and will vary at district level.

All of the options will result in an increase in recycling and composting and therefore perform positively in relation to the objective.

Option B results in the most recycling / composting followed by Option O.

Option F results in the least recycling and composting.

None of the options target the top of the waste hierarchy, waste reduction. In accordance with government guidance the waste strategy is structured so that waste reduction options are detailed separately in the waste prevention and re-use papers. Dealing with the subjects of waste reduction and recycling in this manner leads to some incompatibilities. For example Option 3 for the prevention and re-use of waste specifies that home composting can divert more than 2.5% of MSW waste arisings. The strategy should explore how a reduction could be undermined by the introduction of Option D and E in this report.

It is therefore recommended that, in accordance with the waste hierarchy, options that deliver the biggest reduction in waste arisings should be prioritised and that options for recycling should complement such measures.

Local community recycling / composting schemes, whilst achieving high rates of recycling and composting could also play a part in delivering the necessary behavioural shift required to achieve a reduction in waste arisings (a win-win solution).

Sustainability Appraisal objective	9) To increase energy efficiency and the proportion of energy generated from renewable sources in Kent
Baseline Low levels of renewable energy provision identified as a sustainability issue at the scoping stage Targets Renewable energy provision estimated at 0.65% in Kent (compared to 1% for the South East) – Kent targets of 111 MW by 2010 and 154 MW by 2015 derived from regional targets in the South East RPG.	
Option A Raise participation and capture rates of current recycling collections to 80%	+ Ranks 5th (lowest) in technical appraisal of energy consumption
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	+ Ranks 1st (lowest) in technical appraisal of energy consumption
Option C Expand glass collections to all households.	+ Ranks 9th (lowest) in technical appraisal of energy consumption
Option D Introduce compostable kitchen waste collections to all households.	+ Ranks 14th (lowest) in technical appraisal of energy consumption
Option E Expand garden waste collections to all relevant households.	+ Ranks 15^{5h} (lowest) in technical appraisal of energy consumption
Option F Expand the current cardboard collections to all households.	+ Ranks 13th (lowest) in technical appraisal of energy consumption
Option G Collect dense and film plastics from 100% of households.	+ Ranks 4th (lowest) in technical appraisal of energy consumption
Option H Collect tins and cans from 100% of households.	+ Ranks 7th (lowest) in technical appraisal of energy consumption
Option I Add kitchen and cardboard to current garden waste collections.	+ Ranks 10th (lowest) in technical appraisal of energy consumption
Option J Collect commingled plastics and tins and cans from 100% of households.	+ Ranks 3rd (lowest) in technical appraisal of energy consumption

Sustainability Appraisal objective	9) To increase energy efficiency and the proportion of energy generated from renewable sources in Kent
Option K Increase recycling at bring sites by 15%.	+ Ranks 12th (lowest) in technical appraisal of energy consumption
Option L Increase recycling at bring sites by 20%.	+ Ranks 11th (lowest) in technical appraisal of energy consumption
Option M Expand the range of bring sites to include dense and film plastics.	+ Ranks 2nd (lowest) in technical appraisal of energy consumption
Option N Increase recycling at the HWRCs to 60%.	+ Ranks 8th (lowest) in technical appraisal of energy consumption
Option O Increase recycling at the HWRCs to 75%.	+ Ranks 6th (lowest) in technical appraisal of energy consumption

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The assessment concentrates on the energy consumed in waste treatment; energy generated (e.g. through the capture and utilisation of landfill gas); and the displacement of energy used in the production of virgin materials.

None of the options will directly deliver an increase in renewable energy generation.

The relative scores for the options are the similar to those for objective 10 regarding consumption of resources, with option B resulting in the most energy reduction followed by Options M and J. Option E results in the least energy reduction followed by Options D and F.

Efficiencies achieved through the displacement of energy used in the production of virgin materials are likely to have benefits in areas outside of Kent and often outside of the UK. Benefits for Kent are likely to be felt in the longer term – reducing the risk of climate change and the benefit of reduced vulnerability to rises in energy prices.

Benefits of energy savings in terms of waste treatment and energy capture are likely to be more local and immediate in nature, e.g. reduced air pollution.

Sustainability Appraisal objective	10) To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services
Baseline Data gaps exist regarding locally produced goods. As part of the monitoring framework for the LTP, the ecological footprint (EF) indicator has been used. The EF for Kent is 3.5. Reduction of this unsustainable ecological footprint is therefore a priority for action. During the scoping stage the following indicators were identified as performing reasonably but still needing action: Per capita consumption (PCC) of water Water use exceeding water availability was identified as a sustainability issue. Targets To stabilise per capita consumption (PCC) of water	
Option A Raise participation and capture rates of current recycling collections to 80%	+ Ranks 5th (lowest) in technical appraisal process measuring resource depletion
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	+ Ranks 1st (lowest) in technical appraisal process measuring resource depletion
Option C Expand glass collections to all households.	+ Ranks 9th (lowest) in technical appraisal process measuring resource depletion
Option D Introduce compostable kitchen waste collections to all households.	+ Ranks 13th (lowest) in technical appraisal process measuring resource depletion
Option E Expand garden waste collections to all relevant households.	+ Ranks 14th (lowest) in technical appraisal process measuring resource depletion
Option F Expand the current cardboard collections to all households.	+ Ranks 15th (lowest) in technical appraisal process measuring resource depletion
Option G Collect dense and film plastics from 100% of households.	+ Ranks 4th (lowest) in technical appraisal process measuring resource depletion
Option H Collect tins and cans from 100% of households.	+ Ranks 7th (lowest) in technical appraisal process measuring resource depletion
Option I Add kitchen and cardboard to current garden waste collections.	+ Ranks 10th (lowest) in technical appraisal process measuring resource depletion

Sustainability Appraisal objective	10) To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services
Option J Collect commingled plastics and tins and cans from 100% of households.	+ Ranks 3rd (lowest) in technical appraisal process measuring resource depletion
Option K Increase recycling at bring sites by 15%.	+ Ranks 12th (lowest) in technical appraisal process measuring resource depletion
Option L Increase recycling at bring sites by 20%.	+ Ranks 11th (lowest) in technical appraisal process measuring resource depletion
Option M Expand the range of bring sites to include dense and film plastics.	+ Ranks 2nd (lowest) in technical appraisal process measuring resource depletion
Option N Increase recycling at the HWRCs to 60%.	+ Ranks 8th (lowest) in technical appraisal process measuring resource depletion
Option O Increase recycling at the HWRCs to 75%.	+ Ranks 6th (lowest) in technical appraisal process measuring resource depletion

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The appraisal process measures resource depletion using crude oil, coal and gas as proxies for non-renewable resources. No measure is made of the use of sustainably produced or local products and services.

Kent is estimated to have an ecological footprint of 3.5. This implies that supporting the lifestyle of the average individual in Kent is requiring an inequitable supply of resources such as oil, coal and gas. As these resources cannot be sourced in Kent alone, the environmental and social impact of such resource extraction is generally felt outside Kent's borders. Such unsustainable use of resources will ultimately have social, economic and environmental consequences for Kent.

All the options score positively in terms of reducing resource depletion.

Option B which results in the most recovery of materials, will achieve the most reduction in resource depletion.

Options that target the recovery of plastics for recycling - Options G, J and M - also rank highly as they reduce resource consumption in the production of virgin plastics. Options D, E, and F score lower as the materials they recover have lower resource depletion impacts.

Options N and O will result in a significant increase in recycling / composting but perform only moderately well because the materials recovered are used primarily as construction aggregates which have low associated resource depletion benefits.

Local community based recycling and composting schemes could deliver the locally produced goods and services element of this objective at the same time as promoting behavioural change.

Sustainability Appraisal objective	11) To improve the health and well-being of the population and reduce inequalities in health
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: Average life expectancy Percentage of people describing their health as good Long-term illness, health problem or disability which limits people's daily activities or the work they could do The proportion of Kent residents who had a long-term illness, health problem or disability in 2001 which limited their daily activities was 17%, compared with 15.5% in the South East and 18% nationally. However this had risen sharply, from 11% in 1991 – this has been identified as a sustainability issue Over the long term, to reduce death rates from circulatory disease, cancer, accidents and suicides appreciably - South East Integrated Regional Framework Targets Public service target: DH: Reduce substantially the mortality rates from major killers by 2010: from heart disease by at least 40 per cent in people under 75; from cancer by at least 20 per cent in people under 75.	
Option A Raise participation and capture rates of current recycling collections to 80%	+ Ranks 4th (lowest) in technical appraisal of health Impacts.
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	+ Ranks 1st (lowest) in technical appraisal of health Impacts.
Option C Expand glass collections to all households.	+ Ranks 14th (lowest) in technical appraisal of health Impacts.
Option D Introduce compostable kitchen waste collections to all households.	+ Ranks 9h (lowest) in technical appraisal of health Impacts.
Option E Expand garden waste collections to all relevant households.	+ Ranks 115h (lowest) in technical appraisal of health Impacts.
Option F Expand the current cardboard collections to all households.	+ Ranks 15th (lowest) in technical appraisal of health Impacts.
Option G Collect dense and film plastics from 100% of households.	+ Ranks 8th (lowest) in technical appraisal of health Impacts.
Option H Collect tins and cans from 100% of households.	+ Ranks 3rd (lowest) in technical appraisal of health Impacts.

Sustainability Appraisal objective	11) To improve the health and well-being of the population and reduce inequalities in health
Option I Add kitchen and cardboard to current garden waste collections.	+ Ranks 7th (lowest) in technical appraisal of health Impacts.
Option J Collect commingled plastics and tins and cans from 100% of households.	+ Ranks 2nd (lowest) in technical appraisal of health Impacts.
Option K Increase recycling at bring sites by 15%.	+ Ranks 12th (lowest) in technical appraisal of health Impacts.
Option L Increase recycling at bring sites by 20%.	+ Ranks 10th (lowest) in technical appraisal of health Impacts.
Option M Expand the range of bring sites to include dense and film plastics.	+ Ranks 13th (lowest) in technical appraisal of health Impacts.
Option N Increase recycling at the HWRCs to 60%.	+ Ranks 6th (lowest) in technical appraisal of health Impacts.
Option O Increase recycling at the HWRCs to 75%.	+ Ranks 5th (lowest) in technical appraisal of health Impacts.

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The appraisal is based on human toxicity related to the inputs (full life cycle) and outputs of the waste treatment activities. Option B, which would result in the greatest recovery of materials for recycling, delivers the most benefit, followed by Options J and H.

Option F – expanding current cardboard collections - delivers the least benefit.

Differentiation between the options is largely down to the nature of materials for recycling and composting, with those options recovering a greater quantity of non-ferrous metals scoring the highest. Options C and M which concentrate on the recovery of glass and plastics do not score as favourably.

The results again demonstrate that the major benefit of recycling / composting is that it reduces the need for primary resource extraction and production. In this case as the production of virgin aluminium generates toxic pollution, options that recycle non-ferrous metal score highly.

The health benefits of these options are likely to be felt outside Kent and are mainly associated with resource extraction and processing.

Sustainability Appraisal objective	12) To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised
Baseline During the scoping stage the following indicators were identified as a priority for action (i.e. performing poorly relative to various comparators): Change in total employment over time Average gross weekly earnings VAT registered business per 1000 population Changes in total VAT registered business stock Proportion of businesses in knowledge-driven sectors Proportion of professional occupations among employed workforce GVA per capita During the scoping stage the following indicators were identified as performing reasonably but still needing action: Unemployment rate Proportion of people of working age in employment The following were identified as sustainability issues: Areas of deprivation and social exclusion; pockets of unemployment Shortage of skills in key growth areas Some town centres in decline, particularly coastal towns Targets Improve average wage levels in Kent compared to the national average so that the variance is 5% or less, on one or more years over the life of the LAA. [LAA Outcome 8] To narrow the gap in GVA per capita between the best and worst performing parts of the region - South East Integrated Regional Framework	
Option A Raise participation and capture rates of current recycling collections to 80%	+ Ranks 11th (highest) in technical appraisal of employment opportunities generated
Option B Increase coverage of recycling and composting collections to 100% and increase participation and capture to 80%.	+ Ranks 1st (highest) in technical appraisal of employment opportunities generated
Option C Expand glass collections to all households.	+ Ranks 8th (highest) in technical appraisal of employment opportunities generated
Option D Introduce compostable kitchen waste collections to all households.	+ Ranks 10th (highest) in technical appraisal of employment opportunities generated

Sustainability Appraisal objective	12) To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised
Option E Expand garden waste collections to all relevant households.	+ Ranks 14th (highest) in technical appraisal of employment opportunities generated
Option F Expand the current cardboard collections to all households.	+ Ranks 7th (highest) in technical appraisal of employment opportunities generated
Option G Collect dense and film plastics from 100% of households.	+ Ranks 6th (highest) in technical appraisal of employment opportunities generated
Option H Collect tins and cans from 100% of households.	+ Ranks 9th (highest) in technical appraisal of employment opportunities generated
Option I Add kitchen and cardboard to current garden waste collections.	+ Ranks 15th (highest) in technical appraisal of employment opportunities generated
Option J Collect commingled plastics and tins and cans from 100% of households.	+ Ranks 4th (highest) in technical appraisal of employment opportunities generated
Option K Increase recycling at bring sites by 15%.	+ Ranks 13th (highest) in technical appraisal of employment opportunities generated
Option L Increase recycling at bring sites by 20%.	+ Ranks 12th (highest) in technical appraisal of employment opportunities generated
Option M Expand the range of bring sites to include dense and film plastics.	+ Ranks 5th (highest) in technical appraisal of employment opportunities generated
Option N Increase recycling at the HWRCs to 60%.	+ Ranks 3rd (highest) in technical appraisal of employment opportunities generated
Option O Increase recycling at the HWRCs to 75%.	+ Ranks 2nd (highest) in technical appraisal of employment opportunities generated

Sustainability Appraisal objective	12) To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The results are based on the appraisal of the employment opportunities associated with each option.

Generally those options that result in increased MRF and transfer capacity perform well (Options B, N, and O)

The options that involve significant collections of kitchen and garden waste (Options D, E and I) and deliver waste to less labour intensive composting sites for processing provide the least employment opportunities.

During the scoping stage of the SA, employment, particularly shortages of skilled employment, was identified as a sustainability issue. Analysis of the breakdown of the appraisal data indicates that only a low proportion of the additional jobs created will be skilled. It is therefore questionable whether any of the options will significantly contribute to this objective.

The appraisal process has also assessed the cost of implementing each of the options. Assessing the sustainability implications of the relative costs of waste processing options is fraught with difficulty and open to debate. For instance the objective specifically calls for the efficient use of resources to be incentivised. This means that options resulting in higher recycling rates and less resource depletion would be more sustainable than those that cost less and are less resource efficient.

The appraisal of costs only focuses on the immediate financial costs of waste collection and disposal. There will also be longer term financial, social and environmental costs associated with those options with higher rates of resource depletion, pollution and climate change.

The ERM appraisal of cost demonstrates that Option B, despite delivering the highest rates of recycling / composting, results in increased costs across the County. Option A is the least expensive collection option as participation and capture can be accommodated through existing collection rounds.

For options N and O increased levels of recycling reduces the overall cost of the options.

4 OPTIONS FOR ENERGY RECOVERY AND DISPOSAL

Option 1	New Energy from Waste (EfW) facility in East Kent
Option 2	Expand current contracted capacity at Allington EfW
Option 3	Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW
Option 4	MBT plant in East Kent stabilising material to be sent to landfill
Option 5	Autoclave in East Kent with fluff to Allington EfW
Option 6	Gasification plant in East Kent
Option 7	Anaerobic Digestion facility in East Kent
Option 8	In-vessel composting facilities across Kent for Garden and Kitchen Waste

Key to the appraisal matrices

Symbol	Likely effect on the SA Objective
+	Positive
?	Uncertain or insufficient information on which to determine impact
-	Negative
0	No significant effect / no clear link

Sustainability Appraisal objective	1) To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment
Baseline During the scoping stage the following indicators were identified as a priority for action: Properties at risk from flooding in Kent 56,000 homes in Kent are at risk of flooding and the fact that houses are still being built in flood risk areas was identified as a key sustainability issue. Increasing potential for flooding was also identified as a sustainability issue. Targets By 2010, to increase the number of properties protected in the South East by 15,000 – South East Integrated Regional Framework To prevent all inappropriate development in the floodplain – South East Integrated Regional Framework	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? Ranks 3rd (Lowest) in technical appraisal process measuring landtake
Option 2 Expand current contracted capacity at Allington EfW	? Ranks 5th (Lowest) in technical appraisal process measuring landtake
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? Ranks 6th (Lowest) in technical appraisal process measuring landtake
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? Ranks 8th (Lowest) in technical appraisal process measuring landtake
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? Ranks 2nd (Lowest) in technical appraisal process measuring landtake
Option 6 Gasification plant in East Kent.	? Ranks 4th (Lowest) in technical appraisal process measuring landtake
Option 7 Anaerobic Digestion facility in East Kent.	? Ranks 7th (Lowest) in technical appraisal process measuring landtake
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	? Ranks 1st (Lowest) in technical appraisal process measuring landtake

Sustainability Appraisal objective	1) To reduce the risk of flooding and the resulting detriment to public well-being, the economy and the environment

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The impact of the technologies on flood risk is largely a factor of site location and flood pressures at and around the site in question. As the location of the sites is, as yet, uncertain so is the impact on flood risk. The Waste Development Framework will include an analysis of potential sites for locating waste management facilities and flood risk will be considered as part of that analysis.

The appraisal by ERM produced an estimation of the landtake required for each processing option. Option 8, although requiring a number of facilities, reduces the land required as well as reducing waste going to landfill.

The differences between the options in terms of landtake are negligible and are unlikely to result in one option being more compatible with the objective than another.

To avoid uncertainty regarding flooding the strategy should include a clear requirement that waste processing facilities do not increase the risk of flooding and where possible alleviate any risk.

Sustainability Appraisal objective	2) To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Baseline During the scoping stage the following indicators were identified as a priority for action: Number of days when air pollution is high – ozone and PM10. Poor air quality was identified as a sustainability issue. Targets Annual reduction in number of days when air pollution is high – Kent Environment Strategy: PM10 – 50 μg/m^3 not to be exceeded more than 35 days per year Ozone - 100μm/m^3 not to be exceeded more than 10 times a year Nitrogen dioxide concentration 200 μm^3 not to be exceeded more than 18 times per year - National Air Quality Strategy Carbon dioxide emissions – By 2050 reduce greenhouse gas emissions from activities in the region by 60% - South East Integrated Regional Framework	
Option 1 New Energy from Waste (EfW) facility in East Kent.	+ Ranks 5th (lowest) in technical appraisal process measuring air pollution Ranks 5th (lowest) in technical appraisal process measuring GHG emissions
Option 2 Expand current contracted capacity at Allington EfW	+ Ranks 6th (lowest) in technical appraisal process measuring air pollution Ranks 7th (lowest) in technical appraisal process measuring GHG emissions
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	+ Ranks 4th (lowest) in technical appraisal process measuring air pollution Ranks 6th (lowest) in technical appraisal process measuring GHG emissions
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	+ Ranks 7th (lowest) in technical appraisal process measuring air pollution Ranks 4th (lowest) in technical appraisal process measuring GHG emissions
Option 5 Autoclave in East Kent with fluff to Allington EfW.	+ Ranks 2nd (lowest) in technical appraisal process measuring air pollution Ranks 2nd (lowest) in technical appraisal process measuring GHG emissions

Sustainability Appraisal objective	2) To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts
Option 6 Gasification plant in East Kent.	+ Ranks 3rd (lowest) in technical appraisal process measuring air pollution Ranks 3rd (lowest) in technical appraisal process measuring GHG emissions
Option 7 Anaerobic Digestion facility in East Kent.	+ Ranks 1st (lowest) in technical appraisal process measuring air pollution Ranks 1st (lowest) in technical appraisal process measuring GHG emissions
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	+ Ranks 8th (lowest) in technical appraisal process measuring air pollution Ranks 8th (lowest) in technical appraisal process measuring GHG emissions

Sustainability Appraisal objective	2)	To reduce air pollution and ensure air quality continues to improve; and to address the causes of climate change through reducing emissions of greenhouse gases and ensure that Kent is prepared for its impacts

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

All the options result in a reduction in air pollution and climate change impacts and the differences between each of the options is relatively insignificant.

Options that result in the greatest levels of recovery particularly of metals and plastics score highly in terms of reducing resource depletion, air pollution and GHG emissions. Some of the options additionally offset other forms of energy generation which result in greater SO_2 production.

In terms of air pollution, Options 7 and 5 result in the greatest amount of plastic and metal recovery as well as energy generation from biogas and RDF and hence score highly.

Options 6 and 3 separate greater quantities of materials for recycling than Options 1 and 2 where waste is sent direct to EfW plant(s) and hence score more highly.

Options 4 and 8 score the worst because they do not generate energy.

In terms of GHG emissions, Options 7, 5 and 6 all have the same rankings as for air pollution for the same reasons.

The two MBT options perform better than the EfW Options 1 and 2 because the large amount of secondary recycling performed at the MBT stage outweighs the additional energy produced at the EfW plants.

It is important to note that the benefits in terms of reducing air pollution and GHG emissions associated with resource extraction and processing (in the short term at least) are for the most part likely to be felt outside Kent.

Reductions in emissions associated with energy reduction are likely to be felt nationally and in the short term and long term.

As indicated in the Scoping Report the impacts of air pollution that are most likely to have an impact on Kent residents are those resulting from the transportation of municipal waste. Therefore mitigation measures will be required which ensure that waste is processed as close to source as possible. More sustainable modes of transport should be developed and utilised where possible – river, sea and rail rather than road transportation.

See objective 7 for the relative transportation impacts of each option.

Sustainability Appraisal objective	3) To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: Rivers of Good or Fair chemical and biological water quality *(See objective 10 regarding water consumption figures)* Targets By 2005, for 91% of river length to achieve compliance with Environment Agency River Quality Objectives – South East Integrated Regional Framework 85% compliance with Bathing water directive guideline standard by 2010	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? Ranks 5th (lowest) in technical appraisal process measuring risk of water pollution
Option 2 Expand current contracted capacity at Allington EfW	? Ranks 1st (lowest) in technical appraisal process measuring water risk of water pollution
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? Ranks 4th (lowest) in technical appraisal process measuring water pollution
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? Ranks 7th (lowest) in technical appraisal process measuring water pollution
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? Ranks 2nd (lowest) in technical appraisal process measuring water pollution
Option 6 Gasification plant in East Kent.	? Ranks 2nd (lowest) in technical appraisal process measuring water pollution
Option 7 Anaerobic Digestion facility in East Kent.	? Ranks 6th (lowest) in technical appraisal process measuring water pollution
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	Ranks 8th (lowest) in technical appraisal process measuring water Pollution

Sustainability Appraisal objective	3)	To maintain and improve the water quality of Kent's rivers, coasts and groundwater and to achieve sustainable water resource management

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The impact on water quality of each of the options is uncertain.

The Waste Development Framework will include an analysis of potential sites for locating waste management facilities and impacts on water quality will be considered as part of that analysis. The technical appraisal by ERM measures the likelihood of problems arising and the consequence of such an event. The risks increase with the number of facilities. The technical appraisal demonstrates that since hazardous landfill and landfill carry the worst scores the options that result in the most waste going to landfill score the most poorly. In terms of the actual risk of the facilities themselves these are low with each option scoring the same with the exception of gasification and incineration which carry a marginally higher risk.

Option 5 scores highly as it is associated with high rates of recovery and a reduction in thermal treatment and associated landfill.

Option 6 scores as highly because it produces limited outputs or residues that require further treatment.

Option 2 ranks the highest as no new facilities are required and therefore there is no additional risk. Risk under Option 2 could be minimised by increasing throughput between 2016 and 2019 and therefore reducing the amount of waste that is sent to landfill instead.

Option 8 scores the worst; this is a factor of the number of facilities increasing risk and not because of the level of risk associated with the individual facilities.

Sustainability Appraisal objective	4) To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: % of Sites of Special Scientific Interest (SSSIs) in favourable condition Population of wild birds Extent of UK BAP priority habitats Decline in the quality and extent of countryside and biodiversity was identified as a sustainability issue. Targets 95% of the SSSI area favourable or recovering by 2010 – English Nature target By 2010, achieve a sustained increase in the wild bird population index (including reversing the historical declines in indices for the farmland and woodland species) - South East Integrated Regional Framework. To maintain the condition and extent of all key regional habitats which are judged to be at a favourable conservation status - South East Integrated Regional Framework To restore and / or re-create key regional habitats so these reach a favourable conservation status - South East Integrated Regional Framework Kent BAP targets / objectives - To retain and maintain all ancient semi-natural woodland; to increase the area of semi-natural woodland by 1,500 ha by 2007; to increase the area of plantation woodland by 350 ha by 2007.	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? - / + Ranks 3rd (lowest) in technical appraisal process measuring landtake
Option 2 Expand current contracted capacity at Allington EfW	? - / + Ranks 6th (lowest) in technical appraisal process measuring landtake
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? - / + Ranks 5th (lowest) in technical appraisal process measuring landtake
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? - / + Ranks 8th (lowest) in technical appraisal process measuring landtake
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? - / + Ranks 2nd (lowest) in technical appraisal process measuring landtake
Option 6 Gasification plant in East Kent.	? - / + Ranks 4th (lowest) in technical appraisal process measuring landtake
Option 7 Anaerobic Digestion facility in East Kent.	? - / + Ranks 7th (lowest) in technical appraisal process measuring landtake

Sustainability Appraisal objective	4) To conserve and enhance Kent's biodiversity, including coastal and marine biodiversity
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	? - / + Ranks 1st (lowest) in technical appraisal process measuring landtake

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The relative impact on biodiversity is uncertain as the actual impact depends on the location of the facility and the landfill site for the disposal of any residues. It has been assumed that in the short term all of the options are likely to have some negative impact on biodiversity and as they stand none of the options will enhance biodiversity.

The Waste Development Framework will include an analysis of potential sites for locating waste management facilities and impacts on biodiversity will be considered as part of that analysis.

In the longer term all of the options will reduce the requirement for landfill which it is assumed will have positive benefits for biodiversity

The appraisal by ERM produced an estimation of the landtake required for each processing option. Option 8, although requiring a number of facilities, reduces the land required as well as reducing waste going to landfill. However the differences between the options in terms of landtake are negligible and are unlikely to result in one option being more compatible with the objective than another.

To mitigate these impacts the strategy should include a clear requirement that waste processing facilities result in no net loss of biodiversity and preferably deliver biodiversity and landscape enhancements and that specific unavoidable impacts are mitigated and / or compensated for as far as possible.

Sustainability Appraisal objective	5) To protect, enhance and make accessible for enjoyment, Kent's countryside and coast, and its historic environment
Baseline During the scoping stage the baseline identified data gaps particularly with regard to heritage. The decline of the marine environment and loss of countryside were both identified as sustainability issues. Targets Remove 40% of the entries on the 1999 'at risk' list [2006]	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? - / + Ranks 3rd (lowest) in technical appraisal process measuring landtake
Option 2 Expand current contracted capacity at Allington EfW	? - / + Ranks 6th (lowest) in technical appraisal process measuring landtake
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? - / + Ranks 5th (lowest) in technical appraisal process measuring landtake
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? - / + Ranks 8th (lowest) in technical appraisal process measuring landtake
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? - / + Ranks 2nd (lowest) in technical appraisal process measuring landtake
Option 6 Gasification plant in East Kent.	? - / + Ranks 4th (lowest) in technical appraisal process measuring landtake
Option 7 Anaerobic Digestion facility in East Kent.	? - / + Ranks 7th (lowest) in technical appraisal process measuring landtake
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	? - / + Ranks 1st (lowest) in technical appraisal process measuring landtake
Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.) Scores are as for Objective 4. Again short-term effects are uncertain but likely to be negative. In the long term the reduction in the requirement for landfill will have positive landscape benefits. To mitigate any negative impacts the strategy needs a clear commitment to protect and enhance the natural and built environment.	

Sustainability Appraisal objective	6) To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: (Number of) New homes built on previously developed land The decline in the quality and extent of countryside and biodiversity was identified as a sustainability issue. Targets Kent Environment Strategy - 80% of new homes on previously developed land (PDL), UK Target - 60% of houses in England on PDL	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? - / + Ranks 3rd (lowest) in technical appraisal process measuring landtake
Option 2 Expand current contracted capacity at Allington EfW	? - / + Ranks 6th (lowest) in technical appraisal process measuring landtake
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? - / + Ranks 5th (lowest) in technical appraisal process measuring landtake
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? - / + Ranks 8th (lowest) in technical appraisal process measuring landtake
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? - / + Ranks 2nd (lowest) in technical appraisal process measuring landtake
Option 6 Gasification plant in East Kent.	? - / + Ranks 4th (lowest) in technical appraisal process measuring landtake
Option 7 Anaerobic Digestion facility in East Kent.	? - / + Ranks 7th (lowest) in technical appraisal process measuring landtake
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	? - / + Ranks 1st (lowest) in technical appraisal process measuring landtake

Sustainability Appraisal objective	6)	To improve efficiency in land use through the re-use of previously developed land and existing buildings, including re-use of materials from buildings

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

Scores are as for Objective 4. Again short-term effects are uncertain but likely to be negative. In the long term the reduction in the requirement for landfill will have positive benefits in terms of the efficient use of land.

To mitigate any negative impacts the strategy needs a clear commitment to building waste processing facilities on previously developed land (PDL) wherever possible.

Sustainability Appraisal objective	7) To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry
Baseline During the scoping stage the following indicators were identified as a priority for action: Travel to work Road traffic Average daily motor vehicle flows The following indicators were identified as performing reasonably but still needing action: Heavy goods vehicles High and growing traffic levels were identified as a sustainability issue. Targets Car use no greater than the 1991 census To reduce regional road traffic in the short to medium term, in line with the Government's national 10 Year Plan (that is, improving the ratio of traffic growth to GDP by 0.8:1 to 0.6:1 by 2010) - South East Integrated Regional Framework To reduce 'private vehicle kilometres travelled' - South East Integrated Regional Framework Number of people killed or seriously injured on roads in the authority - 604 by 2010 (DFT) PSA Target 40% of 1994 / 98 average	
Option 1 New Energy from Waste (EfW) facility in East Kent.	- ? Ranks 3rd (lowest) in technical appraisal measuring road transportation impacts
Option 2 Expand current contracted capacity at Allington EfW	- Ranks 1st (lowest) in technical appraisal measuring road transportation impacts
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	- Ranks 6th (lowest) in technical appraisal measuring road transportation impacts
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	- ? Ranks 2nd (lowest) in technical appraisal measuring road transportation impacts
Option 5 Autoclave in East Kent with fluff to Allington EfW.	- Ranks 8th (lowest) in technical appraisal measuring road transportation impacts
Option 6 Gasification plant in East Kent.	- ? Ranks 5th (lowest) in technical appraisal measuring road transportation impacts
Option 7 Anaerobic Digestion facility in East Kent.	- ? Ranks 7th (lowest) in technical appraisal measuring road transportation impacts

Sustainability Appraisal objective	7) To reduce road traffic and its impacts, promote more sustainable modes of transport and reduce the need to travel by car / lorry
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	- ? Ranks 4th (lowest) in technical appraisal measuring road transportation impacts

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The requirement to reduce road traffic and the need to travel by car and lorry was identified as a priority for action during the scoping stage of the SA process.

As it is assumed that none of the options will result in a net decrease in waste associated traffic, all the options score a negative against the sustainability objective.

Option 2 results in the least transport impacts, mainly because there is no pre-sorting of waste and any by-products are sent to Sheppey for subsequent landfill.

There is little to separate Options 1, 4, 6 and 8, as the assessment is not site specific, any small alteration in the location is likely to affect the order.

Option 5 results in a high quantity of recyclable elements being transported to St Helens in Merseyside and hence ranks 8th in terms of transport impacts.

Mitigation measures would include locating processing facilities close to rail, river and sea connections allowing for more sustainable transportation of waste.

All waste processing sites should be located as close to the source of waste as possible and designed appropriately so as to minimise local transportation impacts.

Sustainability Appraisal objective	8) To reduce waste generation and disposal, and achieve the sustainable management of waste
Baseline During the scoping stage the following indicators were identified as a priority for action: Household waste arisings Growth in waste and lack of landfill capacity was identified as a sustainability issue. Targets To reduce the growth in volume of waste to zero by 2012 - Kent Environment Strategy Target To recover value from 45 per cent of municipal waste and to recycle 30 per cent of household waste by 2010 - 2000 Waste Strategy To reduce landfill for industrial and commercial waste to 85 per cent of the 1998 level by 2005. To increase recovery of all waste in the region by 71% by 2010 - South East Integrated Regional Framework To increase recycling and composting of waste in the region by 50% by 2010 - South East Integrated Regional Framework	
Option 1 New Energy from Waste (EfW) facility in East Kent.	+ Ranks 4th (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 2 Expand current contracted capacity at Allington EfW	+ Ranks 6th (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	+ Ranks 7th (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	+ Ranks 8th (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 5 Autoclave in East Kent with fluff to Allington EfW.	+ Ranks 3rd (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 6 Gasification plant in East Kent.	+ Ranks 4th (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 7 Anaerobic Digestion facility in East Kent.	+ Ranks 2nd (highest) in technical appraisal measuring compliance with the waste hierarchy
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	+ Ranks 1st (highest) in technical appraisal measuring compliance with the waste hierarchy

Sustainability Appraisal objective	8) To reduce waste generation and disposal, and achieve the sustainable management of waste

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

All of the options will result in reduction in the need for landfill and are therefore compatible with the objective.

Option 8 performs best as it increases the tonnage of waste composted as well as reducing the dependence on landfill.

Options 5 and 7 perform strongly due to increased levels of recycling and energy recovery.

Similarly, Options 1 and 6 perform better than Option 2 which results in less waste being thermally treated, more waste being landfilled and less recycling of ferrous metals.

Option 2 sees the introduction of additional thermal treatment in stages and therefore under this option the requirement for landfill is greater between 2016 and 2019.

Option 4 performs the worst as it results in the most waste being sent to landfill.

It should be noted that none of the options seek to reduce waste arisings. In accordance with government guidance, the development of the JMWMS is structured so that waste reduction options are detailed separately in the waste prevention and re-use papers.

Sustainability Appraisal objective	9) To increase energy efficiency and the proportion of energy generated from renewable sources in Kent
Baseline Low levels of renewable energy provision identified as a sustainability issue at the scoping stage Targets Renewable energy provision estimated at 0.65% in Kent (compared to 1% for the South East) – Kent targets of 111 MW by 2010 and 154 MW by 2015 derived from regional targets in the South East RPG.	
Option 1 New Energy from Waste (EfW) facility in East Kent.	+ Ranks 4th (lowest) in technical appraisal measuring energy consumption
Option 2 Expand current contracted capacity at Allington EfW	+ Ranks 5th (lowest) in technical appraisal measuring energy consumption
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	+ Ranks 6th (lowest) in technical appraisal measuring energy consumption
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	+ Ranks 8th (lowest) in technical appraisal measuring energy consumption
Option 5 Autoclave in East Kent with fluff to Allington EfW.	+ Ranks 2nd (lowest) in technical appraisal measuring energy consumption
Option 6 Gasification plant in East Kent.	+ Ranks 3rd (lowest) in technical appraisal measuring energy consumption
Option 7 Anaerobic Digestion facility in East Kent.	+ Ranks 1st (lowest) in technical appraisal measuring energy consumption
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	+ Ranks 7th (lowest) in technical appraisal measuring energy consumption

Sustainability Appraisal objective	9)	To increase energy efficiency and the proportion of energy generated from renewable sources in Kent

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

All the options will result in a net energy saving and are therefore compatible with the objective.

Energy savings are made in terms of reduced demand on virgin materials and through the recovery of energy.

Only Anaerobic Digestion produces what can be classified as renewable energy (under current definitions).

Those options with the highest level of recycling and energy recovery - Options 7 and 5 - rank the highest

Benefits are as for objectives 2 and 10

Options 8 and 4 rank the lowest.

Sustainability Appraisal objective	10) To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services
Baseline Data gaps exist regarding locally produced goods. As part of the monitoring framework for the LTP, the ecological footprint (EF) indicator has been used. The EF for Kent is 3.5. Reduction of this unsustainable ecological footprint is therefore a priority for action. During the scoping stage the following indicators were identified as performing reasonably but still needing action: Per capita consumption (PCC) of water Water use exceeding water availability was identified as a sustainability issue. Targets To stabilise per capita consumption (PCC) of water	
Option 1 New Energy from Waste (EfW) facility in East Kent.	+ Ranks 4th (lowest) in technical appraisal process measuring resource depletion
Option 2 Expand current contracted capacity at Allington EfW	+ Ranks 6th (lowest) in technical appraisal process measuring resource depletion
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	+ Ranks 5th (lowest) in technical appraisal process measuring resource depletion
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	+ Ranks 7th (lowest) in technical appraisal process measuring resource depletion
Option 5 Autoclave in East Kent with fluff to Allington EfW.	+ Ranks 2nd (lowest) in technical appraisal process measuring resource depletion
Option 6 Gasification plant in East Kent.	+ Ranks 3rd (lowest) in technical appraisal process measuring resource depletion
Option 7 Anaerobic Digestion facility in East Kent.	+ Ranks 1st (lowest) in technical appraisal process measuring resource depletion
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	+ Ranks 8th (lowest) in technical appraisal process measuring resource depletion

Sustainability Appraisal objective	10) To reduce the global, social and environmental impact of consumption of resources by using sustainably produced and local products and services

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The appraisal of the options against this objective is based on the appraisal of resource depletion resulting from each option as identified by ERM.

The appraisal process measures resource depletion using crude oil, coal and gas as proxies for non-renewable resources. No measure is made of the use of sustainably produced or local products and services.

Kent is estimated to have an ecological footprint of 3.5. This implies that supporting the lifestyle of the average individual in Kent is requiring an inequitable supply of resources such as oil, gas and coal. As these resources cannot be sourced in Kent alone, the environmental and social impact of such resource extraction is generally felt outside Kent's borders. Such unsustainable use of resources will ultimately have social, economic and environmental consequences for Kent.

All the options score positively in terms of reducing resource depletion.

Options 7 and 5 result in the greatest amount of plastic and metal recovery and hence the need to use virgin materials. Energy is also generated from biogas (Option 7) and a cellulose fibrous material (Option 5) and hence these options score highly. Option 7 performs better than Option 5 simply because of the higher level of throughput. A similar sized autoclave facility may perform better as more energy is generated from 'fluff' combustion than is generated through the production and consumption of biogas on a like-for-like basis.

Option 6 separates greater quantities of materials for recycling and generates energy more efficiently than Options 1 and 2 where waste is sent direct to EfW plant(s) and hence scores more highly.

Options 4 and 8 score the worst because they do not generate any energy.

In order to score positively against the local products and services aspect of this objective the residual waste facilities should be located as close to the source of waste as possible.

Sustainability Appraisal objective	11) To improve the health and well-being of the population and reduce inequalities in health
Baseline During the scoping stage the following indicators were identified as performing reasonably but still needing action: Average life expectancy Percentage of people describing their health as good Long-term illness, health problem or disability which limits people's daily activities or the work they could do The proportion of Kent residents who had a long-term illness, health problem or disability in 2001 which limited their daily activities was 17%, compared with 15.5% in the South East and 18% nationally. However this had risen sharply, from 11% in 1991 – this has been identified as a sustainability issue Over the long term, to reduce death rates from circulatory disease, cancer, accidents and suicides appreciably - South East Integrated Regional Framework Targets Public service target: DH: Reduce substantially the mortality rates from major killers by 2010: from heart disease by at least 40 per cent in people under 75; from cancer by at least 20 per cent in people under 75.	
Option 1 New Energy from Waste (EfW) facility in East Kent.	- / 0 Ranks 8th (lowest) in technical appraisal measuring health impacts
Option 2 Expand current contracted capacity at Allington EfW	- / 0 Ranks 7th (lowest) in technical appraisal measuring health impacts
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	- / 0 Ranks 5th (lowest) in technical appraisal measuring health impacts
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	- / 0 Ranks 4th (lowest) in technical appraisal measuring health impacts
Option 5 Autoclave in East Kent with fluff to Allington EfW.	- / 0 Ranks 6th (lowest) in technical appraisal measuring health impacts
Option 6 Gasification plant in East Kent.	- / 0 Ranks 3rd (lowest) in technical appraisal measuring health impacts
Option 7 Anaerobic Digestion facility in East Kent.	- / 0 Ranks 1st (lowest) in technical appraisal measuring health impacts

Sustainability Appraisal objective	11) To improve the health and well-being of the population and reduce inequalities in health
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	- / 0 Ranks 2nd (lowest) in technical appraisal measuring health impacts

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

ERM has emphasised that the construction of new waste management facilities is often controversial, with their perceived public health impacts central to the debate. There are also numerous conflicting reports and opinions about the relative impacts of different facilities available to fuel this debate.

In an attempt to clarify the situation, DEFRA recently published a health effects report[2] that aimed to bring together, in one place, information from all the studies conducted to date. Although there are a number of data gaps (notably on composting and emerging technologies such as autoclaving), this is the best reference information that is available, and ERM used it as the basis for the technical appraisal work.

Although any health impact should be treated with concern, the studies show the total number of emissions to hospital associated with waste technologies to be relatively low. As a result the options score only a marginal negative against the objective.

Low scores are however reliant on the correct operation of facilities.

The greatest impact is associated with the EfW options. Options 1 and 2 therefore perform the worst.

Option 7 ranks the highest as anaerobic digestion is currently believed to be benign and because the end product is landfilled.

[2] *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes*, Enviros Consulting Ltd and University of Birmingham with Risk and Policy Analysts Ltd, Open University and Maggie Thurgood, 2004

Sustainability Appraisal objective	12) To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised
Baseline During the scoping stage the following indicators were identified as a priority for action (i.e. performing poorly relative to various comparators): Change in total employment over time Average gross weekly earnings VAT registered business per 1000 population Changes in total VAT registered business stock Proportion of businesses in knowledge-driven sectors Proportion of professional occupations among employed workforce GVA per capita During the scoping stage the following indicators were identified as performing reasonably but still needing action: Unemployment rate Proportion of people of working age in employment The following were identified as sustainability issues: Areas of deprivation and social exclusion; pockets of unemployment Shortage of skills in key growth areas Some town centres in decline, particularly coastal towns Targets Improve average wage levels in Kent compared to the national average so that the variance is 5% or less, on one or more years over the life of the LAA. [LAA Outcome 8] To narrow the gap in GVA per capita between the best and worst performing parts of the region - South East Integrated Regional Framework	
Option 1 New Energy from Waste (EfW) facility in East Kent.	? Ranks 6th (highest) in technical appraisal measuring employment opportunities
Option 2 Expand current contracted capacity at Allington EfW	? Ranks 8th (highest) in technical appraisal measuring employment opportunities
Option 3 Mechanical Biological Treatment (MBT) plant in East Kent providing Refuse Derived Fuel (RDF) to Allington EfW	? Ranks 5th (highest) in technical appraisal measuring employment opportunities
Option 4 MBT plant in East Kent stabilising material to be sent to landfill.	? Ranks 2nd (highest) in technical appraisal measuring employment opportunities
Option 5 Autoclave in East Kent with fluff to Allington EfW.	? Ranks 4th (highest) in technical appraisal measuring employment opportunities

Sustainability Appraisal objective	12) To build a strong, stable and sustainable economy which provides prosperity and opportunities (including learning and skills) for all, and in which environmental and social costs fall on those who impose them, and efficient resource use is incentivised
Option 6 Gasification plant in East Kent.	? Ranks 3rd (highest) in technical appraisal measuring employment opportunities
Option 7 Anaerobic Digestion facility in East Kent.	? Ranks 7th (highest) in technical appraisal measuring employment opportunities
Option 8 In-vessel composting facilities across Kent for Garden and Kitchen Waste.	? Ranks 1st (highest) in technical appraisal measuring employment opportunities

Summary (e.g. most sustainable option, key issues arising, potential mitigation measures, sources of uncertainty, assumptions in making the assessment, important impact dimensions etc.)

The appraisal findings are based on technical appraisal work undertaken by ERM.

The results are based on the appraisal of the employment opportunities associated with each option. Overall there is only a marginal variation between the employment opportunities offered by each of the options.

Option 8 provides the most employment opportunities. The additional sites require construction staff and the increased automation of the process sees a drop in unskilled operational staff but an increase in skilled staff.

Option 4 ranks the second highest because of the high amount of waste passing through the labour intensive MBT plant.

Options 1 and 6 require a high level of construction staff.

Option 2 does not require any new staff and therefore ranks the lowest.

During the scoping stage of the SA, employment, particularly the shortage of skilled employment, was identified as a sustainability issue. Analysis of the breakdown of the appraisal data indicates that only approximately 15% of the additional jobs created will be skilled. It is therefore questionable whether any of the options will significantly contribute to this objective. As a result the effect of each of the option is scored uncertain.

The technical appraisal by ERM also notes that some of the undesirable jobs may be hard to fill.

The appraisal process has also assessed the cost of implementing each of the options and notes the uncertainty in predicting the relative financial benefits of each option.

Assessing the sustainability implications of the relative costs of waste processing options is fraught with difficulty. For instance the objective specifically calls for the efficient use of resources to be incentivised. This means that options resulting in higher recycling rates and less resource depletion may be more sustainable than those that cost less and are less resource efficient. The ERM appraisal of cost demonstrates that Option 8 performs the best mainly because composting significantly reduces landfill costs. However such an option would require significant investment in terms of collection of garden waste and may undermine the waste reduction benefits of home composting. The expansion of the current contract at Allington ranks second, although this assumes that the current gate fee is maintained.

Option 4 has the highest cost implications of any of the options.