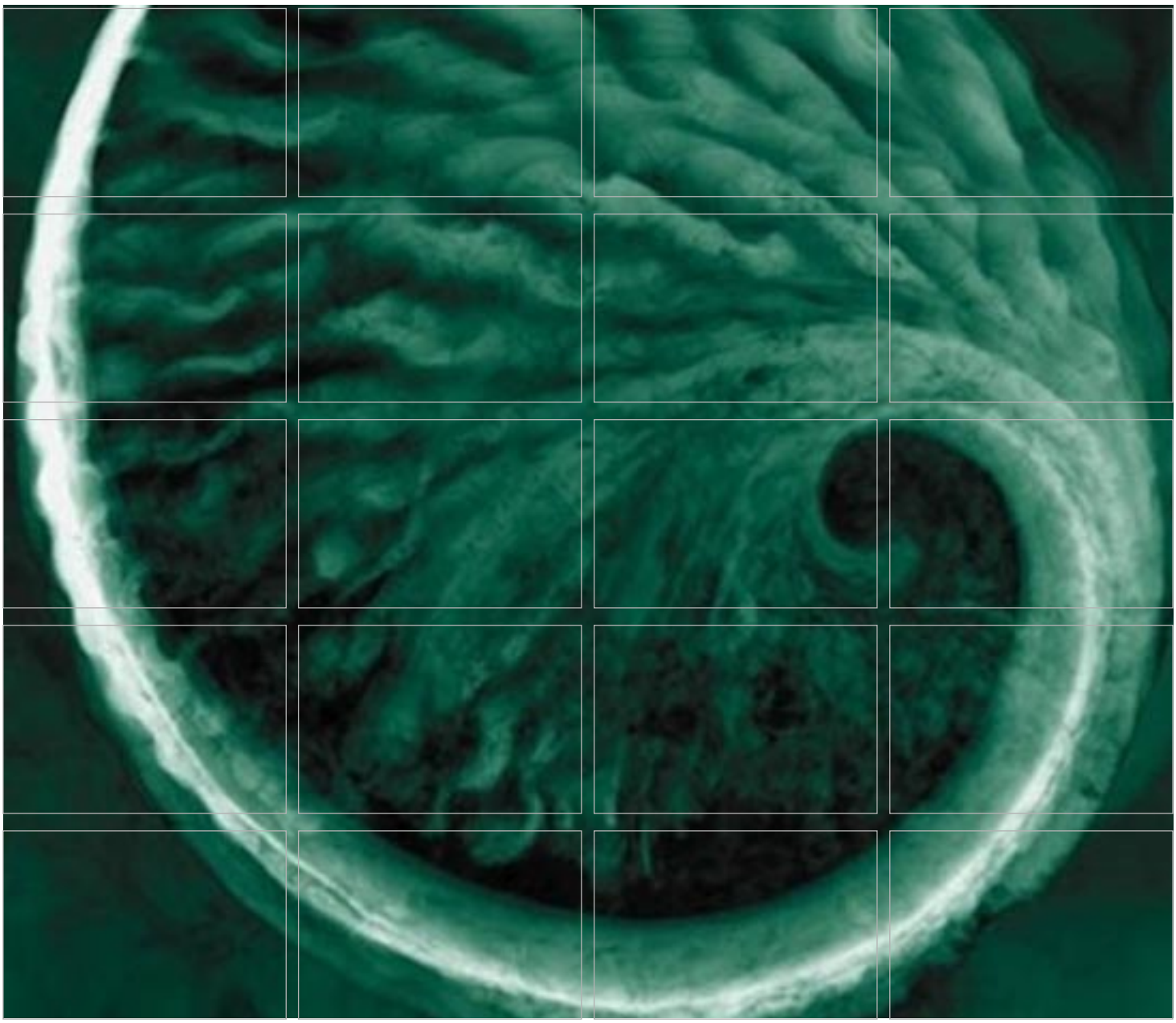


Thurrock Council

Thurrock Waste Management Capacity Needs Assessment – 2010 Update

FINAL REPORT

November 2010

www.erm.com

Delivering sustainable solutions in a more competitive world

ERM

Thurrock Council

Thurrock Waste Management Capacity Needs Assessment - 2010 Update

Final Report

Reference: 0121564

November 2010

Prepared by: Hannah Beeby

For and on behalf of
Environmental Resources Management Limited

Approved by: Kirsten Berry

Signed:
Position: Partner

Date: 8th November 2010

Environmental Resources Management Limited
Incorporated in the United Kingdom with registration number 1014622
Registered Office: 2nd Floor, Exchequer Crt, 33 St Mary Axe, London, EC3A 8AA

CONTENTS

1 INTRODUCTION

1.1 REPORT SCOPE

This report is an update to the *Waste Management Need Assessment Report* from 2007 and also to the *Thurrock Waste Management Capacity Needs Assessment – 2009 Update Report* from September 2009, both produced by Environmental Resources Management Limited (ERM) for Thurrock Council.

This 2010 update supersedes the 2009 update and supplements the original 2007 report.

This report provides updated information on:

- waste arisings;
- estimated current waste management capacity; and
- capacity gap analysis.

Data on both waste arisings and waste capacity have been provided by Thurrock Council for use in this report, waste arising data also comes from the RSS Review technical evidence base.

Where data from the 2009 update is retained, that is restated in this 2010 update. The reader should be able to gain a full understanding of the waste management need of Thurrock by reading this 2010 update and the original 2007 report.

This study covers the period up to 2026/27. The purpose of this report is to update the evidence base to inform the waste policies and the drafting of the Thurrock Local Development Framework, both in terms of performance and capacity required in the future.

1.2 REPORT STRUCTURE

This report is structured according to the following format:

- Section 2 – Sources of Data and Targets;
- Section 3 – Waste Arisings Update;
- Section 4 – Capacity Data Update;
- Section 5 - Capacity Gap Analysis; and
- Section 6 –Conclusions

2 SOURCES OF DATA AND TARGETS

2.1 REGIONAL DATA

2.1.1 Revocation of the Regional Spatial Strategies

As of the 06 July 2010, Regional Spatial Strategies (RSS) were revoked with immediate effect and therefore no longer form part of the adopted development plan.

In the wake of the revocation of the RSS, a letter from the Department of Communities and Local Government (DCLG) Chief Planning Officer stated that Planning Authorities should continue to develop their waste plans. Data and information which was collated by the local authority and industry and other public bodies who form the Regional Waste Technical Advisory Bodies (RTAB) is still material during this transitional period.

2.1.2 East of England Plan and Draft Review

The East of England Plan to 2021 (adopted RSS) was adopted in May 2008 and formed the basis for the Thurrock Municipal Waste Management Strategy (MWMS) and also for the emerging Thurrock Core Strategy. In March 2010 a draft review to this adopted plan (RSS Review) was published which sought to take the region forward to 2031 and focussed on deepening key policy areas including climate change, the coast, energy and waste, transport and economic development. At the time of the revocation of the RSSs, the draft RSS Review was still out for consultation.

Thurrock Council consider that the data produced for the draft review by the RTAB stands, regardless of whether the RSS is extant or not, and is a material data set for the preparation of this need assessment update.

2.2 LOCAL DATA

2.2.1 Thurrock Municipal Waste Management Strategy

The Thurrock MWMS was adopted in September 2008 and stipulates the following targets for the recycling and composting of household waste:

- 2010/11 – 40%
- 2015/16 – 50%
- 2019/20 – 60%

The MWMS also states that Thurrock will meet its landfill diversion obligations.

3 WASTE ARISINGS UPDATE

3.1 INTRODUCTION

Thurrock Council consider the purpose of this report is to test a variety of new scenarios for waste arisings and capacity based upon the more recent RSS Review data, which is considered more up to date and valid compared to the scenarios (seen in the 2009 update) based upon the previous adopted RSS. A number of scenarios are tested based upon the RSS Review data that also reflect (see Scenario F later in this section) the current Submission Draft of the Core Strategy. This contains higher housing numbers than the Review RSS for the same plan period. Scenarios are also tested that are based on more locally derived assumptions about C&I waste arisings.

The range of scenarios will allow Thurrock Council to consider the most valid scenario to incorporate as the basis of policy approach in the adopted version of its Core Strategy and emerging minerals and waste development plan documents.

This report considers the following waste streams

- municipal solid waste, or MSW;
- commercial and industrial, or C&I, waste;
- construction, demolition and excavation, or CD&E, wastes; and
- hazardous waste.

3.2 MUNICIPAL SOLID WASTE AND C&I WASTE SCENARIOS

3.2.1 Scenario A – Adopted RSS

The adopted RSS provides predictions for the growth of MSW and C&I waste arisings. Even immediately after the adoption of that RSS, waste data returns (for MSW at least) were indicating that the growth predicted was not being replicated by the actual arisings. Nevertheless, the adopted RSS was the extant plan prior to its revocation and as such its predictions are used to form Scenario A for MSW and C&I wastes arisings in this update. The waste arisings set out in the adopted RSS policies and appendix C (of that plan) also provide the basis for the policy approach and evidence for the Thurrock Pre-Submission Core Strategy.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.2 Scenario B – RSS Review

By the time of revocation of the RSS, the East of England RSS Review process had already generated a detailed set of predictions which were to have been

used in that document. These data are very recent and are considered to be a more realistic set of data as compared to the actual waste returns seen in recent years. The RSS Review data is used to form Scenario B for MSW and C&I waste arisings in this update.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.3 Scenario C – MSW 1.4 tph

The RSS Review data (Scenario B) assumes that MSW arisings are affected by two drivers, the growth in the number of households and the rate at which households generate waste. For the RSS Review it was assumed that the number of households (in Thurrock) would increase by 950 per year and that the rate at which households would generate waste would decrease steadily from around 1.3 tonnes per household per year (tph) at the start of the plan to around 1 tph by 2031.

The data held by Thurrock Council suggests that the rate of waste generation by households is actually nearer to 1.4 tph. Scenario C therefore explores this as an option to be tested to take account of a lower rate of reduction of household waste production than Scenario B. Scenario C assumes that the number of households increases by 950 households per year, but that the waste generated per household is 1.4 t, remaining constant throughout the plan period.

The C&I waste arisings were held at those predicted in the RSS Review for this scenario.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.4 Scenario D – Thurrock Specific C&I Waste

The RSS Review data (Scenario B) has a lower predicted growth for Thurrock's C&I waste arisings than the adopted RSS. The predictions are based upon the ADAS survey (1) that was carried out for the East of England, which took data from the North West's C&I waste arisings survey and sought to retrofit this to the Region's economic performance. This methodology was cleared by Defra before the project was commissioned and while it is an approximation of C&I waste arisings, at the present time it is the best data available for regional arisings. At a more local level, ie the level at which this update is concerned, the data is not quite so robust, as each individual authority may have differing economic performance to the East of England Region as a whole. As a result, an attempt is made in this Scenario to adjust

(1) http://www.eera.gov.uk/publications-and-resources/studies/topic-based-studies/waste-studies/national-study-into-commercial-and-industrial-waste-arisings/

the ADAS figures to give a more Thurrock specific economic and waste generation profile.

The ADAS survey provides an estimate of the amount of waste an employee generates in each of a series of job sectors. Within the East of England Region, the data suggests, taking an average over all jobs, that C&I waste is generated at 10 tonnes per employee, per year.

Thurrock's economic profile is weighted towards the transport and retail sectors, with a number of jobs also in the public sector, warehousing and a small number in power and utilities. If the ADAS assumptions of waste per job are applied to this Thurrock specific economic profile, the average amount of waste generated falls to around 2.7 tonnes per employee per year.

The RSS Review data predicts a certain amount of growth in C&I waste arisings. If this growth is compared against the 2.7 tonnes per job calculated for Thurrock, the outcome is that the RSS Review data effectively only predicts an extra ~300 jobs per year. This is far short of the anticipated ~1200 job per year that Thurrock is planning for.

To generate a Thurrock specific C&I waste growth prediction, the 2.7 tonnes per job figure has been combined with Thurrock's predictions of job creation. This is Scenario D, which uses the 2.7 tonnes per employee assumption along with an anticipated 1175 jobs per year until 2026/27 to predict the C&I waste generated for Thurrock.

The MSW arisings are held at those predicted in the RSS Review for this scenario.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.5 Scenario E – Phased Growth

All the scenarios thus far have assumed a smooth rate of growth in arisings, ie the same growth, or a gradual change in growth year on year. In reality, and in the wake of the recession, it is more likely that economic and housing growth may be weighted more toward the end of the plan period. This scenario, Scenario E uses the MSW data from Scenario C (1.4 tph arisings) and the C&I waste data from Scenario D, but delivers phased growth, resulting in the same overall number of houses and jobs, but with the bulk of these arriving towards the end of the plan period.

Note that the predicted arising from this scenario is higher than that from Scenario D as it uses the higher rate of MSW generation per household of 1.4 tph.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.6 Scenario F – Core Strategy Growth

The RSS Review assumes that there will be housing growth of 950 houses per annum until 2031. The Thurrock Core Strategy has housing predicted as growing at a higher rate than this, and assumes the building of 1129 houses per year to 2020/21 and 950 houses per year thereafter. Delivery of 1129 houses per year is a very high growth rate. For the purposes of this assessment, Thurrock Council has asked that an average over the plan period is considered, ie 1069 houses per year, as opposed to the stepped growth rates (total number of houses built remains the same). Scenario F has been developed to represent this higher predicted housing growth, with the flat distribution of 1069 house per annum. It is assumed that the amount of waste generated per household falls steadily as assumed in the RSS Review (Scenario B).

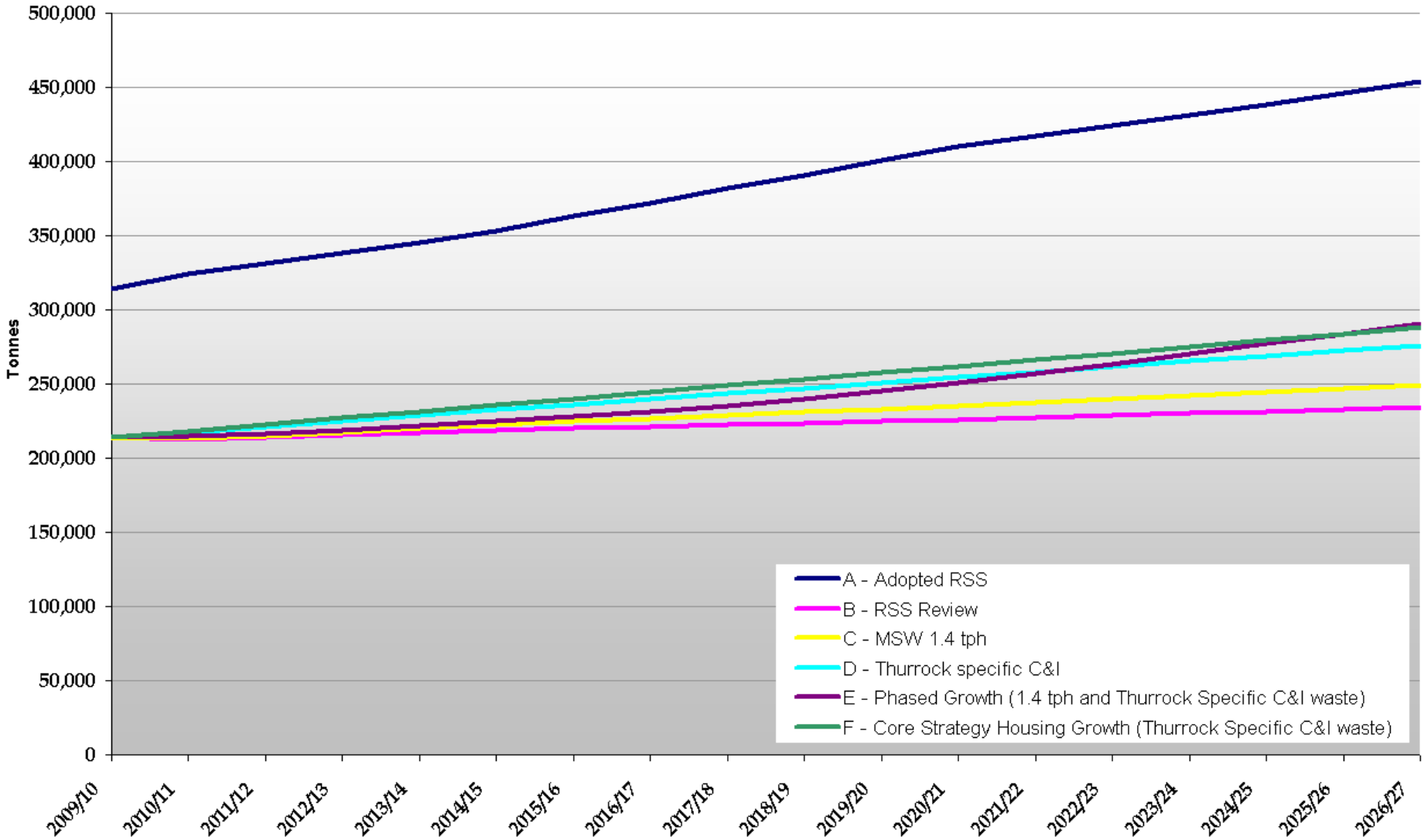
C&I waste for Scenario F is assumed to follow the same growth rates as calculated for Scenario D, ie a Thurrock specific growth rate.

The details of the arisings year on year for this scenario are presented in Annex A.

3.2.7 Combined Arisings for MSW and C&I Waste

The predicted overall arisings from Scenarios A to F are depicted in *Figure 3.1*. As can be seen, the adopted RSS data (Scenario A) far outstrips all of the scenarios based on the RSS review data. Scenarios B to F diverge towards the end of the study period, as the different assumptions take cumulative effect. Scenario B, the scenario that duplicates the RSS Review data is the lowest and from here on in is referred to as the 'Lower Bound'. Scenario F is the highest over the vast majority of the study period (though is exceeded marginally in the final year by Scenario E). Scenario F is therefore referred to as the 'Upper Bound'. The adopted RSS scenario, Scenario A is a useful comparison, but the arisings are so high as to be unrealistic – for this reason Scenario A is not considered further in this update, other than as a counterpoint.

Figure 3.1 Combined Arisings Predictions for MSW and C&I Waste



3.3 *RECYCLING, COMPOSTING & LANDFILL DIVERSION TARGETS*

Thus far this update has considered MSW and C&I waste arisings as a whole. In order to be able to understand what capacity is required, it is now necessary to establish what proportion of this waste is expected to be recycled, what is expected to be recovered and what would remain to be landfilled.

3.3.1 *Adopted RSS Targets*

The adopted RSS assumes that MSW recovery rates (including recycling and composting) will be at:

- 50% in 2009/10; and
- 70% in 2014/15.

It is assumed that recovery rates will plateau after this date.

For C&I wastes the recovery targets are different and are assumed to be:

- 72% in 2009/10; and
- 75% in 2014/15.

The recovery rates for C&I wastes are likewise assumed to plateau after this date.

A smooth rise in recovery rates is assumed between these dates in applying these targets to the predicted arisings (for Scenario A).

3.3.2 *RSS Review Targets*

The RSS Review discusses targets in a slightly different way to that of the adopted RSS – minimum recovered tonnages for each authority are given along with the predicted arising for that authority, allowing the reader to calculate the effective percentages themselves. This yields the following, total, recovery rates, ie again including recycling and composting. Note that these recovery rates are specific to Thurrock.

MSW recovery targets:

- 82.2% in 2015/16
- 88.0% in 2020/21
- 88.0% in 2030/31

C&I waste recovery targets:

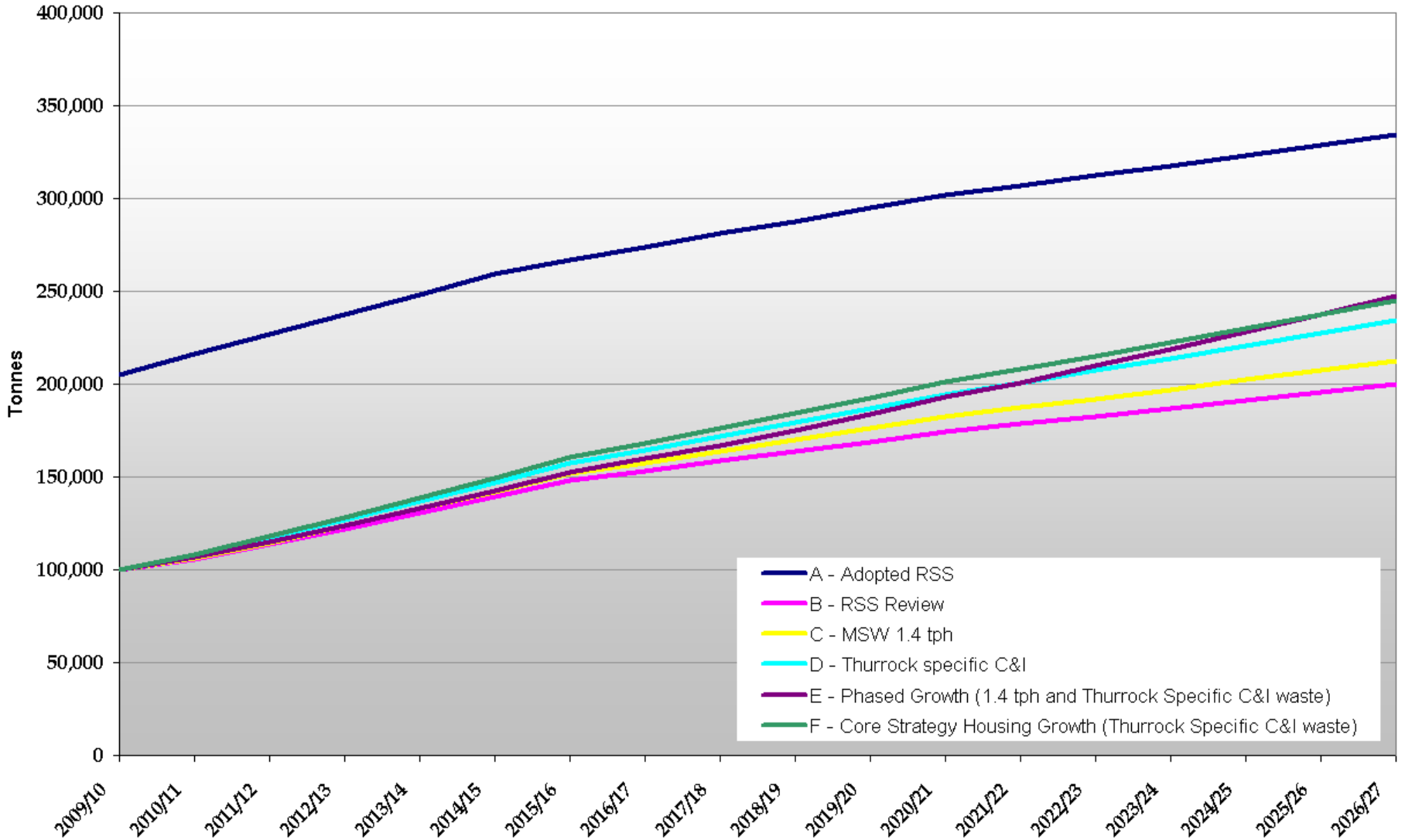
- 46.6% in 2010/11
- 71.1% in 2020/21
- 92.0% in 2030/31

3.3.3 Total Recovery Tonnages

The targets discussed in *Sections 3.3.1* and *3.3.2* have been applied to the arisings calculated earlier in this report. The adopted RSS targets have been applied to Scenario A, and the revised RSS targets to Scenarios B to F. The total amount of recovery therefore expected under each of the Scenarios A to F is presented in *Figure 3.2*. Note that recovery in this case includes recycling and recovery.

Unsurprisingly, the recovery tonnages for Scenario A are greater than those for Scenarios B to F due to higher overall arisings.

Figure 3.2 Total Recovery (where recovery includes recycling and composting)



3.3.4 Recycling and Composting Rates as a Proportion of Recovery

As has been discussed already, both the adopted RSS and the RSS Review present targets as overall recovery rates. In order to better understand the implications for each management route, ie recycling/ composting and recovery, it is necessary to split the total recovery targets.

Only the Upper and Lower Bound scenarios, Scenarios F and B respectively, were considered for this exercise as they represent the full range of total arisings.

Three sub scenarios were created to assess the potential recycling/recovery scenarios as shown in *Table 3.1*.

Table 3.1 Upper and Lower Bounds Recycling Sub Scenarios

Sub Scenario (B or F)	MSW	C& I waste
1	'Recovery' is split 70% to Recycling and Composting and 30% to Recovery. This delivers the recycling targets stated in the Thurrock MWMS.	'Recovery' is split 30% to Recycling and Composting and 70% to Recovery.
2	'Recovery' is split 70% to Recycling and Composting and 30% to Recovery. This delivers the recycling targets stated in the Thurrock MWMS.	'Recovery' is split 70% to Recycling and Composting and 30% to Recovery.
3	'Recovery' is split 90% to Recycling and Composting and 10% to Recovery. This is a high recycling scenario designed to explore the situation where other recovery capacity is not used.	'Recovery' is split 70% to Recycling and Composting and 30% to Recovery.

Figure 3.3 and *Figure 3.4* present graphically the results of these sub-scenarios, allowing upper and lower bounds to be selected for comparison against Thurrock's site capacities (*Section 5*).

As can be seen in *Figure 3.3*, for recycling and composting arisings, Scenario F3 forms the upper bound and Scenario B1 forms the lower bound. For recovery (*Figure 3.4*), Scenario F1 forms the upper bound and Scenario B3 forms the lower bound.

It should be noted that whilst this sets the theoretical upper and lower bounds; for purposes of plan making picking a scenario for recycling will determine the scenario for recovery and vice versa. Nevertheless, the sub scenarios allow consideration of the theoretical maxima and minima.

Thurrock Council also considered that sub-scenario F2 should be assessed as this provides an alternative split of recycling/recovery within Scenario F, ie the scenario which is based upon the current housing allocations in the submitted Core Strategy. Therefore Scenario F2 is also assessed in the capacity gap assessment section of this update report (Section 5) to allow a minimum and maximum range recycling and recovery range to be established specifically for Scenario F.

Figure 3.3 Recycling and Composting Sub Scenarios

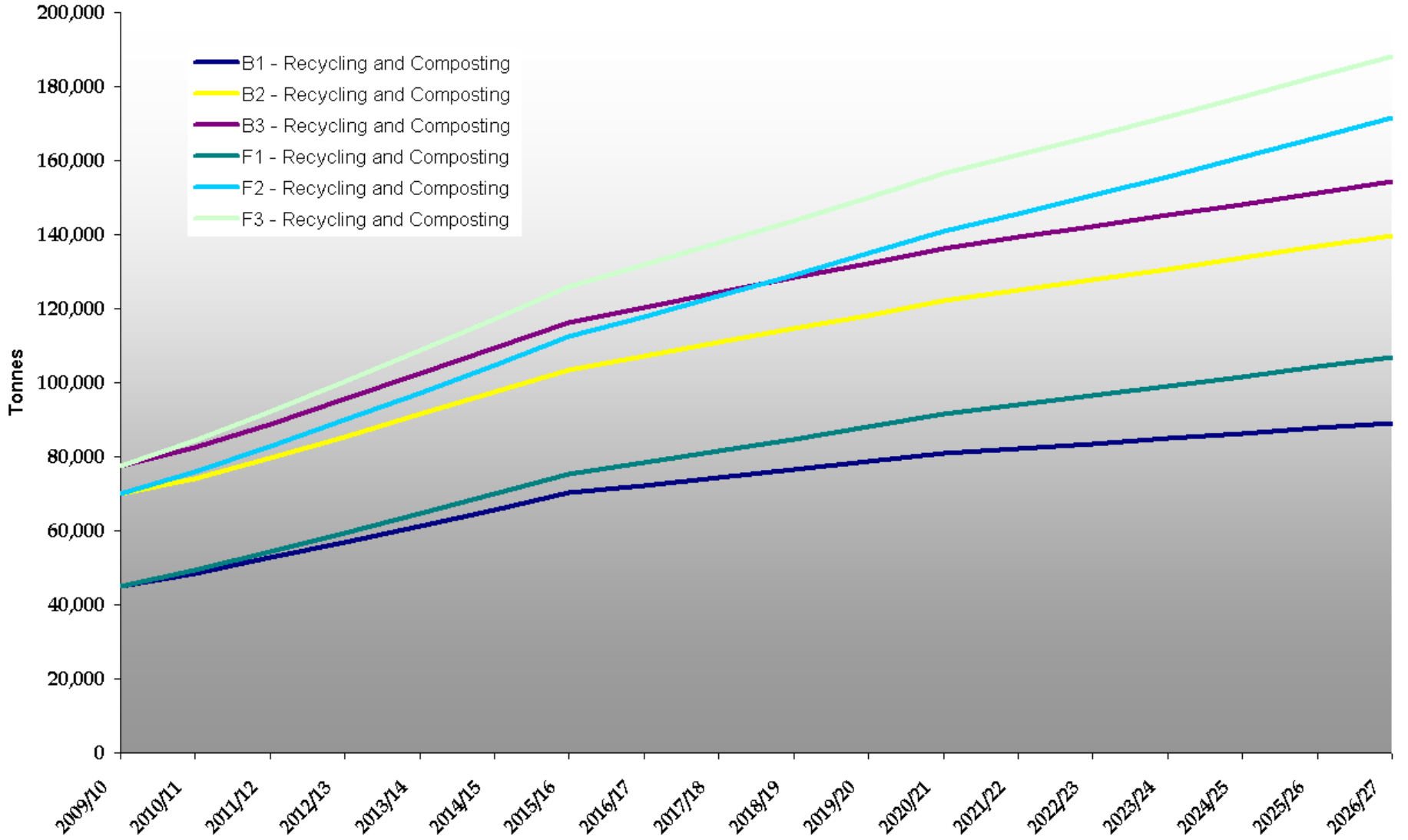
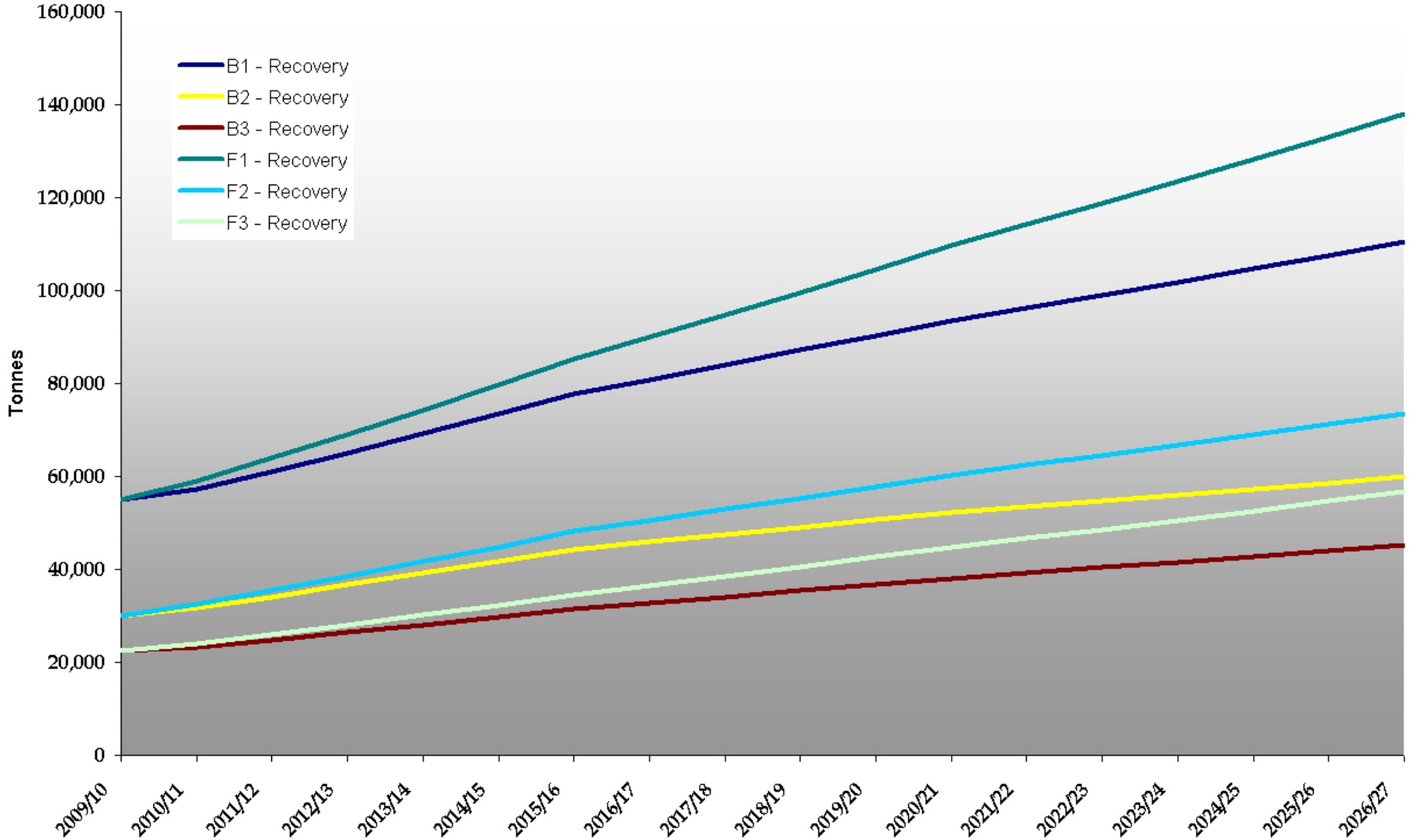


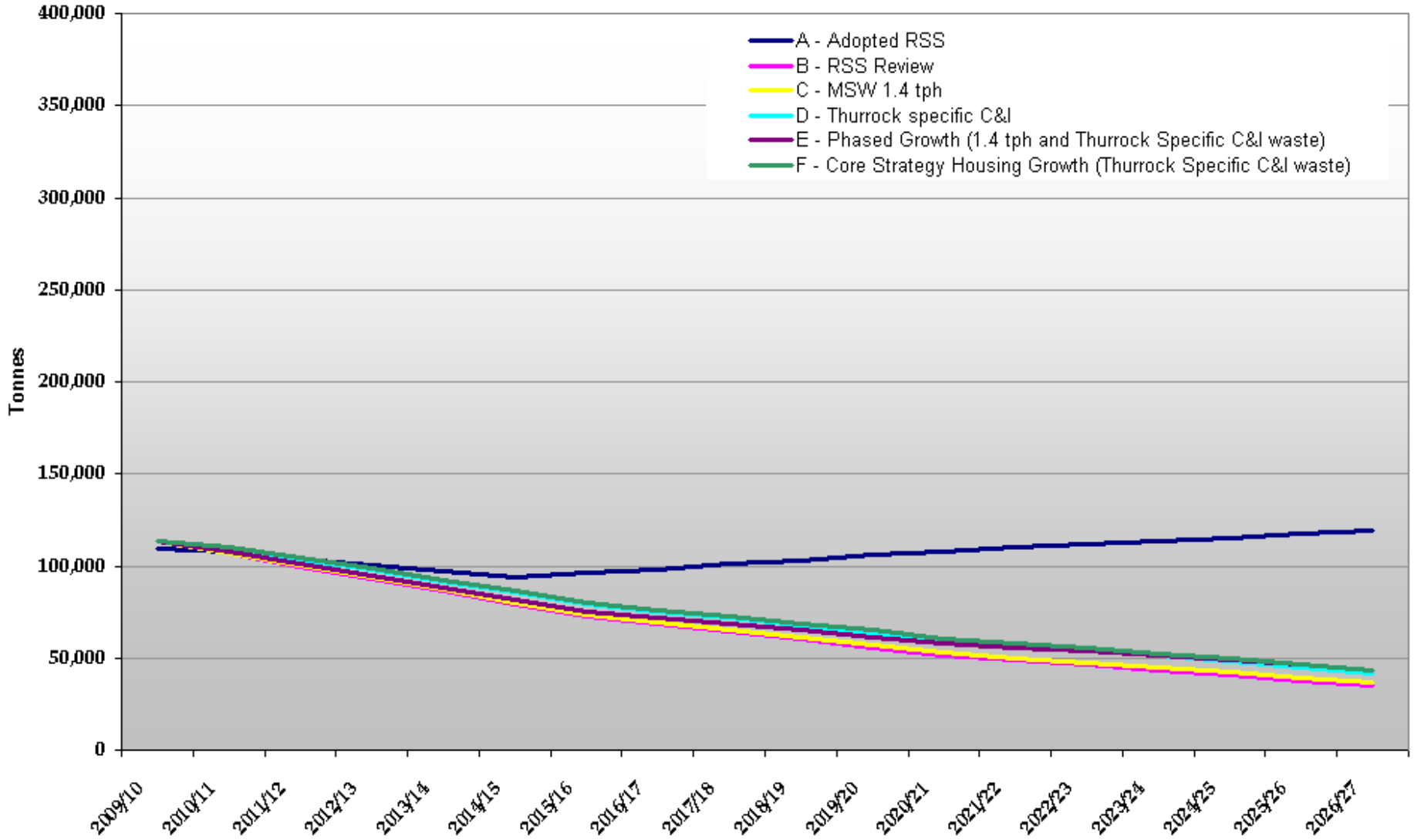
Figure 3.4 Recovery Sub Scenarios



3.3.5 Total Landfill Tonnages

By subtracting the overall recovery tonnages from the arisings for each scenario, it is possible to see what amount of waste is forecast to require landfilling each year during the study period. This is presented in *Figure 3.5*. The change in direction of trend for Scenario A (the adopted RSS) is due to the plateauing of recovery rates, therefore landfill requirement starts to rise again as arisings continue to rise.

Figure 3.5 Total Non Hazardous Landfill (excluding London Imports)

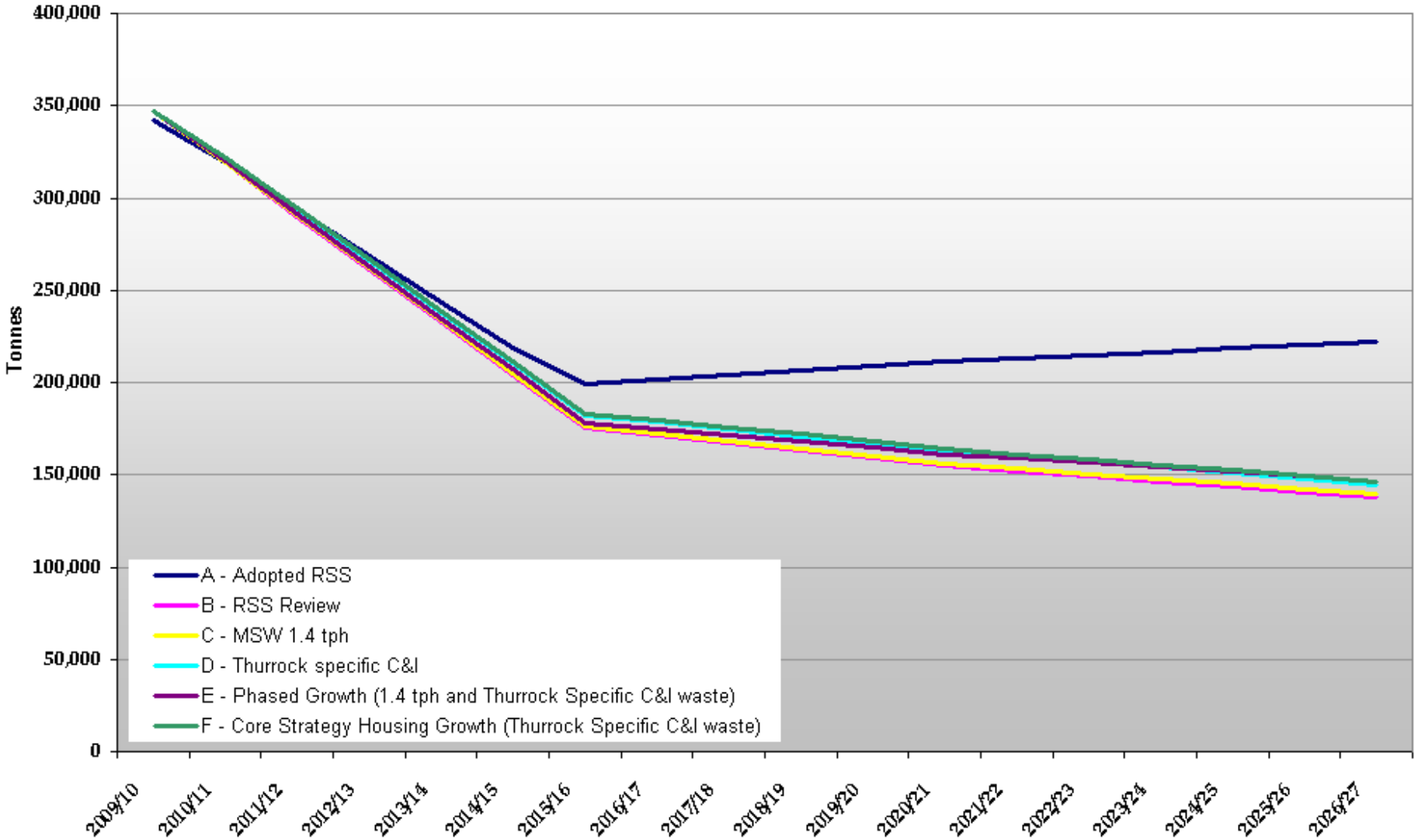


3.3.6 London Imports

Thus far, the arisings considered for all scenarios have excluded the import of residual waste, ie waste from London that is to be landfilled. Both the adopted RSS and the RSS Review make predictions of how much waste from London is apportioned to Thurrock for landfilling. The predicted amounts of London waste to be landfilled are higher in the adopted RSS than in the RSS Review. The overall amount of waste to be landfilled per year for all the scenarios is shown in *Figure 3.6*.

Although the adopted RSS and the RSS Review both provide apportionments of London waste to be landfilled in Thurrock, in practice Thurrock's landfills are filling far faster than predicted. This suggests that they are receiving waste from additional sources or greater amounts of waste from London. Thurrock Council undertook surveys and determined that there was in the region of one million tonnes of waste being landfilled in non hazardous landfills per annum in the recent past. The effect that this may have on the rate at which landfill voids are exhausted is explored in Section 5.1.4. That eventuality represents a worst case scenario. In reality the level of waste to be landfilled from London should decline as more waste is pre-treated and availability is increasingly controlled through the local development framework and planning permissions.

Figure 3.6 Total Landfill (Including London)



3.4 CD&E WASTE ARISINGS UPDATE

CD&E waste arisings are not well understood, and few surveys have been carried out. A national survey was conducted in 2005 by Capita Symonds and was published in 2007 (the Symonds Report). This update relies upon that data, relatively old though it is, as there is no more recent data available. The 2005 figure is used as the figure for 2009/10 as the actual growth rate since 2005 is not known but is likely to have been low as a consequence of the economic downturn. The resulting arisings estimates are therefore subject to some uncertainty, but this is not thought to significantly increase the uncertainty already inherent in the data.

The Symonds Report assessed sub-regions (broadly counties) – Thurrock was included in the Essex sub-region. Overall, the Essex sub-region was found to generate nearly 4,000,000 tonnes of CD&E waste. Of this, 49% was found to be recycled at fixed facilities and by mobile plant, 29% was used or disposed of at landfills and the remaining 22% was spread on registered exempt sites. With no better information available, these splits have been assumed to apply to Thurrock.

In order to obtain an overall CD&E waste tonnage estimate for Thurrock, population statistics were used to apportion waste to Essex, Southend-on-Sea and Thurrock. By this method Thurrock was calculated to generate approximately 350,000 tonnes of CD&E waste per annum.

The growth rates from Scenarios B and F were applied to this figure, developing an Upper (from Scenario F) and a Lower (from Scenario B) Bound for arisings.

2012 is likely to result in a marked change in the destinations for C and D waste. At present many sites benefit from exemptions under environmental permitting regulations and no permit is required for the use of C and D waste on them. Post 2012, these sites will need to obtain a permit. It has been mooted that this will effectively end the spreading, of any significant amounts, of CD&E waste on such sites and the waste instead will be sent to either recycling or to landfill facilities. Assuming this is the case, which is not yet proven, it is considered appropriate to model two scenarios for the diversion of this waste. The first, termed Scenario G, assumes this waste will be diverted to recycling. The second, termed Scenario H, assumes that this waste will be split 50:50 between landfill and recycling until 2021, when it will all be recycled (thus meeting the 70% diversion from landfill requirement of the revised Waste Framework Directive 2008/98/EC).

Figure 3.7 to *Figure 3.10* demonstrate the four corresponding eventualities, Scenario G with upper and lower bound arisings and Scenario H with upper and lower bound arisings.

Figure 3.7 Scenario G (Lower Bound) – Waste from Exempt Sites is Assumed to be Recycled

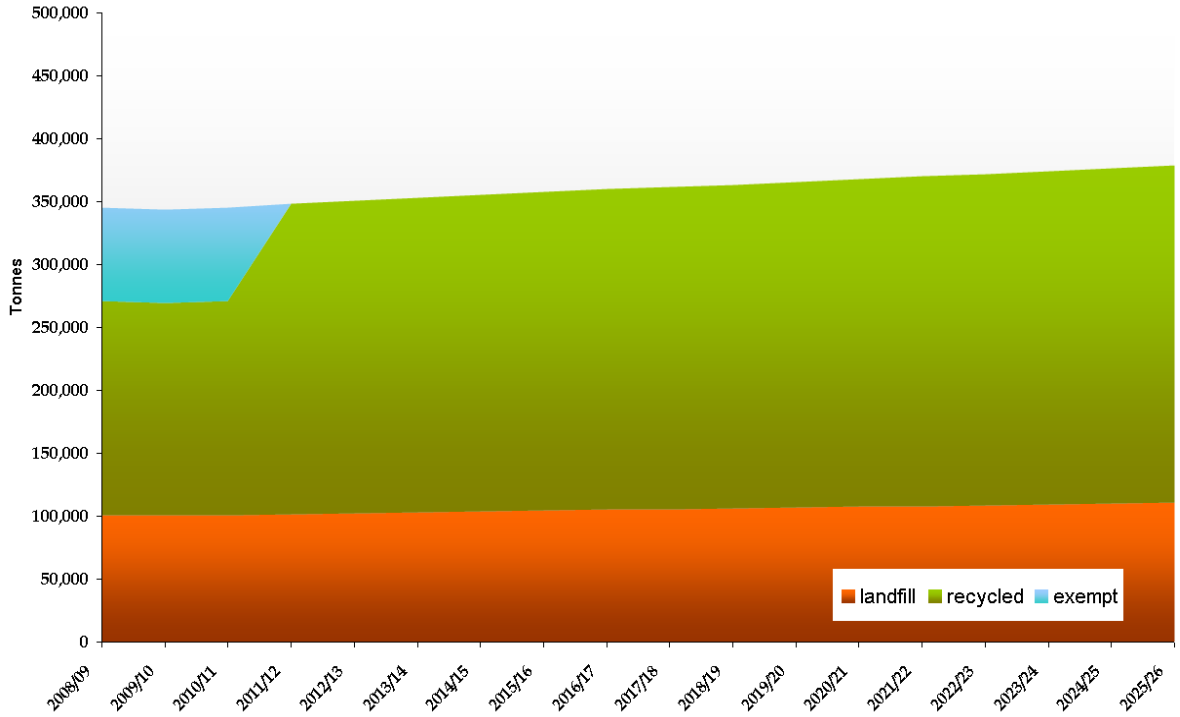


Figure 3.8 Scenario H (Lower Bound) – Waste from Exempt Sites is Assumed to be split between Landfill and Recycling until 2021

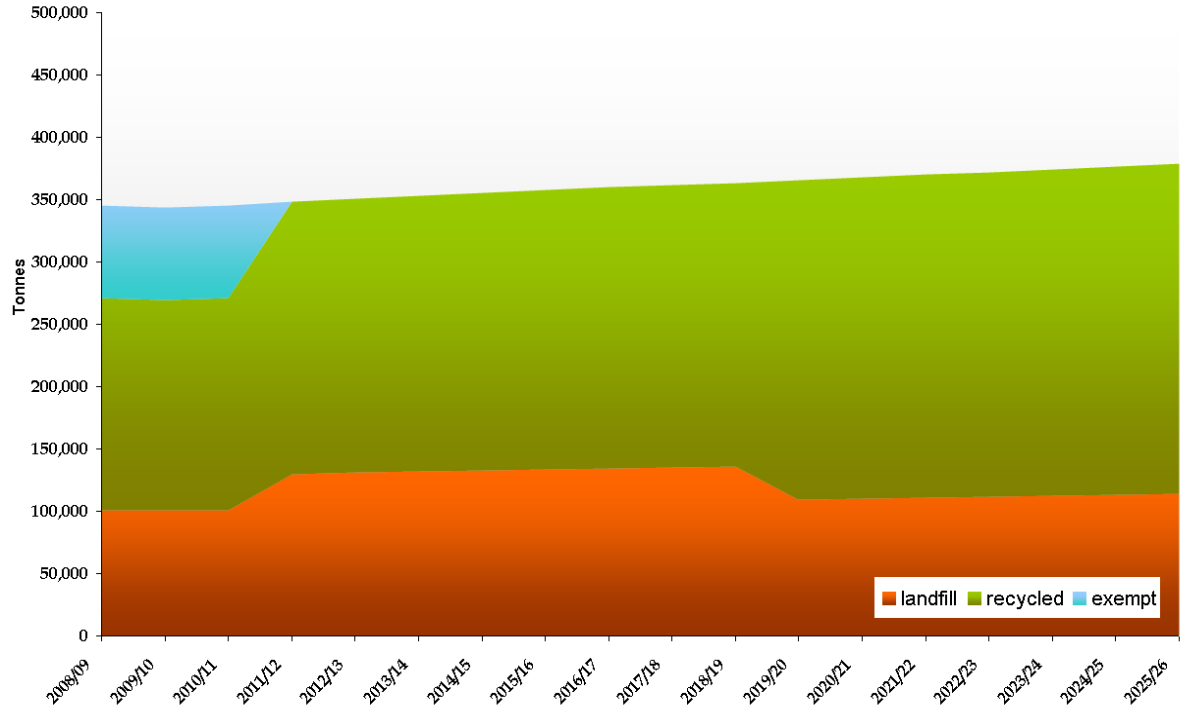


Figure 3.9 Scenario G (Upper Bound) – Waste from Exempt Sites is Assumed to be Recycled

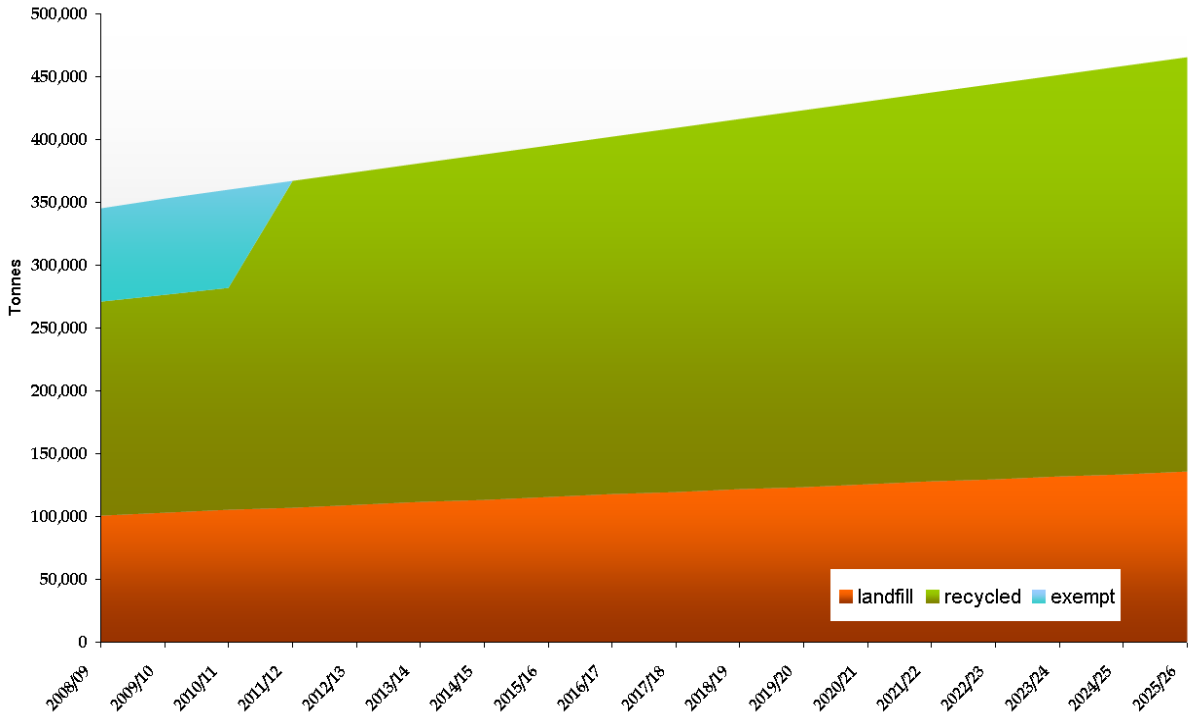
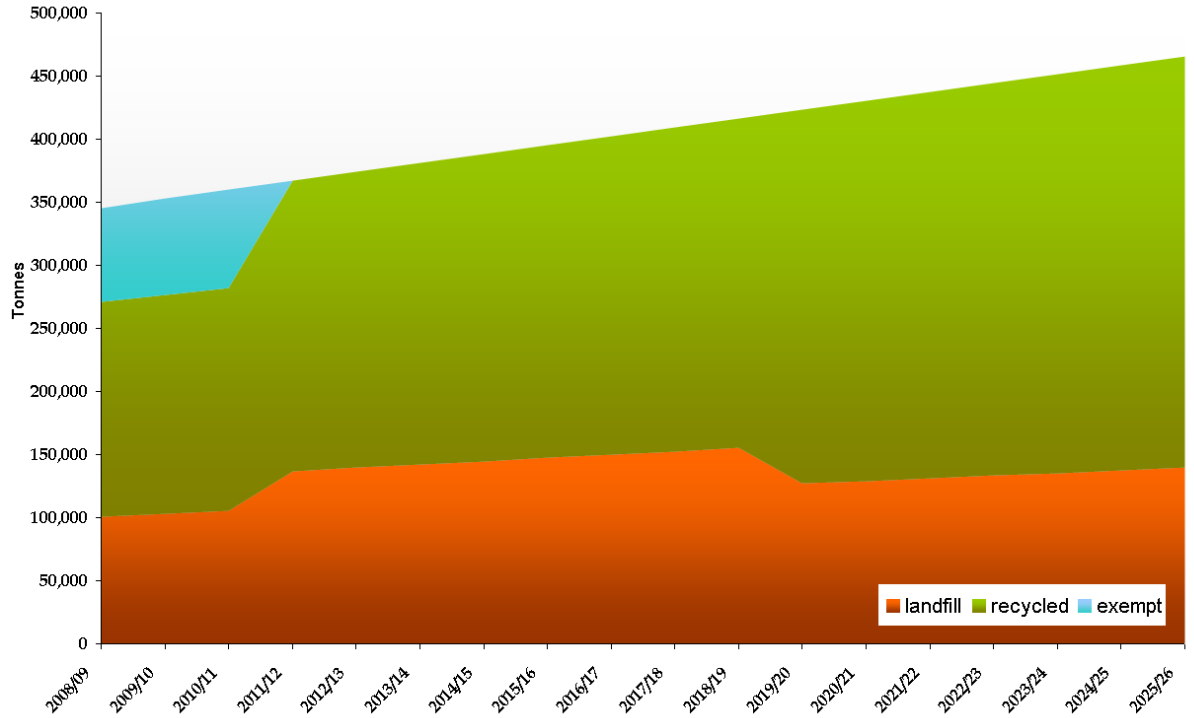


Figure 3.10 Scenario H (Upper Bound) – Waste from Exempt Sites is Assumed to be split between Landfill and Recycling until 2021

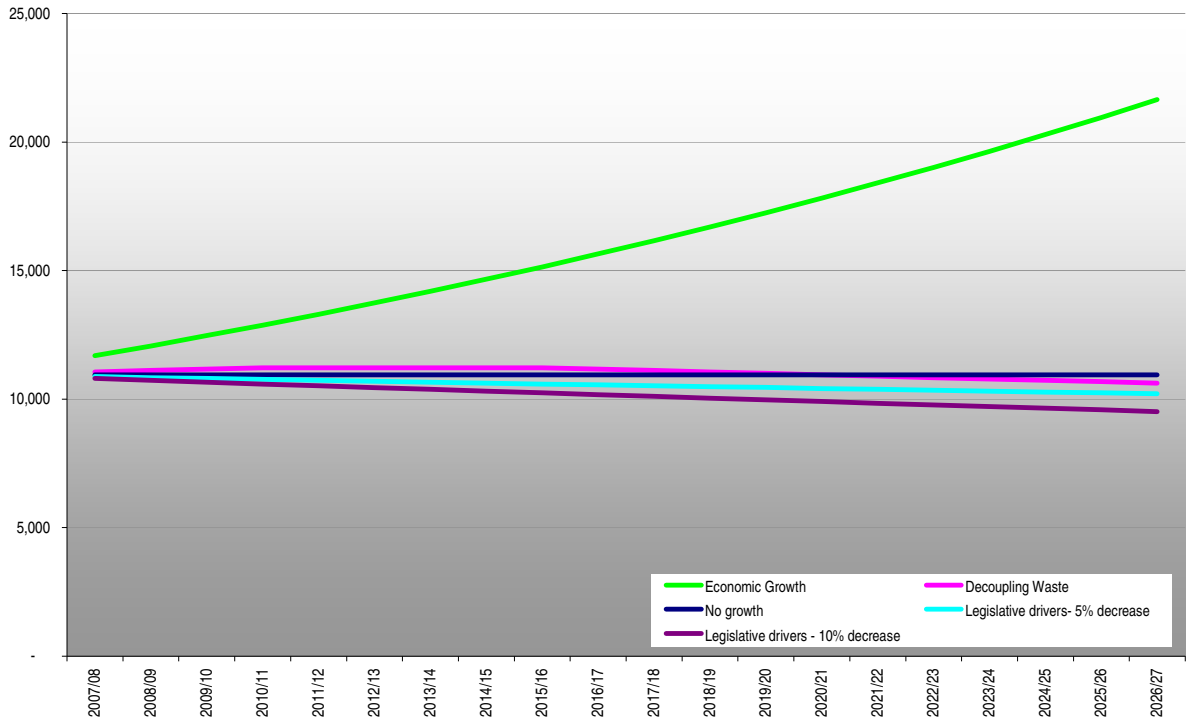


3.5 HAZARDOUS WASTE ARISINGS UPDATE

The predictions for hazardous waste arisings have not been reassessed since the 2009 update; therefore the information presented here is the same as that presented in the 2009 update.

Data from the Environment Agency's Hazardous Waste Interrogator 2007 was used to update the hazardous waste arisings section. The same growth rates as used in the original study were applied. The forecasts are shown below in *Figure 3.11*.

Figure 3.11 Hazardous Waste Growth Rate Scenarios

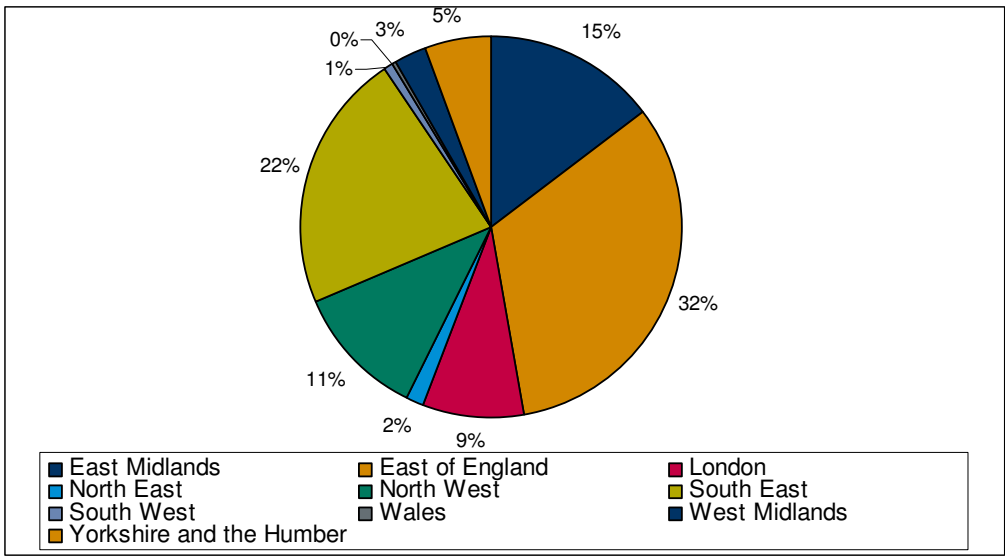


No specific hazardous waste management capacity types are identified in this study. As such, there are no comparisons in *Section 5* for hazardous wastes. The specialist nature of hazardous waste treatment means that hazardous waste will travel greater distances to recycling/disposal destinations, if required. Destinations for the c. 11,000 tonnes of hazardous waste produced in Thurrock in 2007 are shown in *Figure 3.12*. A third of the hazardous waste produced in Thurrock was treated within the East of England Region. The surrounding regions of the East Midlands and the South East of England treated over a third of the waste, leaving approximately 30% to be sent further afield for treatment.

Rwe NPower has a dedicated landfill on its site in Thurrock; this facility is in place to take ash from the power plant. This site does not import waste from elsewhere and simply landfills ash produced on site at the power station.

Therefore this void has not been included as available void for hazardous waste.

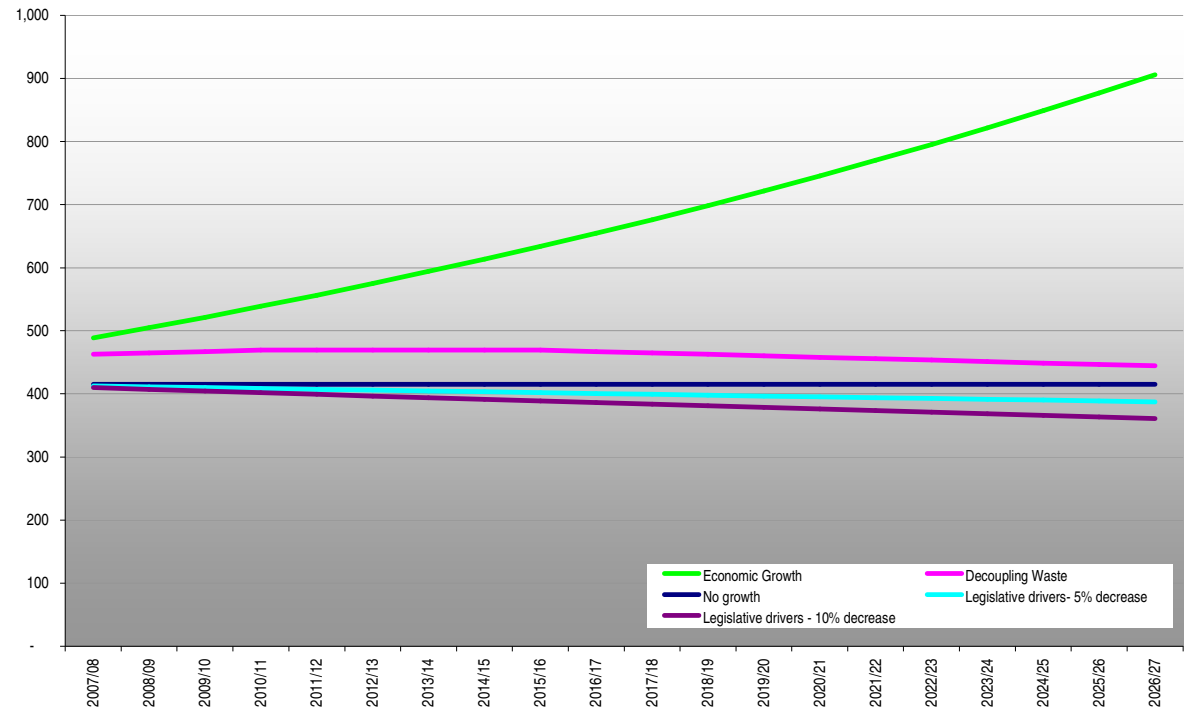
Figure 3.12 Location of Treatment of Thurrock Hazardous Waste Arisings, by Region



3.6 AGRICULTURAL WASTE ARISINGS

Agricultural wastes have not been updated since the original 2007 report. They form a very small amount of the overall waste stream. The forecast has been extended in line with the other waste streams. However, no changes were made to the baseline data.

Figure 3.13 Agricultural Waste Growth Rate Scenarios



These wastes are insignificantly small in comparison to MSW and C&I waste arisings, and have therefore not been included in any comparisons to available capacity.

4 CAPACITY DATA UPDATE

4.1 INTRODUCTION

In consultation with Thurrock Council, ERM has reviewed the updated list of waste management sites. This list includes information on all sites which manage MSW, C&I waste and CD&E waste arisings. No facilities were explicitly identified for the management of hazardous wastes.

4.2 SITE CAPACITIES

4.2.1 MSW and C&I waste sites

Recycling and composting capacity is provided by a small number of commercial skip operators. One organisation (Nordic Recycling) operates a merchant materials recycling facility (MRF) at Tilbury Docks. However, this facility is not within Thurrock's MSW management contract, and accepts wastes from London and other sources. As such, the capacity available to Thurrock is difficult to estimate. The majority of the other recycling capacity is for the recycling of metals and end of life vehicles (ELV). These sites are not included in the 'recycling' category as they do not offer capacity that can be used for general MSW and C&I waste and only offer a specific service. ELV facilities often have a much larger permitted capacity than is used and therefore would skew the results to be overly positive.

There is no treatment capacity currently available for MSW or C&I wastes. There is one large physical treatment facility, however this site is solely for the combustion of used tyres and therefore offers no capacity for general MSW and C&I wastes. The remaining sites in Thurrock for 'treatment' are WEEE recycling facilities and, as such, are similar to the tyre facility, offering little or no capacity for general MSW and C&I waste. All 'treatment' sites are therefore being discounted, due to their specialist nature.

It should be noted that, on 27 August 2009, Tilbury Green Power was granted planning permission by the Secretary of State for a biomass and energy from waste power station located in Thurrock. The consent allows for 300,000tpa of waste (80,000tpa MSW and 220,000tpa C&I waste) and 350,000tpa of biomass and waste wood to be brought on to the site. It is anticipated that the plant will be operational in 2012. This facility is shown in the capacity tables as 'non-operational' capacity.

4.2.2 CD&E waste recycling sites

The CD&E recycling sites in Thurrock have been extensively re-assessed for the purposes of this 2010 update. There are five, authorised, currently operational sites. Capacities for each have either been derived from the

operators themselves or where this has not been possible by reference to comparable facilities for which data is known.

Of these five sites, four are not expected to remain open for the full study period; one will be lost to redevelopment and three are temporary facilities associated with former quarries/landfill sites. The life of one of the latter may be extended. Two different capacity eventualities are therefore considered in *Table 4.4* – representing different closure timetables.

4.2.3 Landfill Sites

Landfill capacity has been assessed in four different scenarios. The scenarios assess the capacity that is: currently operational; currently operational but without planning permission; currently non-operational with planning permission; and potential voidspace arising from mineral extraction sites.

4.2.4 Capacity Summary Tables

Table 4.1 to *Table 4.5* show the capacity for landfill and non-landfill facilities in Thurrock. These capacities are compared to the relevant arisings data in *Section 3*. The capacities are aggregated values for all sites of that type in Thurrock. Where no capacity data was available for a site, an extrapolation was made using the data for the sites with known capacity to approximate the capacity without a known capacity. Data were available for between 80% and 100% of all sites.

Table 4.1 Operational Non Landfill Capacity by Site Type (tonnes per annum)

	Operational Capacity	No. Sites	Capacity blanks	Sites with capacity	Extrapolated value
Transfer*	55,000	5	1	4	68,750
Treatment	0	0	0	0	0
Recycling	10,000	1	0	1	10,000
Metal/ELV Facility	440,643	10	0	10	440,643
C&D Recycling**	547,400	5	0	5	547,400

* Part of this transfer capacity is recycling capacity and added in *Table 4.3* below

** CD&E capacities are discussed further in *Table 4.4*.

Table 4.2 Non-Operational Non Landfill Capacity by Site Type (tonnes per annum)

	Operational Capacity	No. Sites	Capacity blanks	Sites with capacity	Extrapolated value
Transfer*	2500	1	0	1	2500
Treatment	300,000	1	0	3	300,000
Recycling	-	-	-	-	-
Metal/ELV Facility	-	-	-	-	-
C&D Recycling	-	-	-	-	-

* Part of this transfer capacity is recycling capacity and added in *Table 4.3* below

** CD&E capacities are discussed further in *Table 4.4*.

In order to estimate the amount of MSW and C&I waste recycling capacity that is available, it has been assumed that 20% of waste transfer facility capacity is effectively available for bulking up of recyclables. Therefore the total capacity for recycling of waste is:

Recycled waste capacity = Capacity (recycling) + 20% Capacity (transfer)

Note that this is an overall approximation, based on the overall transfer capacity. This is a typical recycling rate based on experience elsewhere and as accepted in adopting the East of England Plan; it is not implied that any one transfer facility recycles 20% of its capacity.

Table 4.3 MSW/C&I Waste Non-Landfill Capacity Table (tonnes per annum) Aggregated Capacity for Comparison with Arisings Data

		Operational	Non operational	Total (inc. currently non operational sites)
MSW/C&I waste	Recycling	23,750	500	24,250
	Recovery	0	300,000	300,000

Table 4.4 CD&E Waste Non-Landfill Capacity Table (tonnes per annum) Aggregated Capacity for Comparison with Arisings Data

C&D Recycling	Closure Option 1 - Closures in 2011/12, 2012/13, 2014/15 and 2019/20	Closure Option 2 - Closures in 2012/13, 2014/15, 2015/16 and 2019/20
2009/10	547,400	547,400
2010/11	547,400	547,400
2011/12	378,440	547,400
2012/13	293,960	462,920
2013/14	293,960	462,920
2014/15	125,000	293,960
2015/16	125,000	125,000
2016/17	125,000	125,000
2017/18	125,000	125,000
2018/19	125,000	125,000
2019/20	125,000	125,000
2020/21	75,000	75,000
2021/22	75,000	75,000
2022/23	75,000	75,000
2023/24	75,000	75,000
2024/25	75,000	75,000
2025/26	75,000	75,000
2026/27	75,000	75,000

Table 4.5 Landfill Capacity Table (tonnes)

	Operational with p/p	Operational plus w/o pp	Operational/ planned	All including potential
Non Haz	5,600,000	5,600,000	5,600,000	7,600,000
Inert	3,830,000	4,230,000	5,900,000	9,400,000

5 CAPACITY GAP ANALYSES

5.1 MSW AND C&I WASTES

5.1.1 Recycling and Composting

The arisings of MSW and C&I waste to be recycled and composted were calculated in Section 3. These are now compared with the predicted available recycling and composting capacity as discussed in Section 4. *Figure 5.1* and *Figure 5.2* show the predicted arisings year on year along with the predicted processing capacity.

Figure 5.1 Lower Bound (Scenario B1) MSW and C&I Waste Recycling

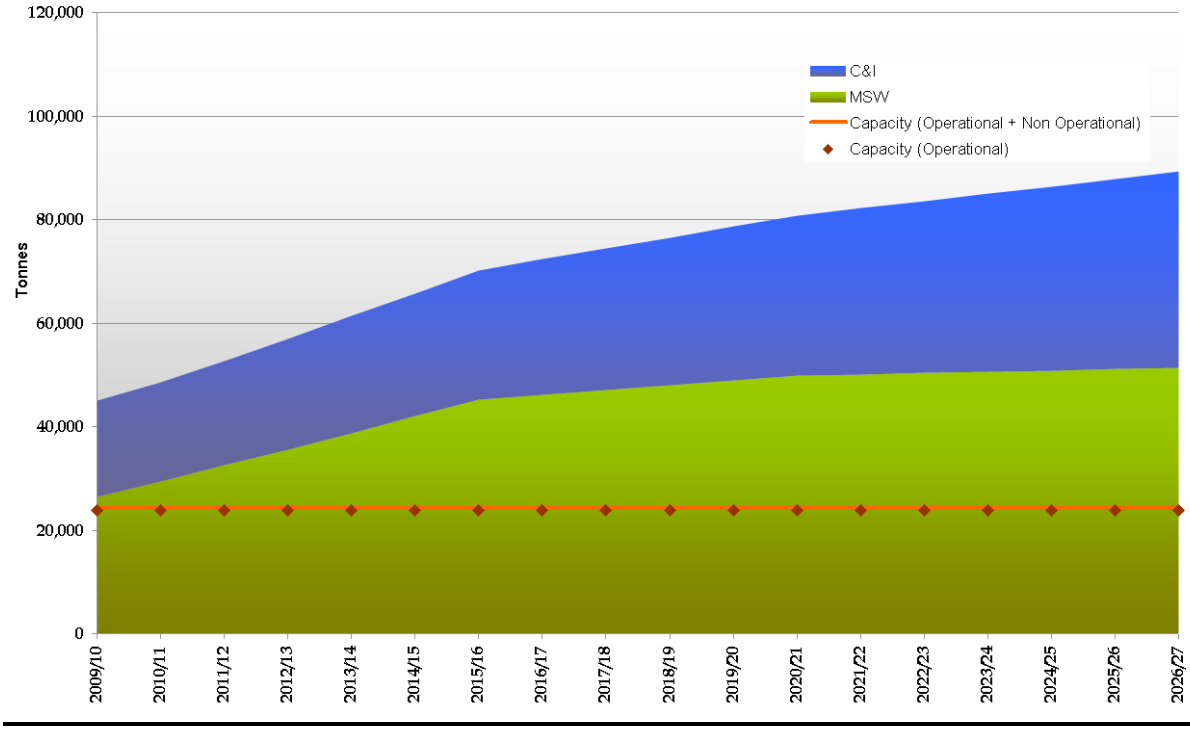
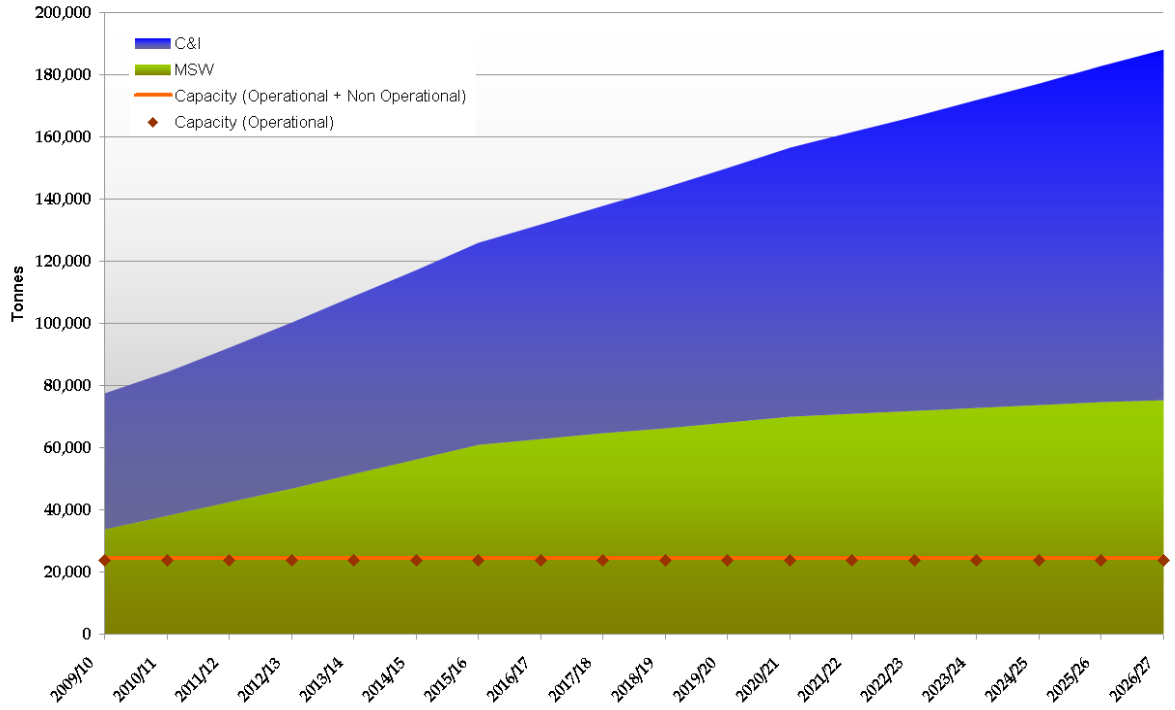


Figure 5.2 Upper Bound (Scenario F3) MSW and C&I Waste Recycling

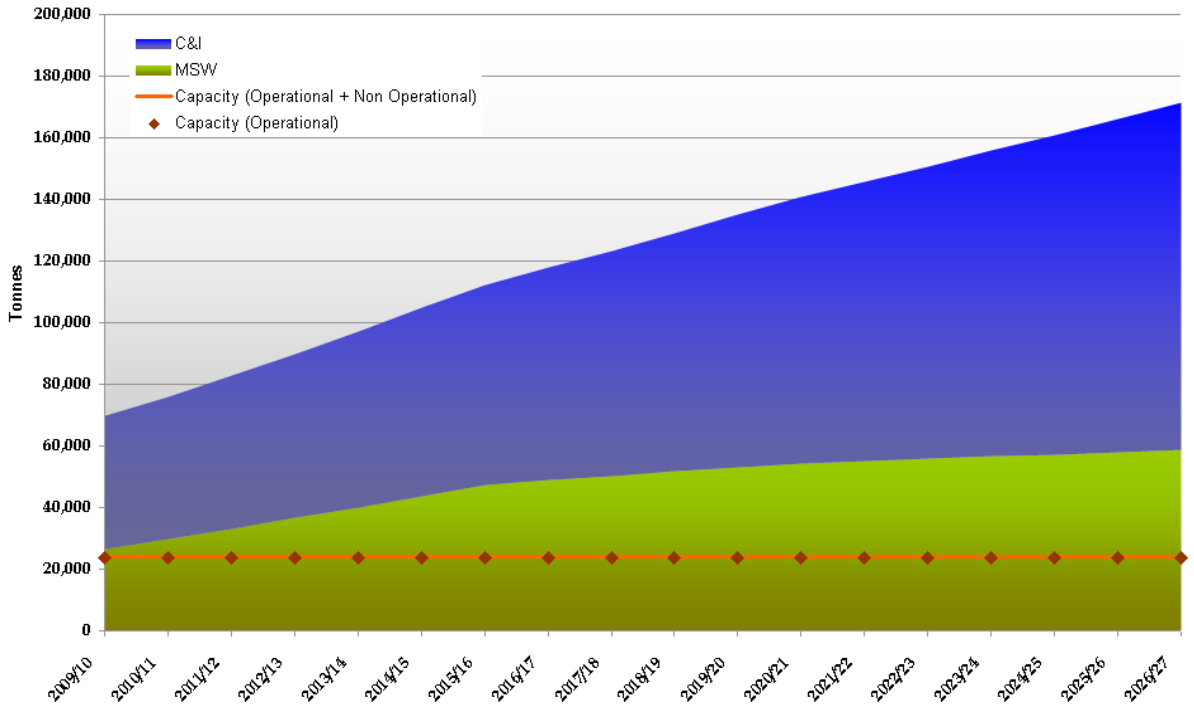


For both the Upper and Lower Bounds recycling and composting capacity is insufficient to deal with even the MSW arisings, let alone the C&I waste arisings. Thurrock Council needs to plan for the delivery of recycling and composting capacity, regardless of the assumed scenario. As the difference between operational and operational plus non-operational capacity is very small, this does not significantly alter the need for capacity. The maximum capacity gap by the end of the study period is approximately 164,000 tonnes (upper bound arisings); the mimum capacity gap by the end of the study period is approximately 65,000 tonnes (lower bound arisings).

The alternative split of recycling/recovery for C&I waste (F2) is also considered. The recycling capacity gap assessment for Scenario F2 is shown in *Figure 5.4*. That figure shows that in Thurrock is potentially facing a recycling capacity gap of almost 148,000 tonnes by the end of the study period.

The details of the capacity gap year on year for are presented in Annex B.

Figure 5.3 Upper Bound (Scenario F2) MSW and C&I Waste Recycling



5.1.2 *Recovery*

The arisings of MSW and C&I waste to be recovered were calculated in Section 3. These are now compared with the predicted available recovery capacity as discussed in Section 4. *Figure 5.4* and *Figure 5.5* show the predicted arisings year on year along with the predicted processing capacity.

Figure 5.4 Lower Bound (Scenario B3) MSW and C&I Waste Recovery

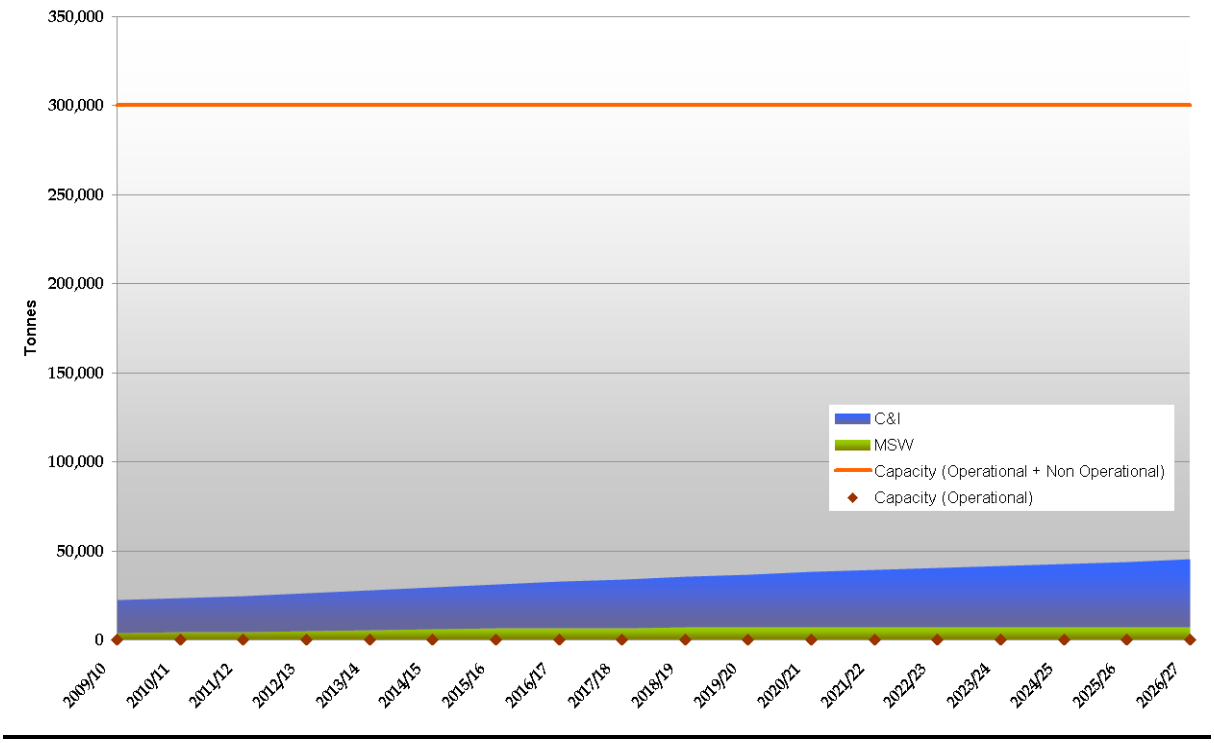
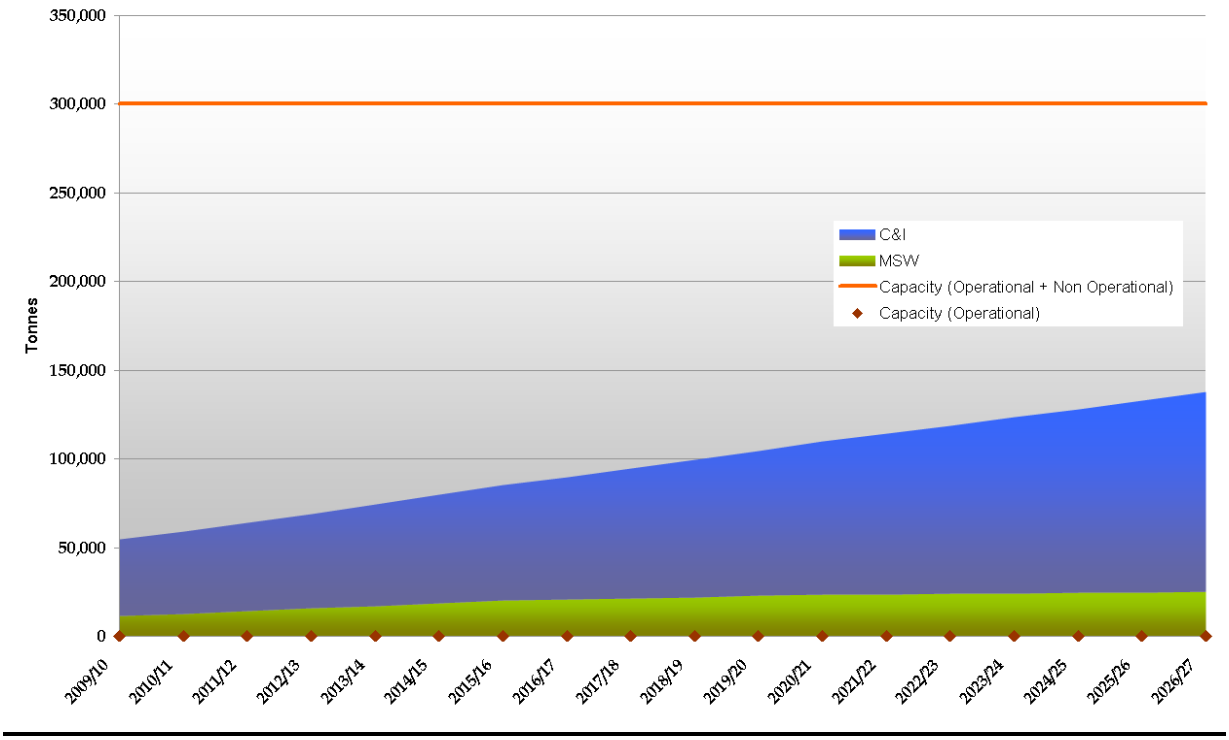


Figure 5.5 Upper Bound (Scenario F1) MSW and C&I Waste Recovery



At present there is no operational recovery capacity in Thurrock – therefore in both the Upper and Lower Bound scenarios the capacity gap is equal to the arisings. As discussed in Section 4.2.1 however, the Tilbury Green Power

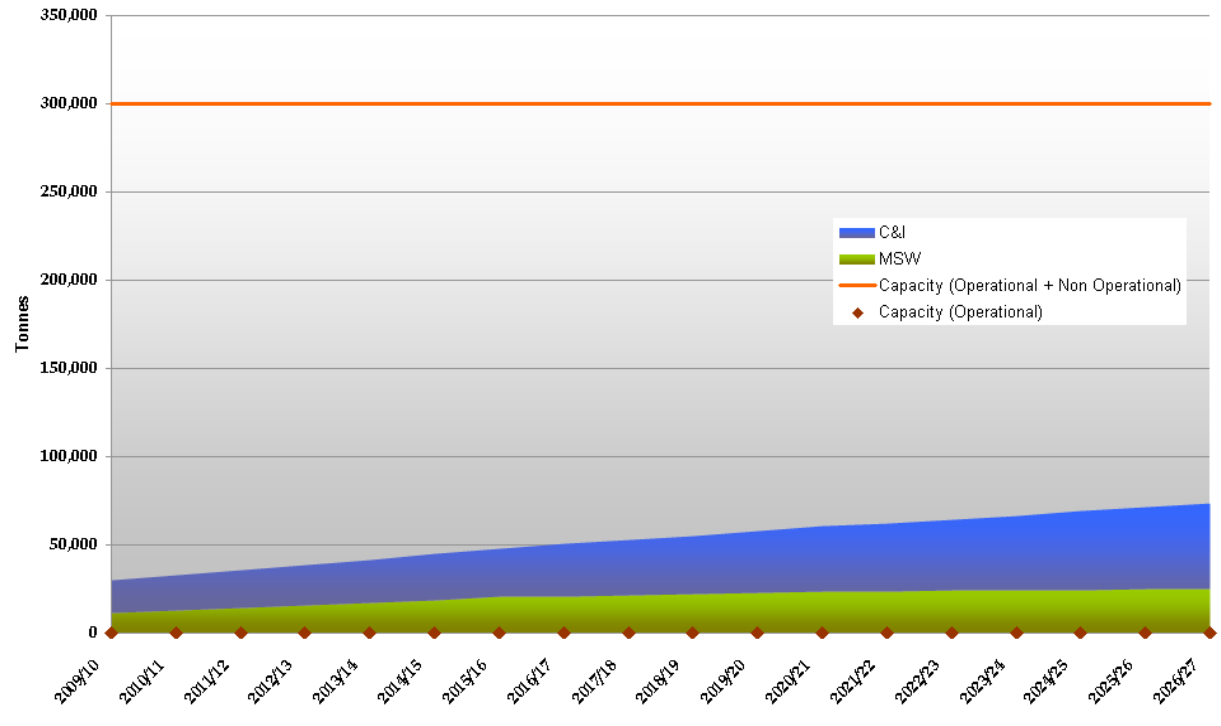
scheme has been granted planning permission. As can be seen in *Figure 5.4* and *Figure 5.5*, the inclusion of this capacity provides more than sufficient recovery capacity for Thurrock's need. The planning permission states that of the permitted capacity, only 80,000 tonnes per annum are available to MSW and 220,000 tonnes per annum for C&I wastes. *Figure 5.4* and *Figure 5.5* demonstrate that even given this restriction, the scheme would be more than sufficient to manage Thurrock's assumed residual wastes. The proviso to this is that the capacity of the Tilbury Green Power scheme is not contracted to Thurrock, and may not necessarily be so.

With regard to planning for the future, Thurrock will need to establish the level of certainty of the delivery of the Tilbury Green Power scheme and the likelihood of this capacity being available to manage wastes arising within the Authority. Until this capacity is confirmed to be available, Thurrock should continue to consider how future policy will deliver between 45,000 tonnes (Lower Bound arisings) and 140,000 tonnes (Upper Bound arisings) of recovery capacity by the end of the study period.

The alternative split of recycling/recovery for C&I waste (F2) is also considered. The recovery capacity gap assessment for Scenario F2 is shown in *Figure 5.6*. That figure shows that in Thurrock is potentially facing a recovery capacity gap of almost 74,000 tonnes by the end of the study period.

The details of the capacity gap year on year are presented in Annex B.

Figure 5.6 Upper Bound (Scenario F2) MSW and C&I Waste Recovery



5.1.3 *Non Hazardous Landfill*

The arisings of MSW and C&I waste to be landfilled were calculated in Section 3. These are now compared with the known remaining landfill capacity as discussed in Section 4. *Figure 5.7* and *Figure 5.8* show the predicted remaining landfill capacity each year after arisings for that year have been subtracted.

Figure 5.7 Lower Bound (Scenario B) Non Hazardous Landfill

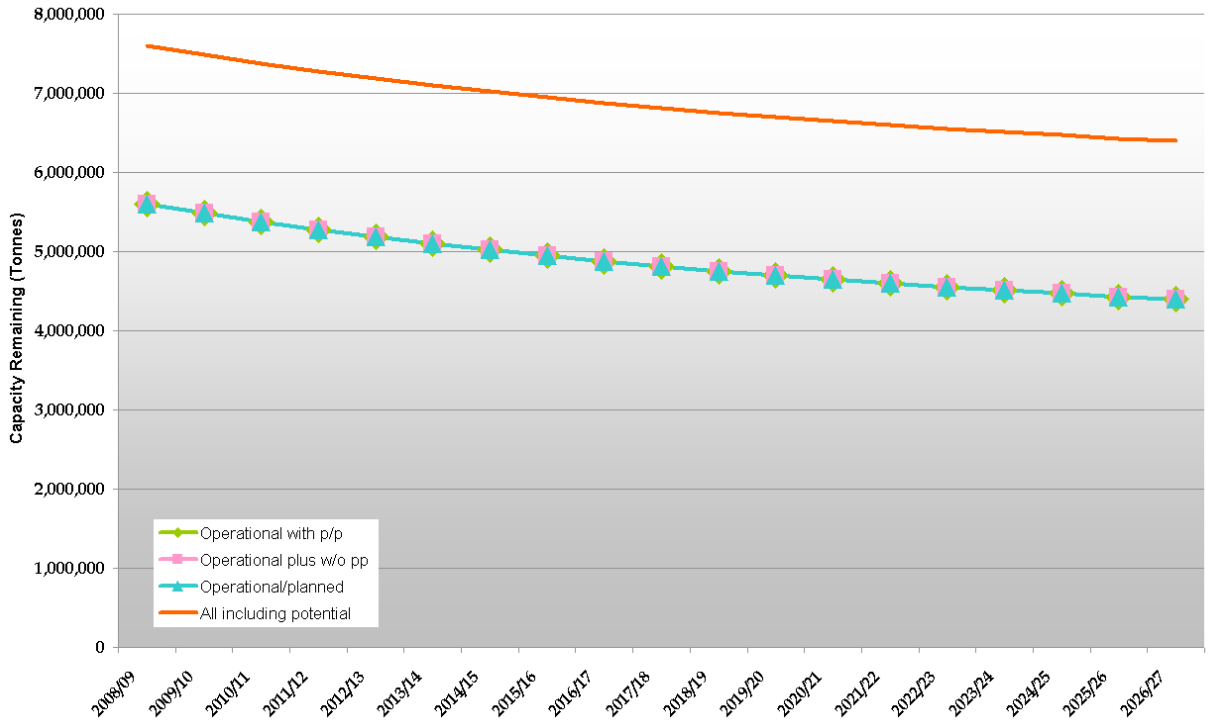
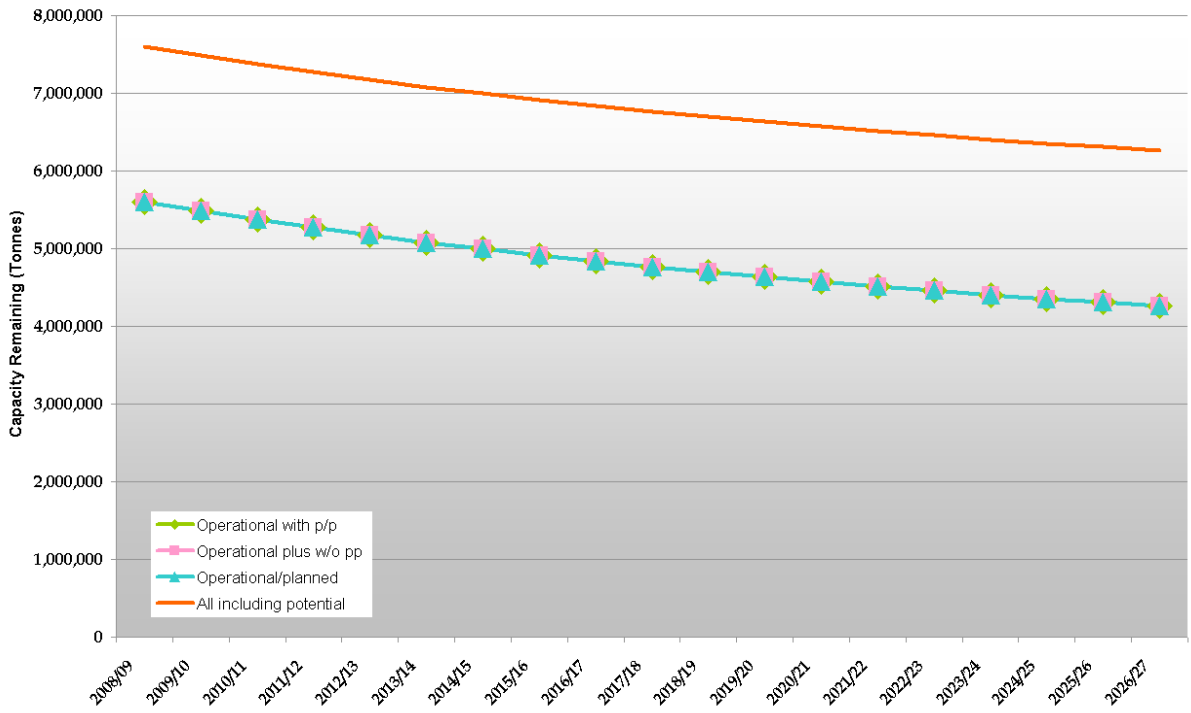


Figure 5.8 Upper Bound (Scenario F) Non Hazardous Landfill



As can be seen from *Figure 5.7* and *Figure 5.8* Thurrock appears to have sufficient landfill capacity throughout the study period to manage waste arisings within the Authority, regardless of the status of capacity considered. The key uncertainty for Thurrock with regard to landfill is that it is likely that not just Thurrock's waste will be disposed of in Thurrock's landfill facilities. Additional imports of waste for disposal would make the gradient of these capacity curves much steeper and reduce the remaining landfill capacity available to Thurrock. A significant region exporting waste for disposal into Thurrock is London; the implication of this activity is discussed in the next section of this update.

The details of the capacity gap year on year for are presented in Annex B.

5.1.4 Non Hazardous Landfill Including London Imports

The arisings of MSW and C&I waste to be landfilled were calculated in Section 3. These are now added to the waste apportioned to Thurrock and compared with the known remaining landfill capacity as discussed in Section 4. *Figure 5.9* and *Figure 5.10* show the predicted remaining landfill capacity each year after arisings for that year have been subtracted.

Figure 5.9 Lower Bound (Scenario B) Non Hazardous Landfill incl London

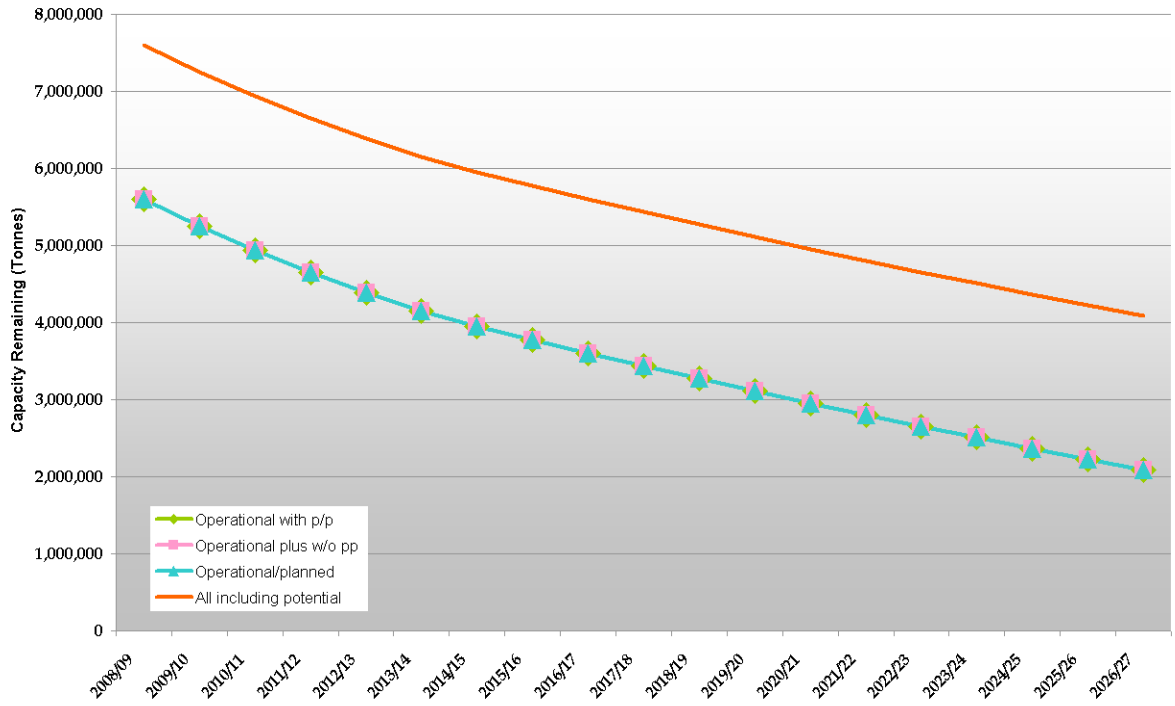
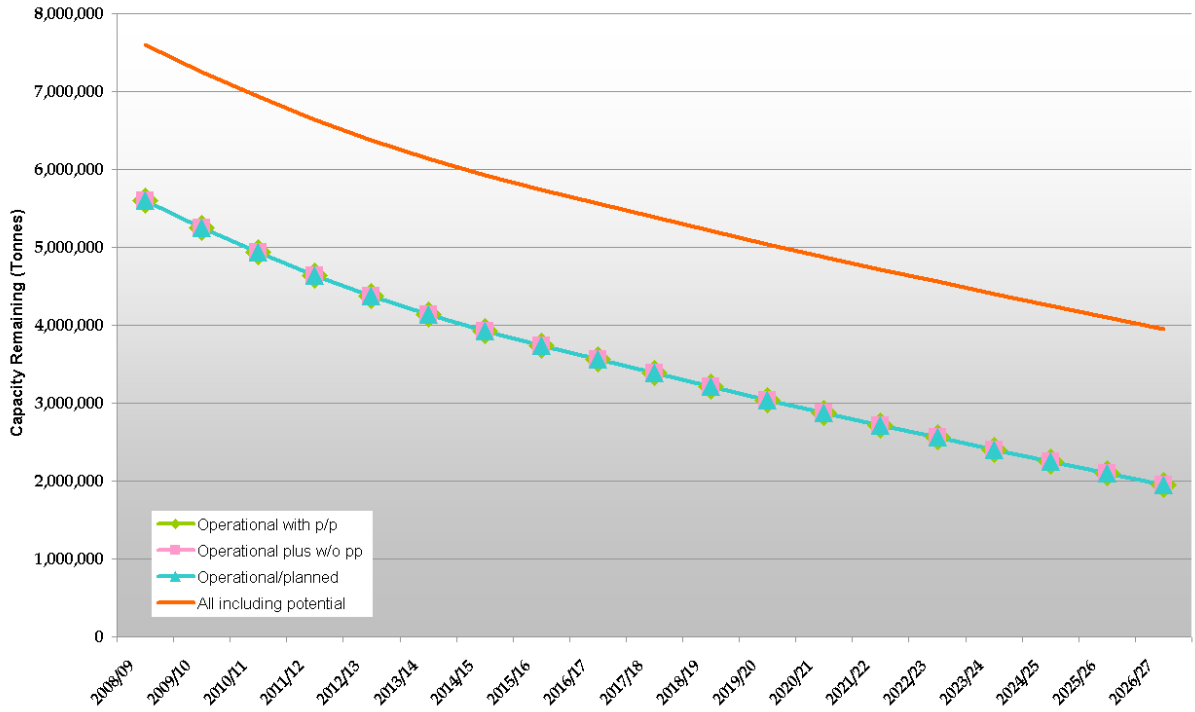


Figure 5.10 Upper Bound (Scenario F) Non Hazardous Landfill incl London



As with the landfill capacity assessment excluding London's waste, the Thurrock landfill capacity assessment *including* London's waste appears to be sufficient to manage the arisings predicted. However, the rate of decline of

capacity is much greater in *Figure 5.9* and *Figure 5.10* than that seen in *Figure* 5.7 and *Figure 5.8*.

Despite the apparent availability of landfill capacity, in reality the situation is not expected to be this optimistic. Landfill facilities in Thurrock have accepted over one million tonnes of waste per annum from London in the recent past – many times the allocation in the draft RSS Review. If this continues, the remaining landfill void will be depleted very quickly indeed. To explore this possibility, for illustrative purposes only, a further two scenarios have been run. These assume that the London imports are 0.88 million tonnes per annum. The results are shown in *Figure 5.11* and *Figure 5.12*. As can be seen in these figures, the result of the higher rate of import is that Thurrock's landfill capacity is exhausted as early as 2014/15 (or 2016/17 if all the potential capacity comes forward). Clearly this is very different situation to plan for. At the very least, Thurrock will need to undertake further surveys to understand the rate of imports and the implications for landfill capacity.

Figure 5.11 Lower Bound (Scenario B) Non Hazardous Landfill incl London at 0.88 million tonnes per annum

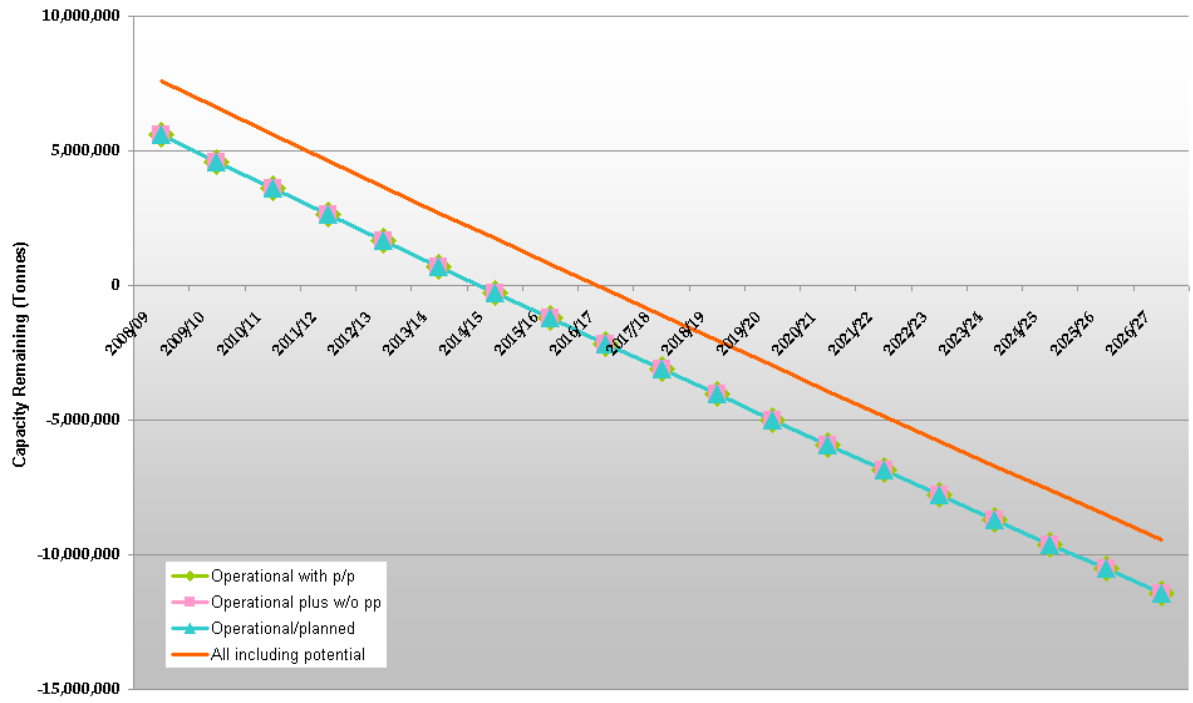
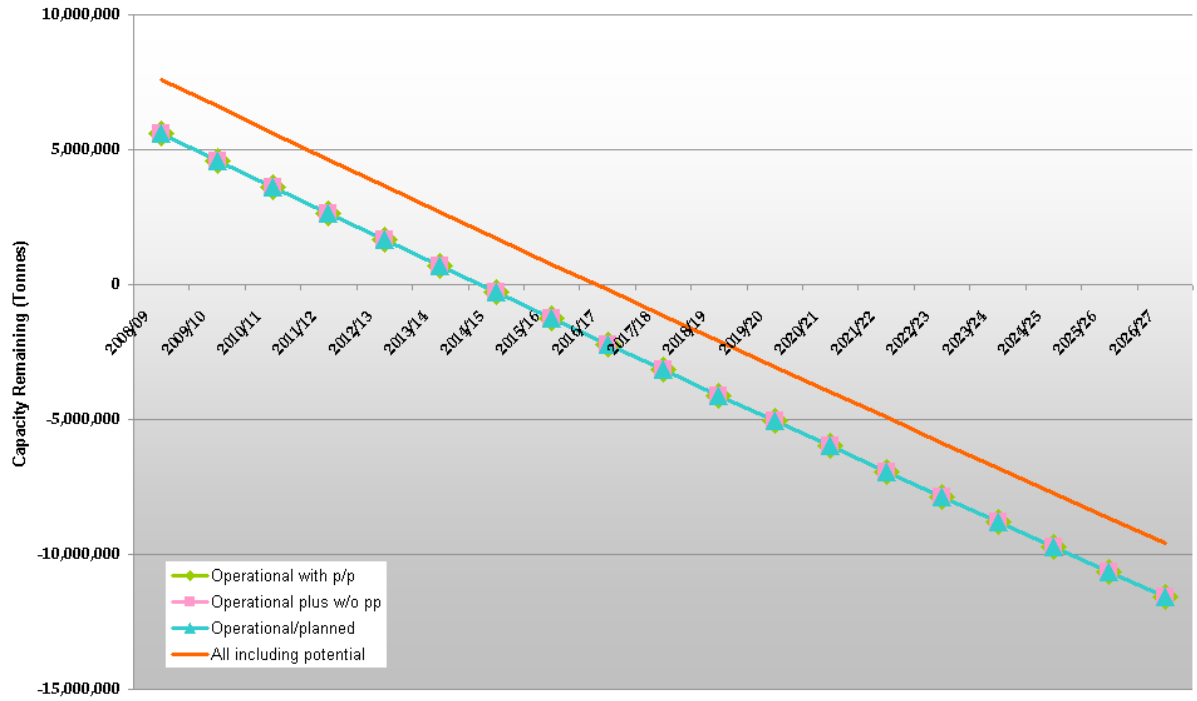


Figure 5.12 Upper Bound (Scenario F) Non Hazardous Landfill incl London at 0.88 million tonnes per annum



5.2 CD&E WASTES

5.2.1 Recycling

The arisings of CD&E wastes were discussed in Section 3 along with a consideration of the treatment of currently exempt wastes post 2012. In Section 4 the available CD&E recycling capacity was considered, in particular considering the likelihood of closure of existing sites. *Figure 5.13* and *Figure 5.14* present this information graphically.

Figure 5.13 Lower Bound (Scenario B) CD&E Recycling

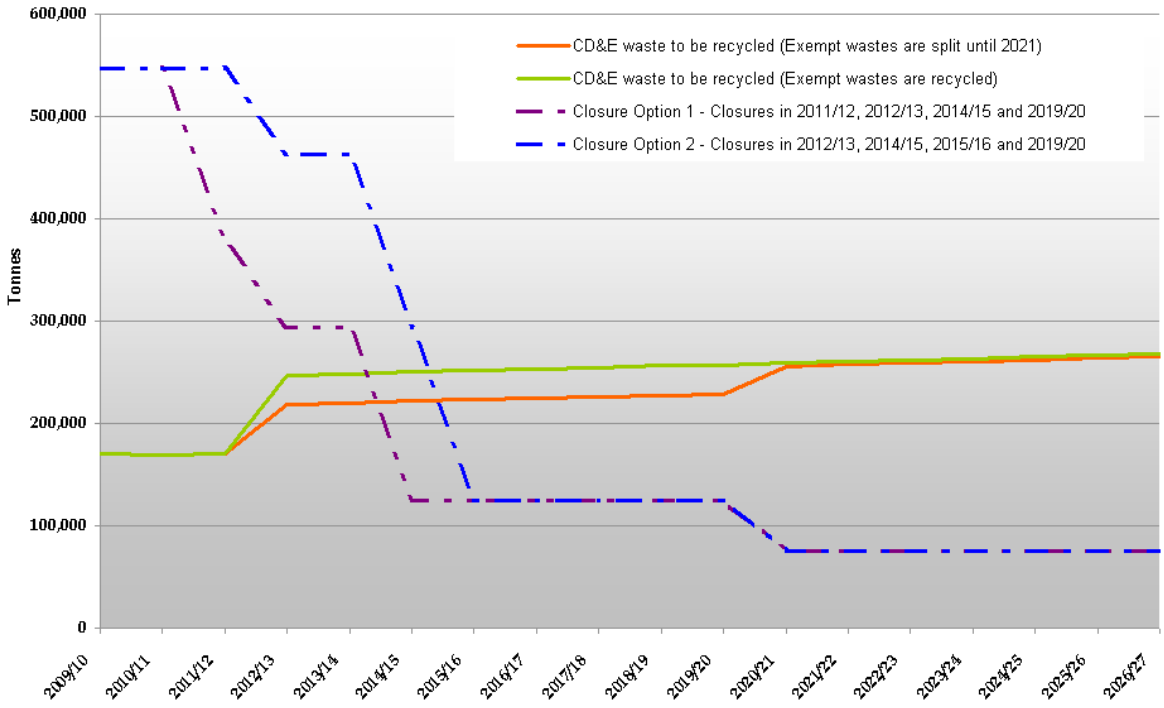
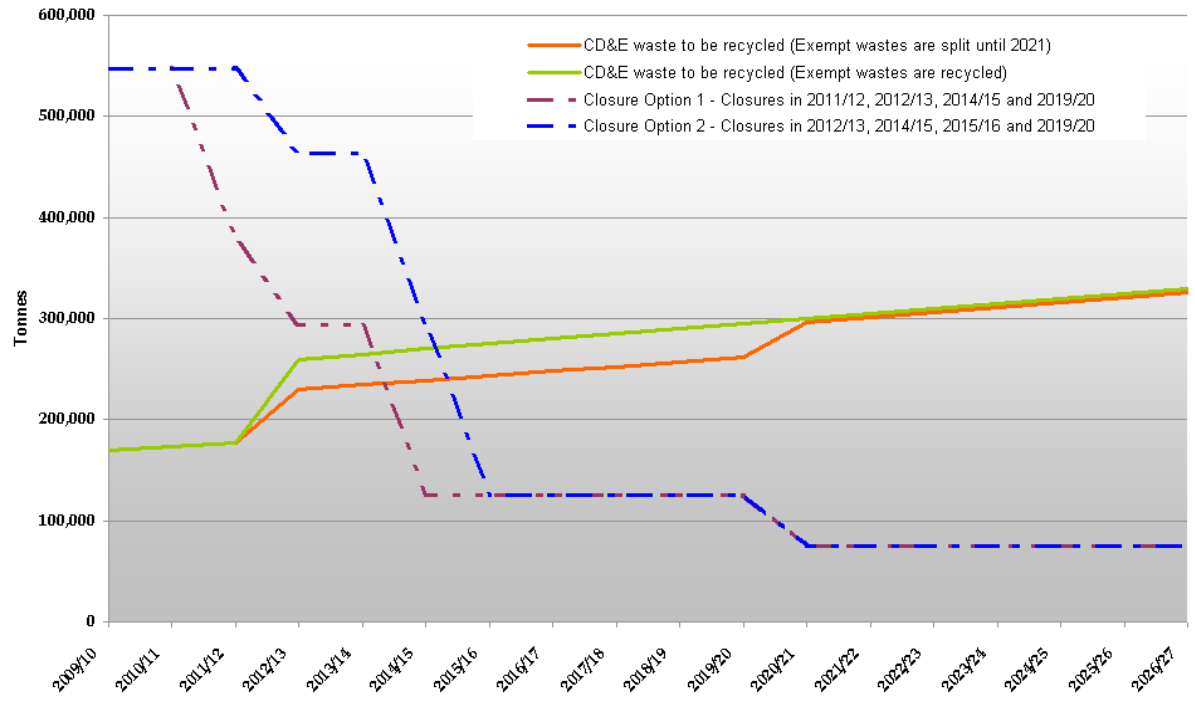


Figure 5.14 Upper Bound (Scenario F) CD&E Recycling



Thurrock has a current oversupply of CDE recycling capacity to meet its own needs. However, in both the Upper and Lower Bound, and regardless of the route by which exempt waste is treated or site closure scenario, Thurrock will fall short of CD&E recycling capacity before 2015/16. The capacity gap

depends on the arisings scenario; approximately 255,000 tonnes of capacity being required by the end of the study period in the upper arisings scenario and approximately 195,000 tonnes being required by the end of the study period in the lower arisings scenario. Whilst these are significant gaps, it should be noted that in practise this undersupply of capacity will be reduced by the extent of recycling carried out on development sites by mobile crushers and screens. In addition the nature of CD&E recycling sites is to process significant amounts of waste – so that even without the contribution of mobile facilities this capacity gap could be managed with only one or two new (or retained) sites.

The details of the capacity gap year on year for are presented in Annex B.

5.2.2 Inert Landfill

The arisings of CD&E wastes were discussed in Section 3 along with a consideration of the treatment of currently exempt wastes post 2012. In Section 4 the available inert landfill capacity was considered. *Figure 5.15* to *Figure 5.18* present this information graphically, factoring in the variables of growth scenario and treatment of exempt wastes.

Figure 5.15 Lower Bound (Scenario G) Inert Landfill

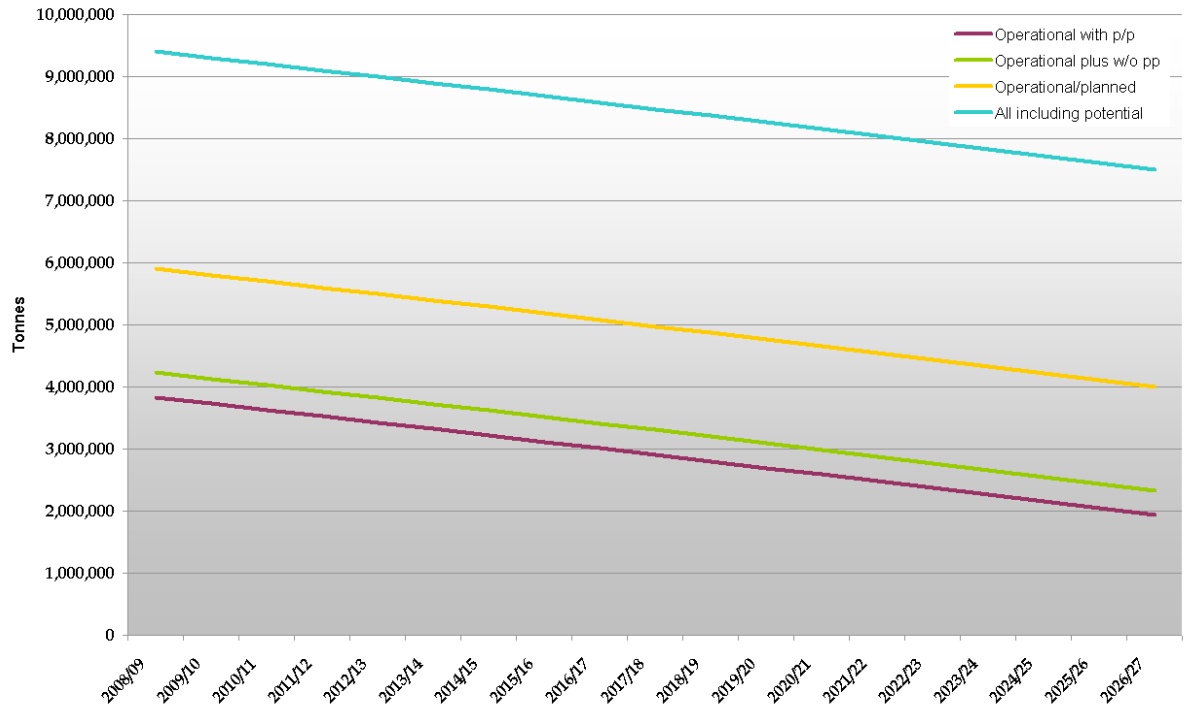


Figure 5.16 Lower Bound (Scenario H) Inert Landfill

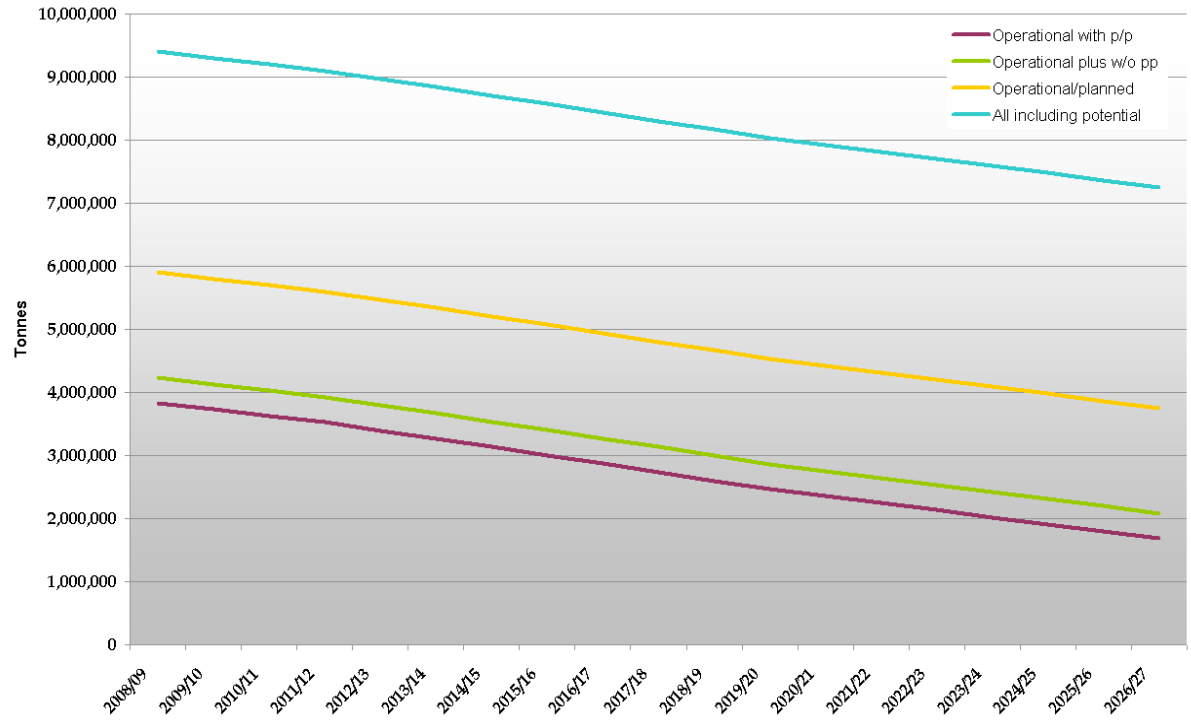


Figure 5.17 Upper Bound (Scenario G) Inert Landfill

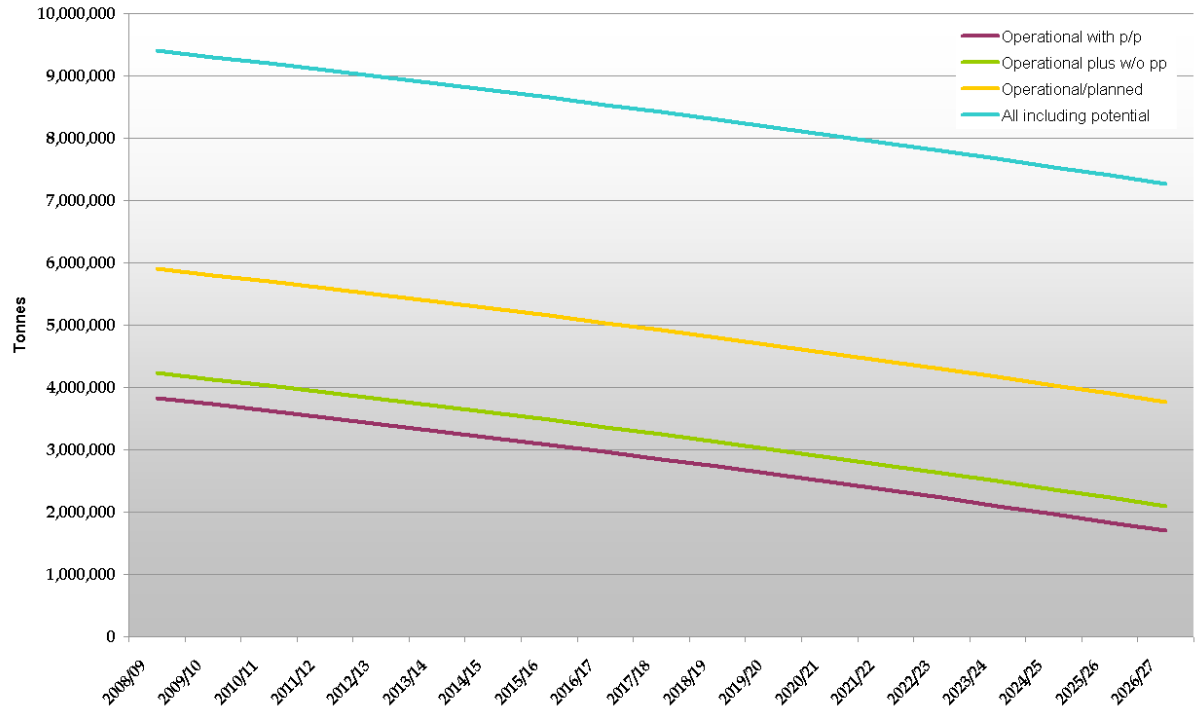
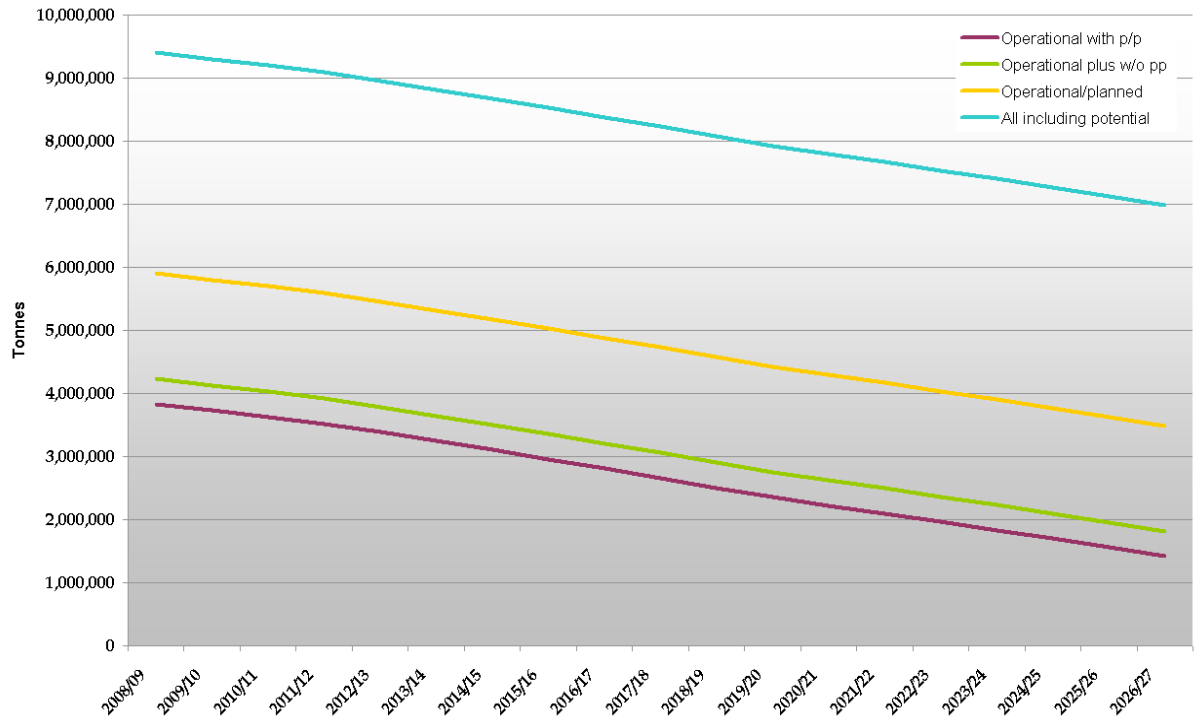


Figure 5.18 Upper Bound (Scenario H) Inert Landfill



There appears to be sufficient landfill capacity throughout the study period to manage CD&E waste arisings within the Authority, regardless of the status of capacity considered. In the most optimistic scenario (ie all potential landfill void becomes available), Thurrock may have in excess of 7 million tonnes of void remaining at the end of the plan. In the most pessimistic scenario, Thurrock may have less than 1.5 million tonnes of void remaining by the end of the study period.

Clearly this is quite a difference; though whilst the arisings scenario makes a difference, the most important factor in determining which outcome occurs is the delivery (or not) of the planned or in planning void. A priority action would be to establish what, if any, of this capacity is likely to be delivered. In any event, there would appear to be sufficient void for the study period.

The details of the capacity gap year on year for are presented in Annex B.

Within Thurrock, there is only small amounts of non-specialist waste management capacity. This is reflected in the capacity gap assessment for recycling and composting and for recovery.

For both the Upper and Lower Bounds of arising recycling and composting capacity is insufficient to deal with even the MSW arisings, let alone the C&I waste arisings. The maximum recycling and composting capacity gap by the end of the study period is approximately 164,000 tonnes (upper bound arisings); the mimum capacity gap by the end of the study period is approximately 65,000 tonnes (lower bound arisings). The alternative split of recycling/recovery of C&I waste (Scenario F2) would result in a capacity gap of 148,000 tonnes by the end of the study period.

At present there is no operational recovery capacity in Thurrock – therefore in both the Upper and Lower Bound scenarios the capacity gap is equal to the arisings. If the Tilbury Green Power scheme is delivered it could provide more than sufficient recovery capacity for Thurrock's need, even despite the planning permission restrictions. The proviso to this is that the capacity of the Tilbury Green Power scheme is not contracted to Thurrock, and may not necessarily be so. Until this capacity is confirmed to be available, Thurrock should continue to consider how they will deliver between 45,000 tonnes (lower bound arisings) and 140,000 tonnes (upper bound arisings) of recovery capacity by the end of the study period. The alternative split of recycling/recovery of C&I waste (Scenario F2) would result in a capacity gap of 74,000 tonnes by the end of the study period.

Thurrock appears to have sufficient non hazardous and inert landfill capacity throughout the study period to manage waste arisings within the Authority, regardless of the status of capacity considered. The key uncertainty for Thurrock with regard to landfill is that it is likely that not just Thurrock's waste will be disposed of in Thurrock's landfills. One such exporter of waste to be landfilled is London. At present the landfill capacity within Thurrock would appear to be sufficient to manage even these arisings.

Nonetheless, despite the apparent availability of non hazardous landfill capacity, in reality the situation is not expected to be this optimistic. Landfill facilities in Thurrock have accepted over one million tonnes of waste per annum from London in the recent past – many times the allocation in the draft RSS Review. If this continues, the remaining landfill void will be depleted very quickly indeed. Indeed, if it is assumed that imports are 0.88 million tonnes per annum, then landfill capacity is exhausted in 2014/15 (or 2016/17 if all potential capacity comes forward). That eventuality represents a worst case scenario. In reality the level of waste for landfill from London should decline as more waste is pre-treated and availability is increasingly controlled through the local development framework and planning permissions.

For inert landfill capacity Thurrock appears to have sufficient landfill capacity throughout the study period to manage its own CD&E waste arisings, regardless of the status of capacity considered. In the most optimistic scenario (ie all potential landfill void becomes available), Thurrock may have in excess of 7 million tonnes of void remaining at the end of the plan. In the most pessimistic scenario, Thurrock may have less than 1.5 million tonnes of void remaining at the end of the study period. In any event, there would appear to be sufficient void for the study period. A priority would be to try and establish what, if any, of this capacity is likely to be delivered.

Finally, for CD&E waste recycling, in both the Upper and Lower Bound, and regardless of the route by which exempt waste is treated or site closure scenario, Thurrock will fall short of CD&E recycling capacity before 2015/16. The capacity gap depends on the arisings scenario; approximately 255,000 tonnes of capacity being required in the upper arisings scenario and approximately 195,000 tonnes being required in the lower arisings scenario by the end of the study period, however these gaps will be reduced by the extent of recycling carried out at development sites.

In summary therefore, Thurrock is expected to require MSW and C&I recycling and recovery capacity immediately and for the duration of the study period. CD&E recycling capacity will also be required in the Authority, from approximately 2014 onwards.

Annex A

Waste Arisings

A1 WASTE ARISINGS

A1.1 MSW

The table below are the estimates for MSW over the forecast period.

Table 1.1 MSW Forecasts (tonnes)

	A - Adopted RSS	B - RSS Review	C - MSW 1.4 tph	D - Thurrock specific C&I	E - Phased Growth (1.4 tph and Thurrock Specific C&I waste)	F - Core Strategy Housing Growth (Thurrock Specific C&I waste)
2009/10	97,000	75,271	75,271	75,271	75,271	75,271
2010/11	101,000	75,861	76,601	75,861	75,610	76,509
2011/12	101,000	76,436	77,931	76,436	76,175	77,740
2012/13	102,000	76,995	79,261	76,995	76,741	78,961
2013/14	103,000	77,540	80,591	77,540	77,589	80,174
2014/15	105,000	78,070	81,921	78,070	78,493	81,379
2015/16	106,000	78,584	83,251	78,584	79,397	82,575
2016/17	107,000	79,084	84,581	79,084	80,528	83,763
2017/18	108,000	79,568	85,911	79,568	81,658	84,942
2018/19	109,000	80,038	87,241	80,038	82,919	86,113
2019/20	110,000	80,492	88,571	80,492	84,581	87,275
2020/21	111,000	80,932	89,901	80,932	86,244	88,429
2021/22	112,000	81,356	91,231	81,356	87,906	89,575
2022/23	113,000	81,766	92,561	81,766	89,901	90,712
2023/24	114,000	82,160	93,891	82,160	91,896	91,840
2024/25	115,000	82,540	95,221	82,540	93,891	92,960
2025/26	116,000	82,904	96,551	82,904	95,886	94,072
2026/27	117,000	83,253	97,881	83,253	97,881	95,175

A1.2 C&I WASTE

The table below are the estimates for C&I waste over the forecast period.

Table 1.2 C&I Waste Forecasts (tonnes)

	A - Adopted RSS	B - RSS Review	C - MSW 1.4 tph	D - Thurrock specific C&I	E - Phased Growth (1.4 tph and Thurrock Specific C&I waste)	F - Core Strategy Housing Growth (Thurrock Specific C&I waste)
2009/10	217,000	138,449	138,449	138,449	138,449	138,449
2010/11	223,000	136,662	136,662	141,643	139,263	141,643
2011/12	230,000	137,244	137,244	144,837	140,621	144,837
2012/13	236,000	138,299	138,299	148,031	141,978	148,031
2013/14	242,000	139,565	139,565	151,225	144,014	151,225
2014/15	248,000	140,545	140,545	154,418	146,186	154,418
2015/16	257,000	141,489	141,489	157,612	148,358	157,612
2016/17	265,000	142,369	142,369	160,806	151,073	160,806
2017/18	274,000	143,138	143,138	164,000	153,788	164,000
2018/19	282,000	143,785	143,785	167,194	156,815	167,194
2019/20	291,000	144,345	144,345	170,388	160,807	170,388
2020/21	299,000	145,208	145,208	173,582	164,799	173,582
2021/22	304,980	146,110	146,110	176,776	168,792	176,776
2022/23	311,080	147,049	147,049	179,970	173,583	179,970
2023/24	317,301	148,028	148,028	183,163	178,373	183,163
2024/25	323,647	149,045	149,045	186,357	183,164	186,357
2025/26	330,120	150,101	150,101	189,551	187,955	189,551
2026/27	336,723	151,197	151,197	192,745	192,746	192,745

A1.3 C&D WASTE

The table below are the estimates for C&D waste over the forecast period.

Table 1.3 C&D Waste Forecasts (tonnes)

	Upper (Scenario F Growth)	Lower (Scenario B Growth)
2009/10	345,580	345,580
2010/11	352,747	343,645
2011/12	359,901	345,516
2012/13	367,040	348,125
2013/14	374,166	351,054
2014/15	381,279	353,495
2015/16	388,377	355,853
2016/17	395,462	358,084
2017/18	402,534	360,110
2018/19	409,591	361,917
2019/20	416,635	363,556
2020/21	423,665	365,663
2021/22	430,682	367,807
2022/23	437,685	369,988
2023/24	444,674	372,209
2024/25	451,650	374,467
2025/26	458,612	376,764
2026/27	465,560	379,100

A1.4 HAZARDOUS WASTE

The table below are the estimates for hazardous waste over the forecast period. These have not been updated since the 2009 update.

Table 1.4 Hazardous Waste Forecasts (tonnes)

	Economic Growth	Decoupling Waste	No growth	Legislative drivers- 5% decrease	Legislative drivers - 10% decrease
2007/08	11,683	11,058	10,948	10,875	10,803
2008/09	12,068	11,113	10,948	10,839	10,731
2009/10	12,466	11,169	10,948	10,803	10,659
2010/11	12,878	11,225	10,948	10,767	10,588
2011/12	13,303	11,225	10,948	10,731	10,517
2012/13	13,742	11,225	10,948	10,695	10,447
2013/14	14,195	11,225	10,948	10,660	10,378
2014/15	14,664	11,225	10,948	10,624	10,308
2015/16	15,148	11,225	10,948	10,589	10,240
2016/17	15,647	11,168	10,948	10,553	10,171
2017/18	16,164	11,113	10,948	10,518	10,104
2018/19	16,697	11,057	10,948	10,483	10,036
2019/20	17,248	11,002	10,948	10,448	9,969
2020/21	17,817	10,947	10,948	10,413	9,903
2021/22	18,405	10,892	10,948	10,379	9,837
2022/23	19,013	10,838	10,948	10,344	9,771
2023/24	19,640	10,783	10,948	10,309	9,706
2024/25	20,288	10,729	10,948	10,275	9,641
2025/26	20,958	10,676	10,948	10,241	9,577
2026/27	21,649	10,622	10,948	10,207	9,513

A1.5 AGRICULTURAL WASTE

The table below are the estimates for agricultural waste over the forecast period. These have not been updated since the 2009 update.

Table 1.5 Agricultural Waste Forecasts (tonnes)

	Economic Growth	Decoupling Waste	No growth	Legislative drivers- 5% decrease	Legislative drivers - 10% decrease
2007/08	489	463	415	413	410
2008/09	505	465	415	411	407
2009/10	521	467	415	410	404
2010/11	539	469	415	409	402
2011/12	556	469	415	407	399
2012/13	575	469	415	406	396
2013/14	594	469	415	404	394
2014/15	613	469	415	403	391
2015/16	634	469	415	402	389
2016/17	654	467	415	400	386
2017/18	676	465	415	399	383
2018/19	698	462	415	398	381
2019/20	721	460	415	396	378
2020/21	745	458	415	395	376
2021/22	770	456	415	394	373
2022/23	795	453	415	393	371
2023/24	821	451	415	391	368
2024/25	849	449	415	390	366
2025/26	877	447	415	389	363
2026/27	906	444	415	387	361

Annex B

Capacity Gaps

B1 WASTE ARISISNGS VS CAPACITY

B1.1 RECYCLING

Table 1.1 Recycling Capacity Gap (tonnes)

	Operational Capacity (23,750 tonnes)			**Operational + Non Operational Capacity (24,250 tonnes)**		
	Upper (ScF)	Lower (ScB)	ScF2	Upper (ScF)	Lower (ScB)	ScF2
2009/10	53,733	21,285	46,206	53,233	20,785	45,706
2010/11	60,561	24,748	52,089	60,061	24,248	51,589
2011/12	68,451	28,931	59,009	67,951	28,431	58,509
2012/13	76,565	33,231	66,127	76,065	32,731	65,627
2013/14	84,901	37,616	73,443	84,401	37,116	72,943
2014/15	93,457	42,004	80,954	92,957	41,504	80,454
2015/16	102,234	46,430	88,661	101,734	45,930	88,161
2016/17	108,063	48,565	94,100	107,563	48,065	93,600
2017/18	114,021	50,690	99,663	113,521	50,190	99,163
2018/19	120,107	52,801	105,350	119,607	52,301	104,850
2019/20	126,320	54,902	111,160	125,820	54,402	110,660
2020/21	132,660	57,075	117,094	132,160	56,575	116,594
2021/22	137,734	58,437	121,969	137,234	57,937	121,469
2022/23	142,906	59,819	126,941	142,406	59,319	126,441
2023/24	148,165	61,212	132,001	147,665	60,712	131,501
2024/25	153,511	62,618	137,150	153,011	62,118	136,650
2025/26	158,994	64,070	142,426	158,494	63,570	141,926
2026/27	164,464	65,468	147,713	163,964	64,968	147,213

B1.2 C&D RECYCLING

The assumed capacities are stated in Table 4.4 of the report.

Table 1.2 C&D Recycling Capacity Gap (Lower Bound Arisings) (tonnes)

	Closure Option 1 - Closures in 2011/12, 2012/13, 2014/15 and 2019/20		**Closure Option 2 - Closures in 2012/13, 2014/15, 2015/16 and 2019/20**	
	Exempt wastes are recycled	**Exempt wastes are split until 2021**	**Exempt wastes are recycled**	**Exempt wastes are split until 2021**
2009/10	0	0	0	0
2010/11	0	0	0	0
2011/12	0	0	0	0
2012/13	0	0	0	0
2013/14	0	0	0	0
2014/15	125,223	96,683	0	0
2015/16	126,892	98,161	126,892	98,161
2016/17	128,471	99,561	128,471	99,561
2017/18	129,905	100,831	129,905	100,831
2018/19	131,184	101,964	131,184	101,964
2019/20	132,345	102,992	132,345	102,992
2020/21	183,836	180,964	183,836	180,964
2021/22	185,354	182,465	185,354	182,465
2022/23	186,898	183,992	186,898	183,992
2023/24	188,469	185,546	188,469	185,546
2024/25	190,068	187,127	190,068	187,127
2025/26	191,693	188,735	191,693	188,735
2026/27	193,347	190,370	193,347	190,370

Table 1.3 C&D Recycling Capacity Gap (Upper Bound Arisings) (tonnes)

	Closure Option 1 - Closures in 2011/12, 2012/13, 2014/15 and 2019/20		Closure Option 2 - Closures in 2012/13, 2014/15, 2015/16 and 2019/20	
	Exempt wastes are recycled	Exempt wastes are split until 2021	Exempt wastes are recycled	Exempt wastes are split until 2021
2009/10	0	0	0	0
2010/11	0	0	0	0
2011/12	0	0	0	0
2012/13	0	0	0	0
2013/14	0	0	0	0
2014/15	144,889	114,106	0	0
2015/16	149,914	118,558	149,914	118,558
2016/17	154,929	123,001	154,929	123,001
2017/18	159,935	127,436	159,935	127,436
2018/19	164,931	131,861	164,931	131,861
2019/20	169,917	136,279	169,917	136,279
2020/21	224,893	221,566	224,893	221,566
2021/22	229,860	226,477	229,860	226,477
2022/23	234,817	231,380	234,817	231,380
2023/24	239,764	236,272	239,764	236,272
2024/25	244,702	241,155	244,702	241,155
2025/26	249,630	246,028	249,630	246,028
2026/27	254,548	250,892	254,548	250,892

B1.3 RECOVERY

Table 1.4 Recovery Capacity Gap (tonnes)

	Operational Capacity (0 tonnes)			Operational + Non Operational Capacity (300,000 tonnes)		
	Upper (ScF)	Lower (ScB)	ScF2	Upper (ScF)	Lower (ScB)	ScF2
2009/10	54,902	22,454	29,981	0	0	0
2010/11	58,895	23,299	32,502	0	0	0
2011/12	63,875	24,830	35,468	0	0	0
2012/13	69,003	26,449	38,519	0	0	0
2013/14	74,277	28,121	41,654	0	0	0
2014/15	79,698	29,769	44,873	0	0	0
2015/16	85,265	31,430	48,176	0	0	0
2016/17	89,923	32,764	50,507	0	0	0
2017/18	94,697	34,091	52,891	0	0	0
2018/19	99,586	35,404	55,329	0	0	0
2019/20	104,591	36,708	57,819	0	0	0
2020/21	109,712	38,086	60,362	0	0	0
2021/22	114,188	39,231	62,451	0	0	0
2022/23	118,760	40,396	64,582	0	0	0
2023/24	123,424	41,581	66,751	0	0	0
2024/25	128,178	42,786	68,957	0	0	0
2025/26	133,041	44,017	71,218	0	0	0
2026/27	137,962	45,260	73,484	0	0	0

B1.4 NON HAZARDOUS LANDFILL

Table 1.5 Total Arisings vs Non Haz Landfill (Decreasing Capacity) (tonnes)

	Total Arisings		Operational Non Haz Landfill Capacity		Non Haz Landfill Capacity (inc. currently operational sites that do not hold a planning permission)		Non Haz Landfill Capacity (inc currently operational sites and planned sites)		Non Haz Landfill Capacity (inc currently operational sites, planned sites and potential void from mineral extractions)	
	Upper	**Lower**	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
2009/10	**113,782**	**113,782**	5,486,218	5,486,218	5,486,218	5,486,218	5,486,218	5,486,218	7,486,218	7,486,218
2010/11	**109,811**	**106,861**	5,376,406	5,379,356	5,376,406	5,379,356	5,376,406	5,379,356	7,376,406	7,379,356
2011/12	**104,349**	**99,967**	5,272,057	5,279,389	5,272,057	5,279,389	5,272,057	5,279,389	7,272,057	7,279,389
2012/13	**98,595**	**93,207**	5,173,462	5,186,182	5,173,462	5,186,182	5,173,462	5,186,182	7,173,462	7,186,182
2013/14	**92,552**	**86,428**	5,080,910	5,099,754	5,080,910	5,099,754	5,080,910	5,099,754	7,080,910	7,099,754
2014/15	**86,220**	**79,401**	4,994,690	5,020,352	4,994,690	5,020,352	4,994,690	5,020,352	6,994,690	7,020,352
2015/16	**79,600**	**72,251**	4,915,090	4,948,101	4,915,090	4,948,101	4,915,090	4,948,101	6,915,090	6,948,101
2016/17	**76,212**	**68,294**	4,838,878	4,879,807	4,838,878	4,879,807	4,838,878	4,879,807	6,838,878	6,879,807
2017/18	**72,638**	**64,238**	4,766,241	4,815,569	4,766,241	4,815,569	4,766,241	4,815,569	6,766,241	6,815,569
2018/19	**68,878**	**60,091**	4,697,362	4,755,478	4,697,362	4,755,478	4,697,362	4,755,478	6,697,362	6,755,478
2019/20	**64,934**	**55,872**	4,632,428	4,699,606	4,632,428	4,699,606	4,632,428	4,699,606	6,632,428	6,699,606
2020/21	**60,805**	**51,700**	4,571,623	4,647,906	4,571,623	4,647,906	4,571,623	4,647,906	6,571,623	6,647,906
2021/22	**58,181**	**48,966**	4,513,442	4,598,940	4,513,442	4,598,940	4,513,442	4,598,940	6,513,442	6,598,940
2022/23	**55,408**	**46,191**	4,458,034	4,552,749	4,458,034	4,552,749	4,458,034	4,552,749	6,458,034	6,552,749
2023/24	**52,502**	**43,383**	4,405,532	4,509,366	4,405,532	4,509,366	4,405,532	4,509,366	6,405,532	6,509,366
2024/25	**49,460**	**40,540**	4,356,072	4,468,826	4,356,072	4,468,826	4,356,072	4,468,826	6,356,072	6,468,826
2025/26	**46,229**	**37,612**	4,309,844	4,431,215	4,309,844	4,431,215	4,309,844	4,431,215	6,309,844	6,431,215
2026/27	**42,973**	**34,741**	4,266,871	4,396,474	4,266,871	4,396,474	4,266,871	4,396,474	6,266,871	6,396,474

Table 1.6 Total Arisings Including London vs Non Haz Landfill (Decreasing Capacity) (tonnes)

	Total Arisings incl London		**Operational Non Haz Landfill Capacity**		**Non Haz Landfill Capacity (inc. currently operational sites that do not hold a planning permission)**		**Non Haz Landfill Capacity (inc currently operational sites and planned sites)**		**Non Haz Landfill Capacity (inc currently operational sites, planned sites and potential void from mineral extractions)**	
	Upper	**Lower**	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
2009/10	**346,782**	**346,782**	5,253,218	5,253,218	5,253,218	5,253,218	5,253,218	5,253,218	7,253,218	7,253,218
2010/11	**321,811**	**318,861**	4,931,406	4,934,356	4,931,406	4,934,356	4,931,406	4,934,356	6,931,406	6,934,356
2011/12	**294,349**	**289,967**	4,637,057	4,644,389	4,637,057	4,644,389	4,637,057	4,644,389	6,637,057	6,644,389
2012/13	**266,595**	**261,207**	4,370,462	4,383,182	4,370,462	4,383,182	4,370,462	4,383,182	6,370,462	6,383,182
2013/14	**238,552**	**232,428**	4,131,910	4,150,754	4,131,910	4,150,754	4,131,910	4,150,754	6,131,910	6,150,754
2014/15	**211,220**	**204,401**	3,920,690	3,946,352	3,920,690	3,946,352	3,920,690	3,946,352	5,920,690	5,946,352
2015/16	**182,600**	**175,251**	3,738,090	3,771,101	3,738,090	3,771,101	3,738,090	3,771,101	5,738,090	5,771,101
2016/17	**179,212**	**171,294**	3,558,878	3,599,807	3,558,878	3,599,807	3,558,878	3,599,807	5,558,878	5,599,807
2017/18	**175,638**	**167,238**	3,383,241	3,432,569	3,383,241	3,432,569	3,383,241	3,432,569	5,383,241	5,432,569
2018/19	**171,878**	**163,091**	3,211,362	3,269,478	3,211,362	3,269,478	3,211,362	3,269,478	5,211,362	5,269,478
2019/20	**167,934**	**158,872**	3,043,428	3,110,606	3,043,428	3,110,606	3,043,428	3,110,606	5,043,428	5,110,606
2020/21	**163,805**	**154,700**	2,879,623	2,955,906	2,879,623	2,955,906	2,879,623	2,955,906	4,879,623	4,955,906
2021/22	**161,181**	**151,966**	2,718,442	2,803,940	2,718,442	2,803,940	2,718,442	2,803,940	4,718,442	4,803,940
2022/23	**158,408**	**149,191**	2,560,034	2,654,749	2,560,034	2,654,749	2,560,034	2,654,749	4,560,034	4,654,749
2023/24	**155,502**	**146,383**	2,404,532	2,508,366	2,404,532	2,508,366	2,404,532	2,508,366	4,404,532	4,508,366
2024/25	**152,460**	**143,540**	2,252,072	2,364,826	2,252,072	2,364,826	2,252,072	2,364,826	4,252,072	4,364,826
2025/26	**149,229**	**140,612**	2,102,844	2,224,215	2,102,844	2,224,215	2,102,844	2,224,215	4,102,844	4,224,215
2026/27	**145,973**	**137,741**	1,956,871	2,086,474	1,956,871	2,086,474	1,956,871	2,086,474	3,956,871	4,086,474

B1.5 INERT LANDFILL

Table 1.7 C&D Landfill Arisings (Exempt Wastes Recycled) vs Inert Landfill Capacity (Decreasing) (tonnes)

	Arisings		Operational Inert Landfill Capacity		Inert Landfill Capacity (inc. currently operational sites that do not hold a planning permission)		Inert Landfill Capacity (inc currently operational sites and planned sites)		Inert Landfill Capacity (inc currently operational sites, planned sites and potential void from mineral extractions)	
	Upper	**Lower**	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
2009/10	**100,960**	**100,960**	3,729,040	3,729,040	4,129,040	4,129,040	5,799,040	5,799,040	9,299,040	9,299,040
2010/11	**103,054**	**100,395**	3,625,986	3,628,645	4,025,986	4,028,645	5,695,986	5,698,645	9,195,986	9,198,645
2011/12	**105,144**	**100,941**	3,520,843	3,527,704	3,920,843	3,927,704	5,590,843	5,597,704	9,090,843	9,097,704
2012/13	**107,229**	**101,704**	3,413,613	3,426,001	3,813,613	3,826,001	5,483,613	5,496,001	8,983,613	8,996,001
2013/14	**109,311**	**102,559**	3,304,302	3,323,442	3,704,302	3,723,442	5,374,302	5,393,442	8,874,302	8,893,442
2014/15	**111,389**	**103,272**	3,192,913	3,220,169	3,592,913	3,620,169	5,262,913	5,290,169	8,762,913	8,790,169
2015/16	**113,463**	**103,961**	3,079,450	3,116,208	3,479,450	3,516,208	5,149,450	5,186,208	8,649,450	8,686,208
2016/17	**115,533**	**104,613**	2,963,917	3,011,595	3,363,917	3,411,595	5,033,917	5,081,595	8,533,917	8,581,595
2017/18	**117,599**	**105,205**	2,846,318	2,906,390	3,246,318	3,306,390	4,916,318	4,976,390	8,416,318	8,476,390
2018/19	**119,661**	**105,733**	2,726,657	2,800,658	3,126,657	3,200,658	4,796,657	4,870,658	8,296,657	8,370,658
2019/20	**121,718**	**106,212**	2,604,939	2,694,446	3,004,939	3,094,446	4,674,939	4,764,446	8,174,939	8,264,446
2020/21	**123,772**	**106,827**	2,481,167	2,587,619	2,881,167	2,987,619	4,551,167	4,657,619	8,051,167	8,157,619
2021/22	**125,822**	**107,454**	2,355,344	2,480,165	2,755,344	2,880,165	4,425,344	4,550,165	7,925,344	8,050,165
2022/23	**127,868**	**108,091**	2,227,476	2,372,075	2,627,476	2,772,075	4,297,476	4,442,075	7,797,476	7,942,075
2023/24	**129,910**	**108,739**	2,097,566	2,263,335	2,497,566	2,663,335	4,167,566	4,333,335	7,667,566	7,833,335
2024/25	**131,948**	**109,399**	1,965,618	2,153,936	2,365,618	2,553,936	4,035,618	4,223,936	7,535,618	7,723,936
2025/26	**133,982**	**110,070**	1,831,637	2,043,866	2,231,637	2,443,866	3,901,637	4,113,866	7,401,637	7,613,866
2026/27	**136,012**	**110,753**	1,695,625	1,933,113	2,095,625	2,333,113	3,765,625	4,003,113	7,265,625	7,503,113

Table 1.8 C&D Landfill Arisings (Exempt Wastes Split) vs Inert Landfill Capacity (Decreasing) (tonnes)

	Arisings		Operational Inert Landfill Capacity		Inert Landfill Capacity (inc. currently operational sites that do not hold a planning permission)		Inert Landfill Capacity (inc currently operational sites and planned sites)		Inert Landfill Capacity (inc currently operational sites, planned sites and potential void from mineral extractions)	
	Upper	**Lower**	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
2009/10	**100,960**	**100,960**	3,729,040	3,729,040	4,129,040	4,129,040	5,799,040	5,799,040	9,299,040	9,299,040
2010/11	**103,054**	**100,395**	3,625,986	3,628,645	4,025,986	4,028,645	5,695,986	5,698,645	9,195,986	9,198,645
2011/12	**105,144**	**100,941**	3,520,843	3,527,704	3,920,843	3,927,704	5,590,843	5,597,704	9,090,843	9,097,704
2012/13	**136,863**	**129,810**	3,383,979	3,397,894	3,783,979	3,797,894	5,453,979	5,467,894	8,953,979	8,967,894
2013/14	**139,520**	**130,902**	3,244,459	3,266,992	3,644,459	3,666,992	5,314,459	5,336,992	8,814,459	8,836,992
2014/15	**142,172**	**131,813**	3,102,286	3,135,180	3,502,286	3,535,180	5,172,286	5,205,180	8,672,286	8,705,180
2015/16	**144,819**	**132,692**	2,957,467	3,002,488	3,357,467	3,402,488	5,027,467	5,072,488	8,527,467	8,572,488
2016/17	**147,461**	**133,524**	2,810,006	2,868,964	3,210,006	3,268,964	4,880,006	4,938,964	8,380,006	8,438,964
2017/18	**150,098**	**134,279**	2,659,908	2,734,685	3,059,908	3,134,685	4,729,908	4,804,685	8,229,908	8,304,685
2018/19	**152,730**	**134,953**	2,507,178	2,599,733	2,907,178	2,999,733	4,577,178	4,669,733	8,077,178	8,169,733
2019/20	**155,356**	**135,564**	2,351,822	2,464,169	2,751,822	2,864,169	4,421,822	4,534,169	7,921,822	8,034,169
2020/21	**127,100**	**109,699**	2,224,722	2,354,470	2,624,722	2,754,470	4,294,722	4,424,470	7,794,722	7,924,470
2021/22	**129,205**	**110,342**	2,095,517	2,244,127	2,495,517	2,644,127	4,165,517	4,314,127	7,665,517	7,814,127
2022/23	**131,306**	**110,997**	1,964,212	2,133,131	2,364,212	2,533,131	4,034,212	4,203,131	7,534,212	7,703,131
2023/24	**133,402**	**111,663**	1,830,810	2,021,468	2,230,810	2,421,468	3,900,810	4,091,468	7,400,810	7,591,468
2024/25	**135,495**	**112,340**	1,695,315	1,909,128	2,095,315	2,309,128	3,765,315	3,979,128	7,265,315	7,479,128
2025/26	**137,584**	**113,029**	1,557,731	1,796,099	1,957,731	2,196,099	3,627,731	3,866,099	7,127,731	7,366,099
2026/27	**139,668**	**113,730**	1,418,063	1,682,369	1,818,063	2,082,369	3,488,063	3,752,369	6,988,063	7,252,369

ERM has over 100 offices across the following countries worldwide

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Colombia
Ecuador
France
Germany
Hong Kong
Hungary
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Korea
Malaysia
Mexico
The Netherlands
Peru
Poland
Portugal
Puerto Rico
Russia
Singapore
South Africa
Spain
Sweden
Taiwan
Thailand
UK
United Arab Emirates
US
Vietnam
Venezuela

ERM's Bristol Office

St Nicholas House
31-34 High Street
Bristol
BS1 2AW

T: 0117 315 8510
F: 0117 315 8511

www.erm.com