



Medway Local Plan Waste Evidence Base

Medway Waste Needs Assessment 2020 - Report 3

Management Requirements for Construction,
Demolition & Excavation Waste Generated in Medway

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Abbreviations and Glossary

Abbreviations

BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
C, D & E WASTE	Construction, Demolition & Excavation Waste
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EfW	Energy from Waste
EWC	European Waste Catalogue
NPPF	National Planning Policy Framework
nPPG	National Planning Practice Guidance
MRS	Metal Recycling Site
rWFD	Revised Waste Framework Directive
SWMP	Site Waste Management Plans
WDI	Waste Data Interrogator
WNA	Waste Needs Assessment
WPA	Waste Planning Authority
WRAP	Waste Resources Action Programme

Glossary of Terms

Construction, Demolition & Excavation Waste	Waste arising from construction and demolition activities, including excavation during construction, mainly consisting of inert materials such as soils, stone, concrete, and brick. This waste stream also contains non-inert elements such as wood, metals, plastics, cardboard and plasterboard.
Energy from Waste	The conversion of the calorific value of waste into energy, normally heat or electricity through applying thermal treatment of some sort. May also include the production of gas that can be used to generate energy.
Environment Agency	The body responsible for the regulation of waste management activities through issuing permits to control activities that handle or produce waste. It also provides up-to-date information on waste management matters and deals with other matters including flood protection.
Hazardous Waste Landfill	Sites where hazardous waste may be disposed by landfill. This can be a dedicated site or a single cell within a non-hazardous landfill, which has been specifically designed and designated for depositing hazardous waste.
Hazardous Waste	Waste requiring special management under the Hazardous Waste Regulations 2005 due to it posing potential risk to public health or the environment (when improperly treated, stored, transported or disposed). This can be due to the quantity, concentration, or its characteristics.
Incineration	The controlled combustion of waste. Energy may also be recovered in the form of heat (see Energy from Waste). If energy is not recovered it sits at the bottom of the waste hierarchy and is classed as 'disposal' alongside landfill.
Inert Landfill	Landfill site permitted to only accept inert waste for disposal.
Inert Waste	Waste not undergoing significant physical, chemical or biological changes following disposal, and does not pollute surface or groundwater.
Landfill (including land raising)	The permanent disposal of waste to land, by the filling of voids or similar features, or the construction of landforms above ground level (land-raising).
Local Aggregate Assessment	Annual assessment of aggregate availability and demand produced by each Mineral Planning Authority as required by the National Planning Policy Framework (NPPF)
Non Hazardous Landfill	A landfill permitted to accept non-inert (biodegradable) wastes e.g. household and commercial and industrial waste. Will also accept some inert waste. May only accept hazardous waste if a special cell is constructed.
Non Inert	Waste that is potentially biodegradable or may undergo significant physical, chemical or biological change once landfilled.
Recovery	Subjecting waste to processes that recover value including recycling, composting or thermal treatment to recover energy.
Recovery to land	Activities involving the permanent deposit of inert waste for specific purposes not classed as disposal. Generally subject to environmental permitting. May include backfilling of mineral workings.
Recycled Aggregate	Aggregates produced from recycled construction waste such as crushed concrete and planings from tarmac roads.
Waste Transfer Station	A site to which waste is delivered for bulking prior to transfer to another place for further processing or disposal.

1. Introduction

1.1. The Medway Waste Needs Assessment 2020 consists of an overall main report and five waste stream specific supporting reports, namely;

1. Local Authority Collected Waste;
2. Commercial & Industrial Waste;
3. Construction, Demolition & Excavation Waste;
4. Hazardous Waste; and
5. review of management requirements for 'Other Waste'; and

This report is concerned with estimating future management requirements for Construction, Demolition & Excavation (C, D & E) Waste in Medway.

1.2. The National Planning Practice Guidance chapter on Waste states that: "Planned provision of new capacity and its spatial distribution should be based on robust analysis of best available data." (emphasis added) (Para 035). Therefore, this exercise includes a robust analysis to identify what might be considered to be the "best available data" relating to C, D & E waste production and management.

1.3. The definition of Construction, Demolition & Excavation waste presented in the *State of Medway Report Waste* (2009) reads as follows:

"this waste stream arises from the construction sector and can include construction blocks/bricks, concrete, metals, plastics, soils etc. "

However, for the sake of clarity, it is suggested a fuller definition be adopted as follows:

"Waste arising from construction and demolition activities, including excavation during construction, mainly consisting of inert materials such as soils, stone, concrete, and brick. This waste stream also contains non-inert elements such as wood, metals, plastics, cardboard and plasterboard."

1.4. This report reviews and updates the evidence base supporting the preparation of the Waste section of the draft Medway Local Plan, using the following methodology:

1. Estimating C, D & E waste baseline arisings;
2. forecasting arisings for the plan period (to 2030);
3. profiling the existing management methods; and,
4. assessing targets to manage C, D & E waste in accordance with Plan objectives and in doing so, identifying future management requirements.

The approach taken, and the results, are described in detail in the following sections.

2. Estimating C,D &E Waste Baseline Arisings

Context

2.1. Following the revocation of the requirement to produce Site Waste Management Plans there is no requirement on businesses active in the construction and demolition sector to keep or submit records of waste produced during these activities. Hence estimating quantities of Construction, Demolition & Excavation waste arisings for a specific Plan area, with any degree of accuracy, is a challenge. The *State of Medway Report Waste* estimated that in the order of 300,000 tonnes of this waste stream was being produced in Medway each year.

Methodology

2.2. The national methodology for estimating annual waste generation from the Construction, Demolition and Excavation (CD&E) Sectors for England¹ (to report on progress made towards meeting the revised Waste Framework Directive (rWFD) target) uses information collected relating to four principal management routes:

1. Waste dealt with by transfer and treatment facilities (reporting through Environment Agency WDI)
2. Waste sent to landfill (reporting through Environment Agency WDI)
3. Waste managed at sites exempt from environmental permitting, referred to as 'exemptions'.
4. Waste recycled as aggregate (from national estimates produced by the Mineral Products Association)

2.3. The methodology applies a calculation relating to these management routes which, in summary, is as follows:

C, D & E waste generation =

Inputs to final fate (ultimate point of management) permitted facilities (landfill and recovery to land operations) +

outputs from intermediate permitted facilities (such as waste transfer sites) +

inputs to final fate exemptions (facilities exempt from requiring an environmental permit for waste management) +

the quantity of recycled aggregates produced.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/400594/CDE-generation-methodology.pdf

2.4. In order to assess C, D & E waste arisings at Plan area level the national methodology has been modified to reflect local circumstances. In particular, the following modifications have been made:

- the population of exempt sites registered in Medway has been established through the Environment Agency held exempt register. Then the estimated value for the quantity of waste managed at the key exemption managing C, D & E waste ('U1'²) from the WRAP 2013 report³ was applied.
- the quantity of waste converted into recycled aggregate has been based on the value reported in response to a survey of recycled aggregate producers conducted by Medway Council as part of the LAA, rather than from the national estimates produced by the Mineral Products Association.

2.5. The key steps in the methodology are:

Calculate inputs, arising in Medway, to all permitted facilities applying select EWC codes for C,D&E waste

- Deduct EWC codes relating to hazardous waste (counted elsewhere).
- Quantify waste going to its final fate or leaving the Planarea.
- Deduct movements of waste that moved from facilities located in Medway to other facilities within Medway (to avoid double counting).
- Deduct inputs of C,D&E waste to Medway intermediate facilities whose outputs are managed at 'downstream' permitted sites to avoid double counting.
- Quantify and apportion waste managed at sites within Medway but not attributed below regional level within the WDI and reattribute any anomalous values
- Add figure for C, D & E waste sent to EfW and recycled aggregate produced based on LAA survey
- Calculate quantity of C, D & E waste managed at exempt sites
- Sum the above to gain an overall figure

Further detail is set out in the sections below.

2.6. C, D & E waste is taken to be comprised of wastes falling within the following List of Waste/European Waste Catalogue codes:

- Chapter 17 (Construction & Demolition Waste)
- 19 12 09 (minerals such as sand, stones)
- 20 02 02 (soil and stones).

² The U1 permitting exemption covers the use of limited tonnages of specified inert waste in construction.

³ Waste Resources Action Programme (WRAP), 2013, *Review of the Factors Causing Waste Soil To Be Sent To Landfill; 2007 to 2011*.

Inputs Of Medway Waste To Permitted Facilities Anywhere

Step 1: Calculate the tonnage of C, D & E waste from Medway in the Environment Agency WDI sent to permitted sites..

2.7. The total quantity of C, D & E waste reported in the WDI 2018 as arising from Medway managed at permitted sites in 2018 is shown to be just under 92,500 tonnes (92,445 tonnes). The breakdown and management routes are shown in Data Line 3 of Table 1 below.

Table 1: C, D & E Waste from Medway Managed through Permitted Sites (tonnes)

Source: WDI 2018

	Landfill		Recovery to Land	Metal Recycling Sites	Transfer	Treatment	Grand Total
	Non Haz	Inert					
Medway arisings managed at Medway sites	0	29,083	0	0	1,539	0	30,623
Medway arisings managed at sites outside Medway	5,088	27,082	19,557	2,845	103	7,147	61,822
Totals	5,088	56,166	19,557	2,845	1,642	7,147	92,445

Step 2: Deduct EWC codes relating to hazardous component of C, D & E waste

2.8. The requirements for management of hazardous waste is accounted for separately. Therefore the hazardous waste component needs to be deducted to avoid double counting. A total of 22 tonnes of the inputs shown in Table 1 were identified as hazardous waste⁴ which when deducted gives a revised total of **92,423 tonnes**. The amended values are shown in Table 2.

Table 2: C, D & E Waste from Medway Managed through Permitted Sites excluding hazardous waste

Source: WDI 2018

	Landfill		Recovery to Land	Metal Recycling Sites	Transfer	Treatment	Grand Total
	Non Haz	Inert					
Medway arisings managed at Medway sites	0	29,083	0	0	1,539	0	30,623
Medway arisings managed at sites outside Medway	5,088	27,082	19,557	2,845	81	7,147	61,800
Totals	5,088	56,166	19,557	2,845	1,621	7,147	92,423

⁴ This value is very low and a cross check with the Hazardous Waste Interrogator indicates that 4,786 tonnes of hazardous C, D & E waste was consigned from Medway for management in 2018, of which only 13 tonnes was managed within Medway. This discrepancy is resolved in the [Hazardous Waste Assessment Report](#).

Step 3: Quantify waste going to its final fate or leaving the Plan area

2.9. As inputs to Landfill and Recovery to Land involve the permanent deposit of the waste, they are regarded as final points of management, so these values are taken as final as follows: $61,254 + 19,557 = 80,811$ tonnes.

Table 3: Non-hazardous C, D & E Waste from Medway managed via Permanent Deposit

Component	Value (tonnes)	Cumulative Total (tonnes)
Permanent Deposit:	80,811	80,811

2.10. As shown in Figure 1 below waste from Medway managed at intermediate sites outside Medway ceases to be identified as coming from Medway once it has been received at the intermediate management facility. Hence the tonnage managed at intermediate sites outside Medway is also taken to be a 'final value' as follows: $2,845 + 81 + 7,147$. This is shown in Table 4.

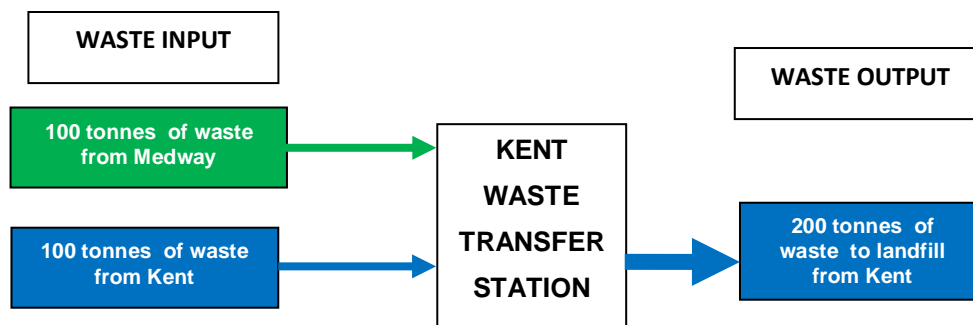


Figure 1: Schematic of how Flows of Medway waste to Sites outside Medway are reported in WDI

Table 4: Table 3 plus managed outside Medway

Component	Value (tonnes)	Cumulative Total (tonnes)
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884

Step 3: Calculate the tonnage of C, D & E waste from Medway in the WDI treated in Medway.

- 2.11. Table 2 shows the total quantity of non hazardous C, D & E Waste arising from Medway reported as having been managed at Medway intermediate sites (Transfer) in 2018 was 1,539 tonnes.
- 2.12. As C, D & E waste from Medway received at intermediate sites (i.e. treatment sites, waste transfer stations and MRS) within Medway is transferred for onward management where it would be counted as Medway C, D & E waste at the receiving site, inputs to these sites are not counted at this stage. Therefore the total reduces by 1,539 tonnes⁵ (o (MRS) + 1,539 tonnes (WTS) + o waste treatment) giving a revised total of 89,345 tonnes.

Table 5: Table 4 minus Medway C, D & E waste managed at Medway intermediate sites

Component	Value (tonnes)	Cumulative Total
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884
<i>Medway Intermediate Sites Inputs</i>	<i>1,539</i>	<i>89,345</i>

Additions

Inputs to Energy from Waste plants

Step 4: Energy from Waste plants taking C, D & E type waste from Medway.

- 2.13. A separate Environment Agency dataset⁶ for waste going to incinerators & energy from waste plants shows that 15 tonnes of non hazardous wood from Medway was managed at Tilbury Green Power EfW at Tilbury Dock. While it is not certain this was sourced from C, D & E waste sources it is not unreasonable to assume it is and so this is added to the estimate of arisings.

⁵ This value is very low and is further explored in the subsequent section addressing misattribution.

⁶ <https://data.gov.uk/dataset/d18fbf9a-eecc-43d7-84e3-1dea6b91425d/waste-data-interrogator-2018>

Recycled Aggregate Production

Step 5: Operator survey for recycled aggregate production in Medway.

- 2.14. The quantity of waste converted into recycled aggregate has been estimated through the annual survey of recycled aggregate producers for recycled aggregate sales conducted by Medway Council.
- 2.15. The value presented for recycled aggregate production was c37,500 tonnes in 2018.⁷

Table 6: Table 5 plus Recycling Aggregate

Component	Value (tonnes)	Cumulative Total
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884
<i>Medway Intermediate Sites Inputs</i>	<i>1,539</i>	<i>89,345</i>
Inputs to EfW	15	89,360
Recycled Aggregate Production	37,500	126,860

Medway C, D & E Waste going to Exempt sites

Step 6: Medway registered exemptions x factor for exemptions taking C, D & E type waste.

- 2.16. The national *Planning Practice Guidance* (nPPG) advises that "...when forecasting construction and demolition waste arisings, the following may be relevant:
- the fact that a sizeable proportion of construction and demolition waste arisings are managed or re-used on-site, or exempt sites, so it is critical that some provision is made for unseen capacity in this way." *Paragraph: 033 Reference ID: 28-033-20141016 (emphasis added)*
- 2.17. The quantity of C, D & E waste managed through exemptions has changed since Regulations were introduced in 2011 which reduced the maximum quantities permitted to be managed through exemptions substantially (from 50,000 tonnes to 5,000 tonnes). Despite this some consideration is still taken on the contribution such activities may make to management of this stream, and hence arisings.
- 2.18. Paragraph U1 exemptions (that cover the use of limited tonnages of specified waste in construction) potentially account for the most significant quantities of C, D & E waste going to a final fate, as it relates to the use of waste in construction, which would primarily be hardcore from demolition used to create hard standing/roads or soils used in the construction

⁷ This value is significantly lower than for previous years, the 3 year average for recycled aggregate production in Medway reported as being c65,000 tpa in the Medway LAA 2018 . This can be tested as a sensitivity.

of bunds. A report produced for WRAP⁸ estimated a mean quantity of waste managed by U1 exemptions as 600 tonnes per exemption.

Table 7: Count of U1 exemptions with live registrations in Medway at end 2018

	2016	2017	2018	Total
Paragraph U1	31	4	0	35

- 2.19. Applying the value of 600 tonnes per exemption to the number of registered U1 exemptions over the three year period (see Table 7) gives an estimated total tonnage from U1 exempt sites in Medway of 21,000 tonnes. This addition to the arisings total is shown in Table 8.

Table 8: Table 6 plus Exemptions

Component	Value (tonnes)	Cumulative Total
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884
<i>Medway Intermediate Sites Inputs</i>	<i>1,539</i>	<i>89,345</i>
Inputs to EfW	15	89,360
Recycled Aggregate Production	37,500	126,860
Input to U1 Exemptions	21,000	147,860

Accounting for Mis, or Non, Attributed Waste

Step 7: Accounting for tonnage attributed to regional level only.

- 2.20. The WDI 2018 reports inputs of C, D & E type waste to two Medway sites as having only been coded down to regional level (in this case London). The tonnage of non hazardous C, D & E waste attributed to each of these sites is shown in Table 9. As this represents virtually the total tonnage of C, D E waste accepted at each site i.e. little inputs are actually attributed, and both sites are located relatively centrally within Medway, for the purposes of this exercise it has been assumed that the total input of non hazardous C, D & E Waste to both sites actually originated in Medway.

Table 9: C, D & E Waste inputs not attributed below regional level to Medway Sites

Source: EA WDI 2018

Site	Value (tonnes)	Cumulative Total
Gillingham Gate, Chatham Docks (Mobile Compactor Services Limited)	1,132	1,132
Unit 20 Knight Road, Rochester S Lawrence (Crushing Contractors) Limited	9,097	10,229

⁸ WRAP, 2013, *Review of the Factors Causing Waste Soil To Be Sent To Landfill*; 2007 to 2011

Table 10: Table 8 plus C, D & E Waste to Medway Plan Area Sites not attributed below regional level

Component	Value (tonnes)	Cumulative Total
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884
<i>Medway Intermediate Sites Inputs</i>	<i>1,539</i>	<i>89,345</i>
Inputs to EfW	15	89,360
Recycled Aggregate Production	37,500	126,860
Input to U1 Exemptions	21,000	147,860
Medway site inputs at Regional level only	10,229	158,089

Step 8: Accounting for misattributed tonnage.

2.21. It was noted in Step 3 that inputs of C, D & E waste to Plan area intermediate sites reported through WDI 2018 were remarkably low at 1,539 tonnes. This prompted a closer examination of attribution of declared inputs to Medway intermediate sites. This has revealed the following:

- 13 sites in Medway reported receiving waste classed as C, D & E waste in 2018;
- of these only 3 reported receiving inputs of C, D & E waste from Medway.

The breakdown on inputs is shown in Table 11 below.

Table 11: Attribution of C, D & E Waste inputs to Medway intermediate sites (exc coded to regional level)

Source: EA WDI 2018

Site Type	Site Name	Tonnes from Medway	Tonnes from outside Medway	
			Kent	Other
CA Site	Capstone	0	2,946	0
	Cuxton	0	3,208	0
	Hoath Way	0	2,039	0
Non Haz WTS	Countrystyle Recycling	1,184	8,245	169
	Kent Soils & Composts Limited	0	24,269	0
Physical Treatment		0	0	1,428

2.22. Table 11 gives a strong indication that C, D & E waste inputs to Medway intermediate sites are not being correctly attributed to Medway. In particular most of the input attributed to Kent is likely to have arisen from Medway, particularly with respect to CA sites operated on behalf of Medway Council.

- 2.23. Further investigation of the specific site inputs to the Plan area Non Hazardous waste transfer sites indicates the following:

Table 12: Reattribution of C, D & E Waste to Kent Soils & Composts Limited (Unit1 Templemarsh Estate)

Source: EA WDI 2018

Site	Tonnes from Medway	Tonnes from outside Medway
Input to Countrystyle Recycling	1,184	8,414
% input	12	88
Input to Kent Soils & Composts Limited		24,269
Reattributed input to Kent Soils & Composts Limited	2,912	

- 2.24. During the course of investigating Medway intermediate site inputs it has become apparent that inputs to the site operated by ADS Skip Hire at Unit 18 Morgans Timber Yard were all attributed to Chapter 20 municipal waste code. Given that skip hire predominately deals with construction and demolition waste, albeit from households, and no outputs are coded as Chapter 20, the tonnage has been reattributed to a Chapter 17 code for mixed C, D & E waste. This gives a tonnage of 4,385 tonnes managed of which 2,273 tonnes is attributed to Medway.
- 2.25. A site at Commissioners Road has permission for infill of an old quarry prior to construction of housing. This is permitted as a Recovery to Land operation by the Environment Agency. The Environment Agency WDI 2018 indicates that all the input to this site came from Kent. However given its relative central position in Medway it is considered that inputs are likely to have come from Medway too. Given there are no known reasons that would mean inputs to this site would have been sourced solely from Kent it has therefore been assumed that an element of input may have been misattributed to Kent (perhaps as Medway having been part of Kent until 1999). Therefore, a proportion of the input has been reattributed applying the profile of inputs to the Manor Farm Barn Inert landfill that is located in a similar geographical position within Medway as shown below.

Table 13: Reattribution of C, D & E Waste to Commissioners Road Recovery Operation

Source: EA WDI 2018

Site	Tonnes from Medway	Tonnes from outside Medway
Input to Manor Farm Barn Landfill & Recovery Operation	21,507	29,083
% input	57%	43%
Input to Commissioners Road Recovery Operation		14,700
Reattributed input to Commissioners Rd	8,450	6,250

2.26. The following additions are made to correct for under reporting for Medway C, D & E waste as described above:

- HWRC (CA sites) 8,193 tonnes.
- Kent Soils & Compost 2,912 tonnes
- ADS Skip Hire 2,273 tonnes plus
- Commissioners Road 8,450 tonnes.

Table 14: Table 10 plus additions in para 2.25

Component	Value (tonnes)	Cumulative Total
Permanent Deposit:	80,811	80,811
Managed Out of Medway:	10,073	90,884
<i>Medway Intermediate Sites Inputs</i>	<i>1,539</i>	89,345
Inputs to EfW	15	89,360
Recycled Aggregate Production	37,500	126,860
Input to U1 Exemptions	21,000	147,860
Medway site inputs at Regional level only	10,229	158,089
Reattributed Waste	21,828	179,917

2.27. The baseline arisings value generated in Table 10 is c180,000 tonnes.

Discussion of C, D & E Waste Arising Baseline value

2.28. The baseline arising value generated of 180,000 tonnes for 2018, is considerably lower than the only known other estimate cited for arisings for Medway, in *The State of Medway Report Waste (2009)* of 300,000 tonnes. It is not clear how the 2009 value was arrived at. Given that, the baseline value arrived at in this report has been generated through the application of a tried and tested methodology it is considered to be reasonably robust given the limitations of the best available datasets. Moreover it is a method that can be replicated on an annual basis to update estimates for the AMR and therefore be relied upon for Plan monitoring purposes. It is therefore proposed that this is the value upon which the future management requirements for C, D & E waste arising in Medway are based.

3. C, D & E Waste Arising and Management Forecasts

- 3.1. Having established a baseline value for C, D & E Waste arisings in Medway, the future management capacity requirement has been determined by:
1. Deciding how much waste may be produced in future; and
 2. how that waste might be managed.
- 3.2. The section that follows addresses both in turn. The latter point requires assessment of how the Plan might wish the waste to be managed through exerting influence on the types of capacity that come forward during the plan period. For example, the estimate takes into account the level of recycling of C, D & E waste being aimed for.

Developing a C, D & E Waste Arising Forecast for Medway

- 3.3. The National Planning Practice Guidance on Waste⁹ recommends as follows:
- "Waste planning authorities should start from the basis that net arisings of construction and demolition waste will remain constant over time as there is likely to be a reduced evidence base on which forward projections can be based for construction and demolition wastes. However, when forecasting construction and demolition waste arisings, the following may be relevant:*
1. *annual existing returns from waste management facilities*
 2. *data from site waste management plans (SWMPs) (where available)*
 3. *the fact that a sizeable proportion of construction and demolition waste arisings are managed or re-used on-site, or exempt sites, so it is critical that some provision is made for unseen capacity in this way*
 4. *any significant planned regeneration or major infrastructure projects over the timescale of the Plan."*
- 3.4. In view of the fact that the baseline generation exercise has accounted for points 1 (EA WDI) and 3 (exemptions), and there appears to be no additional data available from SWMPs, all that is left to consider is any significant planned regeneration or major infrastructure projects scheduled to occur over the Plan period to 2037.

Major Infrastructure Projects

- 3.5. The *Medway Local Aggregate Assessment 2017* identifies a number of planned infrastructure projects which are predicted to put increased pressure on the supply of aggregates through Medway. These include:
- The Lower Thames Crossing: A 13-mile new road and bored tunnel crossing under the River Thames between the east of Gravesend and Tilbury.
 - Ebbsfleet Garden City: A planned development of up to 15,000 homes and 45,000m² of commercial floor space.

⁹ Paragraph: 033 Reference ID: 28-032-20141016

- Housing and infrastructure delivery across Kent and Medway: Includes in the region of 178,600 additional homes (2011-2031) and the provision of 163 extra form entries for schools (2017-2023).
- 3.6. Some of these projects may also create demands for management of waste arising as well. However given the ready availability of consented inert landfill void within Medway and, and the express provision in Kent's Minerals and Waste Local Plan for the management of up to 300,000 tpa of inert waste from outside Kent, it is considered accommodating any significant tonnage of this waste should not be problematic.

Conclusion

- 3.7. Given the lack of expectation that specific planned regeneration or major infrastructure projects will give rise to additional management needs over the timescale of the Plan, a zero growth forecast ought to be the starting point all other things being equal. In fact, even a negative growth forecast might be justified given the overriding pressure for waste minimisation and reduction in off site management driven by:
1. the landfill tax improving site waste segregation and driving cost savings;
 2. the adoption of Site Waste Management Plans as industry practice;
 3. the introduction of BREEAM standards for new buildings and benchmarks for material usage and wastage from construction;
 4. the tightening of regulatory control over the permanent deposit of waste on land;
 5. voluntary initiatives to reduce waste to landfill including 'Halving Waste to Landfill'¹⁰ creating a focus on waste production in the construction sector;
 6. the reduction in bulk of the building stock that may be demolished i.e. Victorian housing with internal brick wall replaced by stud walls; and
 7. the drive to use recycled aggregates in construction, encouraging onsite processing of suitable arisings which aren't counted in the method used to derive the baseline value¹¹.
- 3.8. Given the above factors, a drop in arisings might be expected but it is considered that the downward pressure is likely to be offset by projected house building growth rates. Therefore a static growth rate is proposed; that is to say it has been assumed that arisings of this stream in Medway will amount to 180,000 tpa for the duration of the Plan period.

¹⁰ <https://www.wrap.org.uk/category/initiatives/halving-waste-landfill>

¹¹ Data provided by the National Federation of Demolition Contractors indicates that 55% of demolition waste arising is managed on the site of production, and since demolition waste can represent as much 40% of arisings that reduction would account for a 22% drop in overall arisings.

4. C, D & E Waste Targets

4.1. The Medway Local Plan will have an underlying strategy which will reflect the aspiration of how Medway Council would wish to see future C, D & E Waste arisings being managed in its area. This is normally achieved by setting targets for the management of proportions of a particular waste stream, which once converted into tonnages provide a basis against which management capacity requirements may be determined. In order to assess the management requirement it is first necessary to understand how the C, D & E Waste produced in the Plan area is currently managed which then informs a projection on potential future needs.

Baseline Profile

4.2. By assessing the different elements that contribute towards the baseline value it is possible to generate an existing management profile for this waste stream as presented in Table 15:

Table 15: C, D & E Waste Management Profile Actual Data 2018

Route	Purpose	Tonnes	% of known
Recycling & Reuse	Recycled Aggregate (Table 14)	37,500	28%
	Other Recycling (HWRC+Non Haz WTS) (Table 11+Table 12 + ADS input recycled)	13,608	
	Subtotal	51,198	
Recovery	Exemptions (Table 14)	21,000	58%
	Use of Waste/ Recovery to Land (Table 1 Recovery to Land Total + Commissioners Road Table 13)	28,007	
	Inert Landfill (backfill of mineral workings) (Table 1)	56,166	
	Subtotal	105,173	
Non Inert Landfill	Restoration (Input of soil & stones + minerals)	5,088	3%
	Subtotal Use	5,088	
Unknown	Treatment (remainder)	18,458	10%
	Total	179,917	

Table 15 gives the following management profile for C, D & Waste arising in Medway in 2018:

- 28% re-used and recycled,
- 58% recovered in some other way, and
- no more than 13% is landfilled (3% as restoration material. 10% to treatment assumed to go to landfill to model a worst case demand for non hazardous waste landfill).

This falls well within the expectation of the revised Waste Framework Directive of no more than 30% of this stream landfilled by 2020.

C, D & E Waste Composition

4.3. The principal distinction in the C, D & E waste stream in terms of management (and so targets) is between inert and non inert materials, with a further possible distinction between hard and soft inert materials. By considering what type of material would be suitable for which component of the management profile shown in Table 15 above, it is possible to arrive at an indicative breakdown by material type shown in Table 16. This can inform the setting of appropriate targets as some types of material are only suited to some types of management method. For example only hard inert material can be converted into recycled aggregate, and generally material used in backfill will be soils and sub-soils.

Table 16: C, D & E Waste Composition from Management Profile Actual Data 2018

Hierarchy Tier	Management Route	Inert		Non Inert/ Mixed
		Hard	Soft	
Recycling/Reuse	Recycled Aggregate	37,500	0	0
	Other Recycling (MRS/Single Materials)	0	0	13,698
Other Recovery	Exemptions	0	21,000	0
	Use of Waste/ Recovery to Land	0	28,007	0
	Inert Landfill	0	56,166	0
Disposal	Non Inert Landfill Restoration	0	5,088	0
Unknown	Treatment	0	0	18,458
	Totals	37,500		
	Breakdown	21%	61%	18%

4.4. In the absence of specific data, all waste going to treatment has been assumed to be non-inert. This gives an overall inert content of 82%, with 18% being non-inert. This value corresponds to the value of 17% non inert content generated in the evidence base for the Kent Minerals & Waste Local Plan and aligns closely with values obtained in Waste Needs Assessments produced for other Plan areas in the South East such as Oxfordshire¹².

¹² Construction, Demolition & Excavation Waste Management Needs - Kent Waste Needs Assessment 2017 (BPP Consulting November 2017) <http://consult.kent.gov.uk/file/4794626>
 Baseline, Forecasts & Targets for Construction, Demolition & Excavation Waste Generated in Oxfordshire BPP Consulting February 2014 <https://www.oxfordshire.gov.uk/cms/content/minerals-and-waste-core-strategy>

Management Targets

4.5. The revised EU Waste Framework Directive sets a target for C & D waste of:

- A minimum of 70% by weight of non-hazardous construction and demolition waste prepared for re-use, recycling and other material recovery by 2020.
- Backfilling operations using waste to substitute other fill materials may be counted towards the target. i.e. backfilling of mineral workings may be classed as recovery.
- Naturally occurring material categorised under EWC 17 05 04 (soil & stones) is excluded from the target. i.e. its use is unconstrained by targets.

4.6. The Kent Waste Needs Assessment of 2017 produced as part of the evidence base for the Early Partial Review of the Kent Minerals & Waste Plan includes the following targets for C, D & E waste. These targets reflected those contained in the adopted Minerals & Waste Local Plan (Oxfordshire) following thorough examination:

Table 17: Example C, D & E Waste Management Targets taken from Kent WNA

'Recovery' taken to include backfilling of mineral workings for restoration purposes

		Yr0	Yr5	Yr10	Yr15
Recycling	Inert (Recycled Aggregate)	44%	48%	52%	56%
	Non Inert (Source Separated)	11%	12%	13%	14%
Composting	Non Inert	1%	1%	1%	1%
Recovery	Inert (Recovery to Land & Backfill of Mineral workings)	20%	20%	20%	20%
	Non Inert (EfW)	3%	5%	5%	5%
<i>Remainder to Landfill</i>	Non Inert	21%	14%	9%	4%

4.7. The remaining waste is expected to go to non-hazardous waste landfill for restoration, operational use or disposal as shown in the last line of Table 17. This is not a target as such but a consequence of the targets for other activities being applied.

4.8. When considering the applicability of the above targets to the Medway situation two matters are worthy of particular attention as follows:

- Recycled aggregate production in 2018 of 37,485 tonnes only represents 21% of arisings in year 0 rather than the 44% indicated. However, consideration of the previous year's dataset shows that 97,020 tonnes of recycled aggregate was produced which represents 53% of the 2018 arisings value. It is therefore considered that the indicated increase to 48% in year 5 is realistic; This will largely result from the

management of demolition waste generated by clearance of brownfield sites prior to redevelopment.¹³

- Recovery via deposit to land accounted for 58% of arisings managed in 2018. This contrasts with the Plan period target of 20%. This will largely result from the management of excavation waste generated by construction of footings and foundations on greenfield sites.

In the case of both of the above, types of waste arisings can be expected to vary with the according to whether new development takes place on greenfield or brownfield sites. That is to say, it is likely that recovery to land will reduce if recycled aggregate production increases in any particular year and vice versa, all things being equal. This means that it is considered to be more helpful to combine targets for inert waste management, conferring flexibility between targets according to the type of material produced from year to year.

- Disposal to landfill only represents 10% of current arisings, whereas the proposed target for yr 0 is 21% reducing to 14% in year 5. In order to avoid any suggestion that the Plan strategy is planning to increase disposal to landfill the diversion targets have been adjusted accordingly. In reality it is not possible to determine whether outputs to intermediate facilities went to landfill or not, and much is reported in the WDI as going onward for transfer. This is of particular significance when considering the final fate of processing residue for C, D & E waste referred to as 'trommel fines', which may normally go to landfill but is not known in this case, as it is not actually declared.

4.9. In view of the annual variation between management needs and to confer flexibility it is suggested that composite targets be adopted as shown in Table 18:

Table 18: Proposed C, D & E Waste Management Targets

Yr0 represents 2019 applying 2018 baseline.

Component		Yr0	Yr5	Yr10	Yr15
Inert	Recycled Aggregate	21%	>75%	>75%	>75%
	Recovery to Land	58%			
Non-inert	Source Separated Materials	8%	15%	16%	20%
	Organic Composting	0%			
	Timber (EfW)	0%			
	<i>Remainder to Landfill</i>	10%	10%	9%	4%

¹³ Over time it is to be expected that the hard material content of this stream will reduce as the nature of the building stock requiring demolition changes with the brick content of buildings reducing.

Projected Management Requirement for Medway's C, D & E Waste

4.10. Applying the management targets in Table 18 to the updated baseline value gives the predicted management requirement at each of the Plan Milestone years shown in Table 19. For example, the non-inert management target in Table 18 for yr15 of 20% has been applied to the Medway baseline value to give the projected tonnage shown in dataline 2 column 6.

Table 19: C, D & E Waste Targets Applied to Forecast at Plan Milestone years (tonnes)

Component		Yr0	Yr5	Yr10	Yr15	Diff
Inert	Recycled Aggregate	142,673	>135,000	>135,000	>135,000	-7,673
	Recovery to Land					
Non-inert	Materials Recycling	13,698	27,000	28,800	36,000	+22,302
	Organic Composting					
	Timber (EfW)					
	Remainder to Landfill	18,458	18,000	16,200	7,200	-11,258

4.11. The values in Table 19 indicate that the overall management requirement for inert waste will fall marginally, while management of non-inert waste will rise by c22,000 tpa at the end of the plan period. If the residual component of the C, D & E waste stream goes to landfill in accordance with the targets, this represents a cumulative non hazardous landfill requirement of c0.3 million tonnes to the end of the Plan period as shown in Table 20 below. This material is less suited to diversion to EfW due its less combustible nature.

Table 20: Projected Residual C, D & E Waste Landfill Requirements if all goes to non haz landfill (tonnes)

Year	Tpa	Tonnes Cumulative
2019	18,458	18,458
2020	18,392	36,850
2021	18,327	55,177
2022	18,262	73,439
2023	18,196	91,635
2024	18,131	109,766
2025	18,065	127,832
2026	18,000	145,832
2027	17,640	163,472
2028	17,280	180,752
2029	16,920	197,672
2030	16,560	214,232
2031	16,200	230,432
2032	14,700	245,132
2033	13,200	258,332
2034	11,700	270,032
2035	10,200	280,232
2036	8,700	288,932
2037	7,200	296,132

Capacity Assessment

Recycled Aggregate Production Capacity

4.12. Recycled Aggregate are produced principally at two sites in Medway¹⁴. Production at any particular site will vary according to various factors including availability on feedstock material. Hence the value cited for 2018 cannot be considered representative of true capacity. Examination of recycled aggregate returns for the past decade indicate the following peak inputs:

- 70,000 tonnes in 2017 Site 1; and
- 64,282 tonnes in 2011 at Site 2 respectively.

This indicates that the actual peak output of the two sites combined may be at least c135,000 tpa all other things remaining equal. Hence this suggests that there is sufficient consented capacity in Medway to meet the proposed combined Recycling/Recovery targets by recycled aggregate production provision alone.

¹⁴ The identities of these sites have been anonymised for commercial confidentiality reasons

Recovery to Land Capacity

- 4.13. Recovery to Land capacity is by definition finite and time limited. Generally speaking sites may accommodate c100,000 tonnes before completion. Hence it is not realistically possible to rely on existing sites to provide capacity for the duration of the Plan period. However given that the above section indicates that there is sufficient capacity available in Medway to meet the combined Recycling/Recovery target, this limitation ought not to pose a difficulty in terms of capacity provision in the Plan.
- 4.14. The preferred method of making provision for this type of operation to accommodate the excavation soils stream is to include permissive policies in the plan for applications to be assessed against as they come forward. This is particularly relevant given Medway is a unitary authority and may therefore consent proposals that involve the incorporation of soils into non waste development. For example an acoustic bund surrounding a residential development. Moreover it should be noted that such operations are subject to stringent tests under the environmental permitting regulations that limits the quantity of material used to the absolute minimum required.

Inert Landfill Capacity

- 4.15. Given the limitation on forward planning for recovery to land operations, a review of inert landfill capacity within Medway has been undertaken. The Environment Agency dataset relating to remaining landfill capacity identifies 3 sites within Medway that are permitted as inert waste landfill with remaining capacity as follows:
- Alpha Lake, North Sea Terminal, Cliffe - 1,000,000m³;
 - Chalk Lake, North Sea Terminal, Cliffe - 400,000m³
 - Manor Farm Barn Landfill Frindsbury. - 771,681 m³
- Hence the combined permitted inert landfill capacity amounts to c2.2Mm³. Over the Plan period this equates to c120,000m³ per annum, providing significant contingency and more than compensating for the non-inert landfill requirement of 0.3 million tonnes identified previously.

Non Inert Recycling Capacity

4.16. In order to assess the capacity available within Medway, a review has been conducted of the following:

- the Medway planning register to identify any quantity limits imposed by way of the planning permission;
- the Environment Agency permitted site listing which attributes quantity limits that may apply under the environmental permit; and
- Waste Data Interrogator dataset over the past three years to identify actual peak inputs.

Generally speaking planning permission limits are given primacy, while permit limit can be unrealistic as they may only reflect charging bands or permit types, rather than actual capacity. Therefore consideration of the permit limit are tempered with consideration of actual inputs in the past 3 years via the WDI. The outcome of this exercise is displayed in Table 21.

Table 21: Medway Intermediate Sites Principally Accepting Inputs coded as C, D & E Waste

Source: EA WDI (italicised entry indicates reattributed values)

Site	Planning Register	EA Permit Limit	Peak Value WDI 3yrs (tonnes)	Preferred value (adjusted)
Gillingham Gate, Chatham Docks (Mobile Compactor Services Limited)	8,000	3,100	1,132	8,000
Unit 20 Knight Road, Rochester S Lawrence (Crushing Contractors) Ltd	Not specified	Not specified	22,197	22,100
Unit 18 Morgans Timber Yard (ADS Skip Hire)	Not specified	<i>12,000</i>	<i>4,947</i>	<i>5,000</i>
<i>Total</i>				<i>35,100</i>

Conclusion

4.17. The overall outcome of the assessment is presented in Table 22 below.

Table 22: Medway C, D & E Waste Management Requirements vs Available Capacity

	Peak Capacity Requirement (Table 19 +20)	Capacity	Diff
Recycled Aggregate (tpa)	>135,000	>135,000	0
Recovery to Land (tpa)			
Inert Landfill - void (m3)	0	2,171,681	+2,171,681
Non-inert Recycling/composting	36,000	35,100	-900
Remainder to Non-inert Landfill (cumulative m3)	296,132	0	-296,132-
Balance			+1,874,649

Net self sufficiency is predicted to be achieved for this stream.

We would however recommend contacting WPAs in whose areas non-inert landfill capacity might be sought to confirm its possible availability for the Plan period.