Review of Waste Availability Modelling for the Allerton Waste Recovery Park

Final Report to The Parish Councils' Group

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Report for:

The Parish Councils' Group

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EXECUTIVE SUMMARY

AmeyCespa is currently seeking planning permission from North Yorkshire County Council (NYCC) for a waste treatment facility at Allerton Quarry, near Harrogate. The proposed facility includes a mechanical treatment (MT) plant, an anaerobic digestion (AD) plant, and an Energy-from-Waste (EfW) or 'incineration' facility. The AWRP is AmeyCespa's solution to treat all local authority collected (LAC) residual waste collected on behalf of the York and North Yorkshire Waste Partnership (YNYWP) for a contract period of 25 years.[1] [2] AmeyCespa intends to fill any shortfall in LAC waste with material sourced from the commercial and industrial (C&I) sectors to ensure the full capacity the plant is utilised.

Towards aiming to demonstrate that the plant is both needed and of an appropriate size, YNYWP published a waste flow model on their website in October 2010. This was followed by an updated version of the model published on the North Yorkshire County Council (NYCC) website in July 2012.[3]

The aim of this study is to determine whether the modelling undertaken by YNYWP justifies the scale of the AWRP and if not, to provide information which might be used as a basis for the development of an alternative, potentially smaller facility to treat waste from the YNYWP area. Toward this goal, Eunomia has reviewed both YNYWP models and also developed its own parallel model, based on the YNYWP 2012 version, which includes two revised assumptions that both have a significant impact on the results.

The key findings from our analysis can be summarised as follows:

- Recycling targets set for England might rise in the foreseeable future as a result of revisions to the EU Waste Framework Directive.[4] Within YNYWP's 2012 model, however, recycling rates are shown not even to reach the current requirement of 50% by 2020. Furthermore, the guaranteed minimum tonnage (GMT) requirement under the contract agreed between YNYWP and AmeyCespa, is such that district councils would need to divert waste away from the AWRP for recycling rates to move above 50%, without getting near the 70% target (by 2040) modelled for this study. The likely penalties associated with the GMT requirement are such that this presents a significant financial risk to YNYWP;
- The large growth in trade waste capture assumed in the 2012 model appears to be a large overestimate of what might be likely to happen in terms of any potential increase in local authority participation in the trade waste market as a result of the cessation of LATS in 2013. Whilst a letter from NYCC claims that this assumption within their model is not important, stating that any commercial waste tonnage input to the AWRP would

[1] LAC waste was previously defined as municipal solid waste (MSW), but following clarification of the definition of MSW by the European Commission (EC) to include all commercial wastes, Defra introduced the term LAC waste, and thus the term MSW is no longer relevant in the UK

[2] YNYWP manages LAC waste from the following councils: North Yorkshire County Council, City of York Council, Craven District Council, Hambleton District Council, Harrogate Borough Council, Richmondshire District Council, Ryedale District Council, Scarborough Borough Council and Selby District Council

[3] North Yorkshire County Council (2012) *York and North Yorkshire Waste Partnership Waste Flow Model*, July 2012, http://www.northyorks.gov.uk/index.aspx?articleid=15309

[4] European Commission (2008) *DIRECTIVE 2008/98/EC on Waste*, November 2008

otherwise come from other third party contractors, it is perhaps more important to note that if commercial waste is collected in this way, it would not be regarded as LAC waste and therefore would not form part of the GMT;[5]

- In a recent letter to Marton cum Grafton Parish Council, NYCC claims that the gate fee to be charged by the AWRP for C&I wastes will be commercially competitive.[6] There is, however, no guarantee of this, as securing contracts for merchant C&I waste treatment is extremely difficult at present for two key reasons:
    - There are there a range of large scale facilities, such as the 800 ktpa incinerator being developed by Scottish and Southern Energy (SSE) at Ferrybridge in Yorkshire and the 300ktpa gasification facility which is being constructed by Air Products on Teeside, that will be competing with the AWRP for residual C&I waste; and
    - There are increasing levels of solid recovered fuel (SRF) being exported from the UK.[7] Overseas plant have often paid off long-term capital investments and are therefore able to accept very competitive gate fees, with which new UK facilities (potentially including AWRP) will struggle to compete, even when the additional cost of transport is taken into consideration.[8]
- Whilst securing C&I tonnage might be less of a problem for some integrated waste management companies, which control large geographical swathes of the C&I collection and current landfill market (for example Biffa Waste Management or Sita), AmeyCespa does not currently occupy such a market position. It will therefore be competing directly with a range of UK and overseas treatment capacity, along with any existing landfills owned by the incumbent collection operators based in North Yorkshire and the surrounding regions;
- Eunomia's own modelling of waste flows to the AWRP, which is based the 2012 model, but uses revised assumptions for recycling rates and trade waste captures, presents a far more realistic scenario for the level of residual waste that will require treatment in the YNYWP area. With regard to the GMT, this shows that whilst in the early years of the contract there appears to be some 'headroom', a tonnage shortfall will rise from around 3 ktpa in 2027/28, to over 73 ktpa at the end of the contract in 2039/40. As stated above, this suggests that the current plans for the AWRP present a significant financial risk to YNYWP;
- As shown in Figure ES1, if the proposed AWRP facility were to go ahead in its current guise, our modelling demonstrates that, in 2015/16, there would be a shortfall of 95-110 kt between the tonnage of residual waste from LAC sources forecast by YNYWP and the design capacity of the AWRP. This would mean that AmeyCespa would have to

[5] Letter from David Bowe, Corporate Director for Business and Environmental Services, North Yorkshire County Council to Antony Long, Chair, Marton cum Grafton Parish Council, 21st August 2012

[6] Ibid.

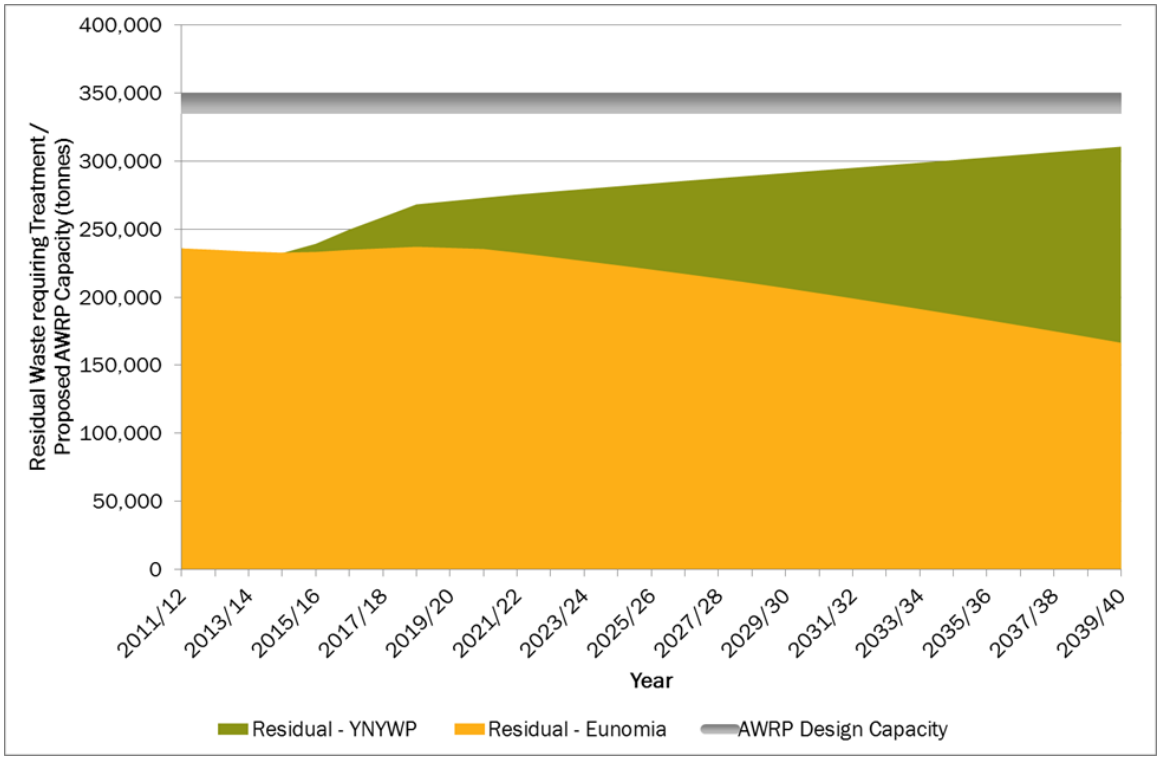
[7] In February 2012, the annual tonnage licensed for export by the Environment Agency stood at 1,921,000 tonnes, albeit the actual tonnage exported was somewhat lower for the previous year. See http://www.letsrecycle.com/news/latest-news/energy/test

[8] Eunomia has recently met with two such organisations in Holland, which are interested in relatively long contracts with local authorities in the UK

source increasing levels of residual C&I waste to ensure sufficient feedstock for the AWRP. This scenario would be amplified if Eunomia's revised assumptions are taken into consideration, such that the shortfall in 2015/16 would be 100-115 kt, increasing to 170-185 kt in 2039/40. Eunomia's model therefore suggests that the proposed AWRP is considerably oversized with regard to the size of plant required to treat residual LAC waste from the YNYWP area;

- Our analysis suggests that the waste modelling undertaken by YNYWP should be revised to address the issues highlighted throughout this report. Any such revision should also include publication of all related assumptions to ensure transparency and aid review by various stakeholders in the planning and permitting process; and
- To better manage the risk of aiming to secure ever increasing tonnages of residual waste from the C&I sector, alternative technologies, such as Mechanical Biological Treatment (MBT), which offers the flexibility to send SRF to spare thermal treatment capacity both in the UK and in other Member States (without reliance on revenues from onsite energy generation), might be considered by AmeyCespa and YNYWP.

Figure ES1: Tonnage of Residual Waste and Proposed AWRP Design Capacity



Note: The AWRP design capacity is presented as a range because the AmeyCespa Planning Statement suggests that although the incinerator will have a design capacity of 320 ktpa, it is more likely to operate at 305 ktpa

Contents

1.0 Introduction, Scope and Objectives

Eunomia Research and Consulting Ltd. ('Eunomia') is pleased to present this report to Parish Councils' Group reviewing the waste modelling undertaken to demonstrate need for the proposed Allerton Waste Recovery Park (AWRP).[9]

Eunomia is a consultancy specialising in waste management and renewable energies. Our expertise covers economic analysis, due diligence, environmental assessment, strategy development, policy design, partnership development and procurement. The company prides itself on the interdisciplinary nature of its work, and its critical perspective on key waste management issues.

We have considerable experience in providing information to support both internal businesses cases and external due diligence exercises for proposed waste treatment infrastructure development. We have recently worked on such projects on behalf of The Cooperative Bank, Nord LB, New Earth Solutions, Shanks Waste Management, FCC, Ludgate Environmental Fund and Scottish & Southern Energy (SSE). We have also undertaken 'gate fee' surveys on behalf of the UK Waste and Resources Action Programme (WRAP) for each of the last five years. Furthermore, we publish a national 'Residual Waste Infrastructure Review' on a six-monthly basis, which provides a regular update to industry on the status of the development of waste treatment facilities on a regional basis.

AmeyCespa is currently seeking planning permission from North Yorkshire County Council (NYCC) for a waste recovery facility at Allerton Quarry, near Harrogate. The proposed facility includes a mechanical treatment plant, an anaerobic digestion (AD) plant, and an Energy-from-Waste (EfW) or 'incineration' facility. The AWRP is AmeyCespa's solution to treat all local authority collected (LAC) residual waste collected on behalf of the York and North Yorkshire Waste Partnership (YNYWP) for a contract period of 25 years.[10] [11] AmeyCespa intends to fill any shortfall in LAC waste with further waste sourced from the commercial and industrial (C&I) sectors to ensure the full capacity the plant is utilised.

To demonstrate that the plant is both needed and of an appropriate size, YNYWP published a waste flow model on their website in October 2010. An updated version of the model was published on the North Yorkshire County Council (NYCC) website in

[9] See http://www.environment-agency.gov.uk/research/commercial/102922.aspx

[10] LAC waste was previously defined as municipal solid waste (MSW), but following clarification of the definition of MSW by the European Commission (EC) to include all commercial wastes, Defra introduced the term LAC waste, and thus the term MSW is no longer relevant in the UK

[11] YNYWP manages LAC waste from the following councils: North Yorkshire County Council, City of York Council, Craven District Council, Hambleton District Council, Harrogate Borough Council, Richmondshire District Council, Ryedale District Council, Scarborough Borough Council and Selby District Council

July 2012.[12] Eunomia has reviewed both models for the purpose of this study, albeit the focus of our analysis has been on the more recent version.

There are two core objectives to this study:

- To provide a critical review of the most recent YNYWP waste flow model (see Section 3.0); and
- To develop and present a revised waste flow model using alternative assumptions where appropriate. The assumptions behind this model are presented in Section 4.0, with the results summarised in Section 5.0.

The aim of this analysis to determine whether the modelling undertaken by YNYWP justifies the scale of the AWRP and if not, to provide information which might be used as a basis for the development of an alternative, potentially smaller facility to treat waste from the YNYWP area. To inform this analysis, we have provided an overview and high-level mass balance of the AWRP in Section 2.0.

[12] North Yorkshire County Council (2012) *York and North Yorkshire Waste Partnership Waste Flow Model*, July 2012, http://www.northyorks.gov.uk/index.aspx?articleid=15309

2.0 Waste Input Requirements for AWRP

Prior to understanding and examining the model published by YNYWP, it is necessary to understand the waste input requirement to the AWRP, which is most easily demonstrated by the provision of an overview of the waste flows through the facility. The majority of this information has been derived from the Planning Statement submitted by AmeyCespa to NYCC.[13]

As highlighted above, the proposed AWRP consists of three primary elements;

- A mechanical treatment (MT) plant;
- An AD plant; and
- An incineration facility.

Further detail on each of these elements is provided in Section 2.1 to 2.3, whilst a high-level mass flow of waste through the facility is provided in Section 2.4.

2.1 Mechanical Treatment Plant

Residual waste from both LAC and C&I sources arrives at the MT plant, where it is passed through various separation processes to recover materials (primarily metals and plastics, but also some paper) for recycling. The remaining fractions are sent to the AD and incineration elements for further treatment.

The MT facility is designed to process up to 260 kilo tonnes per annum (ktpa) of residual waste, with the output streams expected to comprise of:

- 20 ktpa of recyclable material;
- 40 ktpa of largely biogenic material to be sent to the AD plant; and
- 200 ktpa of residual material to be sent to the incineration facility.

These tonnages represent the initial design basis of the AWRP. We suspect that during both commissioning and subsequent full plant operation, there may be technical issues which mean that there is some variation from this basis.

2.2 Anaerobic Digestion Plant

The AD plant has been designed to process up to 40 ktpa of the biogenic fraction from the residual waste from the MT plant. Due to moisture loss and partial degradation of carbon into biogas during the AD process, around 30ktpa of output digestate will be sent to the incinerator for further treatment.

Our analysis indicates that the stream sent for AD will include a considerable amount of non-degradable material, such as remaining plastics and metals within the stream. It will also include a range of partly biogenic materials, such as furniture items, carpet, shoes, which are very unlikely to degrade significantly within the residence

[13] AmeyCespa (2011) PART 1: Planning Statement, August 2011

time in the AD vessels. Consideration of the technical viability of such an approach is outside the scope of this study, but our experience indicates that the treatment of a significant quantity of such non-degradable material is likely to cause operational issues including the 'clogging' of vessels, which may impact upon both amount of energy generated and more fundamentally, the smooth operation of the facility.

2.3 Incineration Facility

Taking into consideration planned and unplanned downtimes for maintenance, the incineration facility has a maximum design capacity of 320 ktpa. In the aforementioned Planning Statement, however, AmeyCespa states that its operating capacity is more likely to be nearer to 305 ktpa. The input streams to the facility will comprise of the following fractions:

- 200 ktpa of residual waste from the MT plant;
- 30 ktpa sourced as an output of the AD plant; and
- 75- 90 ktpa of additional residual waste from either LAC or C&I sources.

Again, these tonnages represent the initial design basis of the AWRP. We suspect that during both commissioning and subsequent full plant operation, there may be technical issues which mean that there is some variation from this basis.

2.4 High-level Mass Flows across the AWRP

As shown in Figure 1, taking into consideration the various mass flows between different elements of the plant, the entire AWRP facility has been designed to accept between 335 ktpa and 350 ktpa of LAC and C&I residual wastes.

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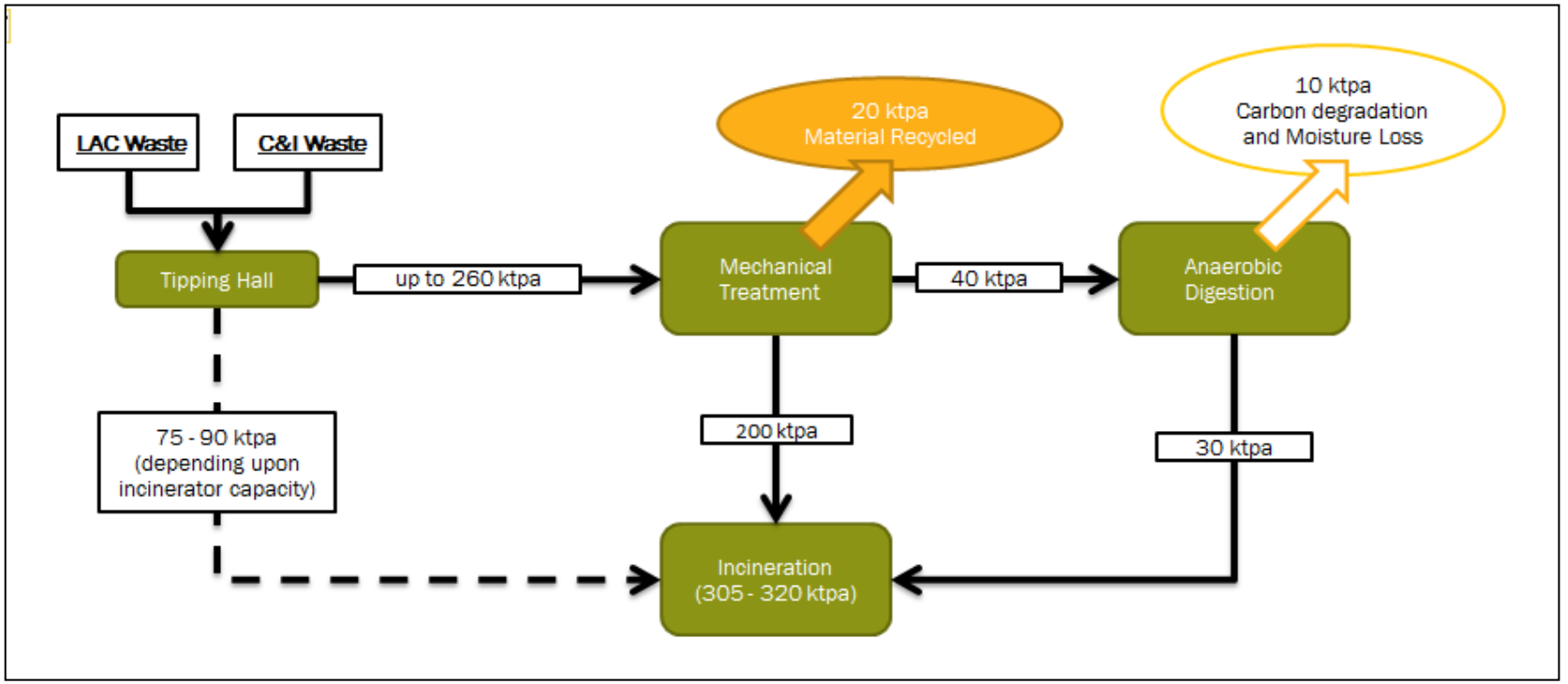
Figure 1: Design Basis Mass Flow of Waste through the proposed AWRP



3.0 Review of Published Waste Models

The purpose of both the 2010 and the 2012 models, published by YNYWP and NYCC respectively, is to calculate the likely level of residual LAC waste arising within the YNYWP area, which will require treatment at the proposed AWRP, from 2015 to the end of the 25 year contract period with AmeyCespa in 2039/40.

It should be noted that no documentation was provided alongside either model. For such models, good practice would be to provide a model guide (either as a front page within the Excel spreadsheet or as a separate Word of PDF document), which would document various assumptions used in the model and any changes between versions. In the absence of such a guide, the evidence presented by YNYWP is not transparent and is difficult to access for various stakeholders in the planning and consenting process.

The construction of any waste flow forecast model requires a number of assumptions to be made. The lack of any model guide therefore made the process of our review more challenging. Our experience in such projects, however, is such that we have been able to undertake detailed analysis to fully explore the models, focusing on the 2012 version, and to document a range of issues, as summarised in Sections 3.1 to 3.4.

3.1 Waste Composition Assumptions

The waste composition data provided for each of the districts within the YNYWP area, including not only that from households but also from HWRCs and trade waste is incredibly detailed within the 2012 model. As no source is provided for any of this data, however, no assessment of its accuracy can be made.

Eunomia has undertaken a detailed internet search as part of this study, but has not been able to find any detailed waste composition studies at a district level having been published in York or North Yorkshire in the recent past. Whilst we do not, therefore, have any evidence to suggest that the compositions do not have a sound basis, it appears that they are unlikely to be based on real data from credible sampling studies.

For the purpose of reviewing the waste flows within the models, however, it should be noted that a highly detailed composition of the waste is largely irrelevant. In the 2012 version, it also appears that the only function of the composition data is for the household waste stream to be divided into ‘composition sensitive’ and ‘composition neutral’ streams, to which two different growth rates are applied. This issue is discussed in greater detail in Section 3.2.

3.2 Assumptions on Household Waste Arisings and Growth Rates

The forecast of future household waste arisings is affected by a large number of factors. The 2012 model published by YNYWP, however, bases future household waste arisings growth on just two main assumptions:

- The growth in the number of households in each district; and
- For kerbside collected household waste, a waste minimisation 'adjustment'.

The annual growth rate for household waste (1.1-1.2% from 2012-2029, falling to 0.8% thereafter) has been sourced from data relating to future growth in households published by the Department for Communities and Local Government (DCLG).[14] Whilst the growth in household numbers is one of many factors which might be used to forecast future household waste arisings, our experience indicates that alone, it does not provide a sufficiently accurate picture.

Recently, Eunomia has undertaken statistical analysis of historic waste arisings alongside social and economic factors to develop detailed waste forecast models for the Welsh Government and for the London Environment Directors Network (LEDNET).[15] This work highlighted the difficulties involved in attempting to forecast future waste arisings for any significant length of time. This is because there are many influences, which in combination, can impact upon the level of future household waste arisings. These include:

- Population;
- Household size;
- Household expenditure;
- Gross Value Added (GVA); and
- Employment.

High-level analysis of population forecasts for the present study suggests that population growth for the relevant districts will be lower than the growth in number of households. More households will lower the average household size, which in turn reduces the average waste per household, as well as the average waste per capita.[16] The reasons behind the YNYWP model relying solely on a single factor (household growth) to calculate future household waste arisings are unclear, as no detail on the related rationale or on a related error margin is made explicit in the model. Very limited attempted justification is provided in Annex 14 of a report recently published by the YNYWP.[17] This simply states that YNYWP believe their estimates are

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[14] Dept. for Communities and Local Government, *Live tables on household projections,* November 2010, Accessed 16th August 2012, http://www.communities.gov.uk/housing/housingresearch/housingstatistics/housingstatisticsby/householdestimates/livetables-households/

[15] Both these studies have recently been submitted to Welsh Government and LEDNET, but are yet to be published

[16] Office for National Statistics (2012) *Subnational Population Projections, 2010-based projections*, March 2012, http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2010-based-projections/index.html

[17] YNYWP (2011) *Part B Award of a Long Term Waste Management Service Contract – Main Report*, November 2011

reasonable because they are 'towards the lower end' of the range forecast within the (now obsolete) Regional Waste Strategy (RWS) for Yorkshire and Humber.[18] The most recent version of this document was published in 2003, however, and therefore provides very scant justification for YNYWP's forecast being anywhere near accurate.

As noted in Section 3.1, the YNYWP model has two growth rates that are applied to different waste types, which can be summarised as follows:

- 'Composition neutral' waste types (including green waste, litter, street sweepings):
  - The growth rate used for households is applied directly to these waste streams.
- 'Composition sensitive' waste types (including residual waste and materials collected at the kerbside for recycling):
  - A waste minimisation rate is applied on top of the household growth rate. This serves to reduce the annual growth of these waste types (as highlighted above) by 0.25%. Whilst we agree that it is likely that levels of household waste will fall over time, again no source or justification is provided for the use of this value.

3.3 Assumptions relating to Trade Waste Capture

In the 2012 model, the capture rate for trade waste managed by several of the local authorities within the YNYWP area (but not City of York) increases dramatically between 2015 and 2019; in some districts growing by 40.1% in one year. Subsequently, the captures are modelled to continue to grow, albeit at a greatly reduced rate until the end of the contract period in 2040.

As with other assumptions in the model, this growth (or increased capture) rate is not backed by any clear evidence or assumption. In this context, it is also important to note that the 2010 model did not include any such significant ramp up in forecast capture rates.

It might be inferred from the 2012 model that this forecast of dramatic growth in trade waste managed by local authorities is the result of an assumption relating to the cessation of the Landfill Allowance Trading Scheme (LATS) in England. Indeed, this inference is backed up within a recent letter sent to the Parish Councils (and made publicly available) by North Yorkshire County Council).[19]

[18] Yorkshire & Humber Assembly (2003) *Let's take it from the Tip*: *Yorkshire and Humber Regional Waste Strategy*, July 2003

[19] Letter from David Bowe, Corporate Director for Business and Environmental Services, North Yorkshire County Council to Antony Long, Chair, Marton cum Grafton Parish Council, 21st August 2012

In the 2011 Waste Review, the Coalition Government announced that LATS was no longer required, and that it would be scrapped following the end of the 2012/13 compliance year. Previously, LATS was credited with influencing local authorities to scale back trade waste services, as collection of greater tonnages made their compliance with the scheme more challenging and potentially costly.

Now that LATS is due to scrapped, it is possible that local authorities will seek to re-establish themselves in the trade waste market as a potential way of raising additional revenue via use of existing capital assets. The aforementioned letter from NYCC makes this point, and goes onto state that their contract with AmeyCespa is such that future 'marginal' disposal costs will be very competitive. This is ultimately proposing that the gate fees to be provided by AmeyCespa to other commercial contractors, for waste over and above the guaranteed minimum tonnage (GMT), will effectively be subsidised by the high contract price paid to them by YNYWP.[20]

In the aforementioned letter, NYCC claim that their assumption within their model that significantly more commercial waste is collected as LAC waste (i.e. by the councils) between 2015 and 2019 is not really important, as this commercial tonnage input to the AWRP would otherwise come from other third party contractors. Whilst NYCC are correct in their letter in the sense that the composition will not be any different, there are two more important issues to consider in this context:

1. If commercial waste is collected by other contractors, it is not regarded as LAC waste and therefore does not form part of the GMT to which YNYWP is contractually bound to supply to AmeyCespa. This could result in significant risk due to the resulting penalties payable by YNYWP, as discussed in more detail in Section 5.0; and
2. Albeit in the aforementioned letter, NYCC claims that the trade waste services offered by local authorities within the YNYWP area will be commercially competitive, there is no guarantee of this. In this context, it should be noted that:
    a. Increasing levels of residual waste, in the form of Refuse Derived Fuel (RDF) or Solid Recovered Fuel (SRF) are being exported from the UK for treatment at a number of different incinerators and cement kilns in other EU Member States;[21] and
    b. Such plant have often paid off long-term capital investments and are therefore able to provide very competitive gate fees, with which new UK

[20] Whether this proposed outcome is defensible in terms of EU Competition Law is an interesting consideration, albeit outside the scope of this study

[21] In February 2012, the annual tonnage licensed for export by the Environment Agency stood at 1,921,000 tonnes, albeit the actual tonnage exported was somewhat lower for the previous year. See http://www.letsrecycle.com/news/latest-news/energy/test

facilities (potentially including AWRP) will struggle to compete, even when the additional cost of transport is taken into consideration.[22]

We therefore believe that whilst there is some likelihood that district councils within the YNYWP area may grow their trade waste collection services, the somewhat outlandish capture rates modelled by YNYWP for between 2015 and 2019 are unrealistic. In our own remodelling of the waste flows in the YNYWP area, therefore, we have reduced this growth rate accordingly, as detailed in Section 4.2.

3.4 Assumptions relating to Recycling Rates

According to the 2012 model, the current recycling rate (2011/12) for LAC wastes is 44.5%. Assuming the proposed AWRP facility goes ahead, the model shows that the recycling rate will increase to 49.3% in 2016/17, an increase of 4.8% over 5 years. It should be noted that this increase is a result largely of the MT plant at AWRP, and that the forecast overall recycling rate would be c.4% lower without the additional recyclable material reclaimed by the facility.

In the model, the recycling rate subsequently falls to 47.9% by 2020/21 as a result of the increased capture of trade waste tonnages, the majority of which is assumed to be residual waste. The recycling rate then essentially remains stable at around 48% for the remainder of the contract period.

Within Annex 14 of the aforementioned document recently published by YNYWP , it is stated that recycling rates at the kerbside will reach 49%, which along with the contribution of the AWRP (which will recycle 5% of the waste input to the MT plant), will result in a total recycling rate of 52%.[23] The fact that the 2012 model does not demonstrate that these rates will be achieved, however, should be of concern. This is because both current Central Government policy and the current waste management strategy for the YNYWP set a target of 50% recycling to be achieved by 2020.[24] [25]

Not only are these targets not met by the forecast within the YNYWP waste flow model, but more importantly, this represents a relatively low level of achievement, which is not 'future-proofed' against future changes in policy that might bring English targets more in line with the 70% rates already set for Scotland and Wales. This issue is discussed further in Section 4.3.

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[22] Eunomia has recently met with two such organisations in Holland, which are interested in relatively long contracts with local authorities in the UK

[23] YNYWP (2011) *Part B Award of a Long Term Waste Management Service Contract – Main Report*, November 2011

[24] Defra (2011) *Government Review of Waste Policy in England 2011*, June 2011, http://www.defra.gov.uk/publications/2011/06/14/pb13540-waste-review/

[25] York & North Yorkshire Waste Partnership (2006) *A Municipal Waste Management Strategy for the City of York & North Yorkshire*, May 2006, http://www.letstalklessrubbish.com/index.aspx?articleid=17204

4.0 Development of Revised Model Assumptions

As outlined above, following our review of assumptions within the YNYWP models in Section 3.0, we have developed a parallel model, using the 2012 model as a basis, to help assess whether the AWRP is of appropriate scale. This remodelling is dependent upon a small number of revised assumptions relating to likely growth in LAC waste arisings, and recycling rates, as set out in Sections 4.1 to 4.3. As set out in Section 3.1, although we believe there is no clear evidence behind the composition data presented by YNYWP within the 2012 model, this has only a very limited impact on waste flows, and we have therefore not sought to introduce revised assumptions in this respect. The results from modelling using our revised assumptions are set out in Section 5.0.

4.1 Household Waste Growth Rate

As noted in Section 3.2, Eunomia has undertaken work for a range of clients in the area of forecasting future household waste growth rates. The work involves a complex statistical analysis of historic data to examine the relative importance of each factor in the level of household waste that arises in a given year. Analysis of this type then allows for a forecast of future household waste arisings based on a combination of these factors.

Within the scope of this study, we adopt the YNYWP assumption and assume that the growth in household waste arisings is in line with that set out in the 2012 model, i.e. that it is based on growth in household numbers, and includes the waste minimisation adjustment applied to the relevant waste types, as summarised in Section 3.2. Whilst we believe there is a risk that this assumption is not entirely accurate, we have modified assumptions relating to both trade waste capture and recycling rates, since these also have a very large impact on residual waste arisings, as explored in Sections 4.2 and 4.3 respectively. In this context, it should be noted, however, that without revised assumptions relating to waste growth rates, we have still potentially *overestimated* the tonnage of waste available to the AWRP in our presentation of results in Section 5.0.

4.2 Trade Waste Capture Rate

As set out in Section 3.3, our analysis of the YNYWP model highlighted a significant growth in the capture of trade waste by local authorities. No related evidence or justification for this dramatic increase was provided, albeit we recognise that the cessation of LATs might result in some local authorities seeking to manage greater tonnages of trade waste due to potential revenue opportunities.

Based on our recent discussions with local authorities during the course of other projects, we believe that the growth in the capture of trade waste in the 2012 model is a gross overestimate.[26] Whilst we believe that there might be strong case to reduce

[26] Eunomia has worked with over 120 waste collection authorities in the UK

these projections by 75%, for the purposes of this study, we have decided to assume a more conservative adjustment. In our model, we have therefore have revised down by 50% the level of trade waste that the NYWP will be able to realistically capture.

4.3 Recycling Rate

As noted in Section 3.4, both current government policy and the current waste management strategy for the YNYWP set a target of 50% recycling to be achieved by 2020. In our model, we have therefore assumed that this target is met, thus increasing the recycling rate by around 0.7% per annum from the current level in the 2012 model and by 2.1% from the level forecast by YNYWP for 2020.

Whilst future government policy on recycling targets post-2020 in England is conspicuous by its absence, it would not be unreasonable to assume that recycling rates will continue to increase. This might be driven by:

- Some local authorities agreeing new waste collection contracts for which costs savings will be delivered by greater collection and onward sale of recyclable materials; and
- Ongoing rises in landfill tax, which encourages the roll-out of improved collection services for recyclable materials.

It should be noted, however, that although we are not party to the details within AmeyCespa's 25 year contract with YNYWP, it is likely it includes a series of conditions designed to ensure that there is little motivation for any council within the YNYWP area to seek to divert additional material into recycling and away from the AWRP. At the same time, it should be acknowledged that recycling targets set for England might rise in the foreseeable future. This is likely to be driven by future revisions to the EU Waste Framework Directive, which is unlikely to stop still at the current requirement for Member States to achieve a 50% recycling rate.[27]

Scotland and Wales have both set recycling targets of 70% by 2025.[28] [29] This, while ambitious, certainly appears achievable in a European context, with several Member States already performing above this level. We therefore believe it is not unreasonable to assume that any future targets for England might be set at a similar rate. Whilst Government would most probably be lenient with underperforming councils if any future target was likely to be met by the country as a whole, meeting 70% is challenging without all local authorities 'doing their' bit. Under such a scenario, therefore, districts within the YNYWP area might effectively be forced to

[27] European Commission (2008) *DIRECTIVE 2008/98/EC on Waste*, November 2008

[28] Scottish Government (2010) *Scotland's Zero Waste Plan*, June 2010, http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/wastestrategy

[29] Welsh Government (2010) *Towards Zero Waste*, June 2010, http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/towardszero/?lang=en

divert material away from the proposed AWRP. This presents a significant risk to YNYWP with regard to the GMT requirement within the contract with AmeyCespa.

In terms of our revised model, however, we have chosen to be 'conservative' in terms of timing. We have therefore assumed that a recycling rate of 70% will not be achieved until 2040, and that this will be delivered by linear, year-on-year increases from the present day.

5.0 Presentation of Results

Table 1 provides a summary of the levels of residual waste requiring treatment, as forecast by both the 2012 YNYWP model and using Eunomia's limited number of revised assumptions as set out in Section 4.0. We have also provided the tonnages which form the GMT agreed in the contract between YNYWP and AmeyCespa.

At the time the proposed AWRP facility is forecast to begin operation in 2015/16, the difference between the level of residual LAC waste forecast by the YNYWP and Eunomia models is just 6 ktpa. During the full contract period, however, this difference increases significantly, rising to nearly 59 ktpa in 2024/25 and up to 146 ktpa in 2039/40.

This marked difference between the two estimates is the result of our revised assumptions relating to trade waste captures and recycling rates only. As set out in Section 4.0, we have not sought to amend any other assumption within the 2012 model, whilst we have also been conservative in our downward revision of YNYWP's forecasts for future trade waste captures. Whilst trade waste does have an influence, however, the difference between the two sets of results is primarily due to the assumption of almost zero growth in recycling by YNYWP over the period of the contract.

It is also important here to recognise the difference between the results from Eunomia's model and the GMT agreed in the contract between YNYWP and AmeyCespa. Whilst in the early years of the contract there appears to be some 'headroom', in year 2027/28, our analysis suggests that YNYWP will not meet the minimum tonnages required for the rest of the contract period. Whilst we are not party to the system of financial penalties within the contract should YNWP not meet the GMT in any given year, we would surmise that this represents a significant future risk to all local authorities within YNYWP.

Table 1: Forecast Residual Waste Requiring Treatment

	2015/16 (Year 1)	2019/20 (Year 5)	2024/25 (Year 10)	2029/30 (Year 15)	2034/35 (Year 20)	2039/40 (Year 25)
YNWYP[1]	239,309	271,152	282,383	292,459	302,317	312,548
Eunomia	233,305	236,308	223,529	206,674	187,336	166,515
GMT[2]	200,000	206,667	215,000	223,333	231,667	240,000
Difference: YNYWP & Eunomia	*6,003*	*34,844*	*58,854*	*85,785*	*114,981*	*146,033*
Difference: Eunomia & GMT	*33,305*	*29,641*	*8,529*	*-16,659*	*-44,331*	*-73,485*

Note:

1. The numbers presented for YNYWP are taken directly from the 2012 model. It should be noted that small modelling errors in this model result in a slight over-estimate of residual waste requiring treatment. For example, in 2039/40 this is in the order of 1,800 tonnes
2. The figures presented for GMT are drawn from a graph presented within the aforementioned Annex 14 of a recent report published by YNYWP: *Part B Award of a Long Term Waste Management Service Contract – Main Report, November 2011*

Figure 2 and Figure 3 show the relative proportions of both waste assumed to be recycled and residual waste that will require treatment within the YNYWP 2012 model and Eunomia's revised model respectively. It should be noted that both Figures highlight the level of residual waste prior to any mechanical treatment at the AWRP, and as such the recycling rate presented does not include any additional recyclable material that might be reclaimed at the MT facility.

Figure 2: YNYWP 2012 Model of Future LAC Waste Flows

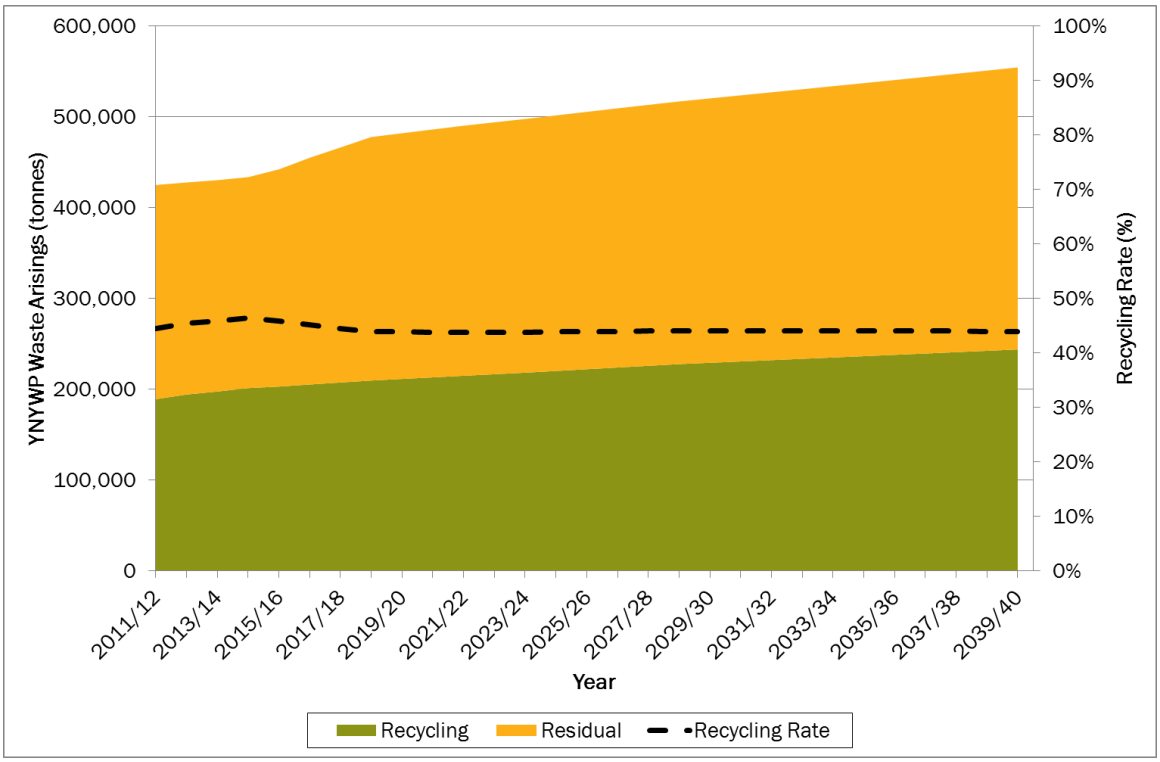
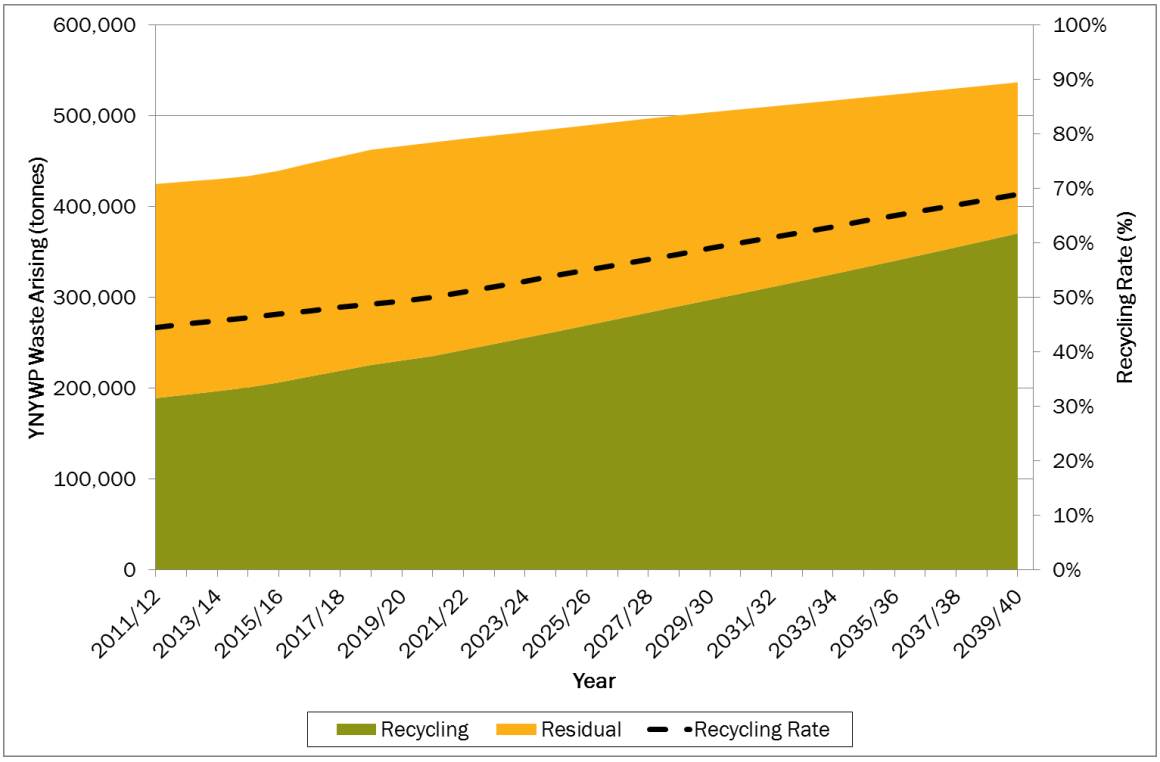


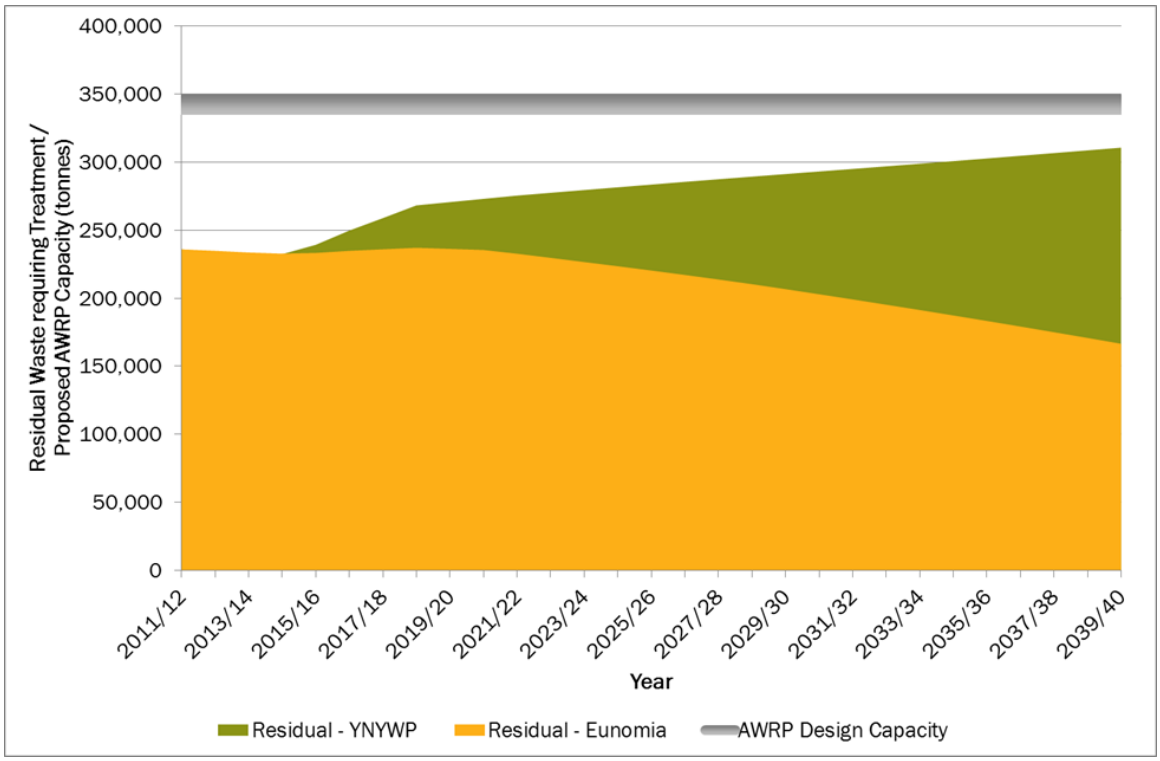
Figure 3: Eunomia Model of Future LAC Waste Flows



In terms of the amount of residual waste that might be sent to the proposed AWRP facility, Figure 4 below shows the gap between the proposed capacity (of both the MT plant and the incinerator) and the amount of residual waste that will require treatment based on YNYWP's assumptions, and Eunomia's revised assumptions. The high-level mass balance shown within Figure 1 in Section 2.4 demonstrates that the AWRP has a design capacity of 335-350 ktpa. In reality, if a shortfall of waste occurred, AmeyCespa would most likely run the MT plant below capacity and send additional material from the tipping hall directly to the incinerator. Albeit this would be the likely commercial decision, in a consenting context, we do not believe it is disingenuous to use the design capacity of the AWRP plant from which to determine any future shortfall in residual waste arisings.

As shown in Figure 4, based on the assumptions within the YNYWP model, in 2015/16 a shortfall of 95-110 kilo tonnes (kt) exists between the amount of residual LAC waste requiring treatment and the design capacity of the AWRP. In 2039/40 this decreases to a shortfall of 25-40 kt due to assumed growth in waste arisings. Figure 4 also shows that, based on Eunomia's revised model, which includes just two revised assumptions relating to trade waste captures and recycling rates, the 2015/16 shortfall rises to 100-115 kt, increasing to 170-185 kt in 2039/40.

Figure 4: Tonnage of Residual Waste and Proposed AWRP Design Capacity



Note: The AWRP design capacity is presented as a range as the AmeyCespa Planning Statement suggests that although the incinerator will have a design capacity of 320 ktpa, it is more likely to operate at 305 ktpa

6.0 Summary of Key Findings

The key findings from our analysis can be summarised as follows:

- Recycling targets set for England might rise in the foreseeable future as a result of revisions to the EU Waste Framework Directive.[30] Within YNYWP's 2012 model, however, recycling rates are shown not even to reach the current requirement of 50% by 2020. Furthermore, the guaranteed minimum tonnage (GMT) requirement under the contract agreed between YNYWP and AmeyCespa, is such that district councils would need to divert waste away from the AWRP for recycling rates to move above 50%, without getting near the 70% target (by 2040) modelled for this study. The likely penalties associated with the GMT requirement are such that this presents a significant financial risk to YNYWP;
- The large growth in trade waste capture assumed in the 2012 model appears to be a large overestimate of what might be likely to happen in terms of any potential increase in local authority participation in the trade waste market as a result of the cessation of LATS in 2013. Whilst a letter from NYCC claims that this assumption within their model is not important, stating that any commercial waste tonnage input to the AWRP would otherwise come from other third party contractors, it is perhaps more important to note that if commercial waste is collected in this way, it would not be regarded as LAC waste and therefore would not form part of the GMT;[31]
- In a recent letter to Marton cum Grafton Parish Council, NYCC claims that the gate fee to be charged by the AWRP for C&I wastes will be commercially competitive.[32] There is, however, no guarantee of this, as securing contracts for merchant C&I waste treatment is extremely difficult at present for two key reasons:
    - There are there a range of large scale facilities, such as the 800 ktpa incinerator being developed by Scottish and Southern Energy (SSE) at Ferrybridge in Yorkshire and the 300ktpa gasification facility which is being constructed by Air Products on Teeside, that will be competing with the AWRP for residual C&I waste; and
    - There are increasing levels of solid recovered fuel (SRF) being exported from the UK.[33] Overseas plant have often paid off long-term capital

[30] European Commission (2008) *DIRECTIVE 2008/98/EC on Waste*, November 2008

[31] Letter from David Bowe, Corporate Director for Business and Environmental Services, North Yorkshire County Council to Antony Long, Chair, Marton cum Grafton Parish Council, 21st August 2012

[32] Ibid.

[33] In February 2012, the annual tonnage licensed for export by the Environment Agency stood at 1,921,000 tonnes, albeit the actual tonnage exported was somewhat lower for the previous year. See http://www.letsrecycle.com/news/latest-news/energy/test

investments and are therefore able to accept very competitive gate fees, with which new UK facilities (potentially including AWRP) will struggle to compete, even when the additional cost of transport is taken into consideration.[34]

- Whilst securing C&I tonnage might be less of a problem for some integrated waste management companies, which control large geographical swathes of the C&I collection and current landfill market (for example Biffa Waste Management or Sita), AmeyCespa does not currently occupy such a market position. It will therefore be competing directly with a range of UK and overseas treatment capacity, along with any existing landfills owned by the incumbent collection operators based in North Yorkshire and the surrounding regions;
- Eunomia's own modelling of waste flows to the AWRP, which is based the 2012 model, but uses revised assumptions for recycling rates and trade waste captures, presents a far more realistic scenario for the level of residual waste that will require treatment in the YNYWP area. With regard to the GMT, this shows that whilst in the early years of the contract there appears to be some 'headroom', a tonnage shortfall will rise from around 3 ktpa in 2027/28, to over 73 ktpa at the end of the contract in 2039/40. As stated above, this suggests that the current plans for the AWRP present a significant financial risk to YNYWP;
- As shown in Figure ES1, if the proposed AWRP facility were to go ahead in its current guise, our modelling demonstrates that, in 2015/16, there would be a shortfall of 95-110 kt between the tonnage of residual waste from LAC sources forecast by YNYWP and the design capacity of the AWRP. This would mean that AmeyCespa would have to source increasing levels of residual C&I waste to ensure sufficient feedstock for the AWRP. This scenario would be amplified if Eunomia's revised assumptions are taken into consideration, such that the shortfall in 2015/16 would be 100-115 kt, increasing to 170-185 kt in 2039/40. Eunomia's model therefore suggests that the proposed AWRP is considerably oversized with regard to the size of plant required to treat residual LAC waste from the YNYWP area;
- Our analysis suggests that the waste modelling undertaken by YNYWP should be revised to address the issues highlighted throughout this report. Any such revision should also include publication of all related assumptions to ensure transparency and aid review by various stakeholders in the planning and permitting process; and
- To better manage the risk of aiming to secure ever increasing tonnages of residual waste from the C&I sector, alternative technologies, such as Mechanical Biological Treatment (MBT), which offers the flexibility to send SRF

[34] Eunomia has recently met with two such organisations in Holland, which are interested in relatively long contracts with local authorities in the UK

to spare thermal treatment capacity both in the UK and in other Member States (without reliance on revenues from onsite energy generation), might be considered by AmeyCespa and YNYWP.