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Sunderland City Council

Waste Arisings and Capacity Requirements

Waste Arisings and Capacity Requirements Report

urbanvision

Updated January 2018

Executive Summary

This report presents a detailed assessment of need for future waste management capacity over the period up to 31st December 2035 for Sunderland City Council. The report addresses the following waste streams:

- Local Authority Collected Waste (LACW)
- Commercial and Industrial (C&I) Waste;
- Construction, Demolition and Excavation (CD&E) Waste;
- Hazardous Waste;
- Agricultural Waste;
- Low Level (Non-Nuclear) Radioactive (LLR) Waste; and
- Water Waste/Sewage Sludge.

Figures are based on the best available data sources in line with current accepted methodologies. These include the Waste Data Interrogator (WDI) and Hazardous Waste Data Interrogator (HWDI), which are maintained by the Environment Agency and updated annually, the latest available data being for 2015. The quality of data available for each waste stream varies; for LACW, accurate data is available from the local authorities and Defra WasteDataFlow. However, data for other waste streams is not recorded as accurately. This study uses a methodology developed for Defra to calculate C&I waste arisings, and takes information for CD&E waste from the EA's WDI.

This Waste Needs Assessment looks at two scenarios of different recycling practice, and how this would be affected by economic growth factors, to predict future waste arisings. Figures for the LACW stream were provided by the Waste Disposal Authority and are in line with their projections; therefore no further modeling has taken place for this waste stream. The scenarios considered include a 'baseline', i.e. the arisings expected if nothing changed from the current situation, and 'maximum recycling/recovery with growth', i.e. if national and local recycling levels identified levels of growth in line with local modeling were achieved. In this way, future waste arisings and any corresponding gap in future waste management capacity can be considered in terms of the minimum to maximum expected requirement.

Table 1: Projected Waste Arisings by Waste Stream (tonnes per annum) – based on WDA LACW projections and Experian growth projections

Waste Type	Quantity 2015	Quantity 2020	Quantity 2025	Quantity 2030	Quantity 2035
LACW	134,708	135,369	140,874	144,117	148,169
C&I	269,159	271,860	276,378	282,948	287,978
CD&E	615,432	614,962	604,667	599,754	599,754
Hazardous	19,010	19,129	19,384	19,691	19,997

Agricultural	24,658	24,658	24,658	24,658	24,658
LLR	0.24	0.24	0.24	0.24	0.24
TOTAL (excluding LLR waste)	**1,062,967**	**1,065,978**	**1,065,961**	**1,071,168**	**1,080,556**

In order to determine whether additional waste management facilities will be required in the future to manage the predicted waste arisings, it is necessary to establish how much waste can be managed by existing waste management facilities. This Waste Needs Assessment looks at information relating to waste permits from the Environment Agency, as well as planning permissions and the WDI, to establish:

- how many waste management facilities there are in Sunderland;
- how much waste in tonnes each facility manages every year; and
- any known end dates for facilities.

A summary of operational waste management capacity for different waste management methods is shown in Table 2. This shows actual operational capacity for 2015 and 2023 following closure of Non-hazardous landfill.

Table 2: Available licensed capacity (tonnes) 2015 &2023

Waste Type	Facility Type	2015	2023
LACW only	Household Waste Recycling Site	26,644	26,644
LACW, C&I	Recycling (MRFS)	17,223	17,223
LACW, C&I, CD&E, Haz	Recycling (MRFS)	100,000	100,000
LACW, C&I, CD&E	Recycling (MRFS)	81,971	81,971
LACW, C&I, CDE	Transfer stations (non-hazardous)	295,967	374,454
LACW, C&I, CD&E, Haz	Transfer stations	4,061	4,061
CDE only	Transfer stations	3,101	3,101
Haz	Transfer stations	453	453
LACW, C&I, CDE	Treatment facility	7,353	7,353
LACW, C&I, CD&E, Haz	Treatment facility	113,482	113,482
CDE only	Treatment facility	477,767	225,196
C&I, Haz	Treatment facility	81,356	81,356
Haz	Recycling facility/treatment	96,941	96,941
HIC, CDE	Non-Haz Landfill	74,584	0

CDE only	Inert LF	469,762	0
CDE only	Reclamation	47,324	47,324
C&I, CD&E, Haz	Metal recycling	74,129	74,129
Haz	Metal recycling	86	86
C&I, Haz	Car Breaker	1,708	1,708
C&I, Haz	Vehicle depolution facility	87	87
Haz	Haz Landfill	0	0
LACW, C&I	Energy recovery	0	0
LACW transfer (recovery)	Transfer (LACW only for PFI)	82,000	82,000
	Total	**2,055,999**	**1,337,570**

Source EA WDI 2007-2015[1]

A key element of this Waste Needs Assessment is to predict whether there is likely to be any gap in future waste management provision and consequently any need for additional waste management capacity during the Plan period. This can be understood by comparing the predicted waste arisings with operational waste management capacity. Where waste arisings are greater than waste management capacity, this is identified as a 'capacity gap'. Where there is sufficient waste management capacity to deal with predicted waste arisings, this is identified as a 'capacity surplus'.

Table 3: Waste Management Capacity Requirements by waste stream and management method – Scenario 1 Baseline / Growth

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2035
Landfill (C+I and LACW)	3,568	3,361	-72,582	-73,759	-75,212
Landfill (Hazardous)	-6,650	-6,051	-6,174	-6,186	-6,208
Landfill (C,D&E)	24,154	-363,498	-431,807	-427,553	-427,553
Energy from waste (C&I)	0	0	0	0	0
Energy from waste (Hazardous)	-13,269	-13,375	-13,590	-13,745	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-456	-463	-468	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	129,823	125,836	122,469	118,989
Recycling Metals	25,106	24,468	23,368	22,295	21,043

[1] Some additional site validation was undertaken to confirm tonnages of MRF sites and sites providing movement of waste to Tees Valley under the waste PFI contract.

Recycling/treatment (Hazardous)	94,695	94,677	94,641	94,615	94,579
Composting	-81	-82	-83	-83	-84
Treatment plant LACW, C&I, C&D)	126,885	125,808	123,995	122,030	119,824
Treatment Plant C,D &E	375,557	373,687	119,701	119,928	119,928
Land recovery	42,807	42,857	43,008	43,058	43,058
Transfer (Recovery LACW)	17,585	11,220	10,161	9,340	8,466
Total	**811,505**	**421,705**	**15,255**	**11,185**	**1,642**

Table 4: Waste Management Capacity Requirements by waste stream and management method – Scenario 2 Recycling) / Growth

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2035
Landfill (C+I and LACW)	3,568	17,470	-48,028	-31,094	-31,761
Landfill (Hazardous)	-9,825	-6,048	-6,174	-6,941	-6,963
Landfill (C,D&E)	24,154	-3347,154	-415,055	-427,553	-427,553
Energy from waste (C&I)	0	-21,639	-30,656	-51,270	-52,175
Energy from waste (Hazardous)	-13,269	-13,375	-13,519	-13,745	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-456	-463	-468	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	86,331	72,482	64,040	60,230
Recycling Metals	25,106	24,089	22,981	21,889	20,635
Recycling/treatment (Hazardous)	94,695	94,677	94,641	94,615	94,579
Composting	-81	-74	-75	-75	-76
Treatment plant LACW, C&I, C&D)	126,885	121,281	114,569	112,554	110,252
Treatment Plant C,D &E	375,557	368,696	114,585	114,812	114,812
Land recovery	42,807	42,857	43,008	43,058	43,058
Transfer (Recovery LACW)	17,585	11,220	10,161	9,340	8,466
Total	**814,681**	**377,873**	**-41,614**	**-53,321**	**-63,422**

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Contents

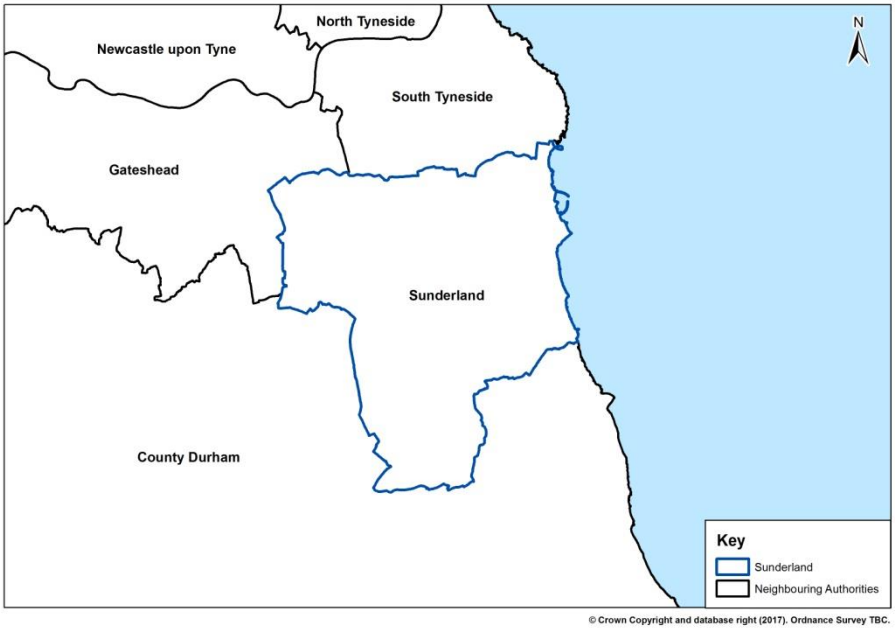
1. Introduction and Context

1.1 Sunderland City Council has commissioned Urban Vision to prepare an assessment of waste arisings and capacity requirements for all controlled wastes arising within Sunderland.

1.2 Sunderland City is located on the north-east coast of England at the mouth of the River Wear, covering an area of approximately 137 km^2. The administrative area of the City is bounded to the south and west by Durham County and to the north by South Tyneside, with the North Sea to the east. There is also a stretch of the north western boundary of the City which adjoins Gateshead.

1.3 The City can be broken down into three distinct areas; the urban area of Sunderland City itself; Washington, which is a new town built from the 1960s onwards; and a number of smaller former coal mining settlements which are located in the south west of the administrative area.

Figure 1: Map of Sunderland



1.4 A previous study prepared by Urban Mines in 2012 (based on data from 2011) was undertaken at the regional level covering all waste Planning Authorities in the North East, and looked at waste arsings for LACW and C&I only. This study did not make an estimation of the arisings of CD&E waste. However, the data used in this report is now 4 years out of date and the study also used data for C&I waste which was taken from a Defra study into C&I arisings which has since been withdrawn.

1.5 As Defra are now advocating a different approach to assessing C&I waste which was developed by Jacobs in 2014, it is considered that the findings of the previous assessment are incomplete, or use

data for which more up to date information is now available and, as such, a revised assessment is required.

1.6 This assessment focuses on establishing arisings of the principal waste streams as set out below:

- Local Authority Collected Waste (LACW);
- Commercial and Industrial (C&I) Waste;
- Construction, Demolition and Excavation (CD&E) Waste;
- Hazardous Waste;
- Agricultural Waste;
- Low Level (Non-Nuclear) Radioactive (LLR) Waste; and
- Waste Water/Sewage Sludge.

1.7 The assessment has been informed by the most accurate up-to-date information available at this time, in most cases referring to 2015 or 2015/16 data unless otherwise stated.

1.8 The key waste streams reviewed and the data sources used are set out in Table 5 below:

Table 5: Waste Streams Reviewed and Data Sources

Waste Stream	Acronym	Description	Data Source
Local Authority Collected Waste	LACW	All waste collected by local authorities. This is primarily waste produced by householders but can include small amounts of waste generated by businesses ('trade waste') and other sources such as street sweepings;	Defra Waste Data Flow, Sunderland Waste Management team
Commercial and Industrial wastes	C&I	Wastes produced by all industry sectors	EA WDI 2015, EA, HWDI 2015, EA records of exempt sites, EA records of incinerators
Construction, Demolition and Excavation wastes	CD&E	Waste produced through the undertaking of infrastructure, regeneration and new development projects	Environment Agency WDI 2015 - http://www.geostore.com/environment-agency/WebStore
Hazardous waste	-	A sub category of all the above waste streams, where the material presents a threat to human health and/or the environment and which requires specialised management as a result	Environment Agency HWDI 2015 - http://www.geostore.com/environment-agency/WebStore

Agricultural Waste	-	Waste produced by farming and forestry activity	Defra Annual Agricultural Census 2015 - https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june Environment Agency. 2003. *Agricultural Waste Survey 2003: A Study of the Management of Non-Agricultural Waste on Farms*. Environment Agency. Environment Agency 2001.Towards Sustainable Agricultural Waste Management, Environment Agency.
Low Level (Non-Nuclear) LLR Waste	LLR Waste	Waste produced by activities such as x-ray photography, clinical and laboratory testing, oil and gas industry	Environment Agency
Waste Water / Sewage Sludge	-	Waste produced from washing, cleaning, and hygienic activities applied to waste water and sewage effluents	Yorkshire Water *Resources Management Plan August 2014* Northumbrian Water *Planning for the Future December 2013* United Utilities *Our revised business plan for 2015-2020*

2. Policy Development

2.1 This chapter briefly reviews waste policy at European, national, sub-regional and local levels. It concentrates only on changes that may directly affect the assumptions about future growth and management priorities for waste that can have a direct impact on the capacity assessment and its results – i.e. general developments in planning policy and practice do not necessarily impact this study.

European and national policy developments

Principal development	Implications
EU Review of Waste Framework Directive Recycling Targets[2]	
A common EU **target for recycling 65% of municipal waste** by 2030	The EU has proposed the targets indicated for all Member states to adopt. Following the BREXIT vote, it is unclear if the UK will look to adopt these targets going forward; however it is likely that these targets will be kept and as such modeling work has assumed these targets will be achieved.
A common EU **target for recycling 75% of packaging waste** by 2030	
A binding landfill target to **reduce landfill to maximum of 10% of municipal waste** by 2030	
A ban on landfilling of separately collected waste	
Waste Management Plan for England	
Promotes high-quality recycling to support the development of a circular economy	Not necessarily a direct impact but could justify assumptions about further improvement in LACW and C&I waste recycling rates though improvement in householder and employee buy-in to recycling initiatives will be essential. PRNs expected to have an extremely indirect impact
Paves way for regulations to improve quality of recyclates produced by MRFs	
Support for Packaging Recovery Notes (PRNs) as a mechanism for improving recycling rates for business wastes	
Encouragement for separate collection of biowaste (food waste) but decision to be left to local authorities	Regarded as a vital means of pushing up recycling and composting of household waste, especially in urbanised authorities. Scale of roll-out in Sunderland may indicate whether it has the potential to boost the recycling rate to the 2020 EU/national target and possibly higher, and which may be reflected in recycling assumptions for these streams

[2] Following the referendum in June 2016, the UK is preparing plans to withdraw from the EU. Until the UK formally leaves the EU, there is no change to the current legal framework. Following withdrawal, the EU Directives will no longer be relevant. However, there is nothing at this stage to suggest that directives already transposed into UK legislation would not be saved, nor that recycling targets would not be saved.

Acknowledges UK already out-performing EU target for recycling CD&E waste by a significant margin	Around 48% of C&D is currently recycled of recovered in some form in Sunderland, with nearly 40% going to landfill, however this is mainly being used at present to complete levels for restoration in a number of non-hazardous landfill sites and as daily cover.
Reiteration of the Proximity Principle (removed on revision of PPS10)	Indirect encouragement for authorities to seek net self-sufficiency in planning for waste and not to continue relying on external capacity indefinitely
National Planning Policy for Waste (and Technical Guidance)	
In spite of its wider significance, the NPPW has few implications for the matters addressed by this study in that it defines the process of establishing and monitoring policies and makes limited reference to the external influences that may need to be taken into account when assessing appropriate growth and performance assumptions.	
National Infrastructure Plan	
The relevant chapter is essentially a commentary on achievement of targets in line with the Waste Framework and Landfill Directives, and progress on bringing forward new infrastructure to achieve them both through public and private funding. Relevant developments on targets reflect the emerging EU proposals referred to above.	
Low Level Radioactive Waste Management Plan for England	
Encourage planning authorities to provide more support for local storage / disposal to relieve pressure on limited national infrastructure	No impacts for this update but may impact need for dialogue with authorities currently receiving these wastes.

Sub-regional and Local policy developments

Sunderland Economic Masterplan- 2010	
Sets the economic direction for 15 years and what public, private and voluntary sectors need to do to realise the masterplan. Recognises the growth of employment in out-of-town locations as a key challenge.	Out-of-town locations will be a source of waste arisings.
Identifies the University as being at the heart of a low-carbon regional economy. Recognises the importance of the position on the waterfront. Aims to tackle the decline of the number of younger people working and living in the city.	Companies will be encouraged to reduce their carbon footprint. Waste management will have a role to play in this through moving waste up the hierarchy. Potential for employment in the waste industry, particularly when new waste management

	technologies are utilised.
Sunderland Economic Update -2012	
Provides update on how Sunderland is meeting the economic Masterplan. Investment in the city and new jobs. A location for a new central business district has been identified.	Consider implication of waste arising from work in developing the new central business district and future waste arisings from new businesses.
Promoting a low carbon economy – Sunderland has established itself as a Low Carbon Enterprise Zone.	Consider role of waste management facilities in the low carbon economy and moving waste up the hierarchy.
Sunderland Transforming Our City: The 3,6,9 Vision	
Sets out a vision of what the city will look like in 3, 6 and 9 years time. Promotes the transformation of the city through growth in the economy through investment in both the public and private sector and the creation of new jobs.	Consider implication of waste arising from work in development of the International Advanced Manufacturing Park and future waste arisings from new businesses across the city and the creation of new infrastructure.
South Tyne and Wear Waste Management Partnership- Joint Municipal Waste Management Strategy - October 2007	
A key development is to move away from the landfill of municipal waste (now LACW) in line with national targets and for the Partnership to aim to be self sufficient where feasible.	Sets targets for recycling and recovery of LACW.

3. Baseline Waste Arisings

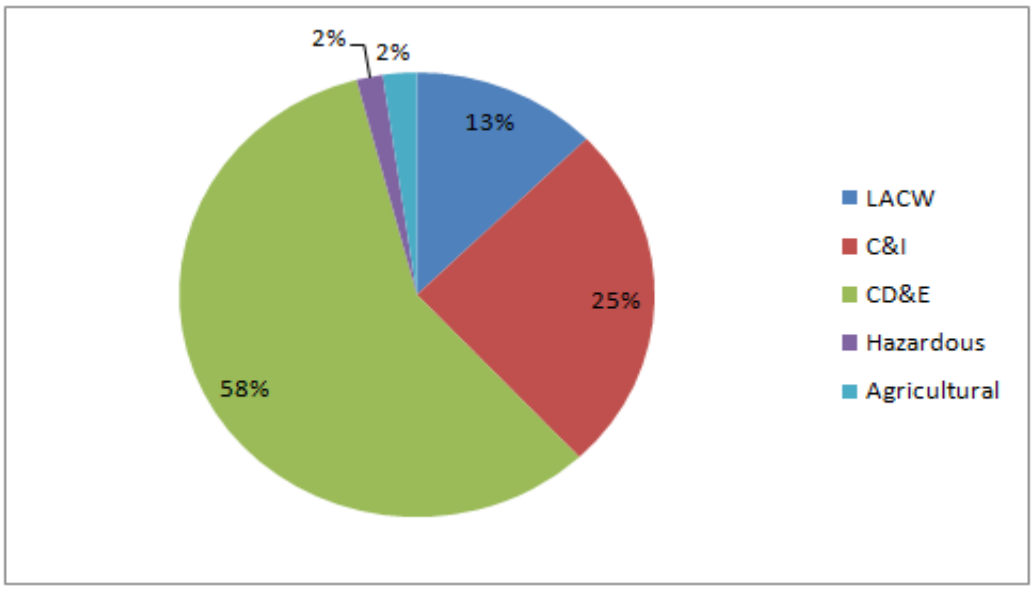
3.1 Each waste stream is discussed in detail in separate sections of this report. This section presents the overall arisings for the five key waste streams in the Plan area in 2015. In 2015, a total of **1,062,967** tonnes of waste arose in the plan area, as shown in Table 6. Table 6 does not include arisings for LLR waste or waste water as we do not have specific details on these waste steams to include here.

Table 6: Baseline waste arisings (2015) (tonnes)

Waste Type	Quantity 2015	% split
LACW	134,708	13%
C&I	269,159	25%
CD&E	615,432	58%
Hazardous	19,010	2%
Agricultural	24,658	2%
Total	**1,062,967**	

3.2 Figure 2 below shows the proportions of the waste streams. This shows 58% of waste arisings in 2015 consisted of construction, demolition and excavation waste. LACW made up 13%, and C&I waste made up 25 % of the total arisings, with hazardous and agricultural sharing the remainder.

Figure 2: Total Waste Arisings 2015[3]



[3] Data sources EA WDI and HWDI 2015, Defra Agricultural Waste Study 2002 and Sunderland Waste Disposal Authority

3.3 Table 7 presents operating waste management capacity within the Sunderland. Capacity information has been taken from:

- throughputs reported via the Environment Agency WDI;
- planning permission data; and review of information on some MRF; and
- Local PFI sites.

3.4 Table 7 shows the change in operational capacity post 2023 when significant existing landfill capacity will be lost, following this point the capacity of built facilities is presumed to remain.

Table 7: Total Actual (2016) and Projected (2023 onwards) Operating Waste Management Capacity by waste stream and management method (tonnes per annum)

Waste Type	Facility Type	2015	2023
LACW only	Household Waste Recycling Site	26,644	26,644
LACW, C&I	Recycling (MRFS)	17,223	17,223
LACW, C&I, CD&E, Haz	Recycling (MRFS)	100,000	100,000
LACW, C&I, CD&E	Recycling (MRFS)	81,971	81,971
LACW, C&I, CDE	Transfer stations (non-hazardous)	295,967	374,454
LACW, C&I, CD&E, Haz	Transfer stations	4,061	4,061
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LACW, C&I, CDE	Treatment facility	7,353	7,353
LACW, C&I, CD&E, Haz	Treatment facility	113,482	113,482
CDE only	Treatment facility	477,767	225,196
C&I, Haz	Treatment facility	81,356	81,356
Haz	Recycling facility/treatment	96,941	96,941
HIC, CDE	Non-Haz Landfill	74,584	0
CDE only	Inert LF	469,762	0
CDE only	Reclamation	47,324	47,324
C&I, CD&E, Haz	Metal recycling	74,129	74,129
Haz	Metal recycling	86	86
C&I, Haz	Car Breaker	1,708	1,708
C&I, Haz	Vehicle depollution facility	87	87

Haz	Haz Landfill	0	0
LACW, C&I	Energy recovery	0	0
LACW transfer (recovery)	Transfer (LACW only for PFI)	82,000	82,000
Total		**2,055,999**	**1,337,570**

4. Predicting Future Requirements

4.1 This update has focused on only 2 recycling options, the first is to remain as current and the second is to increase recycling levels to those currently proposed by Europe as part of the proposals for a Circular Economy. Both recycling scenarios have been modeled in line with the Experian model data for Sunderland and assume that this level of growth will occur.

- Baseline - This reflects the current status and forward planning position.
- Increased recycling – This reflects the achievement of recycling targets proposed by Europe for C&I and C&D waste.
- No change from baseline is proposed for excavation waste or hazardous waste.

4.2 The EU proposed recycling targets are set out below:

- 10% maximum to landfill of municipal waste by 2030 (C&I and LACW)
- 50% recycling C&I by 2020 and 65% by 2030; and
- 70% (by weight) recycling, recovery or reuse of C&D waste (excludes E waste) by 2020.

4.3 For Commercial waste a further target of 25% of waste to energy recovery by 2030 has also been proposed. This is to reflect the high amount of waste currently dealt with through either disposal to landfill or via transfer facilities and is managed outside of Sunderland. The aim is to look to manage this waste further up the hierarchy over the plan period.

4.4 A similar target has been included for industrial waste to reduce the levels sent to landfill. For Industrial waste this looks at recovery of up to 13% of the total I waste managed.

4.5 For all waste streams, targets have been based on the total waste stream for each waste type.

4.6 Although the EU targets relate to municipal waste, outside the UK this definition includes both household waste and that from other sources which are similar in nature and composition, which will include a significant proportion of waste generated by businesses and not collected by local authorities. Consequently, this update applies these municipal waste targets to the C&I waste stream. The term LACW was introduced in the UK to include all waste collected by a local authority. Table 8 provides further information on the four recycling scenarios.

Table 8: 'Change in Behaviour' Scenarios

Waste Stream	Scenario	Practice Assumption
LACW	All scenarios	Waste is managed in accordance with existing and planned arrangements in accordance with the forecasted tonnages of waste to be managed through Energy recovery as part of the waste PFI. This looks to divert 95% of municipal waste from landfill. Although the JMWMS targets of 2007 are still in existence,

		modelling has used the figures for energy recovery tonnages and deducted this from the total forecast for that year. To reflect current landfill levels of 2%, this has been modelled throughout as well.	
C&I Waste		**Commercial waste**	**Industrial waste**
	Scenario 1 Baseline Recycling Scenario	No change from baseline position	No change from baseline position
	Scenario 2 Increased Recycling Scenario	By 2020: 50% recycling 13% EfW By 2030: 10% to Landfill 65% Recycling 25% EfW	By 2020: 77 %Recycling (current levels) 4% EfW By 2030: 10% to Landfill 77 % Recycling 13% EfW
CD&E Waste	Scenario 1 Baseline Recycling Scenario	No change from baseline position	
	Scenario 2 Increased Recycling Scenario	By 2020 70% recycling 30% landfill/reclamation No change from baseline for Excavation waste	

4.7 Growth factors are based on the number of FTE employees as indicated by forecasts produced by Experian[4]. This data has been used for both baseline and increased recycling scenarios. For agricultural waste, no growth is assumed to take place. In addition to the Experian data, growth in the automotive manufacturing and advanced manufacturing sectors have also been planned in relation to growth anticipated as part of the International Advanced Manufacturing Park (IAMP).

[4] UK Local Markets Forecasts Quarterly, Experian September 2016

5. Local Authority Collected Waste

5.1 Local Authority Collected Waste (LACW) is all waste collected by the local authority.

5.2 LACW across the South Tyne and Wear Sub-region is the responsibility of the South Tyne and Wear Waste Management Partnership (STWWMP) which is collaboration between Sunderland, Gateshead and South Tyneside Councils.

Data Sources

5.3 The data sources for this waste stream are the Waste Collection Authority, the WDA, and the Defra database called 'WasteDataFlow'.

Baseline Arisings

5.4 The following table provides information on LACW arisings for Sunderland in 2015/16 based on information taken from WasteDataFlow. A total of 134,708 tonnes arose in the Sunderland in 2015/16, see table 9 below for a detailed breakdown.

Table 9: LACW arisings in 2015/16 for Sunderland, tonnes

Sunderland		Arisings	Recycled, Composted or Re-Used	To Energy Recovery	To Landfill
	LACW	134,708	40,474	91,059	3,175
	Household	123,239	36,171	84,105	2,963

Source: Sunderland Waste Disposal Authority.

Forecast Arisings

5.5 Table 10 shows the forecast LACW arisings ranging from 131,157 tonnes in 2016 to 144,117 tonnes in 2030. These figures have been provided directly by the WDA.

Table 10: LACW Forecast arisings (tonnes)

Waste Type	Quantity 2016	Quantity 2020	Quantity 2025	Quantity 2030
LACW	131,157	135,369	140,063	144,117

Source: South of Tyne and Wear Waste Management Partnership

Operating Capacity

5.6 Many of the facilities permitted to accept LACW will also accept other waste streams such as C&I and CD&E. It is therefore difficult to provide a figure for the total operating capacity for LACW. The operating capacity of facilities processing only LACW within Sunderland is considered to be 108,644 tonnes at 2015, this is assuming that Household waste recycling Centre's and the Sita WTS as part of the Waste PFI programme are the only facilities solely for LACW, however in practice these sites may also take wastes from other sources. There are numerous other waste management sites within the Plan area that have a license to take waste materials of LACW composition alongside C&I and CD&E and hazardous waste streams. Table 7 provides details of operating capacity for all waste streams over the plan period.

5.6 With the exception of LACW which is dealt with under the PFI project and which utilises energy recovery for management of residual waste, Sunderland currently relies on landfill as the primary method of disposing of waste that cannot be recycled or reused for the other key waste streams. There are 3 landfill sites serving Sunderland, all of which are currently planned to close between 2019 and 2022. Once these sites are no longer available, Sunderland will be reliant on capacity elsewhere in the North East. There is still significant capacity within the NE itself and Table 11 below provides details of available capacity in 000's cubic meters as at the end of 2015.

Table 11: North East: Landfill Capacity 2015 000'cm

Landfill Type	Sub-Region				NORTH EAST
	County Durham	Northumberland	Tees Valley Unitary Authorities	Tyne & Wear	
Hazardous Merchant	-	-	6,887	-	**6,887**
Hazardous Restricted	-	-	-	-	**-**
Non Hazardous with SNRHW cell*	1,908	1,220	1,007		**4,136**
Non Hazardous	1,700	16	5,406	5,939	**13,061**
Non Hazardous Restricted	-	-	-	-	**-**
Inert	8,035	784	-	1,965	**10,785**
Total	**11,644**	**2,021**	**13,300**	**7,904**	**34,868**

Source https://www.gov.uk/government/statistics/waste-management-for-england-2015

Projected Capacity Gap/Capacity Surplus

5.7 Recycling and Landfill capacity requirements are shown jointly with the C&I waste stream as most sites within the plan area are licensed to also take waste materials similar in composition to LACW. Table 12 sets out the anticipated capacity gap for LACW and C&I waste over the plan period, excluding Energy from Waste. Energy recovery requirements from Sunderland's LACW are dealt with under the PFI contract and residual waste is exported out of the area for management. However the tonnages to be managed from Sunderland as agreed under the PFI contract are shown in Table 13 below.

Table 12: Forecast capacity requirements for LACW and C&I waste (tonnes) for baseline and increased recycling options. NB the amount for LACW remains the same under all recycling options

Waste Management Method	Year	Baseline	Increased recycling
Recycling (includes C&I)	2015	124,776	124,776
	2020	129,823	86,331
	2025	125,836	72,482
	2030	122,469	64,040

	2035	118,989	60,230
Landfill (includes C&I)	2015	3,568	3,568
	2020	3,361	17,470
	2025	-72,582	-48,028
	2030	-73,759	-31,094
	2035	-75,212	-31,761

Table 13: LACW waste to Energy Recovery through the PFI contract

Waste Management Method	Year	PFI Tonnages
Energy from Waste LACW	2015	91,059
	2020	97,424
	2025	98,483
	2030	99,304
	2035	100,178

5.8 As table 12 shows, there is no tonnage requirement for additional recycling capacity to manage LACW or C&I waste over the plan period. However, there is a gap in landfill due to the closure of 3 sites within the plan period. The gap is not sufficient to warrant a landfill site in its own right and, through Duty to Co-operate (DtC) it may be possible to agree that capacity elsewhere within the region would be available for this waste. As Sunderland has an excess of recycling and treatment capacity this could be used to compensate for exports of waste to landfill.

5.9 Although there is sufficient recycling capacity, this does not include any provision for composting waste. This need is currently met elsewhere within the NE region. Sunderland should continue to liaise with those areas receiving green waste and waste for energy recovery to ensure they are accounting for this input in their own assessment of future waste need.

6. Commercial and Industrial Waste

Data Sources

6.1 The method for calculating Commercial and Industrial (C&I) waste arisings is based on the approach set out in *New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England* (DEFRA, published August 2014)[5]. A summary of the approach used is provided in Appendix 4. This approach uses data from the Environment Agency WDI as the basis for calculating C&I waste arisings in Sunderland.

Baseline Arisings

6.2 A total of 269,159 tonnes of C&I waste was recorded as arising in Sunderland in 2015. This total includes C&I waste arisings that were deposited in Sunderland as well as deposits that were known to arise in the North East of England and were deposited in Sunderland but have no identified origin above the North East level.

Forecast Arisings

6.3 The following table provides information on forecast C&I waste arisings for Sunderland.

Table 14: Forecast C&I waste arisings in Sunderland (tonnes)

Year	Arisings (tonnes)
2015	269,159
2020	272,035
2025	277,307
2030	282,116
2035	287,978

Source Sunderland waste model 2017

Operating Capacity

6.4 There are very few waste management facilities that are permitted only to receive C&I waste. Most facilities will accept C&I waste alongside CD&E waste and LACW. It would therefore be very difficult to give a precise figure for the total available capacity for C&I waste in Sunderland. Full details of operating capacity throughout the plan period can be found in Table 7.

Projected Capacity Gap/Capacity Surplus

6.5 Table 12 (Chapter 5) shows a surplus capacity for the recycling of C&I and LACW across all potential scenarios. It also indicates a shortage of landfill over the plan period.

6.6 Table 15 below provides details of Energy recovery requirements over the plan period. This requirement has been identified to enable the reduction is waste to landfill to meet the EU 2030 target of 10% and to reduce the amount of waste sent out of the area through transfer stations which accounts for nearly 27% of Commercial waste and 6% of industrial waste. There are currently no energy recovery

[5] DEFRA (2014) New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England

facilities operating within Sunderland. A review of waste removed from transfer stations in Sunderland indicates that 16% of this waste went on to recovery for commercial waste and 24% for industrial waste.

6.7 This indicates that there is a requirement for waste to be managed this way, however there may be sufficient capacity within the NE to handle this need. Facilities exist within County Durham and Tees valley, which together managed 686,000 tonnes of waste in 2015, with 595,000 of that handled in Tees Valley and treating both C&I and Local Authority collected waste.

Table 15: Energy recovery requirements 2015-2035

Waste Management Method	Year	Baseline	Increased recycling
Energy Recovery (C&I only)	2015	0	0
	2020	0	-21,639
	2025	0	-30,656
	2030	0	-51,270
	2035	0	-52,175

Source Sunderland Waste Model 2017.

6.8 The waste model shows a surplus of requirement for treatment facilities within the Plan area, however there are no facilities for composting waste for either LACW or C&I waste and this may be something for which a localised need could be considered. However, the 2012 Urban Mines report identified that significant capacity for this form of waste management exists at the NE level and suggests there is sufficient for the management of green waste but a potential under provision regionally for anaerobic treatment of food waste.

7. Construction, Demolition and Excavation Waste

7.1 Waste materials generated from Construction, Demolition and Excavation (CD&E) operations include a wide range of surplus waste construction materials as well as materials generated by the demolition of old buildings and soils and sub-soils from excavation. Most of these materials are inert with respect to their pollution potential. However, materials such as wood are biodegradable, plasterboard produces a polluting leachate, and asbestos is classified as hazardous.

Data Sources

7.2 An estimate of how much CD&E waste is produced in Sunderland can be made by looking at how much CD&E is managed through permitted sites. Data published by the Environment Agency for 2015 (EA WDI) gives quantities of CD&E waste deposited at sites which are subject to an Environmental Permit. This data provides some information on origin and waste movements; but it is incomplete as not all details are fully recorded. However, it remains the most appropriate data set available and is considered the best approach.

7.3 A request for waste managed under exemption did not result in a return of any information from the EA, however as this waste does not enter the waste stream and as such is not accounted for within the assessments made in this chapter, it is not considered to alter the overall results of this work. Exemptions only last for a period of 3 years and are used to allow waste materials to be brought on to a site and used without registering through any systems which record the quantity of waste. Exemptions include a limit of the material that may be brought on to a site but there is no method of recording what was actually managed as exempt sites are not required to provide waste returns to the EA under the Exemption. Data on exemptions can be used to show the number of sites operating in an area to give an indication of the role they play in local waste management; however as no data is available on the level of waste managed at these sites it is not possible to accurately assess their role.

Baseline Arisings

7.4 Table 16 shows that there was in the order of 762,987 tonnes of CD&E deposited in Sunderland in 2015. However not all of this waste arose within Sunderland only 615,432 tonnes arising within the Plan area. Table 16 shows the types of facilities where CD&E waste is managed in Sunderland.

Table 16: CD&E waste deposits by management method in Sunderland in 2015 (tonnes)

Management Method	Construction and Demolition Waste	Excavation Waste	Total
Transfer	130,242	135,976	266,218
Treatment	122,169	86,616	208,785
Reclamation		6,891	6,891
CA site	336		336

Metals Recycling	2,554		2,554
Non Hazardous Landfill	806	242,234	243,040
Inert Landfill		35,162	35,162
MRF	2		2
Totals	**256,108**	**506,879**	**762,987**

Source: EA WDI 2015

7.5 Table 17 shows that the there is almost a 50/50 split in waste managed locally and waste exported. No calculation has taken place as part of this exercise to remove double counted waste i.e. waste that may go through more than one site in Sunderland as all the facilities have been required to manage the waste. Table 17 shows that the majority of waste transferred (42%) went to non- hazardous landfill for which there is limited local capacity remaining.

Table 17: Management of Construction and Demolition Wastes Arising in Sunderland in 2015 (tonnes)

Construction & Demolition Waste			
Site type	Managed Locally	Exported	Total Arisings
CA Site	204		204
Haz Waste Transfer	2,640	3,299	5,938
Inert LF		19	19
Inert Waste Transfer	241		241
Inert Waste Transfer / Treatment	40,960	225	41,185
Material Recycling Facility	0	24	24
Metal Recycling	566	362	928
Non Hazardous LF	760	79,459	80,219
Non Haz (SNRHW) LF		1,266	1,266
Haz Landfill		23	23
Non-Haz Waste Transfer	14,909	12,136	27,045
Non-Haz Waste Transfer / Treatment		396	396
Physical Treatment	34,444	2	34,445
Biological Treatment	1,833	2	1,835
TOTAL	**96,556**	**97,213**	**193,769**
% of waste managed	49.8%	50.2%	

Source: EA WDI 2015

7.6 Table 18 shows that around 21% of excavation waste is exported. As with C&D waste, the majority of waste exported (20%) was sent to landfill.

Table 18: Management of Excavation Wastes Arising in Sunderland in 2015 (tonnes)

Excavation Waste			
Site type	Managed Locally	Exported	Total Arisings
Haz Waste Transfer	973	16	988
Inert LF	35,162	66,313	101,475
Inert Waste Transfer	297		297
Inert Waste Transfer / Treatment	5,223	264	5,487
Material Recycling Facility	0	123	123
Non Hazardous LF	241,659	15,537	257,197
Haz Landfill		6	6
Non-Haz Waste Transfer	32,889	68	32,957
Physical Treatment	11,014	7	11,021
Reclamation	1,338	3,175	4,513
TOTAL	**328,554**	**85,509**	**414,064**
% waste managed	79%	21%	

Source: EA WDI 2015

7.7 Table 19 provides detail on the movement of wastes into and out of transfer stations.

Table 19: Movements of CD&E Wastes through Transfer Stations in Sunderland in 2015 (tonnes)

Nature of movement	Construction & Demolition (tones)	Excavation (tones)
Locally arising wastes managed at local WTSs	17,789	34,159
Wastes imported	112,452	101,817
Wastes removed from local WTSs	34,197	21,950

Forecast Arisings

7.8 Table 20 shows the forecast arisings for CD&E waste at five-year intervals throughout the Plan period under agreed growth levels in line with the Experian data. The forecast is based on arisings from 2015 and includes waste deposited within Sunderland known to arise in Sunderland and waste

Managed in Sunderland which is known to arise within the North East but for which other origin below that levels is unknown.

Table 20: Forecast Arisings for CD&E in Sunderland in 2015 (tonnes)

Year	Growth
2015	615,432
2020	614,962
2025	604,667
2030	599,754
2035	599,754

Operating Capacity

7.9 It is not possible to identify the total existing capacity available to manage CD&E waste. This is because a number of facilities will accept these wastes alongside other waste streams. Operational exclusive CD&E waste management capacity at all types of facilities within Sunderland is 997,953 tonnes as at the end of 2015. This capacity excludes sites within the Plan area that can accept, by license, CD&E waste alongside C&I waste and is therefore not a true reflection of the total available capacity for this waste stream. If sites which accept CD&E alongside other waste streams are included, there is an additional 1,221,310 tonnes of capacity available for CD&E, LACW, C&I and hazardous waste management.

Projected Capacity Gap/Capacity Surplus

7.10 As explained above, it is not possible to identify a projected separate capacity gap for CD&E with a high degree of certainty. However, the capacity gap for inert waste landfill can be identified due to the specifics of the waste that can be taken at these sites, and ranges, from 410,800 tonnes in 2035 under the increased recycling option; to 427,553 tonnes per annum in 2035 if existing baseline recycling levels were maintained.

7.11 There is significant capacity within Sunderland for the recycling and treatment of CD&E waste alongside other waste streams; as such no additional facilities are identified as being required. Increased recycling of C&D waste is assumed to occur to enable the EU target of 70% (by weight) recycling, recovery or reuse of CD waste (excludes E waste) by 2020. No further increases are projected after that date; however there is sufficient capacity for greater recovery to divert more waste from landfill within existing sites.

7.12 The gap in landfill arises due to the closure of all existing landfill sites within Sunderland by 2022. A number of sites have already stopped accepting non-hazardous waste and are now working towards restoration and only accepting inert waste. The following closure dates have been identified:

- Houghton Quarry Landfill Site – 2019
- Springwell Quarry - 2022
- Field House Quarry – 2020

7.13 Table 11 in Chapter 5 identifies the current available landfill capacity by landfill type. This indicates there is significant capacity (over 10 million cm) within the North East. Duty to Co-operate with neighbouring areas will be important to identify if that capacity would be available for waste arising in Sunderland.

8 Hazardous Waste

8.1 The 2005 Hazardous Waste (England and Wales) Regulations and the List of Wastes (England and Wales) Regulations set out what is defined as hazardous waste. Waste is classified as "Hazardous Waste" if it has characteristics that make it harmful to human health, or to the environment, either immediately or over an extended period of time.

8.2 Hazardous waste is a sub category of LACW, C&I and CD&E wastes. Estimated totals for LACW, C&I waste and CD&E waste are inclusive of waste in the sub-category of hazardous.

Data Sources

8.3 Data on hazardous waste is sourced from the 2015 Hazardous Waste Environment Agency Interrogator.

Baseline Arisings

8.4 A total of 19,010 tonnes of hazardous waste was recorded as arising in Sunderland in 2015.

Forecast Arisings

8.5 Table 21 provides information on forecast hazardous waste arisings for Sunderland.

Table 21: Forecast Hazardous waste arisings in Sunderland (tonnes) including AWRP hazardous outputs

Arisings	Tonnage
Arisings 2015	19,010
Arisings 2020	19,129
Arisings 2025	19,384
Arisings 2030	19,691
Arisings 2035	19,997

Operating Capacity

8.6 Hazardous waste management within Sunderland is confined to waste taken to metal recycling sites – vehicle depollution facilities, and a solvent recycling facility. Remaining arisings are deposited at transfer stations for onward movement (for treatment and disposal) or are exported directly from the area.

Projected Capacity Gap/Capacity Surplus and Required Facilities

8.7 There is a forecast gap in capacity for hazardous landfill throughout the Plan period under all scenarios. The future capacity requirement for hazardous waste management has been taken into account under the main classes of waste materials for which hazardous waste is a sub-set. However, hazardous waste facilities for most forms of treatment, incineration and for landfill are located outside the Plan area and it is anticipated that provision will continue and remain available throughout the Plan period. It should be noted that hazardous waste facilities require economies of scale so that provision of facilities within the plan area for the small quantities of arisings would be unlikely to be viable, unless a new facility were to import significant quantities from outside the area. The identified facility for solvent

recycling has a large capacity and currently imports significant quantities of waste from outside Sunderland and the North East.

9 Agricultural Waste

9.1 Agricultural premises are defined in the Agriculture Act 1947 as land used for: horticulture, fruit growing, seed growing, dairy farming, livestock breeding and keeping, grazing land, meadow land, osier land (growing willow), market gardens and nursery grounds. It also includes woodlands where that use is ancillary to the use of land for other agricultural purposes. This definition includes all arable farming.

9.2 This waste is made up of the following substances:

- Compostable and digestible materials (farm yard manure, slurry, vegetables);
- Combustible materials (straw, silage wrap (plastic), bale twine and net (plastic), fertiliser and seed bags (plastic), animal feed bags (plastic), animal feed bags (paper & card), horticulture (plastic), tree guards (plastic), paper seed bags (paper & card), and oil);
- Hazardous and Difficult Waste; chemical materials (silage effluent), agrochemical (plastic), agrochemical (paper & card), animal health (plastics), animal health (paper & card), animal health (glass), animal health (rubber/metal), pesticide washings, sheep dip (organic phosphates) and sheep dip (synthetic pyrethroids); and
- Other (waste milk).

9.3 However some of the above materials can also be defined as agricultural by-products and not necessarily wastes due to the fact they contain important nutrient resources and they are not defined as wastes when applied to the land as fertiliser for agricultural improvement or put to some other beneficial use on-farm.

Data Sources

9.4 In order to estimate agricultural waste arisings for Sunderland, data has been extrapolated using the relationship between the number of farm holdings and associated waste generation. This work is based on the Defra annual agricultural census by region and farm type (particularly the dataset called *Local Authority breakdown for key crops areas and livestock numbers on agricultural holdings*[6] which provides a local authority breakdown for the number of farm holdings in 2013) and the report Towards Sustainable Agricultural Waste Management (Environment Agency, 2001).

9.5 The principal source on agricultural waste arisings and 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 estimate given below has been derived from published regional information and scaled down to provide a representative figure for the Sunderland area alone, which will introduce some inaccuracy.

[6] https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june

Baseline Arisings

9.6 There are 42 commercial farm holdings Sunderland (Defra, 2013). Data on estimated agricultural waste arisings at the regional level from 1998 has been used to extrapolate an agricultural waste arising for Sunderland of 24,658 tonnes of waste per annum, the majority being managed within the generating farm holding.

Table 22: Estimates of Agricultural Waste Arisings in the North East (1998)

Waste type	Quantity Arising in the North East per annum (tonnes)
Plastic Packaging	1,015
Cardboard and paper packaging	304
Metal, glass, wood and rubber packaging	63
Other non-packaging plastics	3,020
Agrochemicals	2,265
Animal Health Products	6,570
Machinery Waste (oils, batteries, tyres, redundant machinery)	2,467
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	1,140
Organic by-products waste (slurry, waste milk, straw)	2,420,942
Animal By-products	12,810

Source: Environment Agency (2001) towards sustainable agricultural waste management, Appendix C

Table 23: Extrapolated Agricultural waste Arisings (rounded) for Sunderland based on 42 Farm Holdings[7]

Waste Type	Potential Waste Management Treatment Route	Quantity Arising in Sunderland per annum (tonnes) (rounded)
Plastic Packaging	Recycling/Landfill	10
Cardboard and paper packaging	Composting on site/recycling/ landfill	3
Metal, glass, wood and rubber packaging	Recycling/landfill	1
Other non-packaging plastics	Recycling/landfill	30
Agrochemicals	Treatment/incineration	23
Animal Health Products	Incineration	66

[7] For reference, the total number of farm holdings in the North East in 2013 was 4,174

Machinery Waste (oils, batteries, tyres, redundant machinery)	Recycling/treatment	25
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	Hazardous Landfill	11
Organic by-products waste (slurry, waste milk, straw)	Composting/land recovery/ treatment on site	24,360
Animal By-products	Specialised Treatment	129
TOTAL ARISINGS		24,658

Sources: Environment Agency (2001) Towards sustainable agricultural waste management, Appendix C; Defra (2013) June Census Local Authority breakdown for key crops areas and livestock numbers on agricultural holdings

Table 24: Potential Treatment Routes for Extrapolated Agricultural Waste Arisings for Sunderland

Waste Management Route	Tonnage
Management within the farm holding	
Composting on site/ land recover/ treatment on site	24,363
Management outside of the farm holding	
Recycling	66
Treatment plant/ incineration	89
Animal by-products incineration	129
Landfill	0
Hazardous Landfill	11
Total Management off site	295
Total Arisings	**24,658**

9.7 Table 24 summarises the waste arisings by treatment route. In each case it is assumed that the current management method represents the optimal management route with respect to the Waste Hierarchy – e.g. all material suitable for recycling is managed in that way and is not disposed to landfill. Table 24 also distinguishes between waste that is currently managed on site and that which should be managed off site. Only the latter material would require management capacity that is currently available or that would be delivered by policies and allocations in the NLWP.

9.8 Table 24 shows that that the majority of agricultural waste arisings (24,363 tonnes, or 99%) are managed on the farm. Therefore approximately 300 tonnes are managed off site. For the purposes of planning for this waste stream, it is the c.300 tonnes of waste requiring off-site management that should be considered, this waste would be captured as part of the C&I waste stream and managed through sites licensed to accept such waste.

Forecast Arisings

9.9 It will be necessary to provide for management of waste leaving the farm holdings amounting to approximately 300 tonnes per annum (assuming no growth in the volume of agricultural waste arisings).

9.10 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 had to re-register their agricultural exemptions covering such practices as land spreading and depositing dredgings cleared from farm ditches along banks from 1st October 2013. In addition to re-registration, some of the exemptions are also changing. There are approximately 30 exemptions covering agricultural activities and nearly all exemption activities covered at present will still be covered in the new system. However, in some cases there may be slight changes to the limits and conditions within the waste exemption. There are also a number of new exemptions that could be applied to farming. In addition to any effect of the new exemption regulations, it is likely that in the future more waste could be diverted from landfill to recycling (due to the increasing awareness of the potential to recycle). It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting. The quantities involved for management off-site from farm holdings are likely to be so small they will be of low significance in the overall waste arisings for the Sub-region.

9.11 In addition to any effect of the new exemption regulations, it is likely that in the future more waste could be diverted from landfill to recycling (due to the increasing awareness of the potential to recycle). It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting. The quantities involved for management off-site from farm holdings are likely to be so small they will be of low significance in the overall waste arisings for Sunderland.

Operating Capacity

9.12 The majority of arisings are managed on the farm holdings via land treatment/spreading, composting and, increasingly, by on-site aerobic digestion.

Conclusion

9.13 Data sources for agricultural waste are based upon extrapolations of data from past survey information. These original surveys also noted that an assessment of the likely accuracy of the estimates has been undertaken and this was defined as ‘Medium’.

9.14 It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting.

9.15 The future arisings that will require management off site are likely to be small, in the region of 300 tonnes per annum. There is no immediate need to provide any new facilities solely to cover agricultural wastes. Waste generated that requires specialist treatment is likely to continue to be treated at appropriate facilities over the plan period.

10 Low Level Radioactive Waste

Data Sources

10.10 Most (98%) of Low Level Radioactive (LLR) Waste in the UK arises from operation of nuclear power stations, nuclear fuel reprocessing facilities, and also from the decommissioning and clean-up of nuclear sites. The remaining 2% is produced by non-nuclear industry users of radioactivity. No nuclear sites are located in Sunderland. Non-nuclear industries are the sole producers of LLR Waste in Sunderland for which capacity will need to be planned. Therefore, when compared to the total LLR Waste produced in the UK, the amount produced in Sunderland is very small.

10.11 The EA regulate how users of radioactive substances dispose of their LLR waste. They do this by granting permits that place limits on disposal of solid waste to land and on discharges to water and air.

10.12 In February 2016, the UK Government published an updated UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry[8]. The strategy was prepared by the Nuclear Decommissioning Authority (NDA) and sets out the need to apply the waste hierarchy, make best use of existing LLR Waste management assets and the need for new fit-for-purpose waste management routes for LLR Waste.

Baseline Arisings

10.13 There are few permitted premises in Sunderland that generate LLR waste**.** A detailed study for the NE sub-region in to the production and disposal of LLW and VLLW was undertaken in August 2013 by Urban Mines. The report details the existing producers within the NE region and in each authority and the level of waste produced. The information was gained from the EA. An updated position on producers and levels of waste was requested from the EA as part of a larger data request, however no new information was provided. As such the position as stated in this paper is the most up to date position.

10.14 This note identifies that only Sunderland Royal Hospital is currently producing LLW or VLLW. The paper indicated that in 2011, 2,900,000 Becquerel's was transferred for radioactive incineration and 7.10183mega Becquerel's of waste water was produced.

Forecast Arisings

10.15 There is no likelihood of a nuclear facility being located in Sunderland in the next 20 years, which means it is highly unlikely that LLR Waste will increase significantly above current levels.

Operating Capacity

10.16 There are no permitted premises in Sunderland that receive LLR waste. The permitted premises that do generate LLR waste, dispose of that waste either under exemption as Very Low Level Waste, or to sewer, or by transfer to permitted clinical waste incinerators.

[8] DECC et al *UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry* February 2016 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/497114/NI_LLW_Strategy_Final.pdf

Projected Capacity Gap/Capacity Surplus

10.17 Arisings of LLR Waste from existing sources are not expected to change over the plan period. It is unlikely that the management routes of the small amount of LLR Waste produced in Sunderland will change over this period. It is recommended that Sunderland make contact, under the Duty to Cooperate, with relevant authorities in order to establish whether they are aware of any foreseeable changes which may affect the position for LLR Waste over the period to 2030.

11 Waste Water/Sewage Sludge

Data Sources

11.1 Northumbrian Water is responsible for operating Waste Water Treatment Works (WWTW) within Sunderland.

Baseline Arisings

11.2 Water companies plan operations in 5-year cycles, known as an Asset Management Period (AMP). The current AMP is known as AMP6 – the sixth period – which runs from 2015-2020. During AMP6, UK water companies will come under increased pressure to improve their relative efficiency whilst achieving improved wastewater effluent quality. In 2016 the water companies will start preparing for AMP7 – the seventh period – including assessing what new waste water infrastructure will be required post-2020.

11.3 Northumbrian Water has produced a Water Resources Management Plan covering the period from 2015 to 2040. This purpose of this document is to ensure Northumbrian Water has sufficient water to both supply the public and maintain adequate water in the environment over a 25-year period.

Forecast Arisings and operating capacity

11.4 A review of information in the WRMP 2014 indicates that there is surplus supply in the company and changes to population forecast over the period will not result in the need to invest in new water resources. The AMP6 investment is targeted at upgrading and maintaining the existing infrastructure.

Projected Capacity Gap/Capacity Surplus and Required Facilities

11.5 As a general principle, when greater capacity is required, WWTW operators would try and place new plant on existing treatment works or, failing that, acquire 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.

11.6 There are currently no known requirements for additional waste water treatment facilities. Northumbrian Water should be kept informed of Plan preparation and invited to comment at relevant stages.

12 Movement of Waste across Authority Boundaries

12.1 A summary of Imports and Exports of waste into and out of Sunderland is shown in Table 25. Further details of movements of waste are shown in Appendix 7. The table is a snapshot in time and shows that, in 2015, a high proportion of inert CD&E waste arising in Sunderland was also managed in the Sunderland and the area also imported more waste than it exported, therefore is a net importer of CD&E waste.

12.2 A considerable proportion of the hazardous waste arising in Sunderland is exported and managed elsewhere, although the area still imports more than double the level of hazardous waste produced locally and therefore is a net importer of hazardous waste. Similarly with HIC waste, the area imports more waste than arises locally and exports less than half of this amount, as such the area is a net importer of HIC waste. However, considerable amounts of this waste are managed through waste transfer stations.

Table 25 Imports and Exports Summary for Sunderland (2015)

	Hazardous	Household Industrial & Commercial (HIC)	Inert CD&E	Total (tonnes)
Waste originating in Sunderland and managed in Sunderland	1,971	202,374	615,432	836,816
Waste arising elsewhere and managed in Sunderland (imports)	39,172	402,317	334,702	776,191
Waste arising in Sunderland and exported for management elsewhere (exports)	17,039	164,744	187,146	368,929

Source: EA WDI 2015

12.3 Table 26 shows activity at transfer stations within Sunderland. The difference between waste deposited and waste removed is just over 98,000 tonnes, indicating more waste is deposited than removed.

Table 26 Waste Deposited at Transfer Stations and subsequently removed for onward Waste Treatment, Sunderland (2015)

	Total	Household Industrial & Commercial	Inert	Hazardous
Waste deposited at Waste Management Sites in Sunderland	624,705	352,978	266,218	5,511
Waste Removed from Waste Management Sites in Sunderland	526,650	469,733	55,790	1,127

*Data taken from HWDI using disposal or recovery route for detail on how waste was managed. NB this dataset does not include information on facility type.

12.4 A list of planning authorities for which there have been cross border waste movements is shown in Appendix 8.

13 Summary of future waste management requirements and overall conclusions

13.1 Tables 27 and 28 below show the predicted future capacity gaps/surplus for Sunderland for both the baseline recycling and increased recycling options modeled. Both options are assumed to be delivered in line with growth anticipated within the Experian model. Figures shown in negative represent a capacity gap meaning new facilities are required; positive figures represent a capacity surplus, for which no new facilities have been identified as being required.

Recycling and Treatment Requirements

13.2 There is a capacity surplus for recycling and treatment facilities for LACW, C&I, Hazardous and CDE waste throughout the Plan period under all options, therefore no additional facilities are required.

Energy Recovery Requirements

13.3 There is a requirement for energy from waste for C&I identified from the outset in order to assist in diverting waste from landfill and to reduce the amount of waste managed through waste transfer stations. However, as there is significant capacity within the North East that is already operational it may be that capacity locally will be to treat waste to produce material (refuse derived fuel- RDF or solid recovered fuel- SRF) for export for treatment elsewhere. Energy Recovery facilities need to be of sufficient scale to ensure they are economically viable and can achieve the level of feedstock necessary, as such a local facility for Sunderland may not be viable.

13.4 There are no specialist high temperature incinerators within the Plan area and a capacity gap is identified for this waste management route throughout the Plan period under all scenarios. This waste is currently exported for treatment elsewhere within the region. However, due to the fairly low levels of waste requiring management via this route, it is not likely to be economically viable for a facility to be built solely to manage waste arising within the Plan area, and therefore it is likely that this waste will continue to be exported or a larger scale facility developed to take waste from surrounding areas.

Composting

13.5 A very small capacity gap for composting is identified for Commercial waste, however as there are no existing composting facilities in Sunderland, management via this route is not identified as currently being a waste management option for managing C&I or LACW. LACW green waste is currently managed through export outside the plan area. For LACW and C&I waste this may be something for which a localised need could be considered. However, the 2012 Urban Mines report identified that significant capacity for this form of waste management exists at the NE level and suggests there is sufficient for the management of green waste but a potential under provision regionally for anaerobic treatment of food waste.

Landfill requirements

13.6 Under both scenarios, there is a requirement for hazardous waste landfill. This is because there are currently no hazardous waste landfill facilities within the Plan area. The current waste management

option is to export this waste to existing hazardous landfill facilities within the North East region and this is expected to continue. Table 11indicates that in 2015 there was in excess of 6.8 million cm of capacity within the Tees Valley Authority area.

13.7 There is sufficient non-hazardous landfill capacity until 2022 when the last of 3 landfill sites in the Plan area is due to close. From 2023 onwards a gap is identified for around 72,000 tonnes under baseline recycling and 53,000 tonnes under increased recycling. Under baseline this requirement increases to around 75,000 tonnes and under increased recycling this gap reduces to around 32,000 tonnes.

13.8 There is a gap in inert landfill capacity from 2020 under both recycling options. Under baseline the gap in around 363,000 tonnes in 2020 rising to around 438,000 in 2021 then reducing to around 427,5000 tonnes from 2030 and remaining at this level for the rest of the plan period. Under increased recycling the gap in 2020 is around 347,000 rising to around 422,000 tonnes in 2021 and then reducing to 411,000 tonnes in 2030 and remaining at that level for the remainder of the plan period.

13.9 At the end of 2015 there was over 10 million cm of capacity for inert waste landfill remaining in the North East Region, this capacity could be sufficient to meet this need and the authority should enter in to DtC discussions with those areas where capacity would be sought. In addition, there is significant recycling and treatment capacity for inert waste in Sunderland, therefore recycling, treatment and recovery of waste locally could be achieved above the 70% identified by Europe and this would lower the amount of C&D waste to be sent to landfill.

Table 27 Waste Management Capacity Requirements by waste stream and management method – Scenario 1 Baseline Recycling/ Growth

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2035
Landfill (C+I and LACW)	3,568	3,361	-72,582	-73,759	-75,212
Landfill (Hazardous)	-6,650	-6,787	-6,929	-6,941	-6,963
Landfill (C,D&E)	24,154	-363,498	-431,807	-427,553	-427,553
Energy from waste (C&I)	0	0	0	0	0
Energy from waste (Hazardous)	-13,269	-13,375	-13,590	-13,745	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-456	-463	-468	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	129,823	125,836	122,469	118,989
Recycling Metals	25,106	24,468	23,368	22,295	21,043

Recycling/treatment (Hazardous)	94,695	94,677	94,641	94,615	94,579
Composting	-81	-82	-83	-83	-84
Treatment plant LACW, C&I, C&D)	126,885	125,808	123,995	122,030	119,824
Treatment Plant C,D &E	375,557	373,687	119,701	119,928	119,928
Land recovery	42,807	42,857	43,008	43,058	43,058
Transfer (Recovery LACW)	17,585	11,220	10,161	9,340	8,466
Total	**811,505**	**421,705**	**15,255**	**11,185**	**1,642**

Table 28 Waste Management Capacity Requirements by waste stream and management method – Scenario 2 Increased Recycling) / Growth

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2035
Landfill (C+I and LACW)	3,568	17,470	-48,028	-31,094	-31,761
Landfill (Hazardous)	-6,650	-6,051	-6,174	-6,186	-6,208
Landfill (C,D&E)	24,154	-347,154	-415,055	-410,800	-410,800
Energy from waste (C&I)	0	-21,639	-30,656	-51,270	-52,175
Energy from waste (Hazardous)	-13,270	-13,375	-13,590	-13,745	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-456	-463	-468	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	86,331	72,482	64,040	60,230
Recycling Metals	25,106	24,089	22,981	21,889	20,635
Recycling/treatment (Hazardous)	94,695	94,677	94,641	94,615	94,579
Composting	-81	-74	-75	-75	-76
Treatment plant LACW, C&I, C&D)	126,885	121,281	114,569	112,554	110,252
Treatment Plant C,D &E	375,557	368,696	114,585	114,812	110,252
Land recovery	42,807	42,857	43,008	43,058	43,058

Transfer (Recovery LACW)	17,585	11,220	10,161	9,340	8,466
Total	**831,972**	**377,873**	**-41,614**	**-53,321**	**-63,422**

APPENDIX 1: Waste Management Capacity Gap/Surplus for Sunderland 2015-2035

The tables below show the predicted future capacity gaps/surplus for Sunderland for each of the recycling scenarios for the growth option. Figures shown in negative represent a capacity gap, meaning new facilities may be required and positive figures represent a capacity surplus for which no new facilities are required.

The capacity gap/surplus is identified by comparing the predicted waste arisings (Detailed in Appendix 3) with known waste management capacity (Appendix 2). Where waste arisings are greater than waste management capacity, this is identified as a 'capacity gap'. Where there is sufficient waste management capacity to deal with predicted waste arisings, this is identified as a 'capacity surplus.

Baseline Recycling / Growth

Waste Management Method	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035
Landfill (C+I and LACW)	3,568	3,811	3,996	3,573	3,393	3,400	3,264	3,111	-72,068	-71,925	-72,379	-73,139	-73,023	-73,281	-73,385	-73,941	-75,212
Landfill (Hazardous)	-9,825	-6,917	-6,910	-6,786	-6,784	-6,787	-6,784	-6,784	-6,794	-6,790	-6,927	-6,937	-6,934	-6,933	-6,935	-6,943	-6,963
Landfill (C,D&E)	24,154	20,938	20,938	22,546	26,800	-363,498	-438,708	-434,453	-434,453	-430,199	-431,807	-431,807	-431,807	-427,553	-427,553	-427,553	-427,553
Energy from waste (C&I)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy from waste (Hazardous)	-13,269	-13,353	-13,281	-13,335	-13,347	-13,370	-13,370	-13,406	-13,507	-13,495	-13,566	-13,673	-13,638	-13,659	-13,683	-13,766	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-455	-453	-454	-455	-456	-456	-457	-460	-460	-462	-466	-465	-465	-466	-469	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	127,447	133,152	132,015	130,707	129,826	129,159	128,276	127,288	126,625	125,848	125,052	124,531	123,914	123,219	122,458	118,989
Recycling Metals	25,106	24,932	24,945	24,563	24,359	24,510	24,323	24,270	23,795	24,000	23,588	22,869	22,923	22,630	22,594	22,097	21,043
Recycling/treatment (Hazardous)	94,695	94,681	94,693	94,684	94,682	94,678	94,678	94,672	94,655	94,657	94,645	94,627	94,633	94,629	94,625	94,611	94,579
Composting	81,919	81,918	81,919	81,919	81,919	81,918	81,919	81,918	81,918	81,918	81,917	81,917	81,917	81,918	81,917	81,917	81,916
Treatment plant LACW, C&I, C&D)	126,885	126,829	126,671	125,912	125,492	125,888	125,476	125,452	124,667	125,087	124,421	123,112	123,136	122,544	122,528	121,648	119,824
Treatment Plant C,D &E	375,557	371,363	371,363	373,460	373,687	373,687	373,914	374,141	121,571	121,798	119,701	119,701	119,701	119,928	119,928	119,928	119,928
Land recovery	42,807	42,807	42,807	42,807	42,857	42,857	42,907	42,958	42,958	43,008	43,008	43,008	43,008	43,058	43,058	43,058	43,058
Transfer (Recovery LACW)	17,585	17,633	11,142	11,158	11,490	11,220	10,952	10,712	10,475	10,317	10,161	10,005	9,851	9,697	9,518	9,340	8,466
Total	893,505	891,635	890,981	892,061	894,800	503,874	427,275	430,411	100,045	104,542	98,148	94,268	93,834	96,428	95,367	92,385	83,642

Increased Recycling / Growth

Waste Management method	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035
Landfill (C+I and LACW)	3,568	6,819	9,371	11,349	15,080	17,505	16,506	19,116	-53,185	-50,327	-47,889	-45,609	-40,337	-36,490	-33,736	-31,177	-31,761
Landfill (Hazardous)	-6,650	-6,163	-6,155	-6,050	-6,048	-6,050	-6,047	-6,048	-6,058	-6,054	-6,172	-6,182	-6,179	-6,178	-6,180	-6,189	-6,208
Landfill (C,D&E)	24,154	21,295	26,760	35,335	41,367	-347,154	-422,364	-418,109	-418,109	-413,855	-415,055	-415,055	-415,055	-410,800	-410,800	-410,800	-410,800
Energy from waste (C&I)	0	-9,901	-14,907	-17,336	-20,059	-21,632	-23,163	-25,951	-27,702	-27,657	-30,582	-32,455	-38,810	-42,924	-47,005	-51,378	-52,175
Energy from waste (Hazardous)	-13,270	-13,353	-13,281	-13,335	-13,347	-13,370	-13,370	-13,406	-13,507	-13,495	-13,566	-13,673	-13,638	-13,659	-13,683	-13,766	-13,958
Thermal Treatment (Hazardous - no energy recovery)	-452	-455	-453	-454	-455	-456	-456	-457	-460	-460	-462	-466	-465	-465	-466	-469	-476
Recycling (Hhold, C+I , C&D, Haz)	124,776	119,442	113,320	102,524	93,148	86,338	84,464	82,365	78,886	75,492	72,528	70,373	68,688	65,623	64,888	63,999	60,230
Recycling Metals	25,106	24,560	24,573	24,185	23,979	24,131	23,943	23,889	23,410	23,616	23,204	22,478	22,532	22,237	22,201	21,699	20,635
Recycling (Hazardous)	94,695	94,681	94,693	94,684	94,682	94,678	94,678	94,672	94,655	94,657	94,645	94,627	94,633	94,629	94,625	94,611	94,579
Composting	-81	-74	-73	-73	-73	-74	-74	-74	-74	-74	-75	-75	-75	-75	-75	-75	-76
Treatment plant LACW, C&I, C&D)	126,885	127,088	125,736	123,784	122,176	121,362	120,960	119,722	117,697	118,110	114,996	113,650	113,708	113,127	113,088	112,171	110,252
Treatment Plant C,D &E	375,557	369,890	369,890	370,246	370,473	368,696	368,923	369,150	116,579	116,807	114,585	114,585	114,585	114,812	114,812	114,812	114,812
Land recovery	42,807	42,807	42,807	42,807	42,857	42,857	42,907	42,958	42,958	43,008	43,008	43,008	43,008	43,058	43,058	43,058	43,058
Transfer (Recovery LACW)	17,585	17,633	11,142	11,158	11,490	11,220	10,952	10,712	10,475	10,317	10,161	10,005	9,851	9,697	9,518	9,340	8,466
Total	**814,680**	**794,269**	**783,424**	**778,823**	**775,269**	**378,051**	**297,859**	**298,540**	**-34,435**	**-29,916**	**-40,674**	**-44,790**	**-47,552**	**-47,408**	**-49,755**	**-54,164**	**-63,422**

APPENDIX 2: Total Operating Waste Management Capacity by waste stream and management method 2015 – 2035

This table presents the findings of work to assess the capacity at operating waste management facilities within Sunderland. Information has been taken from a review of past years inputs through the EA WDI, planning permission data and more detailed review of some MRF sites.

Waste Catergory	Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
LACW only	Household Waste Recycling Site	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644	26,644
LACW, C&I	Recycling (MRFS)	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223	17,223
LACW, C&I, CD&E, Haz	Recycling (MRFS)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
LACW, C&I, CD&E	Recycling (MRFS)	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971	81,971
LACW, C&I, CDE	Transfer stations (non-hazardous)	295,967	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454	374,454
LACW, C&I, CD&E, Haz	Transfer stations	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061	4,061
CDE only	Transfer stations	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101	3,101
Haz	Transfer stations	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453	453
LACW, C&I, CDE	Treatment facility	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353	7,353
LACW, C&I, CD&E, Haz	Treatment facility	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482	113,482
CDE only	Treatment facility	477,767	477,767	477,767	477,767	477,767	477,767	477,767	477,767	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196	225,196
C&I, Haz	Treatment facility	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356	81,356
Haz	Recycling facility/treatment	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941	96,941
HIC, CDE	Non-Haz Lanfill	74,584	74,584	74,584	74,584	74,584	74,584	74,584	74,584	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CDE only	Inert LF	469,762	469,762	469,762	469,762	469,762	79,464	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDE only	Reclamation	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324	47,324
C&I, CD&E, Haz	Metal recycling	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129	74,129
Haz	Metal recycling	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86
C&I, Haz	Car Breaker	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708	1,708
C&I, Haz	Vehicle depolution facility	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
Haz	Haz Landfill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LACW, C&I	Energy recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LACW transfer (recovery)	Transfer (LACW only)	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000	82,000
Composting	LACW, C&I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	2,055,999	2,134,486	2,134,486	2,134,486	2,134,486	1,744,188	1,664,724	1,664,724	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570	1,337,570

APPENDIX 3: Waste Management Capacity Requirements by waste stream and management method 2015 – 2035- Increased Recycling / Growth

The following tables present the findings of work to assess the future amount of waste that will require management (i.e. future waste arisings), shown by waste stream and management method, within Sunderland.

Commerical waste management	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	31,601	28,794	23,786	21,434	20,218	19,124	15,500	13,165	10,838	10,852	7,261	7,288	4,841	2,417	1,212	0	0	0	0	0	0
Treatment	6,343	5,999	7,136	8,336	9,514	10,757	10,731	11,968	13,247	13,263	15,733	15,791	15,733	15,714	15,753	15,811	15,830	15,889	15,928	15,889	15,966
metal recycling	14,107	14,397	14,272	14,289	14,272	14,343	14,307	14,361	14,451	14,469	14,523	14,577	14,523	14,505	14,541	14,595	14,613	14,666	14,702	14,666	14,738
composting	81	74	73	73	73	74	74	74	74	74	75	75	75	75	75	75	75	75	76	75	76
Non haz Landfill	35,008	33,593	30,922	28,579	26,164	23,906	26,230	25,132	24,085	22,909	21,784	20,650	16,943	14,505	13,329	12,162	12,177	12,222	12,252	12,222	12,282
MRF	31,789	29,994	30,922	32,151	33,300	35,858	36,961	38,297	40,945	42,201	43,569	44,945	45,989	48,350	48,469	48,649	48,709	48,888	49,008	48,888	49,128
Recovery	0	8,398	11,893	14,289	15,461	15,539	15,500	16,755	16,860	16,880	18,154	18,221	22,994	25,384	27,870	30,406	30,443	30,555	30,630	30,555	30,705
Industrial waste management	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	8,485	6,009	3,014	3,047	1,533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Treatment	68,964	69,106	69,320	70,073	70,502	70,073	70,502	70,502	71,249	70,819	71,463	72,751	72,751	73,351	73,351	74,210	73,781	74,256	74,900	75,115	75,973
metal recycling	35,735	36,055	36,167	36,560	36,784	36,560	36,784	36,784	37,173	36,949	37,285	37,957	37,957	38,270	38,270	38,718	38,494	38,742	39,078	39,190	39,638
composting	2,207	2,253	2,260	2,285	2,299	2,285	2,299	2,299	2,323	2,309	2,330	2,372	2,372	2,392	2,392	2,420	2,406	2,421	2,442	2,449	2,477
Non haz landfill	32,833	31,548	31,646	31,990	30,653	30,466	29,120	27,588	26,331	24,633	23,303	22,142	20,560	19,135	17,541	16,133	16,039	16,143	16,283	16,329	16,516
MRF	2,007	3,005	4,521	4,570	6,131	6,093	6,131	6,131	6,196	7,698	7,768	7,908	7,908	7,973	7,973	8,066	8,020	8,071	8,141	8,165	8,258
Recovery	0	1,502	3,014	3,047	4,598	6,093	7,663	9,196	10,842	10,777	12,428	14,234	15,815	17,541	19,135	20,972	20,851	20,986	21,167	21,228	21,471
	0																				
C&D	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	22,522	14,574	10,930	7,109	3,555	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Treatment	81,774	87,441	87,441	87,086	87,086	88,863	88,863	88,863	88,863	88,863	91,084	91,084	91,084	91,084	91,084	91,084	91,084	91,084	91,084	91,084	91,084
CA Site	214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
metal recycling	975	911	911	889	889	889	889	889	889	889	911	911	911	911	911	911	911	911	911	911	911
Non haz landfill	62,702	61,937	54,651	35,545	31,991	26,659	21,327	21,327	21,327	21,327	21,860	21,860	21,860	21,860	21,860	21,860	21,860	21,860	21,860	21,860	21,860
Inert landfill	20	3,643	5,465	15,995	17,773	21,327	26,659	26,659	26,659	26,659	27,325	27,325	27,325	27,325	27,325	27,325	27,325	27,325	27,325	27,325	27,325
Hazardous landfill	5,050	4,554	4,554	4,443	4,443	4,443	4,443	4,443	4,443	4,443	4,554	4,554	4,554	4,554	4,554	4,554	4,554	4,554	4,554	4,554	4,554
MRF	25	9,108	18,217	26,659	31,991	35,545	35,545	35,545	35,545	35,545	36,434	36,434	36,434	36,434	36,434	36,434	36,434	36,434	36,434	36,434	36,434
Excavation waste	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	33,912	33,912	33,912	33,912	33,536	33,536	33,159	32,782	32,782	32,405	32,405	32,405	32,405	32,028	32,028	32,028	32,028	32,028	32,028	32,028	32,028
Treatment	20,435	20,435	20,435	20,435	20,208	20,208	19,981	19,754	19,754	19,527	19,527	19,527	19,527	19,300	19,300	19,300	19,300	19,300	19,300	19,300	19,300
Reclamation	4,517	4,517	4,517	4,517	4,467	4,467	4,416	4,366	4,366	4,316	4,316	4,316	4,316	4,266	4,266	4,266	4,266	4,266	4,266	4,266	4,266
Non haz landfill	281,329	281,329	281,329	281,329	278,203	278,203	275,078	271,952	271,952	268,826	268,826	268,826	268,826	265,700	265,700	265,700	265,700	265,700	265,700	265,700	265,700
Inert landfill	101,557	101,557	101,557	101,557	100,429	100,429	99,300	98,172	98,172	97,043	97,043	97,043	97,043	95,915	95,915	95,915	95,915	95,915	95,915	95,915	95,915
Haz landfill	275	275	275	275	272	272	269	266	266	263	263	263	263	260	260	260	260	260	260	260	260
MRF	123	123	123	123	122	122	120	119	119	118	118	118	118	116	116	116	116	116	116	116	116
Hazardous waste	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Hazardous waste																					
Incineration without energy recovery	452	455	453	454	455	456	456	457	460	460	462	466	465	465	466	469	469	471	473	472	476
hazardous Landfill	1,325	1,333	1,326	1,331	1,332	1,335	1,335	1,338	1,348	1,347	1,354	1,365	1,361	1,364	1,366	1,374	1,373	1,379	1,385	1,384	1,393
Recovery	9,476	9,535	9,485	9,523	9,531	9,548	9,548	9,574	9,646	9,637	9,688	9,764	9,739	9,754	9,771	9,830	9,822	9,866	9,909	9,900	9,968
Transfer (D)	1,718	1,728	1,719	1,726	1,728	1,731	1,731	1,735	1,748	1,747	1,756	1,770	1,765	1,768	1,771	1,782	1,780	1,788	1,796	1,794	1,807
Transfer (R)	3,793	3,817	3,797	3,812	3,816	3,822	3,822	3,833	3,861	3,858	3,878	3,909	3,899	3,905	3,912	3,935	3,932	3,950	3,967	3,963	3,990
Treatment	2,246	2,260	2,248	2,257	2,259	2,263	2,263	2,269	2,286	2,284	2,296	2,314	2,308	2,312	2,316	2,330	2,328	2,339	2,349	2,347	2,363

Waste Management Capacity Requirements (tonnes) by waste stream and management method 2015 – 2035 Baseline Recycling / Growth

Commerical waste management		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	26.6%	31,601	31,879	31,601	31,641	31,601	31,760	31,680	31,800	31,998	32,038	32,157	32,277	32,157	32,118	32,197	32,316	32,356	32,475	32,555	32,475	32,634
Treatment	5.3%	6,343	6,399	6,343	6,351	6,343	6,375	6,359	6,383	6,423	6,431	6,455	6,479	6,455	6,447	6,463	6,487	6,495	6,519	6,535	6,519	6,551
metal recycling	11.9%	14,107	14,231	14,107	14,124	14,107	14,178	14,142	14,195	14,284	14,302	14,355	14,408	14,355	14,337	14,373	14,426	14,444	14,497	14,533	14,497	14,568
composting	0.1%	81	82	81	81	81	82	81	82	82	82	83	83	83	82	83	83	83	83	84	83	84
Non haz Landfill	29.4%	35,008	35,317	35,008	35,052	35,008	35,184	35,096	35,229	35,449	35,493	35,625	35,757	35,625	35,581	35,669	35,801	35,845	35,977	36,065	35,977	36,153
MRF	26.7%	31,789	32,069	31,789	31,829	31,789	31,949	31,869	31,989	32,189	32,229	32,349	32,469	32,349	32,309	32,389	32,509	32,549	32,669	32,748	32,669	32,828
Recovery	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial waste management																						
Management route	% of total waste arising	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	5.6%	8,485	8,485	8,511	8,604	8,656	8,604	8,656	8,656	8,748	8,695	8,774	8,932	8,932	9,006	9,006	9,112	9,059	9,117	9,196	9,223	9,328
Treatment	45.9%	68,964	68,964	69,178	69,929	70,357	69,929	70,357	70,357	71,102	70,674	71,316	72,601	72,601	73,201	73,201	74,057	73,629	74,104	74,746	74,960	75,817
metal recycling	23.8%	35,735	35,735	35,846	36,235	36,457	36,235	36,457	36,457	36,843	36,621	36,954	37,620	37,620	37,931	37,931	38,375	38,153	38,399	38,732	38,843	39,287
composting	1.5%	2,207	2,207	2,213	2,237	2,251	2,237	2,251	2,251	2,275	2,261	2,282	2,323	2,323	2,342	2,342	2,370	2,356	2,371	2,392	2,398	2,426
Non haz landfill	21.9%	32,833	32,833	32,935	33,292	33,496	33,292	33,496	33,496	33,851	33,647	33,953	34,565	34,565	34,850	34,850	35,258	35,054	35,280	35,586	35,688	36,096
MRF	1.3%	2,007	2,007	2,013	2,035	2,047	2,035	2,047	2,047	2,069	2,056	2,075	2,112	2,112	2,130	2,130	2,155	2,142	2,156	2,175	2,181	2,206
Recovery	0.0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Management route C&D	**% of total waste arising**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	13.00%	22,522	23,677	23,677	23,100	23,100	23,100	23,100	23,100	23,100	23,100	23,677	23,677	23,677	23,677	23,677	23,677	23,677	23,677	23,677	23,677	23,677
Treatment	47.19%	81,774	85,968	85,968	83,871	83,871	83,871	83,871	83,871	83,871	83,871	85,968	85,968	85,968	85,968	85,968	85,968	85,968	85,968	85,968	85,968	85,968
CA Site	0.12%	214	225	225	220	220	220	220	220	220	220	225	225	225	225	225	225	225	225	225	225	225
metal recycling	0.56%	975	1,025	1,025	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,025	1,025	1,025	1,025	1,025	1,025	1,025	1,025	1,025	1,025	1,025
Non haz landfill	36.18%	62,702	65,917	65,917	64,309	64,309	64,309	64,309	64,309	64,309	64,309	65,917	65,917	65,917	65,917	65,917	65,917	65,917	65,917	65,917	65,917	65,917
Inert landfill	0.01%	20	21	21	20	20	20	20	20	20	20	21	21	21	21	21	21	21	21	21	21	21
Hazardous landfill	2.91%	5,050	5,309	5,309	5,180	5,180	5,180	5,180	5,180	5,180	5,180	5,309	5,309	5,309	5,309	5,309	5,309	5,309	5,309	5,309	5,309	5,309
MRF	0.01%	25	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Excavation waste																						
Management route E	**% of total waste arising**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Transfer	7.67%	33,912	33,912	33,912	33,912	33,536	33,536	33,159	32,782	32,782	32,405	32,405	32,405	32,405	32,028	32,028	32,028	32,028	32,028	32,028	32,028	32,028
Treatment	4.62%	20,435	20,435	20,435	20,435	20,208	20,208	19,981	19,754	19,754	19,527	19,527	19,527	19,527	19,300	19,300	19,300	19,300	19,300	19,300	19,300	19,300
Reclamation	1.02%	4,517	4,517	4,517	4,517	4,467	4,467	4,416	4,366	4,366	4,316	4,316	4,316	4,316	4,266	4,266	4,266	4,266	4,266	4,266	4,266	4,266
Non haz landfill	63.63%	281,329	281,329	281,329	281,329	278,203	278,203	275,078	271,952	271,952	268,826	268,826	268,826	268,826	265,700	265,700	265,700	265,700	265,700	265,700	265,700	265,700
Inert landfill	22.97%	101,557	101,557	101,557	101,557	100,429	100,429	99,300	98,172	98,172	97,043	97,043	97,043	97,043	95,915	95,915	95,915	95,915	95,915	95,915	95,915	95,915
Haz landfill	0.06%	275	275	275	275	272	272	269	266	266	263	263	263	263	260	260	260	260	260	260	260	260
MRF	0.03%	123	123	123	123	122	122	120	119	119	118	118	118	118	116	116	116	116	116	116	116	116
Hazardous waste		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Hazardous waste	**% of total waste arising**																					
Incineration without energy recovery	2.38%	452	455	453	454	455	456	456	457	460	460	462	466	465	465	466	469	469	471	473	472	476
hazardous Landfill	6.97%	1,325	1,333	1,326	1,331	1,332	1,335	1,335	1,338	1,348	1,347	1,354	1,365	1,361	1,364	1,366	1,374	1,373	1,379	1,385	1,384	1,393
Recovery	49.85%	9,476	9,535	9,485	9,523	9,531	9,548	9,548	9,574	9,646	9,637	9,688	9,764	9,739	9,754	9,771	9,830	9,822	9,866	9,909	9,900	9,968
Transfer (D)	9.03%	1,717	1,728	1,719	1,726	1,728	1,731	1,731	1,735	1,748	1,747	1,756	1,770	1,765	1,768	1,771	1,782	1,780	1,788	1,796	1,794	1,807
Transfer (R)	19.96%	3,793	3,817	3,797	3,812	3,816	3,822	3,822	3,833	3,861	3,858	3,878	3,909	3,899	3,905	3,912	3,935	3,932	3,950	3,967	3,963	3,990
Treatment	11.82%	2,246	2,260	2,248	2,257	2,259	2,263	2,263	2,269	2,286	2,284	2,296	2,314	2,308	2,312	2,316	2,330	2,328	2,339	2,349	2,347	2,363

APPENDIX 4: Methodology for Calculating Commercial and Industrial Waste Arisings

This appendix presents the proposed approach to assessing levels of C&I waste over the plan period for Sunderland.

In 2014, Defra employed consultants Jacobs to prepare a methodology for calculating arisings of C&I waste. The Defra report[9] sets out a 5-step approach to calculating arisings:

1) Calculate waste arisings sent to permitted facilities;

2) Calculate waste arisings received at incineration facilities;

3) Estimate waste arisings handled at exempt facilities;

4) Calculate waste arisings exported directly from the UK; and

5) Map waste to the sector that generated it and validate.

The method proposed for Sunderland does not include carrying out step 4. This is because it is not considered relevant to the arisings currently managed by the authorities (as waste is not known to be exported from Sunderland to countries abroad) and is therefore not a dataset which will impact on the arisings calculations.

Defra step 5 involves mapping waste to sector. However, in order to better understand what is happening to waste and to identify future requirements, the proposed approach for Sunderland maps arisings to *waste management route* rather than sector.

Therefore, the proposed approach is based on steps 1-3 of the Defra method, as well as step 5 which is tailored to suit the requirements of the NY Sub-region.

The principle raw data sources for estimating C&I waste arisings are:

- Environment Agency (EA) Waste Data Interrogator (WDI)
- EA Hazardous Waste Data Interrogator (WDI)
- EA list of exempt sites (not provided b y the EA)
- EA data waste received at Incineration facilities (NO facilities identified in Sunderland)

Step 1 Calculation of waste arisings sent to permitted facilities

There are two parts to Step 1:

Calculate known C&I waste arisings managed at facilities within Sunderland; and estimate the amount of 'unknown' waste arisings that are likely to be C&I waste arisings managed at facilities within Sunderland.

Calculating 'Known' Arisings

[9] New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England, DEFRA, Project Report, Final, EV0804, August 2014

Information used to calculate arisings sent to permitted facilities within the NY Sub-region is taken from the EA waste data Interrogator (WDI). This is done by assessing data for the whole of England by *origin*. The WDI has been used to extract information on all waste managed in England in 2014,including the details of the site (e.g. address, operator and management type) and the authority where the waste was managed, as well as information on the origin of the waste. The latter enables information to be gathered on the waste managed with Sunderland that also arose in the Sunderland, as well as how much waste arose in the Sunderland and was managed elsewhere. This gives a total figure for the amount of waste produced in Sunderland.

'Unknown' Arisings

Within the WDI dataset there is a level of 'unknown' waste arisings managed in Sunderland which arose within the North East Region. However, the dataset does not reveal how much of this waste actually originated in Sunderland. There is also an 'unknown' amount of waste arisings managed outside the North East Region but which originate from within the Region. It is likely that some of these 'unknown' arisings are from Sunderland and therefore a methodology for attributing some aspects of the arisings to Sunderland is required.

The proposed approach to calculating these unknown arisings is to look first at the makeup of the unknown arisings to match it back to the waste stream it originated from i.e. LACW, CD&E, C&I. This can be broken down to the constituent waste streams. This then allows for each waste stream to be looked at separately and conclusions made about that arising and for the removal of any waste which has already been accounted for elsewhere i.e. LACW.

The following points about each waste stream should be noted:

The waste coded as 'municipal waste' is already accounted for as part of the arisings for LACW obtained from Sunderland's WDA team. LACW waste arisings will need to be removed from this figure to prevent double counting of this waste stream.

Any waste identified as CD&E waste does not need to be included in the estimation for C&I waste and is therefore excluded further from calculation of this waste stream and included as part of the CD&E stream[10].

For Sunderland the waste arising in the North East that was managed in Sunderland has been assumed to arise in Sunderland, and these figures have subsequently been added to the total for the waste stream.

Adjustments

The Defra report looked at 4 years worth of data from 2009 to 2012 by individual EWC code and waste management method. Waste passing through a waste transfer station will be recorded more than once in the WDI, for example at a transfer facility and then again at a processing facility. Therefore, to remove double counting of such arisings, information on waste managed at transfer facilities is removed from calculations except where they have a destination outside of England, as waste going to these sites would not be picked up at other facilities recorded within the WDI.

The Defra report also removes tonnages of waste with an origin outside of England, however, as mentioned previously, this study looks at only Sunderland and its arisings and therefore this is not an issue for this assessment.

[10] The CD&E element of the uncoded Yorkshire and Humberside waste is added to the total CD&E calculations

Step 2 Calculation of waste arisings received at incineration facilities

Information used to calculate arisings received at incineration facilities has been obtained on request from the Environment Agency because this information is not publically available. Information is provided on the quantities managed by European Waste Classification (EWC) and this is used to identify what waste streams the material come from.

This dataset includes information on waste received at the following types of facility:

- Animal By-Products;
- Animal Carcasses;
- Clinical;
- Co-Incineration of hazardous waste;
- Co-Incineration of non-hazardous waste;
- Hazardous;
- Municipal and/or Industrial & Commercial; and
- Sewage Sludge.

The tonnages received are recorded against EWC codes which allows for removal of waste attributed to household waste. The data received from the EA indicated that there are no such facilities in Sunderland.

Step 3 Estimates of waste arisings handled at exempt facilities

A waste exemption is a waste operation that is exempt from requiring an environmental permit. Exemptions can involve the use, treatment, disposal and storage of waste. Since 2010 there has been a significant change to the waste exemptions system with exemptions being redefined with greater clarity over the types and quantities of waste that can be used under each exemption. Each exemption now lasts for a period of 3 years, after which, if an operator wishes to continue, they need to reapply. However, there is no requirement for an exemption which is completed within the 3 years to be removed from the register.

There are 4 groups of exemptions:

- Using waste (U codes);
- Treating waste (T codes);
- Disposing of waste (D codes); and
- Storing waste (S codes).

The EA hold records on exempt facilities and, like the data on incineration facilities, this is not publicly available and is obtained on request. This information contains a list of exempt sites operating in the sub-region and the level of waste covered by the exemption (i.e. the maximum amount of waste permitted to be handled at an exempt site each year). However, because this is an exemption, there are no detailed records to say how much waste has been received at the site as input records are not required.

The Defra report suggests the following approach be used when estimating the amount of C&I waste managed through exempt sites. The exemptions should be reviewed to identify those exempt sites which:

- are likely to be handling waste that is not captured through other facilities/datasets;
- are likely to relate to non-C&I waste generation activities (e.g. construction and demolition waste);
- result in low volumes of waste being handled; or
- have low numbers of relevant exemptions.

The Defra approach identifies 21 exemption paragraphs from a potential total of 57 which are considered to contribute to C&I waste arisings. Of these, T4 - preparatory treatments (bailing, sorting, shredding etc) - is considered the most important and likely to handle the most waste. The Defra approach is to estimate a throughput figure per facility as this dataset was done for England, however as this is for NY sub-region, the actual throughputs can be used.

The Defra report also includes an approach to removing any waste from the exemptions information which would be identified as being household waste from estimates of arisings. To undertake this work, as request for this information was made to the EA but this data was not received.

Step 4 Calculate waste arisings exported directly from the UK

As set out above, Step 4 of the Defra approach is not considered relevant to the NE Sub-region.

Step 5 Mapping waste to the sector that generated it and validate.

This aspect of the assessment is carried out as the data is being assessed. As stated above, the Defra approach is to map waste arisings to the EWC. This allows the data to be mapped back to the business sector which produced the waste and does not look at how the waste is managed.

To allow the data to be used to assist in the calculation of waste arisings and to identify how this was managed the proposed approach matches the waste arisings to the waste management route. This is more appropriate for the NY Sub-region because the Defra approach does not allow for any estimate of how waste was managed at permitted facilities. This means, using just the Defra approach, no assessment can be made on how much was recycled, reused, disposed or incinerated. Using the waste management route, an assessment can be made and is considered more useful in waste planning and for future monitoring.

Total C&I arisings.

The total arisings are obtained by summing up the totals from steps 1-3. Step 4, as discussed above, was not undertaken for this study as it was not considered relevant in the context of Sunderland.

APPENDIX 7: Movement of Household, Commercial and Industrial Wastes

Exports exceeding 1,000 tonnes – (Total 162,531) Source EA WDI 2014

Authority	Household, Industrial and Commercial Waste
County Durham	14,218
Cumbria	1,843
Gateshead	40,434
Hartlepool	20,239
Lancashire	1,622
Middlesbrough	1,887
North Tyneside	43,650
Northumberland	1,925
Redcar and Cleveland	11,496
Stockton-on-Tees	25,217

Imports exceeding 1,000 tonnes (Total 327,269 tonnes) Source EA WDI 2015

Authority	Household, Industrial and Commercial Waste
County Durham	124,155
Darlington	6,723
Derbyshire CC	1,014
Gateshead	82,621
Hertfordshire	4,923
Kingston Upon Hull	2,619
Leeds	3,478
Luton	1,623
Middlesbrough	1,141
Newcastle Upon Tyne WPA	17,796
North Tyneside	19,442
Northumberland	23,046
Scottish WPA	34,155
South Tyneside	4,533

APPENDIX 8: Movement of Construction and Demolition Wastes

Exports exceeding 1,000 tonnes – (Total 182,943) Source EA WDI 2015

Authority	CONSTRUCTION AND DEMOLITION WASTES
County Durham	76,354
Gateshead	76,317
Hartlepool	16,220
Newcastle Upon Tyne WPA	4,404
Northamptonshire WPA	3,911
Northumberland WPA	3,530
Stockton-on-Tees WPA	2,207

Imports exceeding 1,000 tonnes (Total 331,841 tonnes) Source EA WDI 2015

Authority	CONSTRUCTION AND DEMOLITION WASTES
County Durham	100,563
Gateshead	77,288
Hartlepool	3,868
Newcastle Upon Tyne	75,672
North Tyneside	28,960
Northumberland	12,688
South Tyneside	31,604
Stockton-on Tees	1,198

APPENDIX 9: Movement of Hazardous Wastes for Sunderland

Exports exceeding 100 tonnes – (Total 16,599 tonnes)

Authority	Hazardous Waste
Northamptonshire	107
Salford	155
St. Helens	162
North Yorkshire	163
Nottinghamshire	176
Darlington	200
East Sussex	210
Derbyshire	258
Newcastle Upon Tyne	272
Hartlepool	279
Wakefield	285
Sefton	319
West Berkshire	372
Cheshire West and Chester	378
Liverpool	380
Walsall	479
Knowsley	500
Rotherham	638
Gateshead	648
North Tyneside	679
Middlesbrough	846
Redcar and Cleveland	1,240
Stockton-on-Tees	1,933
Lancashire	5,920

Imports exceeding 100 tonnes (Total 38,624 tonnes)

Authority	Hazardous Waste
Redcar and Cleveland	101
Lincolnshire	129
North East Lincolnshire	133
Stockton-on-Tees	148
Gateshead	169
Northumberland	231
East Riding of Yorkshire	235
Kirklees	455
County Durham	708
North Tyneside	806
Wakefield	1,260
Falkirk	34,248

APPENDIX 10: Sunderland Waste Sites (WDI 2015)

General waste sites.

Site Name	Site Operator	Waste Facility Type
Springwell Quarry (Non Haz WT)	Thompsons of Prudhoe	Aggregate recycling and treatment
Hendon S T W	Northumbrian Water Ltd	Biological Treatment
Washington Sewage Treatment Works	Northumbrian Water Ltd	Biological Treatment
Hanrattys Of Sunderland	Pout & Foster Ltd	Car Breaker
Lisburn Autos	Khan S	Car Breaker
Wellington Lane Auto Dismantlers	Mr K Barkley	Car Breaker
J C Atkinson And Son Ltd	J C Atkinson And Son Ltd	Clinical Waste Transfer
Tradebe solvent recycling	Solvent Resource Management Ltd	Haz Waste recyling
Ocean Terminal (Tradebe Solvent Recycling Ltd)	Tradebe Solvent Recycling Ltd	Haz Waste Transfer
Hylton Bank Transfer Station	Sunderland City Council	Haz Waste Transfer
Safety Kleen	Safety- Kleen U. K. Limited	Haz Waste Transfer
Gentoo Houghton Depot	Gentoo Group Limited	Haz Waste Transfer
Gentoo Washington Depot	Gentoo Group Limited	Haz Waste Transfer
Leechmere Waste Transfer Station Facility	Gentoo Group Limited	Haz Waste Transfer
Field House Quarry	A Mc Call & Sons (Houghton-le- Spring) Ltd	Inert LF
Swinney Skip Hire & Haulage	Ian Rawding & Robert Burnett	Inert Waste Transfer
Wilf Husband - Hetton Moor Farm Quarry	Miss Janette Husband And Mr Wilfred Paul Husband	Inert Waste Transfer / Treatment
Monument Park	Premier Waste Recycling Limited	Material Recycling Facility
Stephenson Road Recycling Facility (Saica Natur)	Saica Natur U K Limited	Material Recycling Facility
Materials Recycling Facility (Niramax Group Ltd)	Niramax Group Ltd	Material Recycling Facility
Mill House Scrapyard	Mr David Auld	Metal Recycling
Europa Works	European Metal Recycling Ltd	Metal Recycling
Hay Street , ward brother steel	Ward Bros. (Steel) Limited	Metal Recycling
T Curry & Son (Metal Recyling Site)	T Curry & Son	Metal Recycling
Hendon Scarp Yard	Ward Bros. (Steel) Limited	Metal Recycling

Site Name	Site Operator	Waste Facility Type
Thompsons of Prudhow Springwell Quarry (Non Haz LF)	Thompsons of Prudhow	Non Hazardous LF
Houghton Quarry Landfill Site	Biffa Waste Services Ltd	Non Hazardous LF
Salisbury Street Depot	Stuart McKensie	Non-Haz Waste Transfer
T Curry & Son (Non-Haz WT)	T Curry & Son	Non-Haz Waste Transfer
Thompson Waste Ltd	Thompson Waste Limited	Non-Haz Waste Transfer
Timberpak Ltd	Timberpak Limited	Non-Haz Waste Transfer
Washington Transfer Station	Green North East Trading Bidco Limited	Non-Haz Waste Transfer
Sunderland Skips Ltd	Sunderland Skip Services Ltd	Non-Haz Waste Transfer
Max Recycle UK Ltd	Max Recycle U K Ltd	Non-Haz Waste Transfer / Treatment
Derek Purvis Skip Hire	Derek Purvis	Non-Haz Waste Transfer/Treatment
5b Freezemoore Road	Grab & Deliver Ltd	Physical Treatment
Port of Sunderland	Northumbrain rds Ltd	Physical Treatment
Hendon Dock Process Plant	Tradebe Solvent Recycling Limited	Physical-Chemical Treatment
Eppleton Quarry	Hall Construction Services Ltd	Reclamation
H D H Car And Van Breakers	Dale Wallace	Vehicle Depollution Facility
Pottery Road, Low Southwick	Commercial Vehicle Exports (Northern) Limited	Vehicle Depollution Facility
Sunderland Recycling Centre	Obrien waste recycling solutions	Waste recycling , Transfer & Treatment

LACW Waste Sites

Site Name	Site Operator	Waste Facility Type
Campground Waste Recycling Centre	Gateshead Metropolitan Borough Council	HWRC
Beach Street Waste Reception Site	Sunderland City Council	CA Site
Jack Crawford House W T S	Suez Recycling And Recovery U K Ltd	Waste transfer (LACW)
Campground Waste Transfer Station	Suez Recycling And Recovery North East Ltd	Non-Haz Waste Transfer

APPENDIX 11: Glossary

Acronym	Term	Definition
AD	Anaerobic Digestion	A process where biodegradable material is encouraged to break down in the absence of oxygen. Material is placed into a closed vessel and in controlled conditions the waste breaks down to produce a mixture of carbon dioxide, methane and solids/liquids known as digestate which can be used for fertiliser, compost or Solid Recovered Fuel (SRF)
APCRs	Air Pollution Control Residues	Bi-product produced from treatment of wastes through an energy from waste plant
C&I	Commercial and Industrial Waste	Waste generated by shops, offices, factories and other businesses and industry
-	Composting	A biological process which takes place in the presence of oxygen in which organic wastes, such as garden and kitchen waste, are converted into a stable, granular material. This can be applied to land to improve soil structure and enrich nutrient content.
CD&E	Construction Demolition and Excavation Waste	Controlled waste arising from the construction, repair, maintenance and demolition of buildings and structures.
EfW	Energy from Waste	The controlled high temperature burning of waste. Energy recovery is achieved by utilising the calorific value of the materials burnt. The most efficient facilities combine the production of heat (usually in the form of steam) with power (electricity) which is usually referred to as combined heat and power (CHP).
ELV	End of Life Vehicle	Motor vehicles that fall into the category of 'waste' as defined by the EU Waste Directive.
EA	Environment Agency	Agency which regulates waste management activities by issuing waste management licenses and other permits and exemptions. The EA also conducts national surveys of waste arising and waste facilities.
GVA	Gross Value Added	A measure of the value of the goods and services produced in the economy.
-	Hazardous waste	A sub category of all waste streams, where the material produced is hazardous and requires specialist treatment

Acronym	Term	Definition
-	Inert waste	Inert waste is waste that does not undergo significant physical, chemical or biological changes following disposal and does not adversely affect other matters that it may come into contact with, and does not endanger surface or groundwater.
-	Landfill	Restoration of land (for example, a former quarry) using waste.
-	Land recovery	The restoration of land using inert waste to enable the land to be used for a new purpose.
LACW	Local Authority Collected Waste	Previously known as municipal waste, LACW refers to all waste collected by a Local Authority.
LACW(H)	Local Authority Collected Waste Household	Household waste collected by a Local Authority
LACW (Other)	Local Authority Collected Waste other	Non-household waste collected by a Local Authority (such as street cleaning collection, rubble from household waste recycling sites).
LACW (Secondary)	Local Authority Collected Waste secondary	Secondary bi-products from initial treatment of LACW household waste through EfW producing metals, APCRs and bottom ash
LLW	Low level Radioactive Waste	Radioactive waste having a radioactive content not exceeding four GBq/te of alpha or 12 GBq/te of beta/gamma activity.
	Recycling	Turning waste into a new substance or product includes composting if it meets quality protocols.
ROCs	Renewable Obligations Certificates	Green certificates issued to operators of accredited renewable generating stations for the eligible renewable electricity they generate.
SSTW	Sewage Sludge Treatment Works	Infrastructure providing initial treatment of material delivered by foul sewer from homes, businesses and the network draining the wider public realm.
	Thermal Treatment without energy recovery	Management of waste by incineration without use of facilities to capture heat given off for the purposes of energy recovery. Some facilities using this technology to manage LACW still exist while others involve very high temperature incineration due to the properties of specific wastes (ie. clinical, animal by-products and other hazardous wastes)
	Transfer/Transfer Station	Facility for receiving and ‘bulking up’ waste before its onward journey for treatment, recycling or disposal elsewhere.
	Treatment	Physical, chemical, biological or thermal waste management processes which change the characteristics of waste.

Acronym	Term	Definition
-	Waste facilities	Waste facilities include: Transfer stations Energy from Waste (Incineration with energy recovery) Recycling facility Treatment facility (e.g. mechanical biological or mechanical heat treatment) Household waste recycling centre Landfill/landraise Materials recovery facility
-	Waste streams	Waste streams include: LACW C&I CD&E Hazardous Agricultural LLW Waste Water/Sewage Sludge
-	Waste management routes	Waste management routes include: Recycling Composting (in vessel or open windrow) Treatment (recovery via thermal, physical, chemical or biological treatment) Landfill/landraise Transfer onwards to other waste management facility
WDI/HWDI	Waste Data Interrogator / Hazardous Waste Data Interrogator	Data tool prepared by the EA based on information provided by waste operators. It allows for assessments of strategic waste and general waste flow.
WEEE	Waste Electrical and Electronic Equipment	Term used to describe old, end-of-life or discarded appliances using electricity.
WWTW	Waste Water Treatment Works	Infrastructure providing initial treatment of material delivered by foul sewer from homes, businesses and the network draining the wider public realm.

APPENDIX 12: Data Source References

Commercial and Industrial Waste

Environment Agency Waste Data Interrogator 2014 https://data.gov.uk/dataset/waste-data-interrogator-2014

Local Authority Collected Waste

Waste Data Flow - www.wastedataflow.org

Information on waste arisings and growth forecasts – www.northyorks.gov.uk

Hazardous Waste

Environment Agency Hazardous Waste Data Interrogator 2014 - https://data.gov.uk/dataset/hazardous-waste-interrogator-2014

Construction, Demolition and Excavation Waste

Environment Agency Waste Data Interrogator 2014 https://data.gov.uk/dataset/waste-data-interrogator-2014

Agricultural Waste

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

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