

Herefordshire and Worcestershire
Joint review of compliance with the requirement
to separately collect glass, paper, plastic and metals
under the Waste Framework Directive

December 2014

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1. Executive Summary

1.1 Introduction

This report assesses the level of compliance of waste and recycling services in Herefordshire and Worcestershire with the requirements of the Waste Framework Directive as transposed into UK Legislation by the (Waste England and Wales) (Amended) Regulations 2012.

The Regulations require that where it is technically, environmentally and economically practicable, four key recyclable materials, paper, glass, plastic and metals are recycled by means of separate collection; where it is necessary or appropriate to meet the quality standard for the relevant recycling sectors.

The Waste Strategy for Herefordshire and Worcestershire currently envisages a comingled alternate weekly collection of recycling and residual waste. Residual waste will be treated via an Energy from Waste plant (EFW) and recycling through an automated clean Materials Reclamation Facility (MRF).

This report aims to determine whether Herefordshire and Worcestershire comply with the requirements of the directive by benchmarking against other authorities in the West Midlands for quantity and cost, and identifying if the material output from the MRF is of an appropriate quality for the available end markets.

This report has been produced by a joint working group to make best use of resources however compliance with Directive is the responsibility of each individual collection authority. Its findings and recommendations should therefore be endorsed by each individual authority to ensure they are satisfied that they are compliant. It should then be retained by the group and revised to ensure any planned changes to individual collection schemes or to the Joint Waste Strategy are also compliant.

1.2 Key findings

The comingled approach to waste collection taken by the authorities has delivered a significant increase in recycling performance since its introduction and reduced collection costs. This method of collection is supported by the County (Disposal) Authority as part of an integrated partnership approach to waste management.

Concern for Health and Safety was a significant factor in the individual authorities' decisions to change from source separated and twin stream collections to comingled collection. The reduction in manual handling, physical contact with the materials and noise, offered by this system allows a safer working environment for the collection crews.

Customer satisfaction levels with the collection services are high and have remained so following the introduction of wheeled bins and comingled recycling. Given the predominantly rural nature of the area the prospect of multiple containers was an environmental quality concern and wheeled bins were subsequently welcomed by many rural residents as a safe means of waste containment.

1.3.1 Quantity of recycle

Evidence from the WRAP analysis of kerbside dry recycling performance in the UK 2008/09 indicates that the yield of the current comingled collection service is operating within the upper quartile for dry recycling schemes. This data also suggests there is some scope to further increase this yield.

Based on a compositional analysis of the recyclable material collected in Herefordshire and Worcestershire the individual capture rates for the four key materials are also high when compared with WRAP figures, however in the case of metals and plastics some improvement may be possible through raising public awareness. This said these materials make up a relatively small proportion of the available recycle.

Comingled collections allow a wider range of materials to be collected than some kerbside sort schemes and the use of a single container and collection frequency makes the system easy to use. This “ease of use” is considered a contributing factor in increasing yields. It is therefore possible that the introduction of source separation for some or all of the key materials could impact negatively on the quantity of material collected.

1.3.2 Quality of recycle

The recent introduction of a MRF code of practice (Environmental Permitting (England and Wales) Regulations 2010) requires input and output sampling of materials processed by MRFs and will act as a significant driver to improve quality.

The contract between Worcestershire County Council and Severn Waste Services is driving continuous improvement. There are plans to further upgrade the MRF by including a “glass breaker” to remove the glass at the start of the process. It will then pass directly to the glass clean up system reducing its contact with the other materials which should improve their quality and make them easier to sort.

Evidence gathered directly from reprocessors indicates that materials delivered to them meet their requirements and no evidence of rejected or downgraded loads was found. The quality can therefore be regarded as “appropriate for their, the relevant sectors, needs”.

1.4 Cost of collection

The operational cost of comingled waste collection is generally lower than that of the kerbside sort schemes in the West Midlands identified for benchmarking (Section 8.3) however direct cost comparisons are difficult due to the integrated nature of waste collection services and the inclusion of garden waste and commercial waste collection costs in reported revenue outturns.

A number of the authorities in Herefordshire and Worcestershire have already operated kerbside sort systems and significant improvements in costs were achieved by switching to comingled collection (Section 5.5).

Transitional costs to a source separated service are likely to be a significant burden and cannot be justified without clear evidence that it would generate a significantly greater quantity and/or quality of recycle. The evidence set out in this assessment indicates that this is not the case.

Conclusion

Based on WRAP data the majority of authorities are performing in the “above average” range for all materials and in the case of glass, all are “high performing”. The table below shows the quantity of the four key materials collected in kilograms per household.

Average Kg/hh for Herefordshire and Worcestershire

	Glass	Metal	Plastic	Paper
Average Kg/hh	72.70	10.90	14.92	120.52
Performance Level kg/hh	High (53.5 - 79.3)	Above Average (8.5 – 11.4)	Above Average (13.6 – 19.10)	Above Average (111.7 – 138.6)

The authorities are performing well against average national yields for all collection scheme types, kerbside and comingled, and their average yield has been shown to be greater in quantity (kg/hh) than the kerbside schemes in the West Midlands against which they were benchmarked.

Given that the evidence presented shows that the schemes are high performing in terms of quantity and that no evidence has been found to indicate that the quality of the material is a barrier to its further use, we believe the current collection system to be compliant with the directive. It is therefore considered not necessary to proceed to a practicability test for any of the materials. Necessity statements for each material are set out in section 1.6.

It has been identified that there are drivers and opportunities to improve quality and increase quantity and these should be explored to maximise and enhance the performance of the existing scheme. Some recommendations on how to achieve this are made in section 4.

1.6 Necessity Statements

The statements below use the WRAP data to illustrate the performance of the authorities against national averages for all scheme types. The quality element is taken from the statements of those reprocessors receiving the bulk of the material direct from EnviroSort. The evidence detailing the place on the Waste Hierarchy and further details on the reprocessors can be found in tables 15 & 29.

1.6.1 Necessity Statement – Glass

Quantity: WRAP¹ calculates that upper quartile schemes collect above 53 kg/hh per year. The combined authorities collected on average 72.7kg placing them at the top end of the high performance range. Based on the compositional analysis the capture rate for the glass was also found to be 78%.

¹ Analysis of kerbside dry recycling performance in the UK 2008/9, WRAP Sept 2010

Quality: Viridor undertake visual quality control checks on tipping the material and identify at this point any reject loads. Any loads which contain over 2% contamination or which comprise of in excess of 17% fines or contain dirty glass are sent directly for aggregate. There is no evidence that any loads of glass have been rejected by Viridor or that any have been downgraded to aggregate.

Place on Waste Hierarchy: Viridor report that 70% of their output is sent into closed loop recycling i.e. container making and that only 27% goes for aggregate where it is used in road surfacing and drainage or is crushed and used in concreting, fibre glass manufacturing and water filtration. The aggregate component comprises of ceramics, stone and porcelain as well as any downgraded loads which accounts for 12% and any fragments of glass fines less than 10mm which have passed through their process which make up 15%.

Glass quality deteriorates with repeated handling and sorting as natural breakage occurs which predisposes it to being included in the aggregate figure if it then falls <10mm. However there is no evidence that comingled collection increases or decreases this problem and an argument could be made that the cushioning effect of the other materials may reduce it.

We therefore believe that based on the high yield and capture rates being achieved by the authorities and no evidence that the material delivered presents any more of a challenge to the reprocessor than other inputs the authorities are compliant for this material.

1.6.2 Necessity Statement - Paper & Card

Quantity: WRAP calculates that upper quartile schemes collect 138.6 kg/hh per year. The combined authorities collected on average 120.52 kg/hh placing them in the above average range. Based on the compositional analysis the capture rate for the paper was 68%.

Quality: Smurfit Kappa carries out random testing on a weekly basis and has not reported any rejection of loads from EnviroSort or from the bring bank material delivered by the individual authorities. They report typical paper bank contamination levels of between 1.5% and 2.5%.

Place on Waste Hierarchy: Smurfit Kappa receives mixed paper from the authorities and produces paper for paperboard and packaging. Some virgin material is required to ensure the products are fit for purpose so the final product is made from 74% recycled materials. Based on the definition that the material is capable of being turned back into the original product, the reprocessors clear need for the material, and their proximity to the area we believe it is reasonable to class this as closed loop recycling.

The evidence gathered therefore identifies it is not necessary to collect paper and card separately as a high quantity of material is being collected and the quality of the material meets the requirements of the reprocessor with 98% of the collected material ending up in closed loop recycling.

1.6.3 Necessity Statement – Plastic

Quantity: Based on the compositional analysis the combined capture rate for plastics was 48%. While there is further work to be done WRAP calculates that upper quartile schemes collect 19.1 kg/hh per year; the combined authorities collected an average of 14.92 kg/hh placing them in the “above average” range for collection schemes. Plastic is a diverse material with many polymer types, comingled collection allows a wide range of plastics to be collected contributing to this high yield.

Quality: Norton is able to sort a wider range of polymers and delivers both single polymer streams and mixed plastics to Jayplas. The price received for this material is based the quality and the current market conditions however it was found that all materials enter the same process and are resorted twice by the reprocessor before being washed and pelleted / flaked. No loads have been rejected or downgraded.

Place on Waste Hierarchy: Jayplas report that 70% of the total material received goes for closed loop recycling and 20% to other recycling uses, around 10% of the material will go for EfW however this includes materials integral to the products such as labels and caps.

The evidence gathered shows that it is not necessary to collect plastic separately as a high quantity of material is being collected and it is of a quality required by the reprocessor. To do so is likely to significantly increase costs for a relatively small fraction of the total recycling collected. The authorities therefore believe they are compliant for this material.

1.6.4 Necessity Statement – Metal

Quantity: WRAP calculates that upper quartile schemes collect 11.5 kg/hh per year. The combined authorities collected on average 10.90 kg/hh placing them in the top end of the above average range. Based on the compositional analysis the capture rate for metal was 33% however while this indicates there is more work to be done to engage the public in recycling this material there is no evidence separate collection would improve the quantity collected.

Quality: Metals are extracted by a positive sorting process and the efficiency of this process is high. No evidence was found to indicate the quality of the material does not meet the required market specification.

Place on Waste Hierarchy: The market for recycled metals is well developed and given the difficulty in tracing material or determining that any one use is environmentally preferable to another it would be reasonable to assume that all material not sent for disposal should be regarded as having entered closed loop recycling.

The evidence gathered shows that it is not necessary to collect metal separately as a high quantity of material is being collected and it is of a quality required by the reprocessor. To do so is likely to significantly increase costs for a relatively small fraction of the total recycling collected. The authorities therefore believe they are compliant for this material.

1.7 Recommendations

The following recommendations have been drawn from the evidence gathered during this assessment and through communication with the individual authorities.

Comingled Collection

The current specification for comingled recyclate is producing a high quantity and quality of material so while no fundamental change in the material specification or collection services is required opportunities to collect aluminium foil should be reviewed.

Collection authorities need to share best practice within the two counties and explore opportunities for common waste collection policies where these can be shown to enhance the quantity or quality of material delivered to EnviroSort.

Bring Recycling & HWRC's

There are significant differences in provision of bring recycling facilities between the authorities. This should be reviewed to identify opportunities to recycle other materials and any need for additional recycling capacity for the four key materials identified in the WFD, taking into account the provision of facilities at HWRC in each area.

Bulky Waste

The level of recycling of bulky waste is relatively low and ways of increasing this or the use of other collection models to increase its collection or diversion should be investigated. Bulky waste tonnage is not reported to districts in a consistent way and addressing this may raise awareness of any potential opportunity to increase recycling rates.

MRF Input Quality Data

The MRF regulations will mean that data on the input quality of comingled materials delivered to the MRF at Norton will become available at an individual district level. This information should be fed back to each authority on a regular basis so that appropriate action can be taken to train crews, educate residents and where necessary take active enforcement action.

Environmental Performance

As the DECC CO₂ emissions data includes but does not specifically reflect waste collection services, it would be prudent to explore the benefits of reporting this within the current waste services performance monitoring framework to ensure consistency of method, to make it available for future benchmarking and so that it is easily available to performance management teams for external reporting.

Communications

There is a need to work collaboratively on communications to ensure consistent messages across the authorities and to optimise the resources employed. This should enable an increase in communication activity which WRAP has shown has a direct impact on performance. In particular the capture rates for plastics and metal (cans) indicates that there is additional material in the household waste stream that could be diverted into the comingled collections.

2 Introduction

The authorities of Herefordshire and Worcestershire have an integrated partnership approach to waste management. This is set out in the Joint Municipal Waste Management Strategy where shared principles, policies and targets deal collectively with waste and recycling across the two counties.

The authorities have therefore agreed to continue the partnership approach by working jointly on this assessment to produce one document to determine if they are fully compliant with the legal requirements of the Waste Regulations (England and Wales) 2011 (amended 2012) in respect of the requirement for separate collection of recycling as set out in sections 2.1 and 2.2.

The individual authorities are:

- Bromsgrove District Council
- Malvern Hills District Council
- Redditch Borough Council
- Worcester City Council
- Wychavon District Council
- Wyre Forest District Council
- Herefordshire Council
- Worcestershire County Council

2.1 The Waste Framework Directive & Revised WFD

The Revised Waste Framework Directive (rWFD) requires the UK to take measures to promote high quality recycling. This includes a specific requirement, by 1st January 2015, to set up separate collections of paper, plastic, metal and glass as a minimum (Article 12). Collectors of these wastes must collect the four materials separately, unless it is not “necessary” to provide high quality recyclates; or unless it is not technically, environmentally or economically practicable (“TEEP”).

The EU legislation provides clear policy goals to improve the quality and quantity of the recycling with the aim of achieving a “European recycling society” however there is no clear definition of what constitutes “high quality recycling”.

Directive Article 11, Clause 1, Paragraph 2 states: “member States shall take measures to promote high quality recycling and, to this end, shall set up separate collections of waste where technically, environmentally and economically practicable and appropriate to meet the necessary quality standards for the relevant recycling sectors.

2.2 The Waste (England and Wales) (Amended) Regulations 2012

The Waste Framework Directive has been transposed into legislation for England and Wales by The Waste (England and Wales) (Amended) Regulations 2012. This confirmed that collection authorities have a duty when making arrangements for the collection of the four materials, paper, glass, plastics and metals, to ensure that those arrangements are by way of separate collection. The duty applies to waste classified as waste from households and waste that is classified as commercial or industrial waste.

This duty applies where separate collection is necessary to ensure that waste undergoes recovery operations in accordance with the directive and to facilitate or improve recovery; and where it is technically, environmentally and economically practicable.

“Facilitate” has been interpreted as “to increase quantity” and “improve” has been interpreted as to improve the quality of the material i.e. reduce contamination.

Clarification has been provided that comingled collection, where all the materials for recycling are mixed in a wheeled bin and emptied directly into the collection vehicle, is not a form of separate collection and that “collection” occurs at the point where the material enters the vehicle. This is as opposed to using a kerbside box to collect multiple materials and then sorting them at the roadside into separate compartments of the same vehicle or collecting multiple containers either into separate compartments of the same vehicle or multiple vehicles which is regarded as separate collection.

2.3 The Waste Regulations Route Map

As a response to the introduction of the Waste Regulations, WRAP published the Waste Regulations Route Map to help provide guidance to collection authorities on what they felt was required for an assessment.

The Route Map was produced by a working group comprising members of local authority waste networks (coordinated through the Waste Network Chairs), the London Waste and Recycling Board (LWARB) and WRAP.

It does not constitute legal advice; however it aims to offer the best current thinking on how to interpret the requirements of the Waste Regulations and provides a step-by-step guide to carrying out an assessment.

This report follows the principles of the Waste Regulations Route Map as far as possible however to avoid being constrained by it, or repetition of information, the relevant evidence required for each stage of the Route Map is listed in table 1 to show where it occurs in this document.

Table 1: Stages of the Waste Regulations Route Map

Description	Evidence Required	Relevant Evidence
Stage 1: Review what materials are collected and how	Waste collection methods	4.2
	Waste composition data	5.4
	Waste collection costs	5.5
	Costs incurred in changes to collection contracts	5.6
Stage 2: Appraise how materials are managed	Tonnage sent to each treatment route	5.1
	Arrangements for recycling and reprocessing for each method	6.1
	Cost of each treatment method and income	6.5
	Quantity of materials used in open and closed recycling	6.4
	Key documents in selecting treatment and disposal methods	3.5
	Environmental performance baseline / benchmark	8.4
Stage 3: Apply the waste hierarchy to materials to assess options (Regulation 12)	Approach for managing each material	6.1
	Rational for management method (costs, benefits and impacts)	6.4
	Justification for any deviation from Regulation 12	6.5
		3.2
Stage 4: Apply the Necessity and TEEP test to paper, plastic glass and metal collections (Regulation 13)	Necessity Details for each material of how much is recycled, disposed and recovered Necessity statement for each material Output quality statement (by material) Quality outputs from further reprocessing Material specifications for end destination	9.7
		1.6
		6.2
		n/a
	Practicability Statement of practicability should any material meet the necessity test Data used in assessment of practicability Key sensitivities that would affect the outcome of practicability test	9.6
Stage 5: Propose and agree a future approach for all materials	Assessment of sign off process	1.1
	Sign off obtained	
Stage 6: Retain evidence to support the rationale for your decision	Evidence retention	1.1
Stage 7: Set up regular reviews to ensure continuing compliance	Re-evaluation process	3.4

3. Waste Services

3.1 Description of area

Herefordshire & Worcestershire border Shropshire, Staffordshire and the West Midlands to the north, Warwickshire to the east, Gloucestershire to the south, and Gwent and Powys in Wales to the west.

The two countries once operated as a single county however, Herefordshire became a Unitary Authority in 1998 while the two tier structure of Districts being responsible for waste collection and the County for waste disposal remained in Worcestershire.

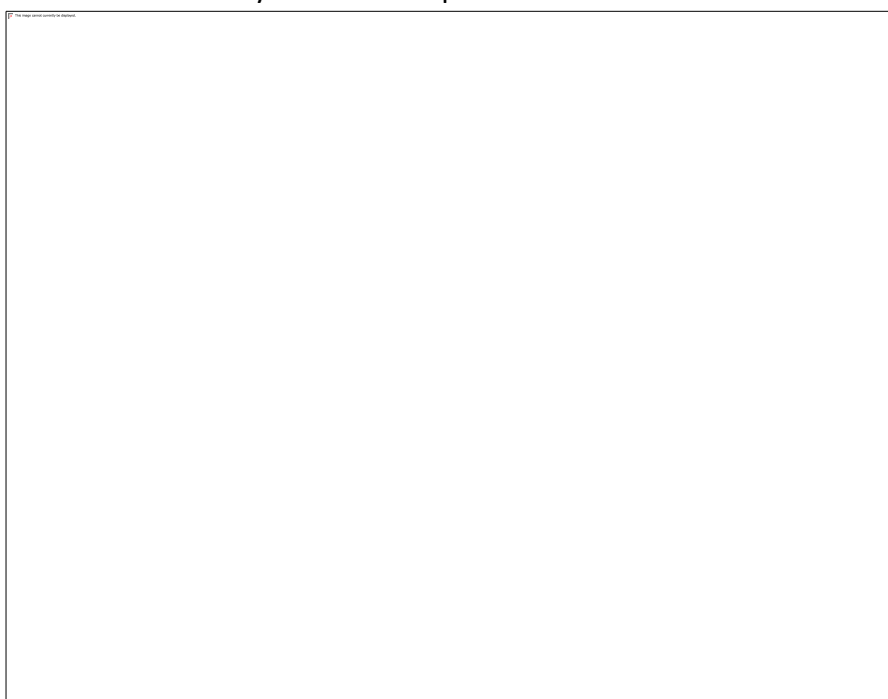


Table 2 shows the relative size of the different authorities. With the exception of Worcester City the authorities are predominantly rural with urban centres concentrated toward the north east.

Table 2: Type and size of authority

Authority	Type of Authority	Hectares	Population Distribution
Bromsgrove	WCA	21,714	Predominantly rural with 91% green belt
Malvern Hills	WCA	57,710	Predominantly rural
Redditch	WCA	13,430	50% rural and 50% urban
Worcester City	WCA	3,328	Predominantly urban
Wychavon	WCA	66,350	Predominantly rural
Wyre Forest	WCA	19,540	50% rural and 50% urban
Herefordshire	WCA / WDA	218,000	Predominantly rural
Worcestershire	WDA	182,000	As above

3.2 The Herefordshire & Worcestershire Joint Municipal Waste Management Strategy (JMWMS)

The JMWMS strategy for Herefordshire and Worcestershire forms the framework for the management of municipal waste in the two counties until 2034. The document is regularly reviewed to ensure it is adapted to reflect changes in legislation and guarantee it's relevancy as National and EU policy evolves. The last review was undertaken in 2009 and the next is due in 2015/16.

The strategy contains ten principles which underpin the management of waste. To enable the authorities to deliver these strategic principles, 18 policies and 6 targets have been agreed, see table 3 to 5 below.

Table 3: Principles of the Herefordshire and Worcestershire JMWMS

	Principles of the Herefordshire and Worcestershire JMWMS
Principle 1	Meeting the challenge of climate change by viewing waste as a resource
Principle 2	Commitment to the waste hierarchy of which waste prevention is at the top
Principle 3	Influencing Government, waste producers and the wider community
Principle 4	Continued commitment to reuse, recycling and composting
Principle 5	Minimising the use of landfill
Principle 6	Partnership
Principle 7	Monitoring and review
Principle 8	Customer focus
Principle 9	Value for money
Principle 10	Consideration of social, environmental and economic impacts

Table 4: Policies of the Herefordshire and Worcestershire JMWMS

Policies of the Herefordshire and Worcestershire JMWMS	
Policy 1	Adopt the following waste hierarchy as a template for their approach to waste management. Prevention, Reuse, Recycling / Composting, Energy Recovery, Safe Disposal to Landfill.
Policy 2	Ensure waste management provides value for money to local communities, taxpayers and fee-paying customers.
Policy 3	Design services around customers while seeking to balance the long term need to reduce waste generated and disposed.
Policy 4	Achieve the existing and future waste targets set within the local area.
Policy 5	Seek to adopt and implement sustainable procurement policies for waste management services.
Policy 6	Work toward a consist and transparent approach in developing and monitoring performance
Policy 7	Actively seek to provide waste managements services that minimise greenhouse gas emissions and other impacts that contribute to climate change.
Policy 8	Collect the same materials for recycling through a comingled collection and prevent waste and increase recycling through restricting collection frequency and/or container capacity.
Policy 9	Implement uniform waste prevention initiatives to reduce the kg/hh waste collected for disposal.
Policy 10	Develop and implement the most sustainable
Policy 11	The Local Authorities will continue to work together to ensure that this Strategy is implemented.
Policy 12	The local Authorities will consider the merits of a common approach across the counties in areas of waste policy that could potentially encourage waste reduction / waste minimisation.
Policy 13	Wherever possible , partnerships with the voluntary and community sector will be developed to ensure that waste is re-used and recycled, such as re-use of old furniture and household appliances.
Policy 14	Opportunities for more sustainable waste management will be sought in new developments wherever possible as part of the planning process – such as provision of home composters and recycling centres. Where necessary representations to Government will be made through the appropriate channels to seek amendments to legislation to support this and the aims of this strategy.
Policy 15	Individual policies will be prepared for all Specific Waste Streams such as abandoned vehicles.
Policy 16	Planning Policy Guidance Notes 10 and 11 (PPG10 and PPG 11) set out

	guidance by which each region must prepare a Regional Waste Management Strategy (RWMS) to inform Regional Planning Guidance (RPG). The West Midlands Regional Strategy has been produced and this Joint Municipal Waste Strategy must be compliant with the Regional Waste Strategy and RPG.
Policy 17	The Local Authorities will seek to adopt and implement a Green Procurement and Waste Management Policy within four years of the date this Strategy is published.
Policy 18	The Local Authorities will aim to have a consistent approach in developing and monitoring performance through Best Value and local performance indicators.

Table 5: Targets of the Herefordshire and Worcestershire JMWMS

Targets of the Herefordshire and Worcestershire JMWMS	
Target 1	Climate Change target measured against NI85, NI86 and NI88.
Target 2	To achieve the national reduction in kg/head of household waste (not reused, recycled or composted) of 35% by 2015 and 45% by 2020 based on 2000 levels
Target 3	To achieve national recycling/composting levels for household waste of 45% by 31 March 2015 and 50% by 31 March 2020.
Target 4	To achieve the requirements of the Household Waste Recycling Act 2003 to provide a kerbside collection of at least 2 recyclables materials for all households by 31 December 2010.
Target 5	By 2015, or earlier if practicable, recover values from a minimum of 78% of municipal waste. The aim of this is to achieve the Best Practicable Environmental Option (BPEO) that was identified in July 2003 through a portfolio of treatment options. That is a minimum of 33% of waste to be recycled and or composted, an additional 45% of waste to be recovered with a maximum of 22% landfilled. BPEO continues to be a policy of the Councils.
Target 6	To reduce the amount of biodegradable municipal Waste landfilled in order to meet the yearly allowances set by the Government under the Landfill Allowance Trading Scheme. In particular target years as below: 102,684 tonnes during April 2012 and March 2013 71,851 tonnes during April 2019 and March 2020

3.3 Sustainability Appraisal for the Joint Municipal Waste Management Strategy Scoping Report Version 4 April 2008 (Application of the Waste Hierarchy)

An appraisal of the Best Practicable Environmental Option (BPEO) for waste management was undertaken jointly for Herefordshire and Worcestershire in 2003. The BPEO process considered the relative merits of various waste management options, to help identify the most practical and cost effective means of increasing levels of recycling in the two counties, taking into account the conservation of the environment across land, air and water. The outcome of the process was endorsed by Worcestershire County Council in July 2003 as forming the basis for preparing the Development Plan.

The preferred outcomes are listed below and these arose from investigating possible options through the Officers Waste Forum. See Appendix C of the JMWMS for the full report

- Implementation of the Core Service across all collection authorities
- Maintain the current range of recyclables available at all Household Recycling Centres, expanding the range at smaller sites as they are rebranded
- Implementation of paid for garden waste collections where appropriate
- Implementation of street sweeping recycling if a suitable processing point can be found locally
- Food waste be dealt with through waste minimisation
- Commercial waste recycling be investigated further and if the issues can be resolved then it should be implemented where appropriate.

These outcomes were intended to enable the authorities to meet the requirements of the national recycling / composting levels of household waste of 40% by 31st March 2010 and 45% by 31st March 2015 and 50% by 31st March 2020.

3.4 JMWMS Review and the Vision

Since the original Joint Municipal Waste Strategy for Herefordshire and Worcestershire was adopted, Government has refreshed the national waste strategy with the publication of Waste Strategy for England 2007. This focused much more on the contribution made by waste collection, treatment and disposal to climate change. Targets for recycling, diversion of waste from landfill and recovery of value from waste set out in Waste Strategy for England are now more demanding than those established previously. The revised JMWMS took on board this new national position which sets out to break the link between economic growth and the growth in waste production, by seeing waste as a resource from which value could be derived.

The revised Strategy recognised an integrated collection and disposal system known as the “Vision for Waste Collection” was central to future joint working. In this system, collection authorities would collect comingled dry recyclables (to be sorted in a reclamation facility) and residual refuse from each household on alternate weeks.

The agreed review period for the JMWMS is that it should be updated at least every 5 years. The next review of the JMWMS is due in 2015 and this document will be reviewed in line with the JMWMS to reflect any changes.

For a full list of key documents; cabinet reports & contract documents, detailing the adoption of the JMWMS and the core waste services see table 7 and 8 below.

Table 6 below shows when each authority introduced comingled recycling.

Table 6: Date co-mingled recycling service introduced

Authority	Date of Service Introduction
Bromsgrove	Phased introduction during 2009/10
Malvern Hills	Introduced May 2013.
Redditch	Phased introduction during 2007
Worcester City	Phased introduction of 13,000 during Oct 2005, Oct 2006 & Oct 2007.
Wychavon	Phased introduction Sept 2008/9 & March 2009/10.
Wyre Forest	Phased introduction May & June 2011
Herefordshire	Phased introduction during 2009/10 – 2010/11

3.5 Key Documents

The following tables identify the key documents for each authority containing the decisions on which their current waste management systems are based.

Table 7 identifies the committee reports or minutes where each individual authority agreed the current waste collection arrangements, table 8 shows documents for the authorities where the collections services are contracted out and table 9 the joint waste disposal contact for Herefordshire and Worcestershire.

Table 7: Cabinet reports and outcomes regarding current collection systems and adoption of the Worcestershire & Herefordshire JMWMS

Authority	Document	Link to Document
Bromsgrove	Adoption of the JMWMS	http://moderngovwebpublic.bromsgrove.gov.uk/ieListDocuments.aspx?CId=105&MId=662&Ver=4
	Adoption of current service	http://moderngovwebpublic.bromsgrove.gov.uk/ieListDocuments.aspx?CId=105&MId=273&Ver=4
	Trade/ Garden/ recycling	http://moderngovwebpublic.bromsgrove.gov.uk/ieListDocuments.aspx?CId=105&MId=432&Ver=4
Malvern Hills	Adoption of the JMWMS	http://moderngov.malvern hills.gov.uk/ieListDocuments.aspx?CId=102&MID=1450&J=5#AI5933
	Adoption of current service	http://moderngov.malvern hills.gov.uk/documents/s4429/EC1023%20-%20Future%20kerbside%20collections.pdf?J=4
	Adoption of Garden Waste service	http://moderngov.malvern hills.gov.uk/documents/s3559/C248%20-%20Green%20Waste%20Collection%20Service.pdf?J=5
Redditch	Adoption of the JMWMS	http://www.redditchbc.gov.uk/democracy/ieDecisionDetails.aspx?ID=626
	Adoption of current service	http://www.redditchbc.gov.uk/democracy/ieDecisionDetails.aspx?ID=886
Worcester City	Adoption of the JMWMS	http://committee.cityofworcester.gov.uk/ieListDocuments.aspx?CId=105&MID=2308
	Adoption of current service	
Wychavon	Adoption of the JMWMS	http://www.e-wychavon.org.uk/modern.gov/ieListDocuments.aspx?CId=105&MID=2308

		d=314&MId=2745&Ver=4
	Adoption of current service	http://www.e-wychavon.org.uk/modern.gov/ieListDocuments.aspx?CId=314&MID=2217#A110200
Wyre Forest	Adoption of the JMWMS	http://www.wyreforest.gov.uk/council/docs/doc40893_20090922_cabinet_minute.pdf
	Adoption of current service	http://www.wyreforest.gov.uk/council/docs/doc40893_20090922_cabinet_minute.pdf
Herefordshire	Adoption of the JMWMS	http://councillors.herefordshire.gov.uk/ieListDocuments.aspx?CId=251&MId=2846&Ver=4
	Adoption of current service	http://councillors.herefordshire.gov.uk/ieListDocuments.aspx?CId=251&MId=5011&Ver=4
Worcestershire	Adoption of the JMWMS	https://public.worcestershire.gov.uk/web/home/DS/Documents/Appendix/Cabinet/Agendas%20and%20Reports%202013/Thursday%2C%2012%20December%202013/Item%204.pdf

Table 8: Key Documents Waste Collection

Authority	Contract Name	Contractor	Contract End Date
Wychvon District Council	Recycling, Refuse Collection, Highways and other Cleansing Contract 2008 -2015	FCC Environment Ltd	7 year contract extended by 2 years to 29 th September 2017
Herefordshire County Council	Waste Collection Contract 2009	FCC Environment Ltd	7 year contact extended by 7 years to 1 st November 2023

Table 9: Key Documents Waste Disposal

Organisation	Contract Name	Contractor	Contract End Date
Herefordshire and Worcestershire	Waste Management Services Contract	Mercia Waste Management	2023 (possible 5 year extension)

3.6 Residual Waste treatment

The Review of the JMWMS included a list of possible options for the treatment of residual waste and an appraisal of these was carried out by Environmental Resources Management Limited (ERM). This included; a financial assessment of Capital and Operational expenditure (CAPEX and OPEX) costs of the various options for comparative purposes and an assessment of the different options against environmental criteria undertaken using the Environment Agency's life cycle assessment tool – Waste and Resources Assessment Tool for the Environment (WRATE).

The Residual Waste Options Appraisal ranked EFW high, particularly with combined heat and power (CHP). In 2009, Herefordshire and Worcestershire Authorities adopted the revised JMWMS. This included a new policy to increase diversion away from landfill. The Residual Waste Options Appraisal (Annex D to the JMWMS) informed the method for treatment of residual waste.

In line with the JMWMS, Mercia Waste Management Ltd proposed an Energy from Waste facility to deal with residual waste and commenced a site search. This resulted in the site at Hartlebury Trading Estate being selected as the best site available in the two counties for an EFW plant. The concept contained in Mercia's EFW proposal and its progressing to planning was supported in principle by Worcestershire County Council Cabinet in December 2009.

The Secretary of State granted planning consent for the EFW Plant at Hartlebury in July 2012 following a comprehensive call-in Planning Inquiry. The consent requires any development on site to commence within three years, i.e. July 2015. All relevant issues associated with site selection, objections and process were dealt with at length in the inquiry and through the council's decision making processes.

3.7 Environmental Baseline

4. Waste Collection Methods

4.1 Core Waste Collection Services in Herefordshire and Worcestershire

The core service envisaged by the Joint Waste Strategy is for an alternate weekly collection of refuse and recycling using a container. The majority of residual waste is delivered to the Hill and Moor landfill with a small percentage diverted to neighbouring EfW facilities. This will change as each collection authority starts to deliver to the Energy from Waste facility currently being developed at Hartlebury. Recycling is delivered comingled either directly to the MRF at Norton or in the case of Bromsgrove, Herefordshire, Redditch and Wyre Forest, via a bulking facility.

4.2 Current Waste Collection Methods

Although all collection authorities in Herefordshire and Worcestershire share the same principles, policies and targets each must take into account local circumstances in managing its transition to the agreed waste collection system. There are therefore some variations in the current core collection services as identified in table 10.

With the exception of Malvern Hills where a weekly refuse collection using sacks is still provided all authorities have now adopted alternate weekly refuse collection.

Table 10: Household waste core collection services

Authority	Service Provider	Residual	Recycling	Garden waste
Bromsgrove	In-house	AWC wheeled bin	AWC Co-mingled wheeled bin	AWC Wheeled bin Chargeable Service March - Nov
Malvern Hills	In-house	Weekly black sack	AWC Co-mingled wheeled bin	AWC Wheeled bin Chargeable Service Annual
Redditch	In-house	AWC wheeled bin	AWC Co-mingled wheeled bin	n/a
Worcester City	In-house	AWC wheeled bin	AWC Co-mingled wheeled bin	AWC Wheeled bin Chargeable Service Annual
Wychavon	FCC Environment Ltd	AWC wheeled bin	AWC Co-mingled wheeled bin	AWC Wheeled bin Chargeable Service Annual
Wyre Forest	In-house	AWC wheeled bin	AWC Co-mingled wheeled bin	AWC Wheeled bin Chargeable Service March - Nov
Herefordshire	FCC Environment Ltd	AWC wheeled bin	AWC Co-mingled wheeled bin	AWC Sack Chargeable Annual

4.3 Materials accepted by the comingled recycling collection

The comingled recycling collection accepts all four of the target materials, paper, glass, plastics and metals (cans). The full specification includes a wide range of material in each target group to increase material capture and to encourage participation through ease of use.

For paper this includes card and cardboard as well as directories and drinks cartons. For plastics this includes plastic bottles as well as pots, tubs and trays. Metal includes both cans and aerosols, and glass includes bottles and jars. The full list of materials accepted by the collection scheme are food and drinks cans, mixed glass and jars, plastic bottles, pots tubs and trays (excluding black), paper, cardboard and cartons.

The range of materials collected through the comingled scheme is wider than those collected by the previous kerbside sort recycling schemes and a number of new items have been added since its introduction as the capacity and ability of the MrF has developed. These include cardboard, tetra-packs and yoghurt pots.

Table 11 shows the tonnage of each of the 4 key materials collected by each district based on their comingled input tonnage split down by the percentage MRF out-put for each material.

Table 11: Tonnage of key materials collected through comingled kerbside collections 2013/14.

	Comingled Collected	Glass (29.83%)	Paper (50.54%)	Plastics (6.12%)	Metal (4.37%)	Rejects (9.08%)
Bromsgrove	9012	2688	4555	552	394	818
Malvern Hills	6622	1975	3347	405	289	601
Redditch	8246	2460	4168	505	360	749
Worcester City	9987	2979	5048	611	436	907
Wychavon	13465	4017	6805	824	588	1223
Wyre Forest	10325	3080	5218	632	451	938
Herefordshire	17131	5110	8658	1048	749	1556
Total	74131	22340	37850	4583	3273	6800

4.4 Households exempt from the core collection services

For each authority, there are a small number of households that are unable to accommodate the core waste collection service due to access or storage issues. For these households the authorities offer a modified service to meet their obligations to enable all households to recycle at least two items. This also meets the individual authorities' aspirations to provide equitable services, accessible to all. Modifications may include weekly sack collections or bulk bin collections.

Where sack collections are provided for recycling the materials specified for collection are the same with the exception of glass which is excluded for safety reasons. An alternative box container for glass is provided by Wychavon D.C. but not by the other authorities.

Table 12 shows the number of households served by the core service and by exempt services for 2013/14.

Table 12: Number of households on waste core collection services

Authority	Type of Authority	No. of Households 2013/14	No. of properties on Core Service	No. of properties on Exempt Service (weekly sacks service)
Bromsgrove	WCA	39,630	35,590	140
Malvern Hills	WCA	33,990	25,759	8231
Redditch	WCA	35,400	37,511	400
Worcester City	WCA	43,860	42386	1432
Wychavon	WCA	52,300	49,556	2,744
Wyre Forest	WCA	45,103	45640	0
Herefordshire	WCA / WDA	82,550	70,515	12,636
Worcestershire	WDA	250,310	n/a	n/a

4.5 Other Waste Collection Services

Table 13 shows the other collection service operated by each of the collection authorities.

Table 13: Other waste collection services

Authority	No. of Bring Banks	No. of Commercial Waste Contracts	Bulky Waste Collections	No. of Household Waste Recycling Centres
Bromsgrove	8	488	Yes In-house	n/a
Malvern Hills	51	399	Yes In-house	n/a
Redditch	8	Preferred supplier Veolia 2004	Yes In-house	n/a
Worcester City	28	671	Yes In-house	n/a
Wychavon	56	979 Contracted to FCC	yes	n/a
Wyre Forest	11	686	yes	n/a
Herefordshire	7	1457 Contracted to FCC	Yes	5
Worcestershire	n/a	n/a	n/a	11

4.5.1 Bring Recycling

Prior to the introduction of extensive kerbside collections, bring recycling banks were provided as a method for householders to recycle. This network was managed locally by the individual authorities and served as the principle route for household recycling for a number of years. Districts are paid a recycling credit by the County Council to assist with the cost of maintaining these networks and the level of payment reflects a portion of the avoided disposal cost.

As kerbside collection schemes were introduced a significant decline in bring recycling tonnage of 70% was observed over the period 2008/9 to 2013/14. With decreasing quantities being collected due to the ease with which residents can recycle from their own doorstep, the number of bring recycling sites has been reduced to make these systems more cost effective.

Despite the financial burden of maintaining these schemes, several districts still maintain extensive networks to support their kerbside collections and to provide a recycling route for textiles. Several collection authorities have, or are, looking to experiment with additional materials such as plastics and electrical items to extend the range of materials that can be collected and to create a viable future for their schemes.

Fig 1 shows the decline in bring recycling by district since comingled collections were introduced.

Fig 1: Bring recycling tonnage by District 2007/8 to 2013/14.

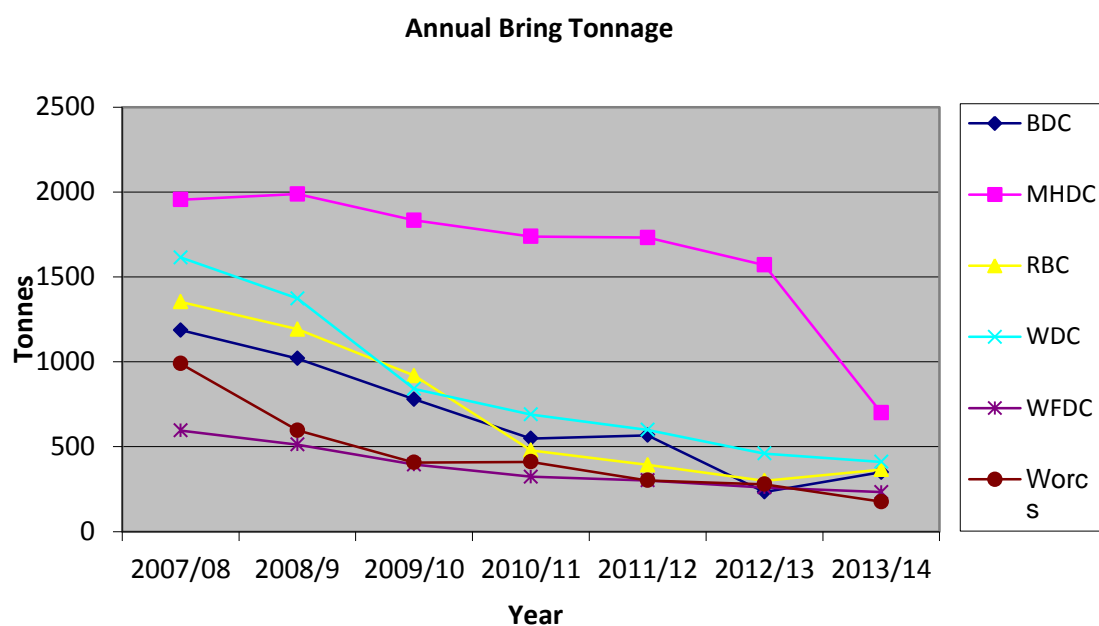


Table 14 below shows the tonnage for 2013/4 of the key materials collected at bring sites. With the exception of Herefordshire were a small amount of cans and plastics are collected comingled all the materials stream are collected separately with the glass element collected colour separated at the majority of sites

Table 14: Tonnage of key materials collected at Bring Recycling Sites 2013/14.

	Glass	Paper	Metals	Comingled
Bromsgrove	88.22	257.43	10.72	0
Malvern Hills	537.51	169.66	0	0
Redditch	78.28	286.1	2.25	0
Worcester City	121.25	120.86	42.36	0
Wychavon	250.53	164.68	6.22	0
Wyre Forest	87.74	141.64	2.79	0
Herefordshire	268.28	0	0	82.98
Total	1431.81	1140.37	64.34	82.98

4.5.2 Household Waste Recycling Centre (HWRCs)

A range of materials are collected at the household waste sites for recycling and reuse including all four of the target materials. As these materials are pre-sorted they are sent to individual reprocessors rather than entering the MRF apart from some comingled collections of cans and plastics.

Destinations for all materials collected can be seen in table 15 below.

Table 15: Destinations of materials from Severn Waste HWRC's 13/14

Material	Reprocessor or Merchant	End product
Glass	T Berryman & Son Ltd , Lidgate Crescent, Langthwaite Business Park, South Kirkby, West Yorkshire WF9 3NR	Glass cullet – bottles, jars
Paper	Mission Recycling , Offenham road, Evesham, WR11 8DX	Paper
Card	Smurfit Kappa Paper Recycling , Duddeston Mill Road, Saltley, Birmingham B8 1AB	Card
	Hereford Waste Paper , Court Y Park, Pixley, LEDBURY, HR8 2RW	Card
	Parry & Evans , Severn Farm Industrial Estate Welshpool, Powys SY21 7DF	Card
	Walkers , Bransons Cross Farm Beoley Ln, Beoley, Redditch, Worcestershire B98 9DP	Card
	Mission Recycling , Offenham road, Evesham, WR11 8DX	Card
Comingled recyclables	EnviroSort	Cans and Plastics
	Pure Recycling Warwick Road, Ettington, Stratford CV37 7PN	

Table 16 below shows the 2013/14 tonnages for the key materials collected at the Household Waste Recycling Centres for Herefordshire and Worcestershire. The glass and paper streams are collected separately on site and the relatively smaller quantities of plastic and cans are collected together to economise on container space at the sites.

Table 16: Tonnage of key materials collected at HWRC's 2013/14.

	Glass	Paper	Plastics	Metal
Herefordshire	193	822.8	8.43	8.43
Worcestershire	270.3	2661.4	13.77	14.51
Total	463.3	3484.2	22.2	22.53

4.5.3 Bulky Waste Collection

Bulky wastes collections are provided independently by all collection authorities. The materials are delivered to Severn Waste Services where white goods are removed for recycling and usable furniture dropped off at a collection point for local reuse charities. The fee structure for the different schemes is set out in table 17 below.

The level of recycling of these materials is relatively low and improvements could assist the authorities to increase their recycling rates. Bulky waste is not reported to districts by individual material type and better information may raise awareness of this opportunity.

Table 17: Bulky waste collection services

Authority	Unit Rate 13/14	Multiple Units
Bromsgrove	£7.50	£7.50 for 1 item, £15 for 2 items, £20 for 3 items More than 3 items then customers advised to call
Malvern Hills	£17.50	Collect 3 items - additional items charged at the same rate
Redditch	£7.50	£7.50 for 1 item, £15 for 2 items, £20 for 3 items. More than 3 items then customers advised to call
Worcester City	£17	General waste - Single item = £17, 2 items £28, 3 items £34. White goods (but not fridges) £20. Small under counter fridges etc. £24, taller fridges and freezers £36.
Wychavon	£19	Up to 2 units £19 min. charge and £19 per additional 2 units
Wyre Forest	£25.00	From £25 - concessions for pensioners in receipt of 100% council tax discount - residents advised to contact for prices
Herefordshire	£20	3 items (i.e. Armchair, Bicycle, Chest of drawers) additional items cost £5 per item.

4.5.4 Commercial Waste Collection Services

Seven of the eight collection authorities collect commercial waste using a combination of bins or sacks. These services are either provided in-house or via the council's collection contactors. Redditch Borough Council has a preferred supplier arrangement, currently with Veolia, and any request for a commercial waste collection is referred to this provider. See table 18 below.

Table 18: Commercial waste collection services

Authority	Provider	Residual Waste	Recycling Service
Bromsgrove	In- house	Wheeled bins or sacks.	No current recycling service.
Malvern Hills	In- house	Wheeled bins or sacks.	Introducing fortnightly comingled recycling service Feb 2015
Redditch	Outsourced to Veolia in 2004	Wheeled bins or sacks.	Service provided by Veolia.
Worcester City	In- house	Wheeled bins or sacks.	No current recycling service.
Wychavon	FCC Environment	Wheeled bins or sacks.	No current recycling service.
Wyre Forest	In- house	Wheeled bins or sacks.	No current recycling service.
Herefordshire	FCC Environment	Wheeled bins or sacks.	Limited Paper collection

4.5.5 Commercial Waste Recycling Services

The government review of waste policy in England 2011 identified that small businesses were finding it difficult to procure recycling services. The review envisaged that SME's should be able to access services similar to those provide to domestic household's. In response WDC recruited 30 customers for a trial paper collection scheme in the Evesham area. Paper was chosen as this was identified as the most common recyclable waste type from small businesses. Additional bins were provided and customers were asked to separate out paper into the trial bin and to bundle cardboard. The trial identified that customer's;

- Often lacked sufficient storage space to separate waste streams.
- Significantly overestimated the amount of recyclable paper in their waste.
- Had poor control over the separation of their waste.
- Perceived the recycling collection as a cost reduction measure rather than an additional service.

With these points in mind WDC concluded that the only viable way forward would be to integrate a recycling service with the domestic waste collection service when a suitable mechanism for apportioning the weight of material collected from commercial and domestic sources could be agreed with Severn Waste Services, the disposal authorities' contractors.

Following agreement between Worcestershire County Council and Severn Waste Services, Malvern Hills District Council will launch a comingled recycling collection service to its commercial waste customers in April 2015. This will collect the same materials as the domestic recycling service on a fortnightly basis. A price differential is being offered to encourage take up of the scheme.

5. Waste Collection Performance

Each district collects residual waste within its own area and maintains a network of bring recycling sites. Reuse organisations are supported by the County Council through the payment of third party reuse credits. Recycling credits are also paid to the districts by County Council for bring bank tonnages although no recycling credits are paid for recycling collected at the kerbside. Garden waste collections are provided on a chargeable basis by all districts apart from Redditch. There are currently no food waste collections operating in the two counties.

The authorities of Herefordshire and Worcestershire have agreed to continue to use the Wastedataflow system as their preferred method of reporting. The data used in this report is therefore taken from Wastedataflow wherever possible.

5.1 Tonnage of material collected by each service

Table 19 below shows the tonnage of waste collected by each authority in 2013/14 broken down by service.

A small proportion of the residual waste is sent for EfW however the vast majority, 96%, is sent to landfill. The kerbside recycling tonnage shown is “collected recycling” prior to sorting and therefore does not allow for any subsequent reject rate at the MRF.

Garden waste services are operated independently by each district apart from Redditch Borough Council where there is no collection service. All of these services are opt-in and chargeable and have been introduced and developed at different times and rate hence the wide range between the authorities in tonnage collected

The level of reuse is fairly low level and varies greatly across the districts as this is a comparatively new diversion route and relies on coverage by local charities for items such as books and shoes. Many bring recycling centre are relatively small and accommodating banks for additional items can be difficult.

Table 19: Tonnage of municipal waste by waste stream 2013/14^[1]

Authority	Residual	Kerbside Recycling	Bring Recycling	Reuse	Green waste	Total
Bromsgrove	22,275	9,012	438	106	8,368	40,199
Malvern Hills	15,840	6,622	763	0	1,846	25,073
Redditch	20,772	6,295	504	105	0	27,676
Worcester City	19,104	10,496	579	47	1,881	32,107
Wychavon	24,458	13,498	577	93	6,140	44,766
Wyre Forest	25,808	10,336	327	0	1,618	37,762
Herefordshire	47,674	16,821	354	39	9,814*	74,701

*figures for Herefordshire include waste from kerbside collections and HHW sites.

^[1] Data taken from Wastedataflow National Indicator Summary Report 2013/14

Table 20 shows the each waste stream as kilograms per household. This allows the tonnage collected to be normalised against the number of properties in each authority so that comparisons can be made between different authorities.

WRAP indicated in its report “Analysis of kerbside recycling performance in the UK 2008/9” that 206 to 213 kg of dry recycling per household signifies a high performing kerbside collection scheme operating in the upper quartile. Five or the seven authorities met this standard in 2013/14 with the remaining two within 10kg.

Where schemes were benchmarked against other authorities with similar frequencies of collection of both residual waste and recycling, authorities providing alternate weekly collections achieved the highest rates with the top quartile being 231 to 261 kg. Two of the seven authorities in Herefordshire and Worcestershire achieved top quartile performance on this basis with a further three within 5kg and classed as above average.

Table 20: Individual waste streams kilograms per household 2013/14^[2]

Authority	Residual kg/hh	Kerbside kg/hh	Bring kg/hh	Reuse kg/hh
Bromsgrove	562	227	11	3
Malvern Hills	466	195	22	0
Redditch	587	178	14	3
Worcester City	436	239	13	1
Wychavon	468	258	11	2
Wyre Forest	572	229	7	0
Herefordshire	578	204	4	0

5.2 Recycling Performance

Table 21 below shows the percentage of household waste recycled for years 2006/7 to 2013/14. The bold figures indicate the years prior to and after the adoption of the current core comingled collection service. Figures prior to 2008/9 use BV82a & BV82b. From 2008/9 onwards, NI192 is used. In all cases the overall recycling rate increased after the introduction of comingled recycling and in some this was by as much as 10%.

^[2] Data taken from Wastedataflow National Indicator Summary Report 2013/14

Table 21: Household waste recycling rate 2006/7 - 2013/14

Authority	Household Waste Recycling Rate by Year (%)							
	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14
Bromsgrove	40.91	43.58	43.49	37.33	40.55	41.69	41.47	40.16
Malvern Hills	24.70	26.00	27.46	28.07	31.67	31.27	31.43	34.42
Redditch	20.11	32.21	31.50	29.10	28.56	28.65	29.26	28.95
Worcester City	25.83	34.08	36.14	33.62	36.16	36.25	37.10	36.14
Wychavon	22.07	24.02	32.75	42.42	43.69	43.63	45.21	42.22
Wyre Forest	27.92	28.46	28.36	26.46	27.58	29.91	31.74	30.10
Herefordshire ²	25.89	30.22	33.15	35.59	39.82	40.11	39.70	38.61
Worcestershire ³	32.26	38.34	41.61	41.75	42.77	43.28	43.54	40.90

5.3 Dry Recycling Performance

Table 22 shows the dry recycling rate for each authority prior to and after the introduction of the comingled collection service. These figures exclude the contribution made by food and garden waste collections which were being introduced at the time.

The average increase in the contribution made to overall recycling rates by dry recycling in the financial year following the introduction of comingled collection was 4.8%.

Table 22: Household waste dry recycling rate 2006/7 - 2013/14

Authority	Household Waste Dry Recycling Rate by Year (%)							
	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14
Bromsgrove	21.63	23.24	21.25	21.00	23.90	25.14	24.49	23.31
Malvern Hills	24.7	26.01	27.39	25.65	27.75	26.47	25.60	28.35
Redditch	20.47	32.17	31.38	28.91	28.04	28.48	29.02	28.73
Worcester City	25.84	34.06	36.03	32.43	32.89	32.62	32.69	31.63
Wychavon	22.08	23.91	25.90	31.93	32.47	32.83	33.04	30.43
Wyre Forest	27.90	28.47	28.25	26.04	27.74	28.43	26.92	26.92
Herefordshire ⁴	18.47	22.83	24.38	26.85	30.43	30.80	29.80	28.40
Worcestershire ⁵	22.36	28.11	29.16	29.10	29.34	30.13	29.71	27.23

² Includes waste from HWRC's

³ Combined rate for all Worcestershire Districts including waste from HWRC's

⁴ Includes waste from HWRC's

⁵ Combined rate for all Worcestershire Districts including waste from HWRC's

5.4 Waste Compositional Analysis & Material Capture Rates

A Waste Compositional Analysis (WCA) was undertaken across the two counties in 2010 to identify the quantities and composition of kerbside, residual and HWRC collected waste and recycling. To reflect local circumstances the data from this analysis has been used to calculate the capture rates rather than national figures.

Table 23 below shows the kilograms collected per household for each of the key materials. These have been ranked by WRAP data to show the performance level of each individual scheme by quartile against UK dry recycling performance.⁶

Table 23: Kilograms of recycling per household by material

Authority	Glass	Metal	Plastic	Paper
Bromsgrove	75.50	11.31	15.50	127.98
Malvern Hills	76.66	11.49	15.73	129.93
Redditch	65.55	9.83	13.45	111.10
Worcester City	70.26	10.53	14.42	119.08
Wychavon	81.02	12.15	16.63	137.32
Wyre Forest	67.46	10.11	13.85	105.22
Herefordshire	72.45	10.86	14.87	112.99
Average Kg/hh %	72.70	10.90	14.92	120.52

Key to Table 24

	Low Performance	Below Average Performance	Above Average Performance	High Performance
Glass	< 29	29.1 - 41.3	41.4 - 53.4	53.5 - 79.3
Metal	< 6	6.1 - 8.4	8.5 - 11.4	11.5 - 20.2
Plastic	< 9.2	9.3 - 13.5	13.6 - 19.1	19.2 - 28.8
Paper & Card	< 86.1	86.2 - 111.6	111.7 - 138.6	138.7 - 197.7

All key materials are ranked as “above average performance” or “high performance” apart from plastic collection in Redditch which just fell “below average”. Glass in particular shows high performance with all authorities towards the upper end of the range for high performing authorities.

It should be noted that the range between low and high performing authorities for the collection of both metal and plastic is very narrow in relation to the overall volume of material collected, being 5kg and 10kg respectively.

⁶ Analysis of kerbside dry recycling performance in the UK 2008/09, Wrap Sep 2010

Table 25 shows the individual capture rates for each collection authority along with an average by material type.

The capture rate of 78% for glass reflects the highest performance identified and illustrates that comingled collection is very effective at encouraging glass recycling. Paper capture is slightly lower at 68% whilst metal and plastic are lower at 48% and 38% respectively.

The capture rate for plastic indicates that there is further communication work to do to increase the levels of plastic recycling; this is supported by feedback from customer services and promotions officers where enquiries around plastic recycling are reported as frequent.

Table 25: Capture rates for household recycling collection services based on compositional analysis

Authority	Glass	Metal	Plastic	Paper
Bromsgrove	78 %	47 %	33 %	68 %
Malvern Hills	80 %	41 %	28 %	63 %
Redditch	78 %	47 %	33 %	69 %
Worcester City	82 %	54 %	38 %	73 %
Wychavon	83 %	55 %	40 %	74 %
Wyre Forest	78 %	46 %	32 %	67 %
Herefordshire	76 %	44 %	30 %	65 %
Average Capture Rate %	78 %	48 %	33 %	68 %

Table 26 shows the individual capture rates for Herefordshire and Worcestershire Household Waste Recycling Centres along with an average by material type. All non-recyclable material (that is black sack and container collected waste) was used in the calculation of these rates). Again the plastic is the lowest ranking of all the key materials with glass scoring the highest, paper close behind and metals coming in third. This follows the same pattern as capture rates from the kerbside recycling collections.

Table 26: Capture rates for household waste recycling centres based on compositional analysis

Authority	Glass	Metal	Plastic	Paper
Herefordshire	82 %	47 %	22 %	70 %
Worcestershire	67 %	31 %	13 %	73 %
Average Capture Rate%	74 %	39 %	18 %	71 %

5.5 Cost of waste collection

Costs to 2008/9 are taken from BVPI 86 as reported on Wastedataflow. For 2009/10 onwards figures are taken from individual headline budget figures from the Revenue Outturn form 5, lines 281 (waste collection) and 284 (recycling collection).

BVPI's were discontinued in March 2011 however authorities still report the cost of waste collection and recycling collection in their Revenue Outturns (RO's). The RO figures are reported to DCLG nationally and can therefore be used to benchmark against other authorities.

To reflect the true cost of the household waste and recycling collection service RO lines 281 and 284 have been combined as the nature of the integrated services means that costs cannot be solely attributed to either the recycling or the residual service. The figures shown are net current expenditure excluding capital costs and commercial waste collection costs.

The bold figures in table 27 indicate the service performance prior to and after the adoption of the current core collection service. Five of the six authorities show reductions in cost. The exceptions being Worcester City where cost increased towards the mean cost while remaining relatively low and Herefordshire where costs remained fairly stable due to the phased introduction of the service.

Table 27: Cost of waste collection per household

Authority	Year						
	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
	BVPI			Revenue Outturn			
Bromsgrove	£78.69	£70.66	£81.43	£70.07	£57.81	£44.95	£51.15
Malvern Hills	£52.23	£50.26	£70.12	£72.74	£51.27	£62.19	£62.46
Redditch	£51.68	£47.82	£47.69	£39.91	£37.07	£31.99	£34.41
Worcester City	£23.10	£41.28	£48.83	£42.62	£47.50	£43.76	£37.10
Wychavon	£57.23	£59.73	£65.47	£50.49	£53.67	£48.15	£48.59
Wyre Forest	£42.12	£44.37	£50.23	£38.15	£33.94	£33.07	£33.75
Herefordshire	£47.71	£55.01	£52.22	£53.74	£146.91	£53.90	£57.78

*Herefordshire included disposal costs 10/11

5.6 Costs incurred in Changes to Contracts / Services

Collection services are provided in-house by all authorities apart from Herefordshire and Wychavon DC who are both independently contracted to FCC Environment Ltd.

Those authorities operating an in-house service would be required to fund any changes to the service including the purchase of new vehicles and any other required resources such as additional containers and staff.

In the case of Wychavon and Herefordshire minor changes to contract are subject to variation rates however in the case of significant change a deed of variation is required and costs are therefore subject to negotiation. These costs would include any redundancy costs or shortfalls in the net book value of vehicles withdrawn from service and compensation for any associated overhead costs. Additional vehicles would incur excess cost if introduced outside of the normal contract tendering process due the need for the contractor to write down the vehicle within the remaining contract period or expose the authority to additional vehicle costs at termination of contract.

As the collection system is alternate weekly and uses the same vehicles for refuse and recycling any changes to the service would need to consider the overall resources used and the impact that any changes would have on the reliability, efficiency and consistency of the core service.

6. Comingled Materials Treatment

6.1 Operational Process

The EnviroSort facility's function within the Integrated Waste Management System is to provide a means for sorting, baling, storage and onward transport of the dry recyclable materials collected by the Waste Collection Authorities comingled kerbside collections.

It is designed to receive 105,000 tonnes per annum of the following mixed waste stream:

- Newspaper and Pamphlets
- Cardboard: corrugated / thick / heavy / light packaging card
- Plastic bottles (PET)
- Plastic bottles (HDPE)
- Mixed container plastics (pots, trays and tubs)
- Mixed container glass
- Aluminium food and drink cans
- Steel food and drink cans
- Paper based liquid food and drink cartons
- Plastic collection sacks

The EnviroSort facility is an advanced MRF with a significant element of automated sorting. The comingled materials go through a number of stages where separation and removal of contaminants occur. At each stage a number of feedback loops allow material to re-enter the correct stream so maximum yield and quality can be achieved.

The stages are summarised below.

- 1) Reception - Visual inspection of load and storage of up to 500 tonnes. Any obvious rejects identified at this point (e.g. black bagged waste) is reloaded onto the vehicle for removal
- 2) Streaming - Initial separation of material into mostly bagged and loose material prior to entering the pre-sorting cabin, with bagged material going via an automatic bag splitter.
- 3) Pre-Sorting Cabin - Cardboard, plastic film and large contaminants are removed by hand.
- 4) Ballistic Separation - From the pre-sort cabin the material passes into a ballistic separator which separates the paper, magazines and light cardboard (2 dimensional stream) from the containers, consisting of plastic bottles, cans and glass bottles (3 dimensional stream).
- 5) Two Dimensional (Paper) Cabin - In the paper cabin, paper products are separated from any remaining three dimensional materials by hand.
- 6) The next stage is to remove ferrous metals with an over-band magnet before the material enters the three dimensional cabin.
- 7) Three Dimensional Cabin - Here three stages of optical sorting occur, starting with the removal of any aluminium via an eddy current separator, then pots tubs and trays before the final sort where the remaining individual plastic polymers are separated.
- 8) Aluminium Clean - The aluminium removed by the eddy current separator undergoes

a further clean in a picking station.

- 9) Glass Clean - Glass passes to the glass clean cabin where any remaining two dimensional fraction is removed and returned to the two dimensional cabin.

Improvements to the plant are planned including a “glass breaker” which will remove the glass at the start of the process directly to the glass clean up system for removal of light items e.g. shredded paper. This should make sorting easier and improve the overall quality of the materials.

6.2 Material input & output

Table 28 shows the volume of comingled recycling processed by the EnviroSort facility. Of the 71,000 tonnes processed in 13/14, approximately 50% consisted of paper and card; glass accounted for 30%, plastics 6.1% and metals 4.5%. Just over 9% of the input material was removed to landfill as rejects. All waste was treated on site with none removed to alternative facilities for processing.

Table 28: EnviroSort material inputs and outputs 2013/14

Material	Input source	Tonnes	Material Output	Tonnes	%
District Kerbside Co- mingled	Bromsgrove	7735.6	Aluminium Cans	641.02	0.90 %
	Hill & Moor(MHDC)	224.4	Cardboard	2867.74	4.03 %
	Herefordshire BB	16,319.9	Domestic Waste (Rejects)	6452.54	9.08 %
	Kidderminster BB	8526.6	Mixed Glass (Glasstick)	21,196.2	29.82 %
	Leominster TS	42.26	Kerbside Mixed	24.06	0.03 %
	Malvern Hills	6513.6	Mixed plastic (Inc. Coloured HDPE & PET)	2326.86	3.27 %
	Redditch TS	8829.5	Paper	33,053.31	46.51 %
	Worcester City	9929.5			
	Wychavon	13,385.3			
	Subtotal	71,506			
Mixed cans	Wychavon Bring	2.44	Plastic *	2029.14	2.85 %
Mixed Cans and Plastics	Worcs. C.C HHW Sites	34.7	Scrap Metal	5.58	0.01 %
Paper	Worcs. C.C HHW Sites	3.26	Steel Cans	2461.58	3.46 %
Total		71,547.09	Total	71,058.03	

*Separated Clear PET and Natural HDPE

6.3 Quality by Material

The contractual arrangements for providing and operating the MRF set minimum recycling performance targets for the contractor. Furthermore the contractor benefits from the value of materials sold. The contractor is therefore motivated to ensure that on an on-going basis the material quality is suitable for the available markets and that the sorting process is as efficient as practical.

6.4 Material Journey & Destinations

Table 29 shows the reprocessors receiving material from EnviroSort in 2013/14 and the treatment and end destinations of these materials as well as the products place in the waste hierarchy.

Materials may pass through several hands or be aggregated before remanufacture, making an assessment of the percentage which enters a closed loop recycling process (as opposed to being recycled) difficult to determine or in some cases such as aluminium irrelevant to any meaningful environmental outcome.

More recently the number of reprocessors receiving materials from EnviroSort has reduced and these still receiving materials are shown highlighted in the table below. There is one addition to the list, Smurfit Kappa, who appear in table 30 for bring recycling as they now also receive paper directly from EnviroSort.

Table 29: Destination and use for material from the EnviroSort 2013/14

Reprocessor	Material	Destination	Treatment	Product	Place in waste Hierarchy
Alcan	Aluminium	Warrington	Smelted	Aluminium ingots	Closed Loop Recycling
Aleris Recycling	Aluminium	Swansea	Smelted	Aluminium ingots	Closed Loop Recycling
Alutrade	Aluminium	Oldbury	Metal Broker	Aluminium scrap	Closed Loop Recycling
Eco Plastics Eco Plastics	Mixed plastic Plastic	Hermswell	Sorted / Wash / Pellet	Plastic pellets	Closed Loop Recycling
Jayplas (J&A Young Ltd)	Mixed plastic	Corby	Sorted / Wash / Pellet	Plastic Bottles / Film	Closed Loop Recycling
Newport Paper	Steel Cans	Newport	Broker*	n/a	n/a
Peute Paper Recycling BV	Paper	Holland	Sort and Manufacture	Paper & Board	Closed Loop & Recycled
PMK Recycling	Aluminium Cardboard Kerbside Mixed	Peterborough	Materials sorting facility	Sorted materials	Recycled
DS Smith (Severnside Recycling)	Cardboard Paper	Newport	Manufacture	Cardboard Paper	Closed Loop Recycling
Sims Group	Steel Cans	Derby	Metal Broker	Bales for resale	Closed Loop & Recycled
Viridor	Mixed Glass	Milton Keynes	Colour sorted.	70% Re-melt 30%	Closed Loop & Recycled

				Aggregate.	
Worcester Community Recycling	Paper	Offenham (Worcs)	Shredded	Animal Bedding	Recycled
	Cardboard				
Wye Valley Metals	Steel Cans	Hereford	Metal Broker	Bales for resale	Closed Loop & Recycled
	Mixed Cans				

* Partner organisation Stora Enso (Suffolk).

6.5 Cost and Income of Treatment Methods

The MRF does not have any agreements with reprocessors for minimum tonnage and all separated products are sold to reprocessors and/or brokers at the price dictated by available tonnage and the material quality at that time. Materials are sold as seen based on the open market value.

The two waste disposal authorities (Herefordshire and Worcestershire) pay for the service as a part of the unitary charge for the whole waste disposal service. There is no comparable gate fee that can be provided. The contractors' costs for design, construction, financing and operating the plant are accounted for in the payments.

An excess revenue sharing arrangement exists whereby both parties would benefit for additional income received, above that set in a base financial model. Increases in yield and/or value gained from sale of the materials would likely benefit both the contractor and the councils.

7. Bring Recycling Materials Treatment

7.1 Bring Recycling Process

Table 30 shows the reprocessors receiving materials from the individual collection authorities and the treatment and end destinations of these materials as well as their place in the Waste Hierarchy.

Table 30: Summary of bring recycling services

Authority	Material	Number of sites	Bring Collection Contractor	Contract In Place	Contract End Date	Reprocessor
Bromsgrove	Glass Mixed		Berryman	No	n/a	Berryman
	Metal (Cans)		Wasteaway	No	n/a	Alutrade
	Paper		Smurfit Kappa	No	n/a	Smurfit Kappa
Malvern Hills	Glass Separated	51	Thamesdown	No	n/a	Berryman
	Metal (Cans)	n/a	-	-	-	-
	Paper		R & S Recycling	No	n/a	
Redditch	Glass Mixed		Berryman	No	n/a	Berryman
	Metal (Cans)		Alutrade	No	n/a	Alutrade
	Paper		Smurfit Kappa	No	n/a	Smurfit Kappa
Worcester City	Glass Separated	17 skips 39 igloos	In-House to Hill & Moor Berryman	No	n/a	Viridor (Sheffield) Berryman
	Metal (Cans)	11	Wasteaway	No	n/a	Tata Steel
	Paper	19	Palm (Abitibi)	No	n/a	Palm (Abitibi)
Wychavon	Glass Mixed		Severn Waste Services	No	n/a	Viridor (Sheffield)
	Glass Separated		Berryman Thamesdown	No	n/a	Berryman Berryman
	Metal (Cans)		Severn Waste Thamesdown	No No	n/a n/a	Norton Novelis
	Paper		Smurfit Kappa Thamesdown	No No	n/a n/a	Smurfit Kappa Thamesdown
Wyre Forest	Glass Separated		Severn Waste			Berryman
	Metal (Cans)	n/a	Severn Waste			Alutrade
	Paper		Severn Waste			R & S Recycling
Herefordshire	Glass Mixed	8	FCC Environment	Yes	1/11/23	Severn Waste Rotherwas
	Metal (Cans)	n/a	-	-	-	-
	Paper	n/a	-	-	-	-

7.2 Bring Recycling Material Journey and End Destinations

Table 31 shows the destination for the bring site collected recycling. While a number of contractors do the initial collection, the material was found to converge towards a limited number of reprocessors.

In the case of glass it was found that some authorities still collect glass in banks specifying an individual colour however this is bulked up at Hill & Moor colour mixed as the reprocessor does not require it to be separated. This is because the majority of glass they now receive comes as mixed glass from MRF's and all glass is passed through colour separator as it would not be economic to operate separate systems.

Table 31: Destination and use of bring recycling

Reprocessor	Material	Destination	Treatment	Product	Place in Waste Hierarchy
Alutrade	Mixed Cans	Oldbury	Sorted Shredded and baled	Aluminium Shed / Steels Cans / Aggregates (Glass)	Closed Loop Recycling / Recycling
Berryman	Glass / Mixed glass	Ardagh Glass	Colour sorted	Glass Cullet	Closed Loop Recycling
Corus / Tata Steel	Steel Cans / Mixed cans?	Port Talbot	Smelted	Steel	Closed Loop Recycling
Novelis	Aluminium Cans	Warrington	Smelted	Aluminium	Closed Loop Recycling
Palm Recycling	Mixed paper	Coventry	Pulp Mill	Paper	Recycled
Smurfit Kappa	Paper / Mixed Paper	Birmingham	Pulp Mill	Paper Board	Recycled
Thamesdown	Mixed paper	Exported China / Holland	Bulked	Mixed paper	Recycled
Viridor	Mixed Glass	Milton Keynes	Colour sorted	Glass	Closed Loop Recycling

7.3 Bring Recycling Cost and Income

A review of the bring bank recycling system was undertaken by a number of the districts in June 2013.

While no final joint report was produced the working group found some differences in costs and income levels between the various service providers. However this was not found to be sufficient to drive any improvements in provision or moves towards joint working given the climate at the time of cost saving and falling yields due to the introduction of the comingled collection service.

Most authorities either had or planned to significantly reduce the number of sites. Others were considering bringing their services in-house to enable collection of commingled materials.

8. Benchmarking

The authorities of the West Midlands have been used to contrast the scheme types and benchmark recycling rates. The infrastructure of the waste management industry in terms of transport, processing and disposal options has a profound impact on the cost of waste treatment. These authorities are therefore considered a better measure for benchmarking our services than using national performance standards.

The definition of kerbside sort used by WRAP in its "Analysis of kerbside recycling performance in the UK 2008/9" is that "The materials are separated at kerbside into a multi compartment vehicle to such an extent that they can be sold directly to a reprocessor and require minimal sorting. The material streams sold can include paper and card together and cans a plastic mixed together.

Based on the above definition, of the unitary authorities, only Dudley MBC and Shropshire Council provide a fully kerbside collection. Both of these authorities mix cans and plastics. For collection authorities only Newcastle-under Lyme and Warwick District Councils meet these criteria.

Details of the collection arrangements for the unitary authorities can be found in table 32 and the collection authorities can be found in table 33.

Table 32: Dry recycling benchmarking between West Midlands Unitary Authorities

Unitary Authority 2013/14	Scheme Type					Household Dry Recycling Rate (BVPI 82 a) %	Kg/hh of dry recycling collected
	Residual	Recycling					
		Glass	Cans	Plastic	Paper		
Herefordshire	AWC Bin	Comingled			Chargeable sacks	28.40	262.16
Sandwell MBC	Weekly Bin	Comingled Weekly Bin			GW Fortnightly (FOC) Food Weekly	27.14	252.12
Walsall MBC	Weekly Bin	AWC Comingled			AW with Green Bin (April to Nov)	25.35	246.52
Stoke on Trent	AWC Bin	Comingled			GW April to Oct Inc. food.	22.29	203.02
Telford and Wrekin	AWC Bin	Comingled		Paper Bag	AWC GW no food.	23.81	250.32
Coventry City	Weekly Bin	AWC Comingled			GW Fortnightly Mar – Nov	22.26	200.36
Solihull MBC	Weekly Bin	Glass Box	AWC Comingled (Service Introduced Sept 14)		GW Fortnightly (FOC) No food	19.58	198.93
Shropshire	AWC Bin	Box 1	Box 2	Box 3	GW & Food alternate week to refuse (FOC)*	24.83	289.78
Wolverhampton MBC	Weekly Bin	AWC Comingled (Introduced Jan 12)			GW April – Nov Food collection	22.94	233.32
Dudley MBC	Weekly Bin	Glass Box	Green Bag	Paper Bag / Card	Garden waste (FOC)	18.32	162.74
Birmingham City	Weekly Bin	Box1 (Introduced Comingled bins Sept 14)		Paper Box	Was FOC Chargeable 2014	17.50	166.11

*Former North Shropshire and South Shropshire Districts only.

Table 33: Dry recycling benchmarking between West Midlands waste Collection Authorities

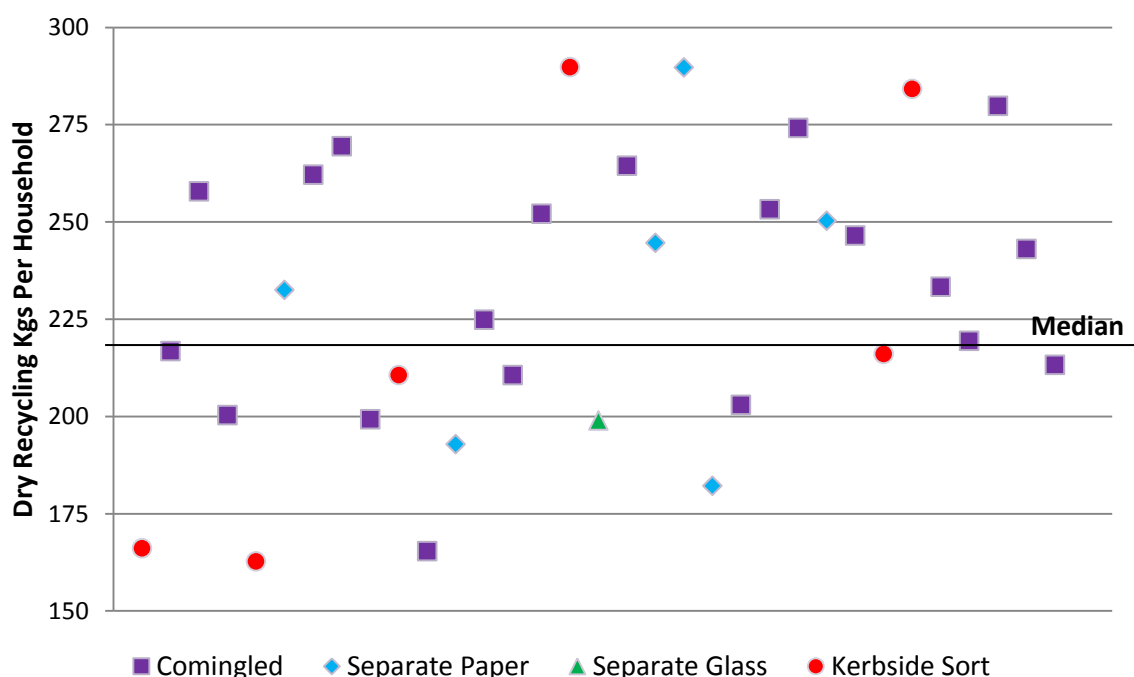
Collection Authority 2013/14	Scheme Type					Household Dry Recycling Rate (BVPI 82 a) %	Kg/hh dry recycling	
	Residual	Recycling						
		Glass	Cans	Plastic	Paper			Green & Food
Worcester City	AWC Bin	Comingled			Chargeable GW	31.63	219.42	
Wychavon DC	AWC Bin	Comingled			Chargeable GW	30.43	243.02	
Tamworth BC	AWC Bin	Comingled (Removing Food summer 14)			Mixed Food and Garden	29.75	274.13	
Redditch BC	AWC Bin	Comingled			No collection	28.73	224.83	
Malvern Hills	Weekly Sack	Comingled Bin			Chargeable GW	28.35	199.31	
Cannock Chase	AWC Bin	Comingled			Mixed Food and Garden	28.13	257.90	
Lichfield DC	AWC Bin	Comingled (Removing Food summer 14)			Mixed Food and Garden	27.86	269.44	
Wyre Forest	AWC Bin	Comingled			Chargeable GW	26.92	213.30	
Warwick DC	AWC Bin	Box 1	Bag	Box 1	Mixed Food and Garden	26.52	216.10	
South Staffordshire	AWC Bin	Comingled			Free GW	26.78	264.49	
Stratford-on-Avon	AWC Bin	Comingled			Mixed Food and Garden	26.56	253.23	
Stafford BC	AWC Bin	Comingled (Inc. Cardboard)		Bin Insert	Free GW	26.51	244.65	
East Staffordshire	AWC Bin	Comingled (Inc. Cardboard)		Paper bag	Mixed Food and Garden	25.08	232.50	
Newcastle-under-Lyme	AWC Bin	box	Sack	Paper bag	Free GW & Food Caddy	24.09	210.61	
Bromsgrove	AWC Bin	Comingled			Chargeable GW Service	23.31	216.81	
Rugby BC	AWC Bin	Comingled			Mixed Food and Garden	22.27	210.61	
Nuneaton and Bedworth BC	AWC Bin	Comingled		Bin Insert	Mixed Food and Garden	21.85	192.85	
Staffordshire Moorlands	AWC Bin	Comingled (Inc. Cardboard)		Paper bag	Mixed Food and Garden	20.07	182.14	
North Warwickshire	AWC Bin	Comingled		Bin Insert	Mixed Food and Garden	17.24	165.40	

8.1 Dry Recycling Rate Unitary Authorities

To take into account the significant variation in provision of garden waste collection services, from opt-out free of charge to opt-in chargeable, and of food waste collections from separate collection to comingled with garden waste, the dry recycling rates have been used to benchmark against other authorities rather than the overall recycling rate.

For Unitary authorities Herefordshire achieved the highest dry recycling rate in the West Midlands. The top four authorities all provided comingled recycling collections. Of the 11 authorities 7 provide weekly refuse collections including Sandwell and Wallsall who achieved respectively the second and third highest dry recycling rates with Sandwell also providing weekly recycling.

Figure 2: Scatter Graph showing the Dry Recycling Kilograms per Household and Method of Collection for West Midland Unitary Authorities 2013-2014- updated



The graph above shows the West Midlands Unitary collection schemes and identifies their performance by quantity of dry recycling per household for 2013-14.

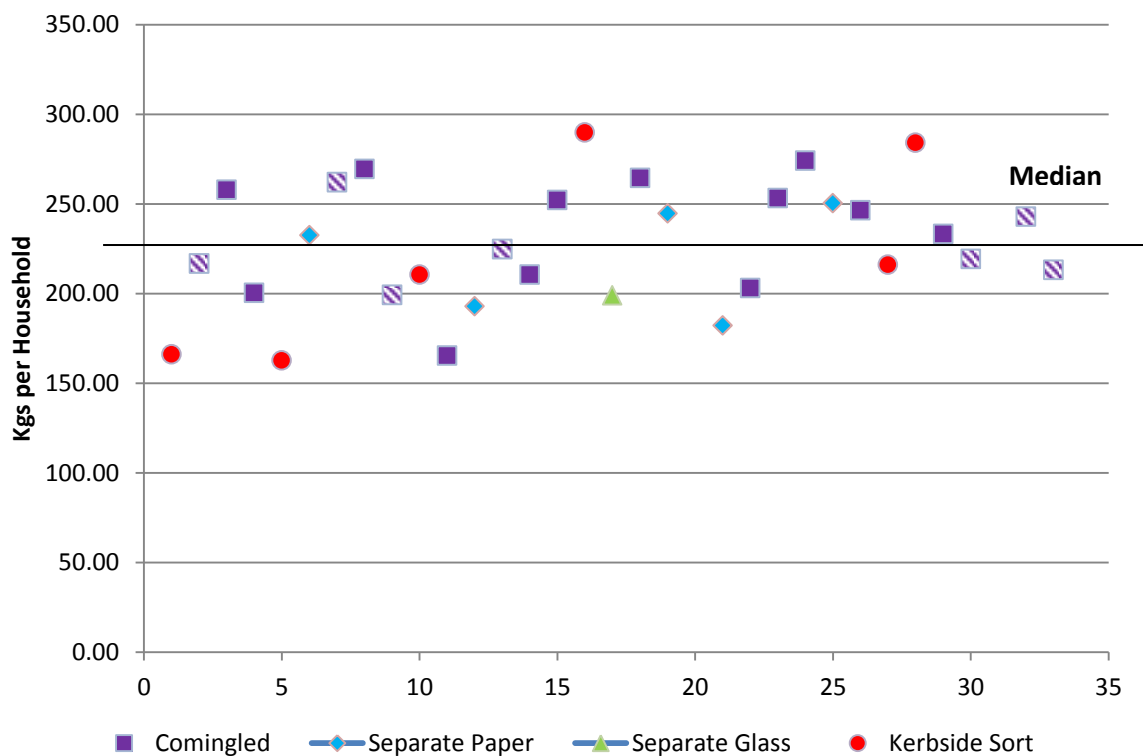
All collection methods show a wide range in yield indicating that collection method is only one factor in overall performance. The yield for the kerbside sort collections range from 162kg to 289kg per hh, the separate glass and separate paper schemes range from 182kg to 289kg and the comingled schemes range from 165kg to 279kg.

Twelve comingled schemes are represented in the upper 50% of the distribution along with 4 separate paper schemes and 2 kerbside sort schemes. In the lower 50% of the distribution, 8 comingled schemes are represented along with 4 kerbside sort, 2 separate

In terms of kilograms per household of the 19 comingled collection schemes operating in the West Midlands, 11 fall on or above the median. Of the 6 Kerbside sort schemes only 2 fall above the median for overall kilograms of dry recycling.

It should be noted that overall performance in the West Midlands is high with most authorities above the 200kgs level identified by WRAP as indicating an effective scheme.

Figure 4: Scatter Graph showing the Kilograms per Household of Dry Recycling and Method of Collection for West Midland Authorities 2013-2014



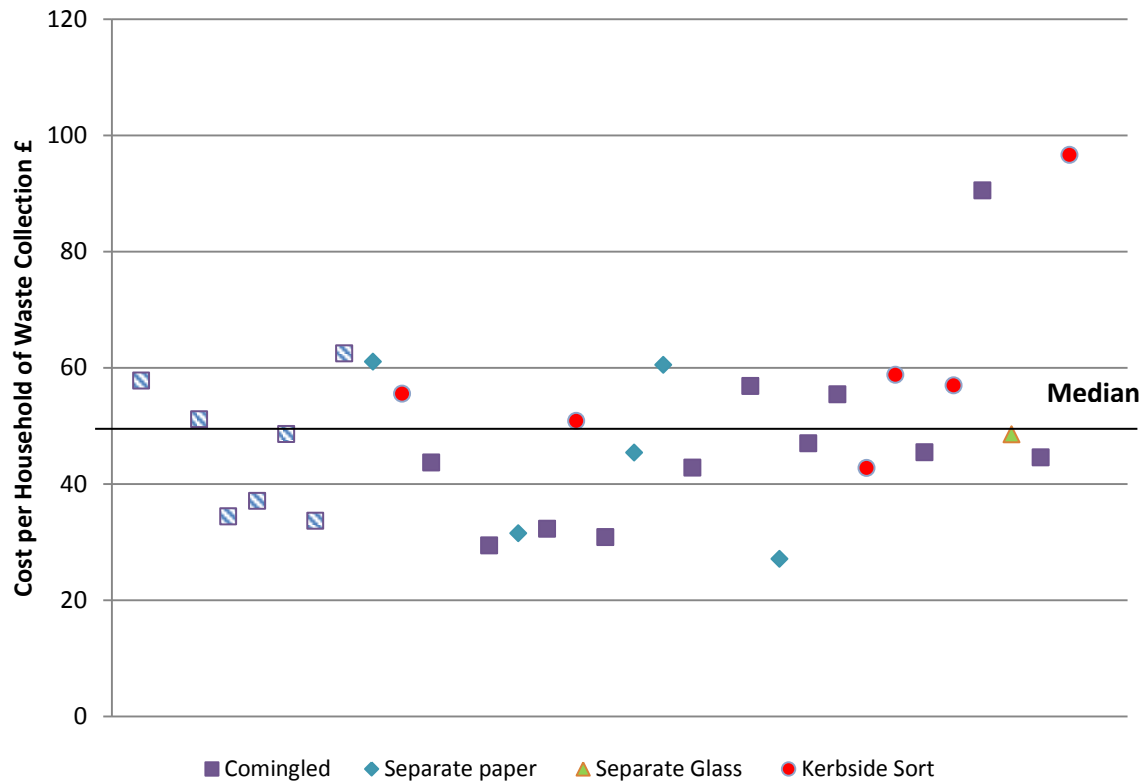
8.3 Cost of Waste Collection.

Figure 5 shows the waste collection cost for all West Midlands authorities in relation to collection scheme type.

For 2012-13 West Midlands authorities collection costs ranged from £29.42 per household to £96.58 per household with the mid-point being £48.48. Of the 29 authorities a higher proportion of kerbside sort schemes fall above the median line whilst the majority of comingled schemes fall below the median.

Four of the 7 authorities in the two counties fall below or on the median line and are shown as hatched squares. Five of the 6 kerbside sort schemes fall above the median line, demonstrating that kerbside sort schemes are more costly.

Fig 5: Cost of Household Waste collection per household 2012-13 for West Midland Authorities⁷



Full details of scheme types and costs for unitary authorities can and be found in table 32 and costs for collection authorities can be found in table 34.

⁷ Revenue Outturn data 2012-13

Table 34: Cost of waste collection West Midlands Collection Authorities in 2012/13⁸.

Collection Authority	Scheme Type					Cost of waste collection and recycling	
	Residual	Recycling					
		Glass	Cans	Plastic	Paper		Green & Food
Nuneaton and Bedworth BC	AWC Bin	Comingled			Bin Insert	Mixed Food and Garden	27.05
Cannock Chase	AWC Bin	Comingled				Mixed Food and Garden	29.42
South Staffordshire	AWC Bin	Comingled				GW (FOC)	30.83
East Staffordshire	AWC Bin	Comingled (Inc. Cardboard)			Paper bag	Mixed Food and Garden	31.48
Lichfield DC	AWC Bin	Comingled (Removing Food summer 14)				Mixed Food and Garden	32.28
Wyre Forest	AWC Bin	Comingled				Chargeable GW Service	33.66
Redditch BC	AWC Bin	Comingled				No collection	34.41
Worcester City	AWC Bin	Comingled				Chargeable GW Service	37.10
Warwick DC	AWC Bin	Red box Glass and Cans	Bag Inc. Card	Red box Paper	Mixed Food and Garden	42.71	
Tamworth BC	AWC Bin	Comingled (Removing Food summer 14)				Mixed Food and Garden	42.76
Stafford BC	AWC Bin	Comingled (Inc. Cardboard)			Bin Insert	GW (FOC) No food.	45.38
Rugby BC	AWC Bin	Comingled				Mixed Food and Garden	46.96
Wychavon DC	AWC Bin	Comingled				Chargeable GW Service	48.59
Newcastle-under-Lyme	AWC Bin	Glass and can box	Plastics Sack	Paper bag	GW Bin (FOC) & Food Caddy	50.80	
Bromsgrove	AWC Bin	Comingled				Chargeable GW Service	51.15
Stratford-on-Avon	AWC Bin	Comingled				Mixed Food and Garden	55.39
North Warwickshire	AWC Bin	Comingled			Bin Insert	Mixed Food and Garden	56.83
Staffordshire Moorlands	AWC Bin	Comingled (Inc. Cardboard)			Paper bag	Mixed Food and Garden	60.45
Malvern Hills	Weekly Sack	Comingled Bin				Chargeable GW Service	62.46

⁸ Revenue Outturn data 2012-13

Table 35: Cost of waste collection West Midlands Unitary Authorities in 2012/13⁹.

Unitary Authority 2012/13	Scheme Type					Cost of waste collection and recycling
	Residual	Recycling				
		Glass	Cans	Plastic	Paper	
Stoke on Trent	AWC Bin	Comingled			GW April to Oct Inc. food.	43.66
Walsall MBC	Weekly Bin	AWC Comingled			AW with Green Bin (April to Nov)	44.56
Coventry City	Weekly Bin	AWC Comingled			GW Fortnightly Mar – Nov	45.39
Solihull MBC	Weekly Bin	Glass Box	AWC Comingled (Service Introduced Sept 14)		GW Fortnightly (FOC) No food	48.48
Shropshire	AWC Bin	Box 1	Box 2	Box 3	GW & Food alternate week to refuse (FOC)*	55.50
Dudley MBC	Weekly Bin	Glass Box	Green Bag	Paper Bag / Card	Garden waste (FOC)	56.94
Herefordshire	AWC Bin	Co-mingled			Chargeable sacks	58.75
Birmingham City	Weekly Bin	Box1 (Introduced Co mingled bins Sept 14)		Paper Box	Was FOC Chargeable 2014	58.78
Telford and Wrekin	AWC Bin	Comingled		Paper Bag	AWC GW no food.	60.99
Sandwell MBC	Weekly Bin	Comingled Weekly Bin			GW Fortnightly (FOC) Food Weekly	90.45
Wolverhampton MBC	Weekly Bin	AWC Comingled (Introduced Jan 12)			GW April – Nov Food collection	96.58

*Former North Shropshire and South Shropshire Districts only.

⁹ Revenue Outturn data 2012-13

8.4 Environmental Benchmarking

The Department of Energy and Climate Change compiles figures on local authority CO₂ emission estimates as part of the UK's National Greenhouse Gas (GHG) inventory. These estimates are used to meet international reporting obligations such as progress against the UK's Kyoto Protocol targets.

Waste collection services make up a significant portion of the emissions reported by LA's for their "Estates and Operations" under the Climate Reduction Commitment, formerly reported as BVPI 185.

Table 36 below shows the total of the scope 1 and scope 3 emissions reported for each of the collection authorities in the two counties. Scope 1, includes in-house waste collection services and scope 3, contracted out services. Scope 2 has been excluded as this refers to emissions from electricity consumption for e.g. street lighting, schools and social housing.

All of the authorities in the two counties have achieved reductions in CO₂ emissions over this period despite the introduction and expansion of garden waste collection services. The DECC data published in April 2014 is not complete and data for only 18 of the 32 authorities in the West Midlands appears making any comparisons or benchmarking against other authorities difficult.

Table 36: Scope 1 CO₂ emissions in tonnes - covering fleet vehicles

	2008-9	2009-10	2010-11	2011-12	2012-13
Bromsgrove	n/a	1,800	2,026	n/a	na
Malvern	n/a	1687	1670	1584	1648
Redditch	n/a	3,569	2,667	n/a	na
Worcester City	n/a	1,725	1,817	1,916	1,618
Wychavon	3728	3846	3823	3587	3366
Wyre Forest	1219	n/a	1127	999	1034

All of the collection authorities use a single pass system on an alternate weekly basis therefore minimising the CO₂ emissions. Further reductions could only be achieved by reducing the frequency of collection which would have to be balanced against the container capacity available to residents.

European emissions standards define the acceptable limits for exhaust emissions from new vehicles sold in EU member states. A series of progressive standards have been introduced since 1988 covering emissions of nitrogen oxides, hydrocarbons, carbon monoxide and particulate matter. When vehicles are procured they must comply with the most recent standard and given the short lifecycle of refuse collection vehicles the majority of vehicles can be expected to meet Euro V currently the highest standard.

9. Quality Standards

The Waste Framework Directive does not give a definition of high quality recycle however Article 11, Clause 1, Paragraph 2 states:

“Member States shall take measures to promote high quality recycling and, to this end, shall set up separate collections of waste where technically, environmentally and economically practicable and appropriate to meet the necessary quality standards for the relevant recycling sectors.”

The following section highlights the current activity from various sectors that seeks to determine what constitutes high quality recycling as well as the legislative driver's in place. It also takes direct evidence from reprocessors receiving materials from the two counties to understand what “appropriate” and “necessary” mean in terms of appropriate to meet the necessary quality standards.

9.1 DEFRA Quality Action Plan

The DEFRA quality action plan sets out the government's vision for improving the quality of recycle and how to help grow the recycling industry. It sets out the following proposals and measures to gauge success.

“6.1 The success of this Action Plan will be measured on a number of levels. In itself, implementation of the various actions and policies in a timely fashion would represent success, as would a coming together of the range of actors in the supply chain to engage in constructive dialogue and develop a shared commitment and level of ambition.”

6.2 The real world impacts of this Action Plan, and its success in promoting high quality recycling, can be measured in a number of ways. In particular we will develop KPIs to measure:

- 1) Levels of non-target and non-recyclable material observed in the inputs and outputs of MRFs – we would expect to see an improvement in average output quality.
- 2) Proportion of outputs meeting reprocessor quality specifications – almost all outputs should meet these specifications.
- 3) The attitudes of reprocessors (UK and overseas) to the quality of outputs from MRFs.
- 4) Number of s implementing quality management systems – aim to get over 90% of MRFs measuring quality.
- 5) Export quality and illegal exports – develop a measure of the effectiveness of EA work to tackle illegal exports.

6) Number of Local Authorities which stipulate quality as a criterion within MRF contracts

7) Amount of material achieving End of Waste status.

6.3 WRAP has undertaken considerable work relating to the performance of MRFs and we will consider whether this can be used as a baseline. We will also develop KPIs in relation to each of the measures in the Action Plan.

6.4 We will report on progress to implement the Action Plan and against each of the KPIs by 2015.”

9.2 WRAP Quality Assessment Study and Survey of Reprocessors 2009

WRAP carried out a quality assessment study in 2009 that identified a broad range in quality with some good quality outputs but also some with high levels of non-target and non-recyclable material. See table 37 below.

Table 37: Percentage of non-target and non-recyclable material, WRAP 2009

Target Material	Min %	Mean %	Max %
Aluminium	0.0	2.5	8.1
Steel	0.4	6.2	23.8
News and PAM	1.9	9.8	22.0
Mixed Paper	2.1	15.8	36.7
Card	1.9	12.0	57.4
Mixed Plastic	0.6	18.2	43.5
Mixed Plastic Bottles	0.5	12.2	23.0
HDPE Coloured Plastic Bottles	3.3	8.7	12.2
HDPE Natural Plastic Bottles	0.8	4.5	14.6
PET Clear	0.5	7.5	20.1
PET Coloured	3.0	8.1	13.2

A WRAP survey of reprocessors in 2009 reported that:

- Over 60% said “only some” or “hardly any” output from MRFs met their quality specification
- Over 75% said the quality of outputs from MRFs was worse than material from other sources.
- That said, the reprocessors surveyed stated that, while outputs from MRFs were generally of a lower quality, this was not universally the case, and that no collection method was in itself a guarantee of a quality product.”

9.3 SEPA Report on Contamination in Source Separated Municipal and Business recycle in the UK 2013

The Waste (Scotland) Regulations 2012 places a duty on authorities to collect five recyclates in a source separated manner unless it can be demonstrated that the amount of recyclates would not be significantly less, and the quality of the material significantly lower, by collecting material comingled.

The Scottish Government identified that there was a lack of robust information on the quality of source separated recycle against which to assess the quality of comingled recyclates and therefore the compliance of collection schemes. Zero Waste Scotland were subsequently commissioned to carry out a UK wide compositional analysis to determine the typical quality of five key source separated recyclates, paper, card, glass, metal and plastics in municipal waste and commercial waste.

The study recruited 61 authorities; of which 8 collected the 5 materials separately, 18 collected 4 separately and 20 three materials. This meant that 10 separate waste streams had to be analysed to determine the amount of non-specified materials which might include for example card in a paper collection or green glass in a brown. In all 860 samples were taken ranging in size from 12kg and 190kg.

The study identified contamination levels in source separated municipal waste of; Paper 1.6%, Card 8.1%, Mixed paper and card 1.7%, Clear glass 1.8%, Green glass 3%, Brown glass 3.6%, Mixed glass 0.7%, Metals 9.1% and Plastics 5.5%.

While these figures give some indication of the likely contamination levels the tight specifications for non-target materials and low sample size make it difficult to use this data for meaningful comparisons. There is no indication of the amount of material rejected by the crew at the kerbside, and any subsequent drop of in participation, and the material from rejected loads was not included.

The report recommended that crews needed to remove contamination from metals more effectively and that as householders found it difficult to determine which plastics are recyclable further public education was needed on what was accepted by individual schemes.

9.4 Resource Association – Recycling quality information point (Re-Quip)

The Resource Association has created an information point (ReQIP) that brings together information from a range of reprocessors about the working quality requirements for recycle received by them. The aim of the project is to improve collaboration across the waste sector by providing additional clarity on the tolerance levels of specific contaminants in the relevant waste streams.

It provides an indication for the effect the different levels of contamination will have on the price paid and the maximum levels of common contaminant types and prohibited materials that will lead to rejection of loads. Below these standards material price may be reduced or the loads may be sent for cleaning or rejected resulting in cost which is likely to be passed on to the supplier.

The level of contamination indicated at which best price would be realised is: Mixed paper 3%, Cardboard 3%, News and Pams 1%, Glass for re-melt 1%, Glass for aggregate >5%, Aluminium cans 3%, Steel cans n/a, Plastic bottles 6%, other plastics 5%, cartons >2%.

We are not aware of any loads from the MRF at Norton that have been sent for cleaning or that have been rejected.

9.5 The Environmental Permitting (England and Wales) (Amendment) Regulations 2014

The Environmental Permitting (England and Wales) (Amendment) Regulations 2014 otherwise known as the MRF Regulations contain requirements for MRFs to routinely sample and compositionally test their mixed material inputs by individual supplier and their main outputs by material stream e.g. news and pams, ordinary corrugated cardboard and mixed paper.

The Regulations require MRF operators to report the average (or arithmetic mean) percentage composition for target material, non-target material and non-recyclable material to the Environment Agency every quarter.

Within the two counties this information will be fed back to the individual collections authorities and is seen as a key future driver in improving the quality of the input materials. Information down to the level of specific vehicle loads will be supplied to each collection authority so that they can take the appropriate action required to ensure improvement.

9.6 Reprocessor statements

A significant element of assessing if the collection scheme is compliant with the rWFD is to determine if the material quality meets the necessary input standards required by reprocessors. The reprocessors who received materials for the authorities were therefore contacted to gain direct evidence of whether they were experiencing any issues with the materials being supplied. None of the reprocessors contacted expressed any concern over the materials being supplied by the two counties.

The responses of the reprocessors contacted can be seen in tables 38 to 41 below.

Table 38: Contractor Statement Thamesdown - Glass

Material	Statement Date: Oct 2014
Glass	<p>Glass is received from bottle banks and is tipped in bays, segregated by colour. All glass cullet is recycled into new glass products. Currently all glass cullet goes to Berryman's Knottingley (flint & green) & Doncaster (amber & mixed) depots in Yorkshire.</p> <p>Quality in relation to both glass and cans is satisfactory and allows Thamesdown Recycling to fulfil criteria relating to the waste hierarchy and a closed loop process.</p>
Metal	<p>Aluminium cans: Aluminium cans are baled and sent to Novelis in Warrington, Cheshire. All cans are recycled into new aluminium products.</p> <p>Steel cans: Steel cans are baled and sent to Tata Steel in Port Talbot, South Wales. All cans are recycled into new steel products</p>
Paper	<p>Paper is collected from paper banks and received at Thamesdown Recycling's site as mixed papers. Due to the potential for contamination by the public use of the banks there is a high likelihood that cardboard or other contaminants will be contained within a load. Because of this, the paper is sent for export to, currently, Holland or China as a lower grade product. All paper is recycled into new paper.</p> <p>In respect of the paper quality, due to the nature of the service provided, it is not possible to guarantee the quality of each load and therefore a precautionary principal is adopted whereby clarifying the load as mixed ensures that it will always attain the specification for this type of recyclate when it gets to the reprocessor.</p>
General Statement on quality	<p>The operations at Thamesdown Recycling deal specifically with recyclable material and therefore any contamination in the inbound containers will be recovered and placed within the appropriate material stream on site.</p>

	Other than a tiny, de minimis, quantity of material delivered to site, which is landfilled, Thamesdown Recycling exhibits virtually a Zero to Landfill philosophy.
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Table 39: Contractor Statement Smurfit Kappa – Paper

Material	Statement Date: Oct 2014
Paper	<p>Smurfit Kappa Recycling provides Paper Bank services for the collection of Mixed Papers, (Grade 1.01 in the EN643 European standard), from the districts of Wychavon, Redditch and Bromsgrove within the counties of Herefordshire and Worcestershire.</p> <p>The EN643 standard places a maximum limit of 2.5% unwanted materials, such as plastics, metal, food contaminated papers etc. and 0% of prohibited materials such as hygiene products, medical waste, chemicals etc.</p> <p>Paper Banks are emptied on site by either Hiab crane trucks or Front End Loader trucks and the contents delivered direct to our paper mill in Birmingham without any sorting or baling taking place. The postal address of the mill is:</p> <p>Smurfit Kappa SSK, Mount Street, Nechells, Birmingham. B7 5RE</p> <p>The material is conveyed into the pulper and subsequently re-made into a number of different grades of brown paper board. These are then sent elsewhere within our UK group operations to be manufactured into corrugated cardboard boxes and packaging.</p>
General Statement on quality	The mill carries out random testing on a weekly basis and we have had no rejections or concerning reports of any paper bank material from your districts. Typical paper bank contamination levels are currently between 1.5% and 2.5%.

Table 40: Contractor Statement Viridor - Glass

Material	Statement Date: Oct 2014
Glass	<p><u>Salmon Pastures Glass Plant Methodology - Operations</u></p> <p>The Glass plant operates under EA issued S2 and T4 permit exemptions, allowing us to store 5000t of both unprocessed and processed glass.</p> <p>All waste; Mixed Container Glass, sourced from local authority kerb-side collections and Material Recycling Facilities from around the UK, arrive at the facility and are weighed on the incoming weighbridge and the following information checked and recorded:</p> <ul style="list-style-type: none"> ▪ Date and time of load receipt ▪ Waste Carrier’s name and registration number ▪ Waste Quantity (in tonnes or cubic metres) ▪ European Waste Catalogue code(s) of the waste ▪ A written description of the waste characteristics ▪ The identity of the waste producer

- Vehicle registration number
- Vehicle Type (and method of containment)
- Driver's name

The delivery is also recognised against a weekly delivery schedule and refused entry if it is not expected until we can ascertain its correct destination.

The vehicle proceeds to the glass plant tipping yard and waits before the tipping process begins. This is to control the process safely and is under the guidance and instruction of a Viridor employee, namely the Glass Plant Site Operative/Loading Shovel driver.

It is then visually inspected for quality by the operative and if they are concerned over excess levels (more than 2% by weight) of non-container glass or non glass contamination, or excessive fines (above 17%) or dirty glass that is unsuitable for our process the operative will radio his Line Manager or Quality Technician to look at the load also. If it is still deemed as unacceptable the load will be set aside in a convenient location and a Non Conformance Report will be raised against the supplier/Viridor Resource Management for further action. This could result in the load being collected and removed from site by the supplier or if suitable the load being downgraded to an aggregate. If downgraded the weighbridge ticket details are amended and the material stored in the sites glass aggregate (CSP) bay, to be sent out as part of the next Aggregate collection.

Accepted material is loaded, via loading shovel, into the two feed hoppers, to be conveyed past an overband magnet, removing and recovering the majority of the ferrous metals. These are stored in a skip and sent to a 3rd party for re-melt on a weekly basis.

Material is then separated over a finger screen into two streams, 0-50mm and above 50mm. This is then conveyed through a picking room where further non glass and non metals contaminants are manually removed, dropped down a chute and conveyed into a bay which is then transported to landfill as general waste. Small, light, paper and plastic contamination is extracted, by suction at key points around the plant, into a small skip bin which is also deposited into the landfill bay.

Glass from both size streams are now passed over further metal detectors, roller magnets for ferrous and eddy current for non-ferrous removal and separation. Ferrous metals will be mixed into the skip used earlier, non-ferrous metals are conveyed into a CanDensor where they are compacted into small bricks which are manually stacked and strapped creating a bale which is stored and sent to re-melters bi-weekly.

The decontaminated glass is then sized through screening beds, separating the fines (<10mm) glass out from the process and dividing the remaining glass into 2 size fractions, 10-20mm and 20–50mm.

The glass is then conveyed to the optical colour sorters for CSP (Ceramic, Stone, Porcelain) decontamination and colour separation. Eight sorters work in tandem on the two size streams, filtering the glass to a final colour specification of 99% purity for Flint (clear) and 90% for both the Green and Amber as well as less than 10g/t of CSP, 5g/t of metal and 500g/t of organics.

As part of the final sort, material that is not the correct colour is ejected to a recirculation conveyor and fed into the colour sort process again at the screen sizing point.

All sorted materials, cullets and aggregates, are transferred from their internal holding bays to the outside yard storage bays by loading shovel. All bays are clearly labelled with their material descriptions.

Waste leaving the site is recorded on the weighbridge as described previously.

Quality control is employed throughout the process and in the final cullet sampling regime which includes testing for colour purity and contamination levels as well as particle size distribution, moisture and loss of ignition. Machine performance testing is also carried out by dropping contaminants through the sorters and visually watching for ejection/acceptance.

All quality and performance data is measured against customer specifications recorded on spread sheets and reported weekly to VRM. We also supply a certificate of conformity based on the previous week's production and testing to customers who ask.

If samples are out of specification, materials are either reprocessed or diluted with other good stock to increase the average to above specification.

Waste processed through the glass plant, based on 2013/14 throughputs and outputs are distributed as detailed below:

	Tonnes	Material Distribution	
		Overall %	Cullet%
Inputs	135262		
Flint	47806	35.34	50.98
Green	37667	27.85	40.17
Amber	8307	6.14	8.86
0-10mm Fines	20289	15.00	
CSP/Glass Aggregate	16758	12.39	
Ferrous	511	0.38	
Non-Ferrous	534	0.39	
Waste	1964	1.45	
End of year stocks	1426	1.05	

The three coloured cullets produced equate to 70% of the in feed stock with this

	<p>being used in the re-melt industry. The CSP/Aggregate and fines outputs are sent to customers within the aggregate industry where it is used in road surfacing and drainage or is crushed and used in concreting, fibre glass manufacturing and water filtration.</p> <p>The metals are also sent for re-melting and the remaining contamination materials are sent to a MRF or landfill, though this equates to less than 1.5% of the original in feed stock.</p> <p>The glass plant processes 24hrs per day 5 days per week over three 8hr shifts, with the remaining time being dedicated to planned maintenance.</p> <p>24 people are employed at the plant with each shift consisting of a Supervisor, 2 mobile plant operatives and 3 pickers/housekeeping operatives. Other support staff includes a Quality Technician, a Maintenance Engineer and Fitter two Engineering Apprentices and a Production Manager.</p> <p>The operation is overseen by an Area Manager, Regional Manager and Regional Director, reporting to Company Directors.</p> <p>All staff have clearly defined roles and responsibilities and are trained to carry out these safely and competently. Training is reviewed annually during a documented review process and further opportunities to develop the employee are recognised.</p>
<p>General Statement on quality</p>	<p>More than 2% contamination at input load removed and supplier informed. Waste to landfill less than 1.5% of output material</p>

Table 41: Contractor Statement Jayplas – Plastics

<p>Material</p>	<p>Statement Date:</p>
	<p>Material is graded on entry and the price offered may be altered to reflect quality.</p> <p>Materials are accepted as single polymer type or mixed plastics however all bales will be broken open and resorted to ensure they contain the correct material so enter the same process. This is followed by a second sort before the material is sent for washing / de-labelling etc.</p> <p>Approximately 70% of the material accepted will go for closed loop recycling while around 20% is used for other purposes (recycled) and the remainder 10% goes to EfW.</p>
<p>General Statement on quality</p>	<p>Jayplas is a leading reprocessor and aims to achieve the highest rates of close lope recycling.</p>

9.7 Percentage of material going to closed loop recycling.

Table 42 shows the percentage of material returning or capable of being returned to its original use through closed loop recycling and how much is known to be recycled into other products or sent for disposal.

Due to the difficulty in identifying material once it enters the materials supply chain and the low response rate from reprocessors receiving materials from the MRF in 2013/14 the figures in table 42 are based on estimates for end use supplied by reprocessors currently receiving material from the Norton MRF. However the tonnage data shown is from 2013/14 so while this represents what is currently being achieved it is not a true reflection for the material outcomes in 13/14 and it is therefore intended to provide baseline against which to measure future performance.

Table 42: Percentage of material currently going to closed loop recycling

Reprocessor	Material	Tonnes	Closed Loop	Tonnes	Other Recycling	Tonnes	Disposal	Tonnes
Viridor	Glass	21,196	71.11%	15027	28.89	6123	1.5%	318
Smurfit	Paper	33,053	98%	32392	0	0	2%	661
Kappa	Cardboard	2868	98%	2811	0	0	2%	57
Jayplas	Plastic	4356	70%	3049	20%	871	10%	436
Sims	Metal/ Fe	2462	100%	2462	0	0	0	0
	Metal / Au	641	100%	641	0	0	0	0
Total		65576		56382		6994		1472
Percentage				86%		11%		2%
Inc. Rejects	Comingled	6453					100%	6453
Total		72029		56382		6994		7925
Percentage				78%		9.7%		11%

10. Options Appraisal / Justification for existing system

The following section looks at the evidence used to justify the move to a comingled collection system. This includes evidence from the districts that have had experience of operating source separations schemes using both kerbside sort and multi-compartment vehicles. The cost and performance model used for determining the best way forward and the other considerations such as health and safety and public satisfaction which are regarded as essential to the operation of an effective service.

10.1 Historical Evidence

Bromsgrove, Redditch and Wyre Forest Council's have operated kerbside sort recycling collection services for a combined total of 18 years. These were seen to be effective at increasing recycling rates from single figures into double figures and were a well-received step onto the recycling ladder for customers. However the performance of these schemes was not regarded as sufficient to achieve the higher levels of recycling required to meet public expectations and the demands of future legislation.

10.1.1 Bromsgrove & Redditch Kerbside Sort

Bromsgrove

Between March 2003 and March 2010 Bromsgrove District ran a kerbside sort recycling scheme. A red box was used to collect paper and textiles and a blue box was provided for cans, glass and plastic. At the point of collection paper, textiles and glass were loaded into separate stillage's on the collection vehicles (mixture of stillage and kerbsiders) while cans and plastic bottles were collected mixed and sorted in an MRF.

Due to the labour intensive nature of the kerbside sort collection, Bromsgrove undertook trials to determine the volume of dry recyclate that could be collected under compaction as opposed to the use of stillage vehicles. The results were around 8 tonnes on the compaction refuse collection vehicles compared with 4 tonnes on the Kerbsiders and only 1.5 tonnes on the stillage vehicles.

Figure 6: Recycling and Residual Kilograms per head against cost

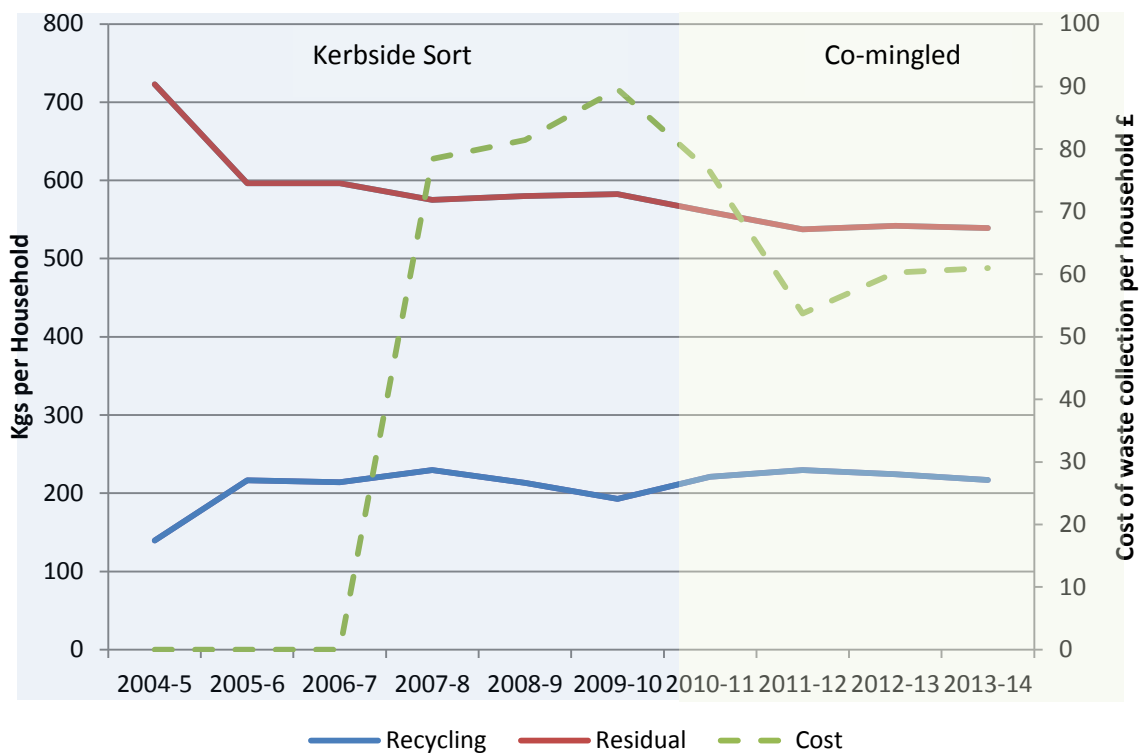


Figure 6 above identifies that since the introduction of comingled recycling the overall kilograms per household of recycling has remained fairly static at an average of 209kg. The slight decrease during 2009-10 is likely to be due to service changes where the previously 'free' garden waste collection became chargeable.

Residual waste has shown a steady decline since 2005 with the kilograms per household falling from 596kg in 2005 to 539kg in 2013. With the introduction of the comingled collection service the cost per household reduced from £78 in 2005 to £61 in 2013. An increase was seen in 2009 again due to the services changes in introducing a chargeable garden waste collection.

The data identifies overall that moving to a comingled service had no impact on the overall volume of recyclables collected per household but it did have a positive impact in reduction residual waste per household by 22% and in reducing of costs per household by 28%.

Redditch

Between April 2003 and March 2007 Redditch Borough Council ran a kerbside sort recycling scheme using one lidded basket to collect paper and textiles and another to collect glass and cans. All items were sorted into the collection vehicles at the kerbside.

Figure 7 Recycling and Residual Kilograms per head against cost.



Figure 7 reflects the introduction of the comingled service where the kilograms per household of recycling increased from 97kg to a peak of 275kg in 2007. Since the comingled service has been operating an average of 237kg of recycling has been collected annually.

Residual waste showed a sharp decline at the point where comingled recycling collections were introduced. In 2004, with the kerbside sort recycling scheme in place, residual waste was at 815kg per household. This fell to 580kg in 2007. Since this date and to 2013, an average of 564kg has been collected per year per household. The Cost of waste collection per household (BVPI 86) stood at £55 in 2006 and this fell to £35 in 2013.

The data identifies that moving to a comingled service has had a positive impact on the quantity of recycling collected per household increasing it by 135% and residual waste was reduced by 30%. Costs were also significantly reduced by 35%.

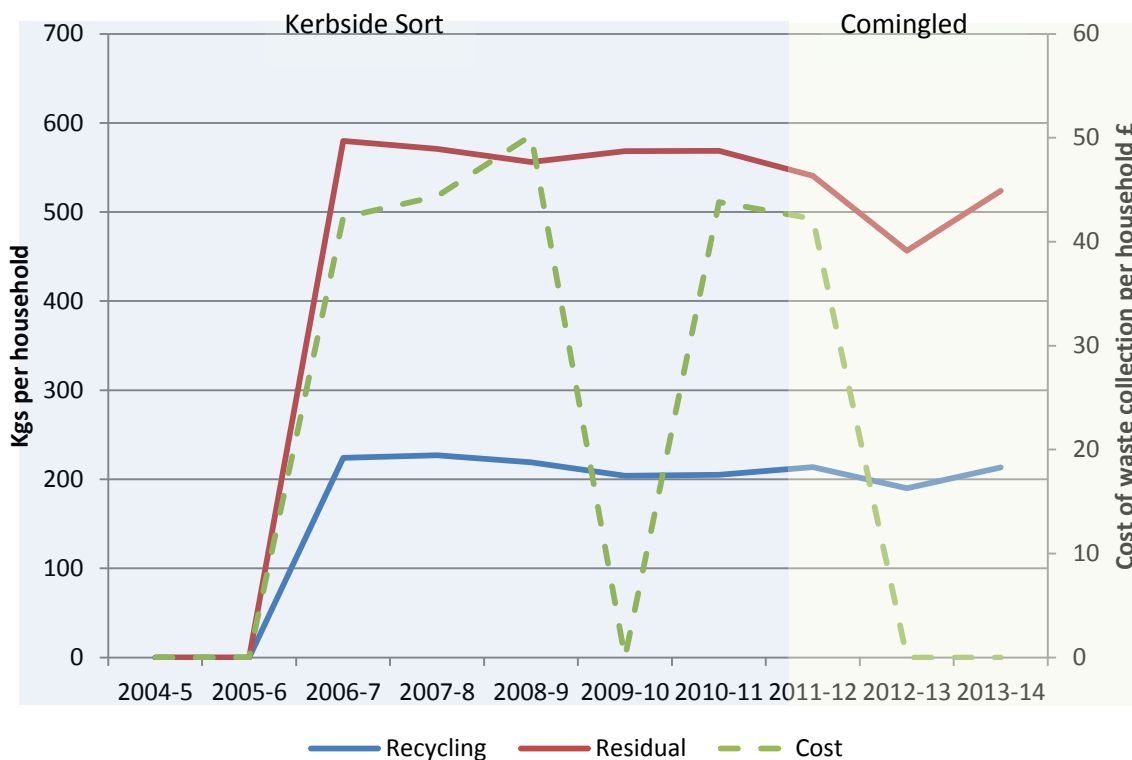
Wyre Forest

Between April 2003 and May 2011 Wyre Forest operated a kerbside sort recycling scheme with two boxes, a green box for glass, plastic bottles and cans, and a black box for paper and textiles. Kerbside vehicles were used to sort the items at the kerbside into separate compartments / stillage's. Cans and plastics were collected mixed and were sorted in an MRF while other materials were bulked and forwarded to reprocessors.

Wyre Forest disposed of their 12 kerbside sort vehicles in 2010 and replaced them with 6 standard refuse freighters. The weekly collection of refuse moved to fortnightly while recycling remained weekly.

The cost of waste collection dropped by 60K, from £1,956,336 in 10/11 to £1,890,969 in 2011/12.

Figure 8: Recycling and Residual Kilograms per head against cost



In figure 8 the kilograms per household of recycling collected by Wyre Forest Council can be seen to remain fairly constant with only some slight deviation from the average of 212kg per household throughout the 10 year period above. The kilograms per household of residual waste declined gradually from 2006-7 until 2013-14 from 224kg to 213kg.

The data identifies overall that moving to a comingled service had neither a positive or negative on the overall volume of recyclables collected per household but once again has shown to have a positive influence in reducing residual waste per household by 5% and in reducing costs by 3%.

10.1.2 Herefordshire & Wychavon & Twin Bag Schemes

Wychavon District Council introduced a twin bag recycling scheme in April 2005. Split bodied refuse freighters (70% Refuse: 30% Recycling) were used to collect refuse weekly and two streams of recycling on an alternate weekly basis. Paper and textiles were collected one week in a purple sack and cans and plastics the next in a clear sack. This was followed in September 2005 by the introduction of a separate collection of glass in a 55lt box for 73% of properties using a dedicated vehicle.

This service allowed the district to lift its dry recycling rate from 15.1% in 2004/5 to 17.45 % in 2005/6, 21.95% in 2006/7 and 23.9% in 2007/8. Several issues were identified with this scheme, the cost of supplying sacks, problems with vehicle compaction plates and the operational efficiency of having to go to tip when either one or the other side of the vehicle was full. The district therefore felt that while this system had been effective in lifting recycling rates its potential had been realised.

WDC Market tested by going out to tender for its collection contract in 2008/9. The tender consisted of two options; the first was based on retaining the twin bag scheme and the second was to move to the alternate weekly comingled collection. The difference in price was in the region of £1M in favour of the comingled collection with this costing £1.4M compared to £2.4M to retain a twin bag scheme.

The move to comingled collection reduced the number of categories of materials as textiles were no longer collected. Guidance at the time was that authorities should consider if materials are already collected for reuse when designing their schemes and in the case of textiles a significant reuse facility is available via charity shops and bring banks. The inclusion of textiles was considered problematic for the automated sorting system and was therefore discontinued.

Herefordshire Council operated a similar twin bag collection service to around 50% of its households until October 2009.

10.2.1 Cost and performance model for moving to the “Vision” system.

In 2005 fully costed models for the waste and recycling collection services of each collection authority were produced by Integrated Skills Ltd. The models looked at six options including weekly or fortnightly collection and comingling versus source separated recycling as well as the inclusion of garden waste collections.

The purpose of the models was to indicate the likely capital costs of switching to the alternate weekly system and any ongoing revenue savings. It therefore modelled existing costs and performance and the expected outturn for each of 6 options.

The options considered were:

- 1) Bags weekly for residual waste, bags weekly for recyclables (small RCVs)
- 2) As 1 but with split vehicles

- 3) Bins fortnightly for residual waste, weekly boxes/kerbsider for recyclables
- 4) Bins fortnightly for residual waste (diamond lift), fortnightly boxes/kerbsider for recyclables + Green
- 5) Bins weekly for residual waste, weekly boxes (Fame) for recyclables
- 6) Alternate weeks for dry recyclables and residuals – bins, No green

10.2.4 Community Considerations

During the tender process for Wychavon’s waste collection contract elected members expressed strong views on the need to ensure that all residents, both urban and rural, had equal access to a universal recycling service. The validity of this approach was indicated by the direction signposted in The Household Waste Recycling Act 2003 which required local authorities to collect at least “two types of recyclable waste together or individually separated from the rest of the household waste” by 2010.

10.3.2 Customer Satisfaction

Principle 8 of the Joint Waste Strategy seeks a customer focused approach to services. Satisfaction surveys are conducted across the two counties every two years. The following figures are taken from the Worcestershire Viewpoint Surveys for Nov 2009 and May 2014.

Table 43: Satisfaction with environmental services, by District

	% very/fairly satisfied					
	Waste collection		Doorstep recycling		Local tips/recycling centres	
	2009	2014	2009	2014	2009	2014
Bromsgrove	69%	84%	67%	81%	69%	83%
Malvern Hills	88%	85%	75%	79%	83%	87%
Redditch	76%	74%	75%	73%	78%	82%
Worcester	74%	81%	74%	79%	80%	87%
Wychavon	82%	84%	78%	76%	82%	84%
Wyre Forest	69%	75%	73%	77%	78%	62%
Average	76%	80%	74%	77%	78%	81%

Satisfaction levels for environmental services are high compared to many other services and have been maintained or improved over the period when comingled collections were introduced.

While it is understood that current thinking is that customer satisfaction is not material evidence in determining compliance with the requirements of the WfD, satisfaction levels are considered relevant as a measure of public support and likely participation in recycling schemes. Street appearance has also been advised as an impact on local environment quality to be considered when designing recycling schemes¹⁰.

¹⁰ DEFRA Guidance for Waste Collection Authorities on the Household Waste Recycling Act 2003.

10.3.3 Health and Safety

Health and Safety was a key consideration in the decision to introduce the comingled recycling collection. Concern for Health and Safety was a main driver in the changeover from source separated to comingled collection for Bromsgrove, Redditch and Wyre Forest. Blades, needles, broken glass and other hazardous items were regularly presented in recycling boxes which then were sorted through by hand to take out the recyclable material; however this was not the only hazard with kerbside sort.

There is an increased risk of lower back injury where the weight of kerbside recycling boxes exceeds 13kg where paper and glass are collected in recycling boxes they regularly exceed the 13kg levels¹¹. In removing the need to lift boxes the risk of back injury to crews was significantly reduced when compared with pulling a wheeled bin.

“The use of wheelie bins reduces the risk of manual handling injury compared to non-wheeled containers. Therefore, where appropriate it would be more appropriate to use wheeled bins for the collection of recyclables.”¹²

Noise is also significantly reduced for crews and the general public where glass in particular is mixed with the other materials. WRAP indicate that higher noise levels can be attributed to collection systems where there is less buffering from comingled materials therefore suggesting that lower noise levels are experienced where a comingled collection is in use.¹³

The reduction in physical contact with materials coupled with the use of wheeled bins rather than boxes or bags as containers, allows a safer working environment for collection crews.

¹¹ HCW Consultants (2006) WRAP Time Study Data on Average Kerbside Recycling Weights, Report for WRAP

¹² Health & Safety Laboratory (2006) .Buxton (HSL/2006/25)

¹³ WRAP Noise exposure in glass collections for recycling (2012),Banbury (ROT043)

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¹⁵ Tonnages taken from 2013/14 Waste Data Flow Entries

Appendix 1 Compositional Analysis of Recyclable Materials by Collection method

Primary Category	Sub-category	Residual Waste Collection ¹⁶	Sub-category	Kerbside Recycling Collection ¹⁷	Sub-category	HWRC Residual Waste ¹⁸
Paper	Paper	8.15%	Paper	47.65%	Paper	2.13%
	Card and cardboard	3.26%	Thin Card	6.55%	Recyclable card	1.65%
			Brown Card	3.87%		
			Beverage Cartons	0.55%	Beverage Cartons	0.03%
Plastic	Dense Plastic	5.86%	Plastic Bottles	5.79%	Plastic Bottles	0.25%
			Plastic Containers	1.3%	Plastic Containers	0.17%
Textiles		3.89%				
Misc. Combustible		12.84%				
Misc. Non Combustible		2.6%				
Glass		2.39%		20.09%		0.63%
Metal	Ferrous Metal	1.41%	Tins and Cans	4.53%		0.15%
	Non-ferrous Metal	0.85%	Aerosols	0.35%		
Garden Waste		7.65%	Contamination	9.31%		5.44%
Putrescibles		39.91%				
Non-putrescible food waste		2.83%				
Fines		1.41%				
Hazardous		0.71%				
WEEE		1.18%				

¹⁶ Herefordshire and Worcestershire Waste Analysis, MEL 2010 – Kerbside Waste Analysis Table 1.4.1

¹⁷ Herefordshire and Worcestershire Waste Analysis, MEL 2010 – Kerbside Waste Analysis Table 2.2.1

¹⁸ Herefordshire and Worcestershire Waste Analysis, MEL 2010 - Residual Waste - Appendix. D

Appendix 2.1 Capture Rates of key materials for Waste Collection Authorities, Bromsgrove DC, Malvern Hills DC & Redditch BC¹⁹

Authority	Collection Method	Residual Waste 2013/14	Waste Type	Residual		Kerbside		Bring Recycling		Material Capture Rate by Authority %
				%	Tonnes	%	Tonnes	%	Tonnes	
Bromsgrove	Residual Tonnage	22,390	Paper	11.41	2,554.70	58.62	5,282.83	57.03	249.79	68.41
	Kerbside Tonnage	9,012	Plastic	5.86	1,312.05	7.09	638.95	0.00	0.00	32.75
	Bring	438	Glass	2.39	535.12	20.09	1,810.51	20.14	88.22	78.01
			Metal	2.26	506.01	4.88	439.79	2.43	10.64	47.09
Malvern Hills	Residual Tonnage	15,800	Paper	11.41	1,802.78	58.62	2,923.66	21.42	163.53	63.13
	Kerbside Tonnage	4,987	Plastic	5.86	925.88	7.09	353.61	0.00	0.00	27.64
	Bring	763	Glass	2.39	377.62	20.09	1,001.98	70.40	537.51	80.30
			Metal	2.26	357.08	4.88	243.39	0.00	0.00	40.53
Redditch	Residual Tonnage	19,892	Paper	11.41	2,269.68	58.62	4,834.27	56.27	283.41	69.28
	Kerbside Tonnage	8,247	Plastic	5.86	1,165.67	7.09	584.70	0.00	0.00	33.40
	Bring	504	Glass	2.39	475.42	20.09	1,656.78	15.54	78.28	78.49
			Metal	2.26	449.56	4.88	402.44	0.45	2.25	47.37

¹⁹ Tonnes taken from 2013/14 Waste Data Flow Entries

Table 2.2 Capture Rates of key materials for Waste Collection Authorities, Worcester City, Wychavon DC, Wyre Forest DC & Herefordshire²⁰

Authority	Collection Method	Residual Waste 13/14	Waste Type	Residual		Kerbside		Bring Recycling		Material Capture Rate by Authority %
				%	Tonnes	%	Tonnes	%	Tonnes	
Worcester City	Residual Tonnage	19,587	Paper	11.41	2,234.88	58.62	5,854.50	8.28	47.98	72.54
	Kerbside Tonnage	9,987	Plastic	5.86	1,147.80	7.09	708.09	0.00	0.00	38.15
	Bring	579	Glass	2.39	468.13	20.09	2,006.43	20.94	121.25	81.97
			Metal	2.26	442.67	4.88	487.38	7.31	42.36	54.48
Wychavon	Residual Tonnage	24,464	Paper	11.41	2,791.34	58.62	7,893.38	23.06	154.30	74.25
	Kerbside Tonnage	13,465	Plastic	5.86	1,433.59	7.09	954.69	0.00	0.00	39.97
	Bring	669	Glass	2.39	584.69	20.09	2,705.19	37.44	250.53	83.49
			Metal	2.26	552.89	4.88	657.11	0.92	6.18	54.54
Wyre Forest	Residual Tonnage	26,261	Paper	11.41	2,996.38	58.62	6,052.79	43.34	141.64	67.40
	Kerbside Tonnage	10,325	Plastic	5.86	1,538.89	7.09	732.08	0.00	0.00	32.24
	Bring	327	Glass	2.39	627.64	20.09	2,074.39	26.85	87.74	77.50
			Metal	2.26	593.50	4.88	503.88	0.85	2.79	46.05
Herefordshire	Residual Tonnage	47,106	Paper	11.41	5,374.79	58.62	9,844.77	0.00	0.00	64.68
	Kerbside Tonnage	16,794	Plastic	5.86	2,760.41	7.09	1,190.71	0.00	0.00	30.14
	Bring	354	Glass	2.39	1,125.83	20.09	3,373.96	75.82	268.28	76.39
			Metal	2.26	1,064.60	4.88	819.56	0.00	0.00	43.50

²⁰ Tonnes taken from 2013/14 Waste Data Flow Entries

Table 2.3 Capture rate HWRC's (Black Bag waste)

Authority	Collection Method	Annual Tonnage 2013/14	Waste Type	Residual		Recycling		Material Capture Rate by Authority %
				Percentage Recyclable	Tonnes Recyclable	Percentage	Tonnage	
Herefordshire	Residual	7007	Paper	4.59	218.44	17.56	835.50	79.27
	Recycling	4759	Plastic	12.97	617.24	0.18	8.43	1.35
			Glass	2.63	125.16	39.25	1868.00	93.72
			Metal	1.63	77.57	0.18	8.43	9.80
Worcestershire	Residual	21740	Paper	6.17	1341.36	20.01	2783.02	67.48
	Recycling	13909	Plastic	13.58	2952.29	0.10	13.77	0.46
			Glass	1.67	363.06	1.94	270.30	42.68
			Metal	1.87	406.54	27.42	3813.43	90.37

Appendix 3 Destinations of materials from EnviroSort 13/14

Plastic Bottles <i>HDPE</i>	Mission Recycling, Offenham road, Evesham, WR11 8DX	Plastic Pellets – used for a variety of products
	J&A Young (Leicester) Ltd. Brook House, Hambleton Road, Egleton ,Oakham Rutland, LE15 8AE	
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	
<i>PET</i>	Mission Recycling, Offenham road, Evesham, WR11 8DX	Various products including fibres
	J&A Young (Leicester) Ltd. Brook House, Hambleton Road, Egleton ,Oakham Rutland, LE15 8AE	
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	
Plastic Film <i>LDPE</i>	Peute Papierrecycling BV Baanhoekweg 4, 3313 LA Dordrecht ,The Netherlands	Various products
	J&A Young (Leicester) Ltd. Brook House, Hambleton Road, Egleton ,Oakham Rutland, LE15 8AE	
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	
Pots, Trays and tubs	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	Further sorting, various products
	ACE UK Herons Way, Chester Business Park, Chester CH4 9QR	
Paper based liquid food and drink cartons	ACE UK Herons Way, Chester Business Park, Chester CH4 9QR	Paper / plastic / aluminium recovered
Steel Cans	Sims Metals UK Ltd Mansfield Road, Derby DE21 4BL	Steel
Aluminium	Alutrade, Howard Road, Park Farm Ind Est, Redditch, Worcs, B98 7SE	Aluminium
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	Aluminium
Glass	T Berryman & Son Ltd, Lidgate Crescent, Langthwaite Business Park, South Kirkby, West Yorkshire WF9 3NR	Further sorting, Aggregates/re-melt

Appendix 3

	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	Further sorting, Aggregates/re-melt
Paper	Mission Recycling, Offenham road, Evesham, WR11 8DX	Paper
	DS Recycling Pant Glas Industrial Estate ,Bedwas Caerphilly, CF83 8DR	Paper
	Peute Papierrecycling BV Baanhoekweg 4, 3313 LA Dordrecht ,The Netherlands	Paper
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	Paper
	Newport Paper Aston House, 3 Springfield Industrial Estate, Newport, Shropshire TF10 7NB	Paper
Card	DS Recycling Pant Glas Industrial Estate ,Bedwas Caerphilly, CF83 8DR	Card
	Mission Recycling, Offenham road, Evesham, WR11 8DX	Card
	PMK, Outgang Road, Baston Fen, Baston PE6 9PT	