



City of Bradford Metropolitan District Council

Waste Needs Assessment, Capacity Gap
Analysis and Site/Facility Requirements Study



PART A

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GLOSSARY OF TERMS

AD	Anaerobic Digestion
C&I Waste	Commercial and Industrial Waste
CDEW/CD&E	Construction Demolition and Excavation Waste
EfW	Energy from Waste
ELV	End of Life Vehicle
GVA	Gross Value Added
LACW	Local Authority Collected Waste
MBT	Mechanical Biological Treatment
ROCs	Renewable Obligations Certificates
RSS	Regional Spatial Strategy
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment

STAGE 1a: Compiling Baseline Waste Arisings for Bradford Council

This Interim Report reviews the robustness and limitations of the available information on current and expected arisings of waste from within the geographical boundary of the City of Bradford Metropolitan District Council (herein referred to as “Bradford”) has been thoroughly carried out for a range of waste streams.

The Interim Report provides information relating to the arisings for each of the following waste streams in Bradford:

- Commercial and Industrial;
- Local Authority Collected Waste;
- Hazardous Waste;
- Construction, Demolition and Excavation Waste;
- Agricultural;
- Low Level Non-Nuclear Radioactive Wastes; and
- Water Waste/Sewage Sludge.

This report also provides information on the movement of wastes between Bradford and other waste planning authorities.

Details of data sources used to inform this Interim Report are provided in Appendix 1.

1. Commercial and Industrial Waste Arisings Projections

1.0 Survey Data Sources

1.1.1 There have been no surveys of Commercial and Industrial (C&I) waste arisings in Bradford specifically, and there is no accurate method of estimates annual arisings of this stream in the authority. However, estimates of the quantities of C&I waste arisings can be extrapolated from surveys that have been undertaken at National and Regional (Northwest) levels. The relevant surveys which have been used for this study use data collected in the years 2009¹ and 2008/9².

1.1.2. The data from the National Report is from a national survey of 6,005 businesses gathered between June and October 2010, with estimates of waste arisings in 2009 and ONS data on business size and number from 2009. Of the interviews conducted for the survey, 54.5% were face-to-face, with the remaining data taken from telephone interviews, corporate data and PPC (Pollution Prevention Control) returns to the

¹ Commercial and Industrial Waste Survey 2009 Final Report May 2011 (Jacobs, for Defra)

² North West of England Commercial and Industrial Waste Survey 2009 (For the Environment Agency , March 2010)

Environment Agency. In total, 7.77% of the surveys were within the Yorkshire and Humberside Region. PPC data is added in to the survey published totals and will therefore introduce distortions into any manipulation of published data. The published totals with PPC data added are not statistically derived and manipulation of the numbers using baseline survey and ONS statistics can distort the results.

- 1.1.3. The North West (NW) survey was completed through site visits to surveyed premises undertaken in 2009, and covered 1000 businesses. The North West survey was chosen as it is geographically close to Bradford (Yorkshire and Humberside Region) and data is published in sufficient detail to allow customisation for the Sub-Region. Details of waste arisings per C&I sector and business size enable estimates to be generated covering the number, sector and size of businesses in Bradford. The North West survey extrapolations correlate with the observed quantity of landfilled C&I waste from the EA Waste Data Interrogator, and this gives confidence that the survey results provide a sufficiently accurate method for estimating arisings in Bradford in the absence of alternative methods.

1.1 Commercial and Industrial Waste Arisings

Stage 1 – Extrapolations for Bradford

- 1.2.1 The first stage in determining C&I arisings for Bradford is to extrapolate data at a Regional level for Yorkshire and Humberside. Table 1 compares the quantity of wastes generated in Yorkshire and Humberside as estimated by the national survey (ONS businesses 2009, projections using ONS data on business size and number from 2008) with estimates from the NW Regional Survey (2008 ONS business data).
- 1.2.2 Note that these surveys are rarely able to generate full-year estimates directly. In practice, the survey will collect details from invoices or the quantity of waste on site in recent months (estimated by container sizes) which will be scaled up to provide an annual estimate. As a result, data collected in mid 2009 when the NW survey was completed is unlikely to be at significant variance within statistical margins of error to the Defra survey, for which field work was carried out in early 2010 for the year 2009/2010. Full details of the extrapolation method are provided in Appendix A of this report.
- 1.2.3 The high values for the power and utilities sector indicate that PPC data for ash disposal at power stations was factored into the national survey results. Projections from the NW survey exclude PPC (Pollution Prevention and Control) data. Exclusion of the Power and Utilities sector³ (due to treatment required at specialised, restricted user landfill) brings the totals closer, although there are still some significant variances within certain SIC (Standard Industrial Classification) categories.

³ Energy industry wastes deposited at restricted landfills require special management and disposal which cannot be undertaken at landfills receiving other C&I wastes. They are not considered along with the wastes generated from general commercial and industrial activity.

Table 1 Comparison of C&I arisings using the published National Survey and the NW Regional Survey for Yorkshire and Humberside for 2009/10

Projected sector arisings for Yorkshire & Humberside	Published Arisings Projected* in the Defra National Survey (1000 Tonnes)	Arisings Projected* from the NW Survey (1000 Tonnes)
Food, and drink	690	526
Textiles/wood/paper/publishing	583	344
Power & Utilities	2,064	215
Chemical/non-metallic minerals manufacturing	571	428
Metal manufacturing	772	372
Machinery & equipment (other manufacturing)	268	459
Retail & wholesale	816	1,272
Other services	795	988
Public sector	387	528
Totals	6,944	5,132
Total minus Power & utilities	4,880	4,917
Difference between surveys: 1,812,000 or 37,000 if the Power and Utilities sector is excluded		

*Extrapolated figures

[Sources: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

1.2.4 The national survey shows relatively high arisings for metal manufacturing, food & drink, and textiles/wood/paper/publishing sectors, whilst projections from the NW survey show a relatively high level of arisings from machinery & equipment (other manufacturing) sector, and the retail and wholesale sector. Variance between the national survey for the Yorkshire and Humberside and NW survey in specific sectors may be due to sampling methodology. For example, the National Survey included 54.5% face-to-face surveys, whereas the NW survey was mainly face-to-face with only PPC data added in as referred to previously. The national survey also reflects an average of all English regions whereas the NW Survey was for one region only. It is only by reviewing other data sets such as those derived from the EA Waste Data

Interrogator that a judgement can be made as to which survey extrapolation is most appropriate for use.

Stage 2 – Comparison of Estimated Projections

1.2.5 The second stage of extrapolation is to project estimates for C&I arisings using the national survey data and compare this with projections extrapolated from the NW survey at Bradford level (see Appendix A for extrapolation method). Extrapolated figures are shown in Table 2.

Table 2 Comparison of C&I Arisings projected from the Defra Survey with a Projection from the NW survey by Standard Industry Classification for Bradford (tonnes) (2009/10)

Sectors	Projected from Defra National Survey (tonnes)	Arisings Projected from the NW Survey (tonnes)
Food, drink and tobacco	23,544	22,886
Textiles/wood/paper/publishing	45,448	41,709
Power & Utilities	38,819	28,356
Chemical/non-metallic minerals manufacturing	50,561	49,412
Metal manufacturing	19,677	17,867
Machinery & equipment (other manufacturing)	31,529	59,543
Retail & wholesale	86,494	123,367
Other services	65,756	77,118
Public sector	42,497	53,829
Totals	<u>404,324</u>	<u>474,087</u>
Difference between surveys 69,763 tonnes		

[Sources: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

1.2.6 The projections using the national survey data show relatively high arisings for metal manufacturing, textiles/wood/paper/publishing and food & drink and sectors. The NW survey is generally lower in all sectors except machinery and equipment (other manufacturing) and higher in commercial waste, in particular from the retail and wholesale sector.

1.2.7 Published data from the national survey also included waste arisings by material type and method of management for Yorkshire and Humberside.

1.2.8 Evaluation of C&I arisings also needs to consider that part of Local Authority Collected Waste which is classified as trade waste. This waste is very similar in composition to household waste and is collected under contract by the local authority typically from very small businesses. The C&I surveys referred to previously estimate total waste generated by business activities, creating a risk that these materials will be double-counted.

1.2.9 Table 3 identifies the quantity of LACW trade waste generated in Bradford (source: Defra Waste Data Flow reporting system).

Table 3 Trade Waste Collections for Bradford

Trade Waste Local Authority Collections (2009/10)	
Local Authority	Tonnes
Bradford	2,855

[Source: Defra WasteDataFlow]

1.2.10 It is also possible to analyse the two survey results by waste management method at regional and local levels. The results are shown in Tables 4 and 5

Table 4 Comparing Defra Survey C&I Arisings with a Projection for Yorkshire and Humberside from the NW survey by Disposal Method (2009/10)

Estimated Waste Arising by Management Method	Yorks and Humber from Defra National Survey (000s tonnes)	Yorks and Humber Arisings Projected from the NW Survey (000s tonnes)
Land disposal (Landfill)	1,997	1,077
land recovery	238	82
Thermal Energy recovery	107	96
Incineration	205	77
Non Thermal treatment	332	169
Transfer Station	78	84
Recycling	3,143	3,256
Composting	92	33
Reuse	213	Included in recycling
Unknown	539	258
Total	6,944	5,132
Total minus Power &Utilities	4,880	4,917
Difference between surveys 37,000 tonnes (without Power and Utilities)		

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

Table 5 Comparing C&I Arisings projected from the Defra Survey with a Projection for from the NW survey by Disposal Method at Bradford level (2009/10)

Estimated Waste Arising by Management Method	Projected from National Survey Using Yorks and Humberside data (tonnes)	Arisings Projected from the NW Survey (tonnes)
Land disposal (Landfill)	116,278	93,823
land recovery	13,858	6,412
Thermal Energy recovery	6,230	11,519
Incineration	11,936	8,089
Non Thermal treatment	19,331	14,702
Transfer	4,542	9,305
Recycling	183,006	302,718
Composting	5,357	5,272
Reuse	12,402	Included in recycling
Unknown	31,384	22,247
Totals	404,324	474,087
Differences between the two surveys 69,763 tonnes		

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

Table 6 Comparing C&I Arisings projected from the Defra Survey with a Projection for from the NW survey by Sector at Bradford level, tonnes (2009/10)

	Projected from National Survey Using Yorks and Humberside data	Arisings Projected from the NW Survey (tonnes)
Food, drink and tobacco	23,544	22,886
Textiles/wood/paper/publishing	45,448	41,709
Power & Utilities	38,819	28,356
Chemical/non-metallic minerals manufacturing	50,561	49,412
Metal manufacturing	19,677	17,867
Machinery & equipment (other manufacturing)	31,529	59,543
Retail & wholesale	86,494	123,367
Other services	65,756	77,118
Public sector	42,497	53,829
	404,324	474,087

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

- 1.2.11 The National Survey estimates the quantity of waste sent to landfill to be almost twice that predicted by the extrapolated NW survey. Landfill data from the EA Waste Data Interrogator shows a total of 1,164,383 tonnes of commercial and industrial waste landfilled in the Yorkshire and Humberside region (EA Household, Industrial & Commercial waste minus reported municipal waste landfilled 2008/9). It is only for landfill that comparable data from the EA Waste Data Interrogator can be used.)
- 1.2.12 Analysis by management method indicates that the higher levels of arisings shown in the NW projection are predominantly accounted for by higher estimates of recycling.

1.2 Conclusion regarding C&I arisings for Bradford

- 1.3.1 Although there are variations in extrapolating data for C&I from the two data sources used here, similar results are obtained with the extrapolated NW survey showing a higher level of recycling. This can be expected because the surveys used different methodologies (mixtures of face to face, PPC data, telephone surveys and corporate data). However, when empirical Environment Agency data about landfilling of C&I wastes is compared with the extrapolations from the national and NW surveys it is clear that the latter provides a closed estimate. This outcome suggests that the NW survey offers a more reliable approach to estimate the quantity of wastes generated than using the national survey and any regional data within it.
- 1.3.2 The model used by this needs assessment therefore uses the NW survey results as a basis for extrapolating comparative estimates for Bradford, although it has been built to allow the option of extrapolation from the national survey results as an alternative.

2. Local Authority Collected Waste

2.0 Data Sources

- 2.1.2 Detailed waste arisings and waste growth forecasts, which are more than adequate to inform the needs assessment modelling process, have been provided by officers from Bradford's Waste Disposal Authority (WDA)
- 2.1.3 As noted in the previous section, part of the LACW stream comprises trade waste collected from businesses. The other two components are household waste and other non-household waste, the latter being material collected from parks and gardens, street litter bins and street sweeping / cleansing activities. In order to prevent double-counting, the approach subtracted the estimated quantity of trade waste (see Table 3) from total LACW arisings.
- 2.1.4 The methodology of the needs assessment is based on calculating the average waste produced by each household currently, and then projecting this forward based on forecast growth in households.

2.1.5 Table 7 summarises the principal estimates.

Table 7 LACW Arisings for Bradford in 2011/12

Baseline Data Local Authority Collected Waste (LACW) Bradford	Tonnes
Total Number of Households	186,000
Population	523,100
Total LACW	224,507
Total household waste	197,058
Tonnes of non-household waste collected	27,449
Waste collected from the kerbside and HWRCs for recycling	38,401
Composted waste	17,130
Household waste recycling / composting performance	28.2%
Residual Mechanical Treatment	141,527
Recycling from Mechanical Waste Treatment*	46,641
RDF* From Treatment Exported	51,504
Residual Disposal Landfill	43,382

[Sources: Defra WasteDataFlow; Bradford City Council]

2.1.6 Residual Waste is sent to a local merchant facility which uses mechanical and hand sorting to extract recyclates. The quantity of material derived is identified in the row titled 'Waste Treatment' in Table 7. The remaining material is mechanically processing into *RDF which is sent to Holland or Denmark for energy recovery. These are interim waste treatment arrangements currently in place up to 2015/17 until the Council adopts a more suitable longer term arrangement.

2.1.7 It is proposed that a new facility will be provided within Bradford to treat residual waste from both Bradford and Calderdale. Residual waste from Calderdale in year 2012 totalled 50,786 tonnes. This figure has been added to the baseline LACW residual waste in the model.

2.1 Summary

2.2.1 Projections of LACW waste arisings will be used to inform the Model. The data published in the national Waste Data Flow website made available through Defra has been confirmed/supplemented by Bradford officers there are no significant variations in arisings between the two data sources which would impact on modelling projections.

3. Hazardous Waste

3.0 Data Sources

3.1.1 Data on hazardous waste is taken from the 2012 Environment Agency Hazardous Waste Interrogator. This is considered by the Environment Agency to be the most accurate source on this waste stream and is used to inform the needs assessment model in preference to data from its standard site Waste Interrogator.

3.1 Hazardous Waste Arisings

3.2.1 Bradford recorded 19,153 tonnes of hazardous waste arisings (Table 8) and 3,578 tonnes of hazardous waste were managed at sites in Bradford in 2012 (Table 9).

Table 8 Hazardous Waste Arisings in Bradford by Substance (2012)

Hazardous Waste Substances Arising in Bradford	Total Arising in Bradford (tonnes)
C&D Waste and Asbestos	4,850
Organic Chemical Processes	3,517
Not Otherwise Specified	2,845
Oil and Oil/Water Mixtures	1,925
Metal Treatment and Coating Processes	1,431
Shaping/Treatment of Metals and Plastics	1,342
Healthcare	1,119
Municipal and Similar Commercial Wastes	859
Packaging, Cloths, Filter Materials	314
MFSU Paints, Varnish, Adhesive and Inks	284
Solvents	270
Waste/Water Treatment and Water Industry	159
Inorganic Chemical Processes	128
Photographic Industry	90
Thermal Process Waste (inorganic)	17
Wood and Paper Production	3
Total	19,153

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

Table 9 Hazardous Waste Managed in Bradford 2012 (tonnes)

Hazardous Waste Classification	Recovery	Transfer (D)	Transfer (R)	Treatment
Agricultural and Food Production			0	
Inorganic Chemical Processes		0	0	
MFSU Paints, Varnish, Adhesive and Inks			8	
Shaping/Treatment of Metals and Plastics			0	
Oil and Oil/Water Mixtures		0	88	
Solvents		0	1	
Packaging, Cloths, Filter Materials		0	8	

Hazardous Waste Classification	Recovery	Transfer (D)	Transfer (R)	Treatment
Not Otherwise Specified	57	3	519	
C&D Waste and Asbestos		475		
Healthcare		68	0	1,660
Municipal and Similar Commercial Wastes	636	32	21	
Total by Management Method	693	579	646	1,660
Total Managed in Bradford				3,578

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.2.2 The movement of hazardous waste reflects the management of these specialised wastes at regionally or nationally significant facilities. Whilst some 2,704 tonnes are seen to be imported (Table 10), Bradford is a net exporter of hazardous waste with 18,287 tonnes exported in 2012 (Table 11).

Table 10 Hazardous Waste Imports to Bradford by waste type and treatment method 2012 (tonnes, rounded)

<i>Hazardous Waste Classification</i>	<i>Recovery</i>	<i>Transfer (Disposal)</i>	<i>Transfer (Recovery)</i>	<i>Treatment</i>
Agricultural and Food Production			<1	
Inorganic Chemical Processes			<1	
MFSU Paints, Varnish, Adhesive and Inks			8	
Oil and Oil/Water Mixtures		<1	83	
Packaging, Cloths, Filter Materials		<1		
Not Otherwise Specified	17	<2	159	
C&D Waste and Asbestos		176		
Healthcare		61		1581
Municipal and Similar Commercial Wastes	625	1	2	
Total by Management Method	641	239	243	1581
Total Imported to Bradford				2704

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

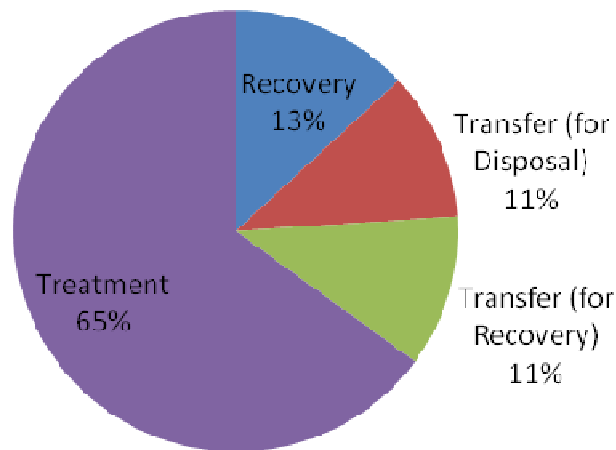
Table 11 Hazardous Waste Exported from Bradford showing treatment method (2012)

Methods used to Manage Hazardous Waste	Hazardous Waste Exports from Bradford (tonnes)
Incineration with energy recovery	73
Incineration without energy recovery	2,449
Landfill	4,357
Other Fate	0
Recovery	3,488
Rejected	79
Transfer (D)	1,104
Transfer (R)	2,162
Treatment	4,575
Total	18,287

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.2.3 Figure 1 shows the proportion of hazardous waste managed at different types of facility in Bradford. The main treatment facility for hazardous waste in Bradford is for healthcare waste. Hazardous waste is also managed through transfer facilities (either for onward disposal or recycling). There are no hazardous landfill facilities within Bradford.

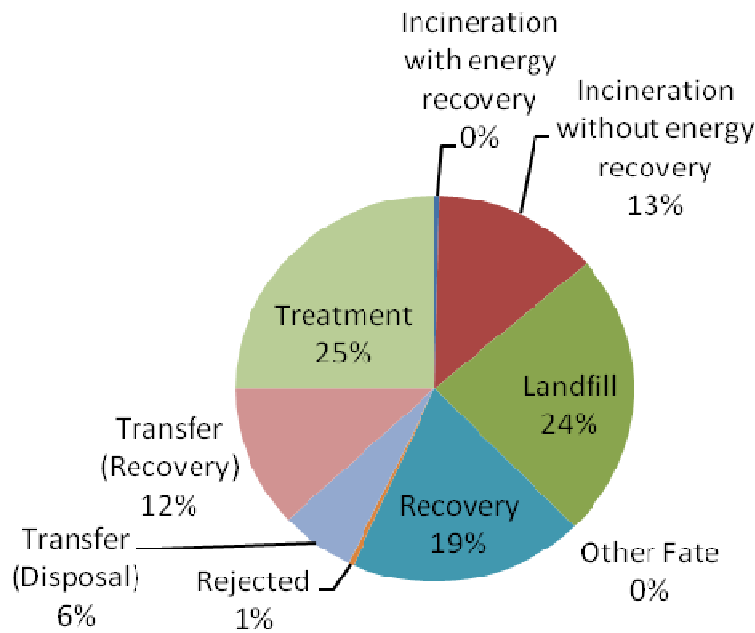
Figure 1 Hazardous Waste Managed in Bradford (2012)



[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.2.4 Figure 2 shows the proportion of hazardous waste managed at different types of facility once it has been exported from Bradford. 27% of hazardous waste is exported for treatment, 23% for recovery, with a further 24% being exported to transfer facilities and onward disposal or recycling.

Figure 2 Hazardous Waste Exported from Bradford Sub-Region (2012)



[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.2.5 Figure 2 shows the proportion of hazardous waste managed at different types of facility once it has been exported from Bradford. 27% of hazardous waste is exported for treatment, 23% for recovery, with a further 24% being exported to transfer facilities and onward disposal or recycling.

3.2.6 Table 12 shows that there are 7 hazardous waste categories exported from Bradford that exceed 1000 tonnes per annum. A further 13% of exports have no substance specified in the Environment Agency Records. The remaining 11% of hazardous waste exports are in relatively small quantities and cover a wide range of substances. In terms of volume, the largest specified category of hazardous waste exported is Construction and demolition waste contaminated with asbestos.

Table 12 Main Exported Hazardous Waste by Substance from Bradford (2012)

Waste Substance	Tonnes
C&D Waste and Asbestos	4,551
Organic Chemical Processes	3,517
Not Otherwise Specified	2,434
Oil and Oil/Water Mixtures	1,920
Metal Treatment and Coating Processes	1,431
Shaping/Treatment of Metals and Plastics	1,342
Healthcare	1,032
Municipal and Similar Commercial Wastes	797
Packaging, Cloths, Filter Materials	314
MFSU Paints, Varnish, Adhesive and Inks	284
Solvents	268
Waste/Water Treatment and Water Industry	159
Inorganic Chemical Processes	128
Photographic Industry	90
Thermal Process Waste (inorganic)	17
Wood and Paper Production	3

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.2.7 Table 13 shows the destination WPA's that receiving in excess of 100 tonnes of exported hazardous waste from Bradford (95% of hazardous waste exports), a full list of waste planning authorities for which there have been cross boarder hazardous waste movements are contained in Appendix C.

Table 13 Destination WPA's of Hazardous Waste exported from Bradford (2012) (tonnes)

Deposit WPA	Tonnage
Kirklees	4,663
Leeds	3,297
Cheshire West and Chester	2,557
Wakefield	1,078
Lancashire	893
Salford	726
Knowsley	676
York, City of	661
Rotherham	615
Derbyshire	591
Sheffield	378
Stockton-on-Tees	283
Nottinghamshire	256
North Yorkshire	207
Walsall	140
North Lincolnshire	132
Newport	100
Liverpool	95
Birmingham City	93
Barnsley	70
Trafford	63
Stockport	59
Cheshire East	58
Blaenau Gwent	52
Northumberland	48
Bolton	46
Bury	45
Stoke-on-Trent City	45
Staffordshire	35
Sefton	34
Dudley	31
Hertfordshire	26
Cambridgeshire	25
Norfolk	22
Lincolnshire	19
Wigan	17
Nottingham City	16
Warwickshire	16
Redcar and Cleveland	14
West Berkshire	12
Wiltshire	9

Deposit WPA	Tonnage
Calderdale	9
St Helens	7
Hartlepool	7
Kingston Upon Hull City	6
Sunderland	6
Bexley	5
Tameside	5
County Durham	4
Northamptonshire	4
Sandwell	4
Doncaster	4
Bristol City	3
Worcestershire	3
Wolverhampton	3
Suffolk	2
East Riding of Yorkshire	1
Leicestershire	1
Cornwall UA	1
Halton	1
North Somerset	1
Essex	1
Cardiff County	1

[Source: Environment Agency Hazardous Waste Data Interrogator, 2012]

3.3 Conclusion

3.3.1 Bradford recorded 19,153 tonnes of hazardous waste arisings and 3,578 tonnes of hazardous waste were managed at sites in Bradford in 2012. Bradford is a net exporter of hazardous waste with 18,287 tonnes exported in 2012, whilst only 2,704 tonnes are seen to be imported.

3.3.2 The movement of hazardous waste reflects the need to manage these specialised wastes at regionally or nationally significant facilities. This reflects the fact that economies of scale are required for such facilities and is it impractical to provide such specialised facilities at a local level. It will remain the case that management requirements for most hazardous waste arisings from Bradford will be met in specialised facilities outside of the Bradford City area.

4. Construction, Demolition and Excavation Waste

4.0 Data Sources

- 4.1.1 Accurate data on the quantity of CD&E waste arisings has historically been poor. Since 1999, CLG has conducted periodic national surveys of arisings and use of alternatives to primary aggregates. The most recent of these (2005) suggested that the production of recycled aggregate in the region had increased slightly since the previous 2003 survey. However, due to the limited level of returns, the apparent changes between this and the previous (2003) survey suggest this is not a robust source of data even if the differences were not statistically significant.
- 4.1.2 An estimate of how much CD&E waste is produced in Bradford can be made in terms of the quantity of material handled at permitted sites. Data has been published by the Environment Agency for 2012 in the EA Waste Data Interrogator database. This source gives quantities of CD&E waste deposited at sites which are operating under an extant Environmental Permit. It provides some information on the origin of wastes and where they moved to, but it is incomplete as some of these details are not fully recorded in all cases.
- 4.1.3 The analysis has separated the stream into C&D waste and excavation waste. The majority of the former (76%) is mixed construction waste and most if this material is non-hazardous and is handled at transfer stations or treatment facilities. Virtually all excavation wastes (89%) are soils which are predominantly used for reclamation with the rest sent to waste transfer stations where they are subsequently re-used.
- 4.1.4 Some CD&E waste is managed under exemptions from the Environmental Permitting process. This material is predominantly excavation waste (specifically soil and stones) which is spread on land for reclamation or improvement. Waste managed under exemptions is not reported to the Environment Agency and therefore is not included in the Waste Data Interrogator.

4.1 Construction, Demolition and Excavation Waste Deposits & Arisings

- 4.2.1 As noted above, CD&E waste recycled or re-used at source or that which is spread on land under an Environmental Permitting exemption is not reported via the Waste Data Interrogator. Therefore, unlike the other waste streams it is not possible to estimate the quantity of arisings, only the amount of waste that needs to be managed away from where it originated. As a result the analysis presented here indicates the minimum quantity of arisings and may be better considered as an estimate of the amount of material that must be managed off-site in third party-operated waste management facilities.
- 4.2.2 Table 14 shows deposits of CD&E in Bradford. A total of 155,468 tonnes of CD&E waste is deposited in Bradford, with over 114,000 tonnes of this being construction and demolition waste and over 41,000 tonnes being Excavation waste.

Table 14 CD&E Deposits in Bradford (2012) (rounded)

Construction & Demolition Wastes	Tonnes	Excavation Wastes	Tonnes
Concrete bricks & gypsum	37,511	Soils	41,345
Mixed construction waste	71,795		
Other wood waste	3,794		
Waste from carbonised road planings	1,023		
Construction & Demolition Total	114,123	Excavation Total	41,345
CD&E Total	155,468		

[Source: Environment Agency Waste Data Interrogator, 2012]

4.2.3 Tables 15 shows how CD&E is managed and at what type of sites in Bradford.

Table 15 CD&E Deposits in Bradford Managed by Waste Management Facility (2012)

Facility Type	Construction & Demolition Tonnes	Excavation Tonnes
Household Waste Recycling Centres	464	3,870
Hazardous Waste Transfer	167	
Inert Waste Transfer / Treatment	21,888	
Metal Recycling	32	
Non-Hazardous Waste Transfer	75,030	21,486
Non-Hazardous Waste Transfer / Treatment	16,542	3,159
Reclamation		12,830
Totals Tonnes	114,123	41,345

[Source: Environment Agency Waste Data Interrogator, 2012]

4.2.4 The new “Duty to Co-operate” requirements mean it is essential that evaluation is made of the movement of waste between authorities⁴.

4.2.5 The baseline data gathered for Bradford (Tables 16-18) is taken from the Waste Data Interrogator extracting information on imports to Bradford by originating WPA, on deposits of waste which originated in Bradford.

Table 16 CD&E deposits at permitted sites in Bradford by origin (2012)

WPA origin	Tonnes
Origin Yorkshire and Humberside	87,326
North East	68
Leeds	4,220
Calderdale	1,620
Origin not recorded/known	32
(Originating from Bradford)	62,203
Total	155,468

[Source: Environment Agency Waste Data Interrogator, 2012]

⁴ Localism Act, paragraph 110.

Table 17 CD&E removed from permitted sites in Bradford to other WPA's (2012)

Destination WPA	Tonnes
Yorks & Humberside	16,930
Leeds	1,612
North East Region	1,204
Manchester	492
Calderdale	368
York	158
Not known	2,401

[Source: Environment Agency Waste Data Interrogator, 2012]

Table 18 Exports of CD&E from Bradford to other WPA's (2012) – Origin recorded at the site of deposit

WPA	Tonnes Originating in Bradford
Calderdale WPA	29,588
Leeds	14,610
North Yorkshire WPA	13,048
Kirklees WPA	5,161
Wakefield	1,345
Doncaster	1,200
Rotherham	440
Sheffield	324

[Source: Environment Agency Waste Data Interrogator, 2012]

- 4.2.6 From the baseline data gathered it can be seen that only 4% of the total of CD&E waste managed in Bradford is definitely⁵ imported from 6 MPAs. The remaining material may be imported but the origin is stated as Yorkshire and Humberside only (known or estimated) and therefore it is impossible to determine whether it was imported or originated locally.
- 4.2.7 Whilst 155,468 tonnes of CD&E waste are managed in Bradford it can be seen from table 15 that all the sites are waste transfer stations of different types. In 2011 95,918 tonnes are recorded as removed from these permitted sites. However, management of CD&E waste at facilities in Bradford would appear to be very variable as data for year 2010 show deposits of 76,884 tonnes and removals (exports) of 124,002 tonnes. It appears that the discrepancy between deposits and removals may reflect a quantity of waste which remains on these sites in short or medium-term storage.
- 4.2.8 Of waste removed from permitted sites in Bradford almost 17,000 tonnes (73%) is recorded as being deposited at sites within Yorkshire and Humberside with the remaining waste deposited as shown in Table 17.

⁵ There is a degree of uncertainty because the origin and fate of waste movements is only reported at a Yorkshire and Humberside level. It can be seen that CD&E waste is mainly arising and managed in the Plan Area and not exported outside the Sub-region.

- 4.2.9 Data from waste removed from sites in Bradford shows that 91% of CD&E is recorded as removed for recovery (recycling) and only 63 tonnes for landfill, with the remaining materials sent for transfer, treatment or an unknown fate.
- 4.2.10 The Waste Data Interrogator can provide an estimate of the amount of CD&E waste recorded as originating in Bradford which waste deposited at permitted sites outside the authority. However this analysis is complex as waste could be exported by two routes:
- Material taken directly from the source in Bradford to an external permitted site;
 - Material moved from the source to a transfer station within Bradford (where it may be stored for some time) and then sent for management outside the authority.
- 4.2.11 Inclusion of wastes moved directly means that the total quantity waste exported should be higher than the quantity of waste recorded as being removed from transfer facilities. However the analysis identifies a lower figure of 65,716 tonnes originating in Bradford in 2012. This discrepancy might be explained if some waste a originating in Bradford has been recorded at Yorkshire & Humberside level only and cannot be distinguished separately.
- 4.2.12 Where the origin is recorded, 94% of the waste is sent to neighbouring or nearby authorities in the former Yorkshire and Humberside region as shown in Table 18. This situation reflects the relative low value and considerable bulk of these wastes which mean it is unlikely to be economically viable to move them over long distances for recycling, re-use or disposal.

Review of Construction Demolition and Excavation Arisings from Bradford

- 4.2.13 The interim report is based on data from the EA WDI identifying that just over 133,600 tonnes of CD&E waste is deposited in Bradford, with 110,500 tonnes of this being construction and demolition waste and 22,100 tonnes of excavation waste. The EA WDI also showed 57,724 tonnes of CD&E waste originating in Bradford was deposited in adjacent waste planning authority areas. As stated previously, these figures represent a minimum estimate as a significant amount of CD&E wastes were recorded as arising in Yorkshire and Humberside – whereas they may have arisen in Bradford specifically – and other wastes were managed at exempt facilities and therefore went unrecorded.

Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005

- 4.2.14 Previous estimates have been based on a Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 undertaken for the DCLG.

Table 19 Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005

English Region Yorkshire & the Humber	Tonnes
Adjusted estimate of population of recycling crushers	106
Estimated production of recycled graded aggregate (tonnes)	3,071,057
Estimated production of recycled ungraded aggregate (tonnes)	2,184,463
Estimated production of recycled soil (excl. topsoil) (tonnes)	549,951
	5,805,577
Estimated tonnage of unprocessed CDEW entering licensed landfills, and its use / fate	
Clean hard C&D waste	236,183
Contaminated hard C&D waste	10,050
Clean excavation waste	2,589,067
Contaminated excavation waste	214,433
Clean 'mixed' CDEW	377,561
Contaminated 'mixed' CDEW	206,493
Other	272,696
Total	3,906,482
Exempt sites (tonnes)	784,947
Total estimated arisings of CDEW in 2005 (tonnes)	10,496,900

[Source: DCLG survey, 2005]

- 4.2.15 The outputs from this survey were based on firstly the estimated number of recycling crushers identified by a regional survey together with the estimated throughput of these recycling crushers. The survey only generated a 21% response rate and therefore it is not clear whether the results are representative, however there is no alternative source for this type of estimate.
- 4.2.16 Mobile crushers are located at development sites to process material primarily for re-use on the same location. As a result an unknown proportion of these wastes – but most likely to be the majority of them - do not leave the source site and are not be recorded and included in EA Waste Data Interrogator records. In statistical terms rate the low survey response rate referred to above makes grossing up problematic. It is also possible that responses were obtained from the most active plant operators further distorting the estimate.
- 4.2.17 The 2005 survey also takes no account of CD&E management through transfer facilities or treatment plant other than recycling crushers.
- 4.2.18 The other data source is a national survey of landfill operators which generated a 39% response rate. The data were averaged and grossed up to reflect tonnage disposed of at the total number of landfills in each category in each region. The Yorkshire and Humberside (population 5.3 million) recorded 188 landfills compared with the NW region's total of 98 (population 6.9 million). This methodology tends to inflate CD&E landfill in Yorkshire and Humberside such that the estimated figure landfilled in this survey was 3,906,482 tonnes whereas the NW region was estimated at only 2,666,260. The EA WDI shows a total of CD&E waste disposed of to landfill in 2011 as 2,065,584

tonnes about half that suggested by the 2005 survey. This analysis indicates that the 2005 survey should not be relied on to provide an adequately robust indication of CD&E arisings.

Data from 2011 and 2012 EA Waste Data Interrogator showing the management of CD&E Waste in Yorkshire and Humberside

- 4.2.19 Management of CD&E waste in the former Yorkshire and Humberside region can be analysed on the basis that this will essentially capture most CD&E waste deposits in the region and this may provide a more representative evaluation of arisings. The total quantity within the former region can then be apportioned between individual waste planning authorities based on population and GVA. This approach has been adopted using data from the EA Waste Data Interrogator for 2011 and 2012.
- 4.2.20 The 2011 data show total deposits at permitted sites in Yorkshire & Humberside of 4,518,777 tonnes of which 1,746,003 tonnes (ca. 39%) were C&D wastes and the remaining 2,772,774 tonnes were excavation wastes. In contrast the 2012 data showed total deposit of 4,630,795 (+2.4%) of which 1,980,916 tonnes (ca. 43%) were C&D wastes and 2,649,879 tonnes were excavation waste.
- 4.2.21 However these estimates will be inflated by double-counting as the Data Interrogator will include waste received at transfer stations and treatment facilities, and some of this material will be recorded again when it is moved to and deposited at other facilities including landfills.
- 4.2.22 Whilst 2,690,132 tonnes were recorded as deposited at transfer and treatment facilities in 2012, data on waste removed from waste facilities indicate that only 1,434,253 tonnes of waste were removed from permitted sites in 2012. The discrepancy might be explained if it is assumed the difference (ca. 1.2 million tonnes) reflects wastes in temporary storage at transfer stations and other facilities, though this assumes all movement of these wastes is reported accurately. However the corresponding data for 2011 also show a short the quantity deposited was about 1 million tonnes more than that recorded as being removed. The Environment Agency has consistently advised that the Data Interrogators provide a better estimate of waste received than waste arising and the discrepancies above suggest that the approach adopted above to estimating arisings will under-estimate the quantity of CD&E wastes being created within Bradford.
- 4.2.23 Records in the Data Interrogator show the type of site that received these wastes but, again, the movement of some wastes in two stages (source to transfer station and then to a deposit or treatment location) will result in an unknown quantity of these wastes being double-counted. When double counting of waste received at permitted sites is taken into account the total arisings managed through permitted sites in Yorkshire & Humberside is indicated to be in the order of **3.5 million tonnes**.

4.2.24 If 3.5 million tonnes is taken as the total managed then landfill would account for in the order of 2 million tonnes (of which C&D 175,035 tonnes landfilled) with the remainder reused or recycled.

Proportion of Regional Waste arising from Bradford

4.2.25 Based on population ONS data gives a Yorkshire and Humberside total of 5.3 million and Bradford 513,000 the proportion of waste arisings would be approximately 10%.

4.2.26 Based on the most recent ONS data for GVA the Yorkshire and Humberside region GVA 2011 was £86.8 billion whereas Bradford's total GVA for 2011 was almost £8.3 billion giving again a proportion in the order of 10%.

4.2.27 This would give C&D arisings for Bradford in the order of 150,000 tonnes and excavation arisings of 200,000.

4.2 Conclusion

4.3.1 The only data available for CD&E wastes is for waste deposited at and removed from permitted waste management sites which are entirely transfer facilities. This data shows that over 90% of CD&E waste is destined for "Recovery" (the classification recovery in the EA Waste Data Interrogator includes recycling and for CD&E waste can be interpreted as a recovery operation).

4.3.2 In conclusion the absence of significant treatment outlets within Bradford is likely to significantly under estimate CD&E arisings in Bradford because an unknown proportion of material is being re-used where it arises and therefore goes unreported. Using a proportional estimate based on the CD&E waste managed in the whole of Yorkshire & Humber side would give C&D arisings for Bradford in the order of 150,000 tonnes and excavation arisings of 200,000.

5. Agricultural Waste

5.0 Data Sources

5.1.1 Estimates have been extrapolated from the regional data for Yorkshire and the former Humberside based on the area of land in agricultural use and the number of farm holdings. The analysis draws on the Defra annual agricultural census by region and farm type (published in 2013 for 2010), the Environment Agency Agricultural Waste and By-Products Survey 2003, and a further Environment Agency survey ('Towards Sustainable Agricultural Waste Management') published in 2011.

5.1.2 The two principal sources on agricultural waste management methods are now over a decade old, however this approach assumes that the on-farm activities that generate wastes will not have changed significantly over the intervening period. Furthermore,

the estimates given below have been derived from regional information and scaling them down to provide a representative figure for the Bradford area alone will introduce some inaccuracy.

- 5.1.3 The Environment Agency's 2001 survey included a subjective assessment of the likely accuracy of the estimates it generated, categorising them as 'High', 'Medium' or 'Low' accuracy. Agricultural waste arisings figures shown at regional level were estimated at predominantly medium accuracy level.

5.1 Agricultural Waste Deposits & Arisings

- 5.2.1 There are 12,143 farm holdings in Yorkshire and the Humber, compared to 417 holdings in Bradford⁶. Table 20 shows extrapolated waste arisings for the whole of Yorkshire and Humber based upon farm holdings number using the Environment Agency surveys referred to above.

Table 20 Estimates of Agricultural Waste Arisings in Yorkshire and the Humber, 2003

Waste type	Quantity (tonnes) Yorkshire and the Humber
Plastic Packaging	2,495
Cardboard and paper packaging	770
Metal, glass, wood and rubber packaging	195
Other non-packaging plastics	6381
Agrochemicals	7098
Animal Health Products	7276
Machinery Waste (oils, batteries, tyres, redundant machinery)	7776
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	2160
Organic by-products waste (slurry, waste milk, straw)	8,186,371
Animal By-products	24,260

[Source: Environment Agency survey, 2003]

- 5.2.2 Table 21 shows the extrapolations of waste arisings for Bradford within the North Yorkshire sub-region (based upon the assumption that each farm holding produces the same proportion and quantity of each waste type). The potential waste management treatment options for each waste type has also been estimated based upon current practice.

⁶ Source: (DEFRA Local Authority breakdown for key crop areas and livestock numbers on agricultural holdings 2010.

Table 21 Extrapolations of waste arisings (rounded) for Bradford based upon the number of farm holdings

Waste Type	Tonnes (rounded)	Potential waste management Treatment route
Plastic Packaging	86	Recycling/Landfill
Cardboard and paper packaging	26	Composting on site/Recycling/Landfill
Metal, glass, wood and rubber packaging	7	Recycling/Landfill
Other non-packaging plastics	219	Recycling/Landfill
Agrochemicals	244	Treatment/Incineration
Animal Health Products	250	Incineration
Waste machinery, oils, batteries, tyres	267	Recycling/treatment
Asbestos & cement-bonded roof sheeting)	74	Hazardous Landfill
Organic by-products waste (slurry, waste milk, straw)	281,126	Composting/Land Recovery/Treatment on site
Animal By-products	833	Specialised Treatment
Total arisings	283,132	

[Sources: Defra survey of farmholdings (Yorks & Humber region), 2010; Environment Agency report on Agricultural Wastes, 2001 and surveys of Agricultural Waste and By-Products,2003]

5.2.3 Table 22 reconfigures the data above to demonstrate the quantities of all wastes managed by the common treatment and disposal methods. Note that where there are alternative methods the waste type is assumed to be managed at the highest available level in the Waste Hierarchy, although there is no way of confirming that this is what occurs in practice.

5.2.4 The reconfiguration also distinguishes more clearly between material that is managed on the farm, and that which leaves the farm and therefore requires third party-provided waste facilities.

Table 22 Potential Treatment routes for Extrapolated Waste Arisings in Bradford

Waste Management Route (optimum route within the waste hierarchy has been chosen)	Agricultural Wastes (rounded tonnes)
Management within farm holding	
Managed on site by composting, land recovery or treatment	281,126
Management off site (type of facility receiving wastes)	
Recycling	605
Treatment plant/Incineration	495
Animal By-Products incineration	833
Landfill	0
Hazardous Landfill	74
Total management off site	2,007 (<1%)
Total arisings	283,132

[Sources: Defra survey of farmholdings (Yorks & Humber region), 2010; Environment Agency report on Agricultural Wastes, 2001 and surveys of Agricultural Waste and By-Products,2003]

5.2.5 For the purpose of planning for future capacity requirements the significant areas are to provide for off farm site waste management. The quantities involved are very small at just over 2,000 tonnes and this is fragmented across facilities of various types. It is

therefore unlikely to be economical to provide local facilities to manage such small quantities of waste although some non-chemical and non-pharmaceutical recyclable material would be suitable for handling at sites in Bradford which managed LACW and C&I wastes.

5.2 *Conclusion*

- 5.3.1 New legislation came into force in April 2010 amending the existing system of waste exemptions including agricultural waste exemptions currently undertaken by farmers. All farmers have to re-register their agricultural exemptions covering such practices as land spreading and depositing dredgings cleared from farm ditches along banks by 1st October 2013. In addition to re-registration some of the exemptions are also changing. There are approximately 30 exemptions covering agricultural activities, however nearly all exemptions covered at present will still be covered in the new system. A number of new exemptions may also be applicable to managing agricultural wastes.
- 5.3.2 In addition to any effect of the new exemption regulations, it is likely that in the future more waste may be diverted from landfill to recycling due to the increasing awareness of the potential to recycle. However the quantity of material will be so small that it will have limited significance in the context of the total need to manage waste arisings in the Plan area. It is recommended that the situation be reviewed post 2013 once all the registrations have come into force.
- 5.3.3 It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting. The Waste Plan should include a capacity allowance that takes account of the need for specialised treatment for certain types of agricultural waste such as animal by-products incineration and hazardous landfill. It should also be borne in mind that the analysis assumed management occurs at the highest practicable level in the Waste Hierarchy though it may not be practicable or cost effective to divert them from landfill.

6. **Low Level Non-Nuclear Radioactive Wastes**

6.0 *Data Sources*

- 6.1.1 The Environment Agency collects data from sites regulated under the Radioactive Substances Act. This data is reported annually and has been provided in response to a specific data request.

6.1 *Low Level Non-Nuclear Radioactive Waste Arisings*

- 6.2.1 The EA were contacted to provide a list of sites permitted to handle LLW in Bradford. The results of this work identified just two facilities: Bradford Royal Infirmary and Bradford University.

- 6.2.2 The information received indicates that levels of LLW produced in Bradford are minimal. This waste includes general items such as gloves, overshoes and tissues which are disposed of as general laboratory waste, as well as glassware and sharps which are contained in sharpsafes and assigned as radioactive and disposed of as radioactive.
- 6.2.3 There is a further category – Very Low Level Non-Nuclear Radioactive Wastes – however management of these wastes is covered by a wide-ranging exemption as the extremely low level of radioactive content means they can be disposed with non-hazardous wastes.

7. Waste Water/Sewage Sludge

7.0 Sewerage Undertaker

- 7.1.1 Yorkshire Waste operates the Waste Water Treatment Works (WWTW) serving the Bradford area, and they were contacted to gain a broad overview of their future capacity requirements as far into the future as possible. The response received explained that they cannot give any indication of what future requirements are likely to be with regard to waste water, especially not for the Plan period.
- 7.1.2 Waste water companies are only regulated on a 5 year cycle through Asset Management Plans (AMPs). The current AMP (AMP 5) will not finish until the end of March 2015. The programme for AMP6 will be driven by water quality requirements (yet to be finalised by the Environment Agency) which aim to achieve compliance with the Water Framework Directive, and respond to forecast capacity demand from growth in households and business premises.
- 7.1.3 As a general principle, when greater capacity is required, WWTW operators would try and place new plant on existing treatment works, or failing that purchase land from an adjacent land owner. Therefore it is unlikely that new sites will be required within the Plan area to handle waste water/sewage sludge. However, in some circumstances it may be beneficial to do so, for example, if there are site sensitive receptors near to an existing works making expansion unfeasible. The precise location would be dependent on engineering and environmental feasibility studies.
- 7.1.4 At present it is not envisaged that sites will be identified within the Waste Management DPD for future use as WWTW as there is no current known requirement for additional facilities. Yorkshire Water should be kept informed of progress with preparation of the Plan and invited to comment at consultation stages.

7.2 Waste currently managed on site

- 7.2.1 The amount of Trade Effluent discharged to Esholt Sewage Treatment Works (STW) is currently at a rate of 989,105 m³ per annum. The site serves a domestic population of

353,182 with a typical rate of 140 litres per day per person. The consented dry weather (normal) flow is 130 tcmd (thousand cubic metres per day).

8. Cross Border Waste Movements

- 8.0 An analysis, using the 2012 EA Waste Data Interrogator has taken place to review cross boundary movements to and from Bradford. Background data has been gathered to review the total deposits of all C&I, LACW, CD&E and Hazardous waste in Bradford and assess the impact of imports and exports.

8.1 Imports to the Sub-Region

- 8.1.1 The EA Waste Data Interrogator includes data on waste origins and the destinations of waste removed from permitted sites.
- 8.1.2 This enables some estimation of cross boundary movements but must be treated with caution as the data recording by site operators is incomplete. Data on waste origin can be entered at District, Waste Planning Area and Regional Levels. Some operators only enter at regional level i.e. Yorkshire and Humberside. Previous needs assessment work in this region has indicated about 50% of deposits recorded only at regional level. Of a total of 829,510 tonnes of waste recorded as deposited at sites in Bradford in 2012 370,606 tonnes were only recorded at Yorkshire and Humberside level. Thus 45% of waste deposited in Bradford cannot be traced at a Waste Planning Authority or District level from the EA Waste Data Interrogator.
- 8.1.3 Waste deposits not coded to a WPA deposited in Bradford include 153,598 tonnes recorded as “household industrial and commercial” (HIC). Examination of the sites submitting these records includes Associated Waste Management Ltd, which is known to have accepted LACW from Bradford totalling 141,527 tonnes in year 2011/12. The C&I estimate also show that 59,081 tonnes of metal waste was estimated as arising in Bradford. These factors would reduce the total of HIC waste only codes at Yorkshire & Humberside level to the order of 170,000 tonnes. However, it is likely that a significant proportion of this total actually arises within Bradford. Leeds, Calderdale and Kirklees all border the urban area of Bradford and the proportion imported from these authorities is estimated to be 15%-20% of all imported material.
- 8.1.4 For CD&E waste coded at Yorkshire & Humberside level (88,508 tonnes) it is likely that most of this waste is of local origin in Bradford with perhaps no more than 15% to 20% from bordering authorities of Leeds, Calderdale and Kirklees.
- 8.1.5 Hazardous deposits of 1,278 tonnes coded at Yorkshire & Humberside level are mainly healthcare waste out of a total of 2,408 tonnes deposited. None were recorded as originating in Bradford (see Hazardous waste section 3 of this report).

8.1.6 Table 23 shows the origin of waste deposited at permitted sites in Bradford in 2012. Data for waste arising from any one WPA of less than 0.5 tonnes is not shown in the table as these deposits are minimal, representing only 61 tonnes of waste in 2012.

Table 23 Waste Imports to Bradford in 2012 (rounded to the nearest tonne)

WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
Barnsley	3	8	0	11
Berkshire	1	1	0	2
Birmingham City	150	322	0	472
Blackburn with Darwen UA	16	11	0	28
Blackpool UA	2	1	0	3
Bolton	21	288	0	309
Buckinghamshire	0	88	0	88
Bury	2	1	0	3
Calderdale	295	2,083	1,620	3,999
Cambridgeshire	2	21	0	23
Cheshire West and Chester	4	2	0	6
Conwy UA	1	19	0	20
County Durham UA	0	5	0	5
Cumbria	2	30	0	32
Darlington UA	1	0	0	1
Derby UA	0	1	0	1
Derbyshire	7	69	0	76
Doncaster	1	81	0	82
Dorset	3	1	0	4
East Riding of Yorkshire UA	9	0	0	9
East Sussex	1	1	0	2
Essex	13	280	0	293
Flintshire UA	0	21	0	21
Gloucestershire	1	2	0	3
Gwynedd UA	2	0	0	2
Hampshire	2	2	0	4
Herefordshire UA	0	1	0	1
Hertfordshire	4	1	0	5
Kent	2	2	0	4
Kingston Upon Hull UA	0	15	0	15
Kirklees	43	2,180	0	2,223
Lancashire	127	540	0	667
Leeds	1,327	12,447	4,220	17,994
Leicester UA	3	1	0	4
Leicestershire	2	2	0	4
Lincolnshire	3	133	0	136
Liverpool	14	2	0	16
Manchester	57	169	0	226

WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
Middlesbrough UA	0	5	0	5
Newcastle Upon Tyne	19	0	0	19
Norfolk	0	1	0	1
North Yorkshire	581	795	0	1,376
Northamptonshire	0	12	0	12
Nottingham UA	57	2,489	0	2,546
Nottinghamshire	14	0	0	14
Oldham	1	0	0	1
Oxfordshire	2	2	0	4
Peterborough UA	0	1	0	1
Plymouth UA	27	0	0	27
Poole UA	2	0	0	2
Portsmouth UA	1	0	0	1
Reading UA	0	1	0	1
Rotherham	2	3	0	5
City of Glasgow	1	11	0	12
Falkirk	1	1	0	2
Dumfries & Galloway	0	1	0	1
Scottish WPA	0	13	0	13
Sheffield	519	1,508	0	2,027
Shropshire	0	24	0	24
Somerset	127	103	0	230
St Helens	1	0	0	1
Staffordshire	1	1	0	2
Stockport	0	49	0	49
Stockton-on-Tees	0	2	0	2
Stoke-on-Trent UA	0	2	0	2
Suffolk	4	28	0	32
Sunderland	0	2	0	2
Surrey	18	38	0	56
Tameside	1	-	0	1
Telford & Wrekin UA	0	2	0	2
Vale of Glamorgan UA	1	0	0	1
Wakefield	56	359	0	415
Warrington UA	9	240	0	249
Warwickshire	0	2	0	2
West Berkshire UA	2	20	0	22
Wigan	0	1	0	1
Wiltshire	1	3	0	4
Windsor & Maidenhead UA	5	0	0	5
Wokingham UA	1	1	0	2
Wolverhampton	2	0	0	2
Worcestershire	0	1	0	1

WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
WPA not codeable (Bedfordshire)	8	1	0	9
WPA not codeable (Cheshire)	234	32	0	266
WPA not codeable (London)	22	20	0	42
WPA not codeable (Merseyside)	1	1	0	2
WPA not codeable (North East)	80	6,097	189	6,366
WPA not codeable (North West)	99	17	0	116
WPA Not Codeable (Not Codeable)	2,203	121,645	3,850	127,698
WPA not codeable (South East)	3	1	0	4
WPA not codeable (South West)	1	0	0	1
WPA not codeable (South Yorkshire)	8	4	0	12
WPA not codeable (Wales)	35	10	0	45
WPA not codeable (Yorks & Humber)	1,278	280,819	88,509	370,605
York UA	19	43	-	62
Bradford City	6,720	221,324	62,208	290,252

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

8.2 Exports from Bradford

8.2.1 Table 24 shows confirmed exports from Bradford to sites located in England and Wales. These totals do not include wastes for which the origin was recorded as Yorkshire and Humberside. Some of these materials may have originated in Bradford and been exported to other authorities but the available records do not allow the quantity to be identified. Table 25 may therefore under-estimate the quantity of waste exported to an unknown extent.

Table 24 Exported Waste from Bradford (2012) (tonnes)

	Tonnes Exported	Hazardous Tonnes	Household/Industrial & Commercial Tonnes	Inert C&D Tonnes
Exports from Bradford	173,686	10,901	88,672	69,782

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

8.2.2 Table 25 lists the WPAs receiving over 90% of waste recorded as originating in Bradford.

Table 25 WPAs Receiving >500 tonnes of Waste Originating in Bradford in 2012 (tonnes).

WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Totals
Leeds WPA	2,824	25,929	16,878	45,631
Wakefield WPA	27	37,695	1,806	39,528
Calderdale WPA	62	2,291	29,589	31,941

North Yorkshire WPA	106	4,563	14,048	18,717
Kirklees WPA	4,836	554	5,161	10,551
Sheffield WPA	388	6,282	330	7,000
Nottingham City WPA	4	4,266	-	4,270
Trafford WPA	-	2,471	-	2,471
North East Lincolnshire WPA	-	1,754	-	1,754
Doncaster WPA	-	90	1,418	1,508
Rotherham WPA	640	76	544	1,260
Stockton-on-Tees WPA	261	459	-	720
Knowsley WPA	554	10	-	564

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

8.2.3 Appendix C provides further detail of authorities and sites that received wastes originating in Bradford.

8.2.4 Records of the destination of waste leaving from permitted facilities (mostly transfer and recycling) from Bradford shows a total of 766,191 tonnes in 2012 which was removed to unspecified destinations in Yorkshire and Humberside (303,251 tonnes) or “estimated Yorkshire and Humberside” (129,895 tonnes). As a result the destination WPA of 56% of the waste exported from Bradford cannot be identified.

8.2.5 Table 26 shows the destination of waste removed from permitted sites in Bradford by WPA, sub region or region (if not codeable to a specific WPA) in 2012.

Table 26 Destination of Waste Removed from Permitted Sites in Bradford by WPA (Tonnes)

WPA	Hazardous	Hhold/Ind/Com	Inert/C+D
Barnsley	0	2,422	0
Birmingham City	53	477	0
Blackburn with Darwen UA	0	6	0
Bolton	4	32	0
Bristol UA	2	0	0
Calderdale	110	1,919	365
County Durham UA	32	0	0
Derby UA	0	840	0
Derbyshire	0	2,438	0
Doncaster	2	101	0
East Riding of Yorkshire UA	0	2	0
Essex	0	5	0
Kingston Upon Hull UA	1	5,766	0
Kirklees	164	1,104	0
Lancashire	7	16	0
Leeds	153	76,651	0
Leicester UA	0	2	0
Lincolnshire	0	1,818	0
Liverpool	22	12,318	0
Manchester	112	6,533	496
Norfolk	20	0	0
North Yorkshire	796	1,698	0
Nottingham UA	0	2,168	0
Rotherham	4	13,918	0
Sheffield	33	5,002	923
Stockton-on-Tees	25	3,595	0
Stoke-on-Trent UA	2	0	0
Suffolk	5	3	0
Sunderland	0	16	0
Wakefield	695	2,118	0
Warrington UA	42	0	0
WPA not codeable (Bedfordshire)	0	34	0
WPA not codeable (Cheshire)	38	9,201	0
WPA not codeable (Merseyside)	2		0
WPA not codeable (North East)	54	3,352	0
WPA not codeable (Not Codeable)	447	99,035	13,578
WPA not codeable (South Yorkshire)	0	36	0
WPA not codeable (West Midlands)	16	353	0
WPA not codeable (Yorks & Humber)	290	305,419	72,273
York UA	887	15,726	158

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

9. Subsequent Stages in Modelling Capacity Requirements

- 9.1 As stated previously, the purpose of the work summarised in this report is to establish the baseline estimates of how wastes are currently being managed and how much waste is being created locally. Table 27 gives total recorded waste deposits at sites in Bradford.

Table 27 Total recorded waste deposits at sites in Bradford (2012)

Facility Type	Tonnes Received	Hazardous	HIC	Inert
Biological Treatment	54,132	0	54,132	0
CA Site	35,623	1,185	30,104	4,335
Car Breaker	1,776	1,518	258	0
Hazardous Waste Transfer	1,019	902	117	0
Hazardous Waste Transfer / Treatment	80,582	124	80,291	167
Inert Transfer Station	21,888	0	0	21,888
Metal Recycling	177,704	4,953	168,788	3,963
Non-Hazardous Waste Transfer	335,630	0	237,918	97,712
Non-Hazardous Waste Transfer / Treatment	86,044	0	66,343	19,701
Physical Treatment	3,827	2,418	1,409	0
Reclamation	12,830	0	0	12,830
WEEE treatment facility	18,395	3,243	15,151	0
Vehicle De-Pollution facility	60	60	0	0
Totals	829,510	14,403	654,511	160,596

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

- 9.2 Table 27 may double-count some waste for two reasons. Parts of the HIC stream are taken to a treatment facility so that recyclable material can be separated with the residual material turned into a secondary product (RDF). The recyclable material is no longer considered to be waste and therefore any further management lies outside the scope of the Waste Plan, but the secondary product will remain waste which requires further management. Therefore it is legitimate to count it twice to that the capacity needed for initial and secondary management can be identified.
- 9.3 Some waste is deposited initially (and possibly for a short period only) at transfer stations before it is bulked into larger loads and sent to a treatment or disposal facility. This material may be included in Table 28 but it has been excluded from the analyses detailed earlier in this report and from the arisings estimates that are used in the subsequent forecasting and gap analysis
- 9.4 Table 28 summarises the baseline arisings estimates that are passed to the forecasting work. Quantities for all streams are for wastes arising in Bradford only except for LACW which includes residual material from Calderdale (ie. this excludes recyclables collected at the kerbside) which will be jointly managed under the proposed residual waste infrastructure procurement.

Table 28 Summary of Baseline Estimates of Waste Arisings by Stream, 2012 (tonnes)

Principal Waste Arisings Year 2012	Tonnes
Commercial Waste	254,314
Industrial Waste	219,773
CD&E	350,000
LACW (including residual waste from Calderdale Borough Council).	272,668
Hazardous	19,155
Total arisings – principal streams	1,115,908

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2012]

9.5 Completing the Needs Assessment will involve further stages which are summarised below.

Stage 1b: Establishing Modification Assumptions for Waste Growth and Management

9.6 The purpose of this stage is to determine the growth and waste management practice modifiers to be applied within the Model to generate estimates of future arisings for the range of waste streams within Bradford.

9.7 LACW growth modifiers have been requested. Yorkshire and Humber Regional econometric model (produced by Leeds city Region Local Enterprise Partnership) data has been obtained and will be used in subsequent forecasting. The proposed modifiers to be used will be discussed and agreed with the Council.

Stage 2: Estimating the Capacity of Waste Infrastructure in Bradford

9.8 Work has been undertaken in compiling the capacity sites database with information updates supplied by Bradford. The work has resulted in a production of a definitive list, which has been agreed by the Council for use in the model.

Stage 3: Generating Forecasts of Future Waste Arisings and Gap Analysis

9.9 Following an interim meeting with the Council, work will commence on the bespoke model.

9.10 Detail of these stages and the resulting estimates of future waste management capacity requirements will be documented in the final report on the Needs Assessment.

Appendix 1: Data Source References

Commercial and Industrial Waste

Defra, *Commercial and Industrial Waste Survey 2009*, prepared by Jacobs; final version published May 2011.

Environment Agency *North West of England Commercial and Industrial Waste Survey 2009*, prepared by Urban Mines; final version published March 2012.

Data from these surveys have been used in conjunction with forecasts of employment growth to project estimates for 2009 forward to 2012, which are used in the model.

Environment Agency Waste Data Interrogator 2012 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Due to inconsistencies in recording the Data Interrogator has not been used to estimate arisings of this stream. It has been used to identify how these wastes were managed and the movement of wastes between Bradford and other authorities.

Local Authority Collected Waste

Waste Data Flow - www.wastedataflow.org

Data are entered by waste collection and disposal authorities. They are available annually (latest data for 2012 when this report was finalised) or quarterly.

Environment Agency Waste Data Interrogator 2012 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Due to inconsistencies in recording the Data Interrogator has not been used to estimate arisings of this stream. It has been used to identify how these wastes were managed and the movement of wastes between Bradford and other authorities.

Information on waste growth forecasts was being provided by the Council at the time this report was finalised.

Hazardous Waste

Environment Agency Hazardous Data Waste Interrogator 2012 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Construction, Demolition and Excavation Waste

Environment Agency Waste Data Interrogator 2012 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Agricultural Waste

Defra Annual Agricultural Census, 2013 - <https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june>

Environment Agency, *Agricultural Waste Survey 2003: A Study of the Management of Non-Agricultural Waste on Farms*.

http://agwasteplastics.org.uk/Images/Reports/agricultural_waste_survey_2003.pdf

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