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9.23 Applicant's Responses to
Deadline 4 submissions and Rule 17
Request of 14 February 2023

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GLOSSARY

Acronym	Full term / Description
AGI	Above Ground Installations
BEIS	Department for Business, Energy & Industrial Strategy
CCTV	Closed Circuit Television
CBMF	Concrete Block Manufacturing Facility
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilisation and Storage
CHP	Combined Heat and Power
CPR	Collection and Packaging Reform
CO2	Carbon Dioxide
DCO	Development Consent Order
DEFRA	Department for Environment, Food and Rural Affairs
DHPWN	District Heating and Private Wire Network
EA	Environment Agency
EfW	Energy from Waste
EV	Electric Vehicle
NPS EN-3	National Policy Statement for Renewable Energy
ERF	Energy Recovery Facility
ES	Environmental Statement
ETS	Emissions Trading Scheme
FRA	Flood Risk Assessment
GHG	Greenhouse Gas
GLNP	Greater Lincolnshire Nature Partnership
H2	Hydrogen
HLCP	Humber Low Carbon Pipeline
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NLC	North Lincolnshire Council
NLGEP	North Lincolnshire Green Energy Park
PRF	Plastic Recycling Facility
RAIN	Residents Against Incinerators
RHTF	Residue Handling and Treatment Facility
SAF	Sustainable Aircraft Fuel
SoCG	Statement of Common Ground
SuDS	Sustainable Drainage Systems
IKWIN	United Kingdom Without Incineration Network

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1.0 INTRODUCTION

Overview

- 1.1 This report sets out North Lincolnshire Green Energy Park Limited's (the Applicant's) comments on the responses to Deadline 4 submissions and the Rule 17 Request of 14 February 2023. This includes responses to submissions from United Kingdom Without Incineration Network (UKWIN), North Lincolnshire Council, Residents Against Incinerators (RAIN) and Environment Agency.

The Proposed Development

- 1.2 The North Lincolnshire Green Energy Park (NLGEP), located at Flixborough, North Lincolnshire, comprises an ERF capable of converting up to 760,000 tonnes of residual non-recyclable waste into 95 MW of electricity and a CCUS facility which will treat a proportion of the excess gasses released from the ERF to remove and store CO₂. Prior to emission into the atmosphere. The design of the ERF and CCUS will also enable future connection to the Zero Carbon Humber pipeline to be applied for, when this is consented and operational, to enable the possibility of full carbon capture in the future.
- 1.3 The NSIP incorporates a switchyard, to ensure that the power created can be exported to the National Grid or to local businesses, and a water treatment facility, to take water from the mains supply or recycled process water to remove impurities and make it suitable for use in the boilers, the CCUS facility, concrete block manufacture, hydrogen production and the maintenance of the water levels in the wetland area.
- 1.4 The Project includes the following Associated Development to support the operation of the NSIP:
- a bottom ash and flue gas residue handling and treatment facility (RHTF);
 - a concrete block manufacturing facility (CBMF);
 - a plastic recycling facility (PRF);
 - a hydrogen production and storage facility;
 - an electric vehicle (EV) and hydrogen (H₂) refueling station;
 - battery storage;
 - a hydrogen and natural gas above ground installation (AGI);
 - a new access road and parking;
 - a gatehouse and visitor centre with elevated walkway;

- railway reinstatement works including; sidings at Dragonby, reinstatement and safety improvements to the 6km private railway spur, and the construction of a new railhead with sidings south of Flixborough Wharf;
- a northern and southern district heating and private wire network (DHPWN);
- habitat creation, landscaping and ecological mitigation, including green infrastructure and 65 acre wetland area;
- new public rights of way and cycle ways including footbridges;
- Sustainable Drainage Systems (SuDS) and flood defence; and
- utility constructions and diversions.

1.5 The Project will also include development in connection with the above works such as security gates, fencing, boundary treatment, lighting, hard and soft landscaping, surface and foul water treatment and drainage systems and CCTV.

1.6 The Project also includes temporary facilities required during the course of construction including site establishment and preparation works, temporary construction laydown areas, contractor facilities, materials and plant storage, generators, concrete batching facilities, vehicle and cycle parking facilities, offices, staff welfare facilities, security fencing and gates, external lighting, roadways and haul routes, wheel wash facilities, and signage.

The Purpose and Structure of this Document

1.7 This document sets out the Applicant's response to Deadline 4 submissions from UKWIN, North Lincolnshire Council, RAIN and Environment Agency.

1.8 In addition, this document seeks to respond to the Rule 17 Request for further information, received by the Applicant on 14 February 2023.

1.9 The Applicant acknowledges other submissions at Deadline 4, including a number of objections from the public. The Applicant does not have any further comment to make on those submissions at this time. In addition, as stated within AB Agri's Deadline 4 submission, a meeting is taking place on 27 February 2023 to further discuss their biosecurity concerns. The Applicant will provide an update to the Examining Authority following this meeting.

2.0 UNITED KINGDOM WITHOUT INCINERATION NETWORK (UKWIN)

- 2.1 The response below specifically addresses UKWIN's Summary of ISH3 Oral submission [REP4-045] and their comments on any other information submitted at Deadline 3 [REP4-042]. It is noted that a number of other documents were submitted at Deadline 4 by UKWIN and the Applicant does not have a specific response to these additional documents at this time. The Applicant will continue to work with UKWIN to address their outstanding concerns, or at least document the differences of opinion, through the Statement of Common Ground between UKWIN and the Applicant.
- 2.2 In the interests of brevity this document addresses points raised in both of the above documents and has sought to group issues by topic, rather than providing a line-by-line response. UKWIN's comments on the overall evolution of the current capacity gap will be addressed in the Statement of Common Ground currently under development with UKWIN, where the Applicant and UKWIN will provide their respective views of supply and demand of residual waste as a fuel in tabular form as requested by the Examining Authority. An updated SoCG with UKWIN is not being submitted at Deadline 5 as the majority of changes made from the version submitted at Deadline 4 are to the detailed tables which were not received by the Applicant in sufficient time to give them proper consideration. An updated version will be submitted at Deadline 6.

Projections of waste arising

- 2.3 This section responds to paragraphs 7-20 of REP4-042 and paragraph 24 of REP4-045.
- 2.4 At the ISH3 hearing on 26 January we agreed that 22 million tonnes represented a reasonable (and conservative) assumption for the volume of residual waste arising in 2020 and available as a fuel for energy-from-waste facilities. Nevertheless, it is important to recognise the inherent uncertainty in this figure:
- In the hearing (around minute 23) we described the data filtering process we undertook to arrive at this figure from the underlying DEFRA Waste Data Interrogator data source. This included:
"We then filter out site categories. They list certain site categories where we were aiming to capture only those that represent the final disposal treatment of waste. The aim is to avoid double counting a waste shipment where it's being stored or being processed."
A result of this methodology is that waste exports are not included – in 2020 these amounted to around 1.7 million tonnes.

- More generally, the choice of how to filter the underlying data can vary between analysts. For example, a survey by Tolvik in 2017¹, found that estimates of residual waste available for EfW varied by almost 2 million tonnes across 5 studies.
 - As a further illustration of this uncertainty, UKWIN's own assessment of total residual waste as fuel, as set out on page 19 of REP2-110 is over 25 million tonnes in 2025.
- 2.5 UKWIN's approach to estimating residual waste available for EfW in 2042 is to apply the Government's 50% reduction target for all residual waste to the 22 million tonnes starting figure in 2020. This is not the best approach because of the uncertainty described above and because volumes which are currently exported should also be included in our view.
- 2.6 A more robust approach is to start with the absolute per capita target announced by the Government in December 2022² of 287kg/capita in 2042 (a 50% reduction in the 2019 per capita residual waste arising of 574kg/capita). We recognise that this target refers to a wider definition of residual waste than is suitable for use as a fuel for EfW, and hence a reduction factor should be applied to account for this. We agree with UKWIN's view that 90% of residual waste would be available as fuel for EfW, as stated at minute 29 of the ISH3 hearing on 26 January: *"And then we assumed that 90% of that residual waste would be available for incineration, which we considered a quite conservative assessment."*
- 2.7 Applying 90% of 287kg/capita to an assumed population of 60 million in 2042 (from ONS forecasts) results in 15.5 million tonnes of residual waste available for EfW in 2042. In fact the base case projection presented in REP3-040 is slightly more conservative than this at 15.2 million tonnes.
- 2.8 With regard to the intermediate targets set out in the Environmental Improvement Plan³:
- Interim target 1 is that "by 31 January 2028, the total mass of residual waste excluding major mineral wastes in the most recent full calendar year does not exceed 437 kg per capita". Applying the 90% scaling factor above implies 393kg/capita of residual waste available for EfW. The Applicant's base case projection in REP3-040 for 2027 is 333 kg per capita (18.9mte and 58m people).

¹ "UK Residual Waste: 2030 Market Review", Tolvik Consulting, November 2017

² "Environmental targets consultation summary of responses and government response", DEFRA, December 2022

³ "Environmental Improvement Plan 2023" HM Government, January 2023

- Interim target 2 is that “by 31 January 2028, the total mass of residual waste excluding major mineral waste in the most recent full calendar year does not exceed 25.5 million tonnes”. Applying the 90% scaling factor above implies 23.0 million tonnes of residual waste available for EfW. The Applicant’s base case projection in REP3-040 for 2027 is 18.9 million tonnes.
- Interim target 3 is that “by 31 January 2028, the total mass of municipal residual waste in a year does not exceed 333 kg per capita”. The Applicant’s base case projection in REP3-040 for 2027 is 0.21kg/capita (12.1mte and 58m people).

2.9 Hence the base case presented is consistent with the interim targets (and actually more conservative).

2.10 We note UKWIN’s quote from the December environmental targets consultation response in relation to targets being stretching yet achievable. We also note that in that document DEFRA has “set the target ambition at the upper limits of achievability based on our evidence base”. In addition, the original consultation⁴ document states “this target is ambitious, with the major changes set out in CPR [Collection and Packaging Reforms] only expected to get us halfway towards our target” – policies to achieve the remainder of the target are yet to be developed. That is why we consider our base case to represent a conservative view of waste arising, and that there is a much higher probability of underachievement (i.e. higher waste arisings) compared to overachievement.

Sustainable Aircraft Fuel

2.11 This section responds to paragraphs 60-83 of REP4-042 and paragraph 21 of REP4-045.

2.12 Our analysis includes the Velocys facility at Immingham (in Table A8 this is referred to as “Waste-to-Jet Fuel Facility”). The other two SAF facilities referred to by UKWIN have not yet received planning consent and so are not included.

2.13 Based on feedstock volumes published on the relevant developer websites the total feedstock requirement, should all three facilities proceed, would be 2.1 million tonnes, not the 2.77 million tonnes suggested by UKWIN.

2.14 All three projects involve gasification of waste-derived fuels, although the precise nature of these fuels is not clear. Given the poor track record of previous waste gasification projects in

⁴ “Consultation on environmental targets”, DEFRA, May 2022

UK, it is likely that as well as residual waste they will also target more homogeneous fuels such as source-segregated plastics (the Altalto project website states that its feedstock will include 'hard to recycle plastics').

2.15 The Jet Zero Strategy document supports development of a UK Sustainable Aviation Fuel (SAF) industry. It announces an intention to create a SAF mandate from 2025, but this policy is still under development and has not yet been enacted. The Jet Zero Strategy does not specify which feedstocks should be used to produce SAF. Residual waste is one of a number of potential feedstocks, and, as noted above, it is more likely that more homogeneous fuels such as source segregated plastic or wood will be preferred in order to minimise the high level of technical risk associated with this immature technology.

Carbon Capture and Storage (CCS) potential

2.16 This section responds to paragraphs 21-33 of REP4-042 and paragraphs 8-15 of REP4-045.

2.17 In response to UKWIN's assertion (REP3-042, paragraphs 10 and 22) it is simply not the case that the Applicant has ignored Government policy. Compliance with policy is addressed in the Planning Statement [REP2-017] and the NPS tracker submitted at Deadline 5 [Document Reference 9.2]. The Applicant has in fact taken a conservative approach, whereby it has demonstrated that the proposal will not result in an over-capacity of EfW waste treatment at a local or national level (see paragraph 2.10.5 of draft NPS EN3) even though this is not yet adopted policy. The Applicant's approach to CCS is not that current policy requires all Energy Recovery Facilities (ERFs) to be CCS ready, but that CCS is clearly a significant part of the Government's response to climate change and that it is reasonable to assume that the Government will increasingly require ERFs to be CCS-ready or actively enabled. This is evident in paragraph 1.7.7 of draft NPS EN-3, which considers the alternative of requiring all combustion plant to be CCS-ready, with no threshold applied: *"As set out in the Energy White Paper, published in December 2020, the government is committed to consult on proposals to update the Carbon Capture Readiness requirements to reflect technological advances, such as conversion to low carbon hydrogen and apply them more broadly, by removing the 300MW threshold and including all combustion technologies within scope. If that consultation leads to changes in the relevant legal or policy framework, then those new requirements will apply and this NPS will be updated to reflect any revised requirements ahead of designation."* It is clear that the proposed development is consistent with adopted and emerging Government policy.

2.18 With regards to future policy, we have taken account of targets which have been announced (for example relating to recycling targets or Net Zero) whilst acknowledging that the detailed policy to achieve such targets is not yet in place in many cases.

2.19 In relation to CCS specifically, we have not claimed that the Government plans to force closure of facilities not fitted with CCS, but we have taken a reasonable view that given Government intent on the benefit of CCS towards the mitigation of climate change, EfW facilities without CCS either ought not to be in operation beyond 2040⁵ or at the very least, will not represent preferable available capacity for EfW in policy terms as compared to those facilities that can provide CCS. We note that the recent Chris Skidmore Net Zero Review⁵ underlined the importance of CCS for meeting Net Zero: “As soon as legislation allows, government must finalise the business models and regulatory frameworks across the value chain, including for industrial CCS, Energy from Waste with CCS and CO₂ transport and storage.” We also note that the EfW industry also appears to have accepted this direction of travel, with several operators announcing that they are investigating the feasibility of CCS.

2.20 The Net Zero Strategy states that “We are exploring options to reduce emissions from these plants within the power sector, including whether support for CCUS at Energy from Waste plants could be provided”. In addition, the Government issued a call for evidence on the UK Emissions Trading Scheme⁷, which stated “We will use evidence gathered in this call for evidence, and via other means, to consider how effective the UK ETS could be to incentivise CCS uptake for EfW and waste incineration plants across the UK”. We believe this shows a clear intent that EfW facilities should reduce emissions through fitting carbon capture, and that facilities with carbon capture should be prioritised over facilities without carbon capture.

2.21 We accept that some existing facilities will fit CCS, particularly if doing so will allow them to avoid the cost of CO₂ emissions if energy from waste is included under the UK ETS. It is not known which facilities will be able to fit CCS technically and economically, and REP3-040 sets out the Applicant's approach adopted to deal with this uncertainty. It remains our view that the facilities likely to fit CCS earliest and most economically (or with the lowest level of Government subsidy) are those located near proposed CCS clusters.

⁵ “Mission Zero: Independent Review of Net Zero”, Rt Hon Chris Skidmore MP, January 2023

Non-R1 capacity

2.22 This section responds to paragraphs 52-59 of REP4-042.

2.23 UKWIN argues that the Applicant should include non-R1 facilities in the assessment. We disagree with this view since the waste hierarchy clearly prioritises energy recovery over disposal. We do not accept the implication that an old inefficient facility lower down the waste hierarchy should be protected from competition from a modern efficient facility which complies with the policy set out in NPS EN-3 paragraph 2.5.64 and 2.5.66 – this is explored further in the next section.

Further comments on the commercial position on non-R1 and non-CCS capacity

2.24 UKWIN addresses some points discussed relating to the prospects for continued operation of energy from waste facilities that do not meet the R1 efficiency threshold, or where it may not be practicable to retrofit the plant with carbon capture and storage technology.

2.25 Regardless of the policy and regulatory environment, the proposed development will operate in a commercial market where its proposition to its waste producer customers, either directly or through intermediate fuel suppliers, will include its sustainability credentials.

2.26 Driven by the climate emergency, increasingly both public and private sector organisations are setting net zero targets and establishing trajectories for their greenhouse gas emission inventories across the value chain, including the contribution of waste management, to meet this ambition before 2050. For example, Unilever has committed to becoming net zero by 2039.

2.27 All other things being equal, this will mean a preference being expressed in the selection of a service provider for the management of residual waste for capacity with: a higher efficiency in energy recovery (as electricity or in the form of CHP and reflected in R1 status); and/or a higher proportion of carbon capture and storage.

2.28 Where an energy from waste facility is not able to achieve R1 status, and where it is not practicable to capture and store carbon, it will become increasingly less attractive as a service provider and its position in the market may become precarious. If a facility is sufficiently efficient to meet the R1 threshold, then it would appear prudent for it to apply to the Environment Agency to achieve that designation. Indeed, for a merchant facility, it would probably be advantageous a choice under current market conditions.

2.29 Where a facility is not sufficiently efficient to meet the R1 threshold, the 'retrofit' required would be a very substantial undertaking indeed, requiring capital expenditure of many tens of millions

of pounds, equivalent to a large proportion of the cost of a new facility, entailing a new planning permission and several years of engineering works. Whether the operator would consider there to be a business case for such an investment is open to question, although it seems unlikely to be attractive for those sites where carbon capture and storage is less practicable, since it would not recover a strong market position as a result.

2.30 It is more likely that an older facility would be retired. The operator may choose to replace it with a new facility at the same location (as has happened at Edmonton), but in this case a new planning consent would be required.

2.31 It is possible to put some numbers to this. Of the facilities listed in Table A6 in REP3-040, around 2 million tonnes of capacity is included as non-R1 facilities. 675 ktpa of this is the Edmonton plant, which is being replaced by Edmonton EcoPark and so it is entirely correct to exclude Edmonton from future capacity. The remainder is covered by nine plants – Bolton, Coventry, Dudley, Eastcroft, Exeter, Milton Keynes, Stoke, Wolverhampton and Lancing. Five of these plants (Coventry, Dudley, Eastcroft, Stoke and Wolverhampton, giving 945 ktpa of capacity), date from the late 1990s or earlier and are dedicated to specific local authority contracts, which will be ended very soon. The cost of refurbishing these plants and improving them to achieve R1 status would be very high and it is likely, in a competitive environment, that local authorities would instead look to using a newer facility, with higher efficiency and better prospects for carbon capture. This is why the applicant indicated, in REP-3-022 Appendix A, that the remaining capacity from these non-R1 plants would be down to 600 ktpa or less by the mid 2030s. For simplicity, it is easier to remove this capacity from the outset.

2.32 It is also notable that there are a number of other plants of a similar age which will be approaching their end of life in the mid 2030s. While these do have R1 status, they are less efficient than modern plants and would, again, require substantial investment to continue operating. If there is some over-capacity in the residual waste market at this time, it is likely that the older, less efficient, plants would close to alleviate this. Replacing less efficient plants with newer plants, particularly if those plants are better placed for CCS, would have a clear carbon benefit.

Commercial points

2.33 In REP4-042, at paragraphs 26-33, UKWIN addresses some points discussed at ISH3 Part 1 on 26th January 2023 relating to the prospects for continued operation of energy from waste

facilities that do not meet the R1 efficiency threshold, or where it may not be practicable to retrofit the plant with carbon capture and storage technology.

2.34 Regardless of the policy and regulatory environment, the ERF will operate in a commercial market where its proposition to its waste producer customers, either directly or through intermediate fuel suppliers, will include its sustainability credentials.

2.35 Driven by the climate emergency, increasingly both public and private sector organisations are setting net zero targets and establishing trajectories for their greenhouse gas emission inventories across the value chain, including the contribution of waste management, to meet this ambition before 2050. For example, Unilever has committed to becoming net zero by 2039.

2.36 All other things being equal, this will mean a preference being expressed in the selection of a service provider for the management of residual waste for capacity with: a higher efficiency in energy recovery (as electricity or in the form of CHP and reflected in R1 status); and/or a higher proportion of carbon capture and storage.

2.37 Where an energy from waste facility is not able to achieve R1 status, and where it is not practicable to capture and store carbon, it will become increasingly less attractive a service provider and its position in the market may become precarious. If a facility is sufficiently efficient to meet the R1 threshold, then it would appear prudent for it to apply to the Environment Agency to achieve that designation. Indeed, for a merchant facility, it would probably be advantageous a choice under current market conditions.

2.38 Where a facility is not sufficiently efficient to meet the R1 threshold, the 'retrofit' required would be a very substantial undertaking indeed, requiring capital expenditure of many £10ms, equivalent to a large proportion of the cost of a new facility, entailing a new planning permission and several years of engineering works. Whether the operator would consider there to be a business case for such an investment is open to question, although it seems unlikely to be attractive for those sites where carbon capture and storage is less practicable, since it would not recover a strong market position as a result.

2.39 It is possible to put some numbers to this. Of the facilities listed in Table A6 in REP3-040, around 2 million tonnes of capacity is included as non-R1 facilities. 675 ktpa of this is the Edmonton plant, which is being replaced by Edmonton EcoPark and so it is entirely correct to exclude Edmonton from future capacity. The remainder is covered by nine plants – Bolton, Coventry, Dudley, Eastcroft, Exeter, Milton Keynes, Stoke, Wolverhampton and Lancing. Five of these

plants (Coventry, Dudley, Eastcroft, Stoke and Wolverhampton, giving 945 ktpa of capacity), date from the late 1990s or earlier and are dedicated to specific local authority contracts, which will be ended very soon. The cost of refurbishing these plants and improving them to achieve R1 status would be very high and it is likely, in a competitive environment, that local authorities would instead look to using a newer facility, with higher efficiency and better prospects for carbon capture. This is why the applicant indicated, in REP3-022 Appendix A, that the remaining capacity from these non-R1 plants would be down to 600 ktpa or less by the mid 2030s. For simplicity, it is easier to remove this capacity from the outset.

2.40 It is also notable that there are a number of other plants of a similar age which will be approaching their end of life in the mid 2030s. [NOTE – this refers to the Hampshire plants, SELCHP, Tyseley and maybe Allington, although some of these are ranked as medium CCS.] While these do have R1 status, they are less efficient than modern plants and would, again, require substantial investment to continue operating. If there is some over-capacity in the residual waste market at this time, it is likely that the older, less efficient, plants would close to alleviate this. Replacing less efficient plants with newer plants, particularly if those plants are better placed for CCS, would have a clear carbon benefit.

Greenhouse Gas points

2.41 In REP4-042, at paragraph 106 onwards, UKWIN addresses some points relating to the greenhouse gas assessment presented in ES Chapter 6: Climate [APP-054] and further points made by the Applicant regarding the assumptions made in this assessment and UKWIN's comments in earlier submissions.

2.42 For the purposes of clarity and with apologies for repetition of those further points where this occurs.

- 1) The Applicant does not resile from the original GHG assessment presented in the ES. However, this was made on a reasonable worst-case basis and presents an overall carbon balance that does not reflect in its entirety the carbon benefits of the development. In the light of UKWIN's comments, it is necessary for the Applicant to explore these benefits to some greater extent in order more comprehensively to inform the Examining Authority and other interested parties of their robustness and scale.
- 2) With that objective in mind, it is important to bear in mind that the assessment: a) excludes the benefits of potential heat recovery, which is part of the development; b) assumes only a minimal extent of carbon capture, where the intention is to connect with the East Coast

Cluster – which is possible with a small additional spur to the scheme currently being consulted on by HLCP [see the Applicant's response to FWQ 6.0.8]; c) gives no credit to the plastics recovery facility, considering that in the counterfactual benefits would accrue elsewhere, which is not certain; and d) adopts reasonable worst case assumptions for the landfill element of the counterfactual with respect to the benefits reported for the ERF, ie in relation *inter alia* to the sequestration of biogenic carbon, landfill gas capture rates and the greenhouse warming potential (GWP) of the methane in landfill gas.

- 3) UKWIN would have the assessment adopt assumptions that extend the worst case, including for some parameter values that have little or no justification. To take one example, it demands consideration of a 75% capture rate for landfill gas (and the methane it contains). In its guidance, DEFRA is clear that its baseline assumption for the landfill gas capture rate is considered towards the likely maximum, and as a consequence it weights the range that it uses for this parameter towards lower values.⁶ The Department refers to the dependence of the results on the level of landfill gas capture, and points to the need for research into this parameter, which was ongoing at the time of publication (February 2014).⁷ That research, carried out by Golder Associates, was published in November 2014, and has the aim of providing Defra with “... an up-to-date, robust figure for the methane capture rate from landfill that can be used to inform policy decision.”⁸ The report confirms the wisdom of the caution voiced by DEFRA. Amongst the summary of Golder's findings, it states:
- i. *“The ratio of methane to carbon dioxide measured in UK landfill gas is calculated to be 57:43% rather than the 50:50% landfill gas production ratio which is the International Panel on Climate Change default value [50:50% is used in the ES].”*
 - ii. *“Review of the current mix of [landfill gas] engine types across the UK portfolio has resulted in an average gross engine efficiency of 40%. It has been assumed that parasitic and other losses are encompassed in a 4% loss factor leading to a net electrical efficiency assumption of 36% [compared with 40% used in the ES].”*

⁶ Energy recovery for residual waste. A carbon based modelling approach. Table 10, page 29. Defra, February 2014.

⁷ Energy recovery for residual waste. A carbon based modelling approach. Discussion, paragraph 208, page 58. Defra, February 2014.

⁸ Gregory, R.; Stalleicken, J.; Lane, R.; Arnold, S.; and Hall, D. Review of landfill methane emissions modelling (13514290381.506/A.1). Executive summary, (unnumbered) paragraph 2, page 1 of 2. Golder Associates. February 2014.

- iii. *“The quantum of methane which passes through landfill gas engines unburnt is calculated to be 1.5% of the gas supplied to engines in any one year [not considered in the ES].”*
- iv. *“Golder used these findings to calculate the 2011 methane capture rate for the Type 3 [modern] landfill portfolio. This whole life collection efficiency is calculated to be 52% [compared with using a methodology based on MELMod methane generation predictions. A second ...slightly more conservative approach arrived at an estimated methane capture rate of 48%. ”⁹*
- v. *“The 75% lifetime capture rate in MELMod appears high, as Golder’s experience with UK landfill gas portfolios is that they may typically achieve an average gas recovery rate of 55-65% over the managed gas abstraction period of the portfolio, which is less than the site’s gassing lifetime.”^{10,11}*
- 4) In the light of these comments, the 68% assumption for the landfill gas capture rate used in the ES can be seen to be a perfectly reasonable worst case. To demand a 75% figure, not least when this context has already been made clear to the interested party concerned, is disingenuous.
- 5) With respect to the sequestration of biogenic carbon in landfill, in its guidance, the Department acknowledges that with respect to carbon sequestration *“The baseline assumptions used in the model assume a very high level of sequestration (around 50%) which could be considered to be an upper limit.”¹²* DEFRA speaks of the significant effect of reducing the assumed rate of sequestration.¹³
- 6) In paragraph 161 of REP4-042, UKWIN refers to the carbon-intensity of electricity generation and repeats its assertion as to the use of marginal consumption values provided by BEIS. The Applicant’s representative requested that UKWIN examine its justification of this reference,

⁹ Gregory, R.; Stalleicken, J.; Lane, R.; Arnold, S.; and Hall, D. Review of landfill methane emissions modelling (13514290381.506/A.1). Executive summary, pages 1 and 2 of 2. Golder Associates. February 2014.

¹⁰ Gregory, R.; Stalleicken, J.; Lane, R.; Arnold, S.; and Hall, D. Review of landfill methane emissions modelling (13514290381.506/A.1). Section 1.5.3, page 3. Golder Associates. February 2014.

¹¹ Typically, landfill gas production from a quantity of waste landfill rises rapidly after emplacement and cover, peaks and then declines over a period of decades. Landfill gas can be actively managed efficiently for only part of this period, as the burdens of abstraction will rise when gassing slows, and concentrations of methane become too low for energy recovery, and eventually for flaring, without a subsidiary gas fuel. Hence the methane recovery rate in the managed abstraction period will be greater than over the lifetime of the landfill. Researchers generally aggregate all lifetime methane emissions from landfill into a single lifetime figure, and this can be compared with the more or less instantaneous emissions from energy from waste. However, landfill is essentially a commitment to emissions in the future which raises questions of intergenerational equity.

¹² Energy recovery for residual waste. A carbon based modelling approach. Discussion, paragraph 209, pages 58 and 59. Defra, February 2014.

¹³ Energy recovery for residual waste. A carbon based modelling approach. Summary, paragraph 19, page 3. Defra, February 2014.

but it has not done so. The BEIS Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal is published on-line at [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal), and was last updated in January 2023. This guidance includes a toolkit for assisting analysts and guidance for using that toolkit, also referred to as a step-by-step guide.

- 7) That the guidance is intended for those assessing the impacts of changes in energy use is evident from the first paragraph of the introduction, “... *specific guidance on how analysts should quantify and value energy use and emissions of greenhouse gases (GHGs). It is intended to aid the assessment of proposals that have a direct impact on energy use and supply and those with an indirect impact through planning, land use change, construction or the introduction of new products that use energy*” and the title of the schematic that introduces the analytic process “*Figure 1: Analytical process to appraise impacts on energy use and GHG emissions* “. Data tables associated with the guidance are provided to assist the analyst.
- 8) Table 1 provides consumption-based and generation-based emissions factors. The introduction to the table states: “*Analysts should use consumption-based emissions factors for measuring GHG emissions per unit of final energy demand. These emissions factors include transmission and distribution losses, including significant losses due to power station inefficiency. Generation-based emissions factors measure GHG emissions per unit of electricity generated.*” Both sets of emissions factors represent a composite of all generating capacity supplying electricity to the grid, including energy from waste plant. Neither is appropriate as part of the counterfactual with which the development should be compared.
- 9) The Applicant does not dispute that the carbon-intensity of its development will be higher than this average, which clearly would be the case for c.50% of the electricity supplied to the grid. This average already includes BEIS’ forecast of supply from energy from waste plant. The correct counterfactual for the electricity supplied to the grid by the development is that generating capacity that would be built if it did not come forward. Currently this is CCGT.
- 10) Under the Electricity (Fuel Mix Disclosure) Regulations 2005, Defra is required to publish the breakdown of electricity supplied to the grid and its carbon-intensity in an annual fuel mix disclosure table, available on-line at [Fuel mix disclosure data table - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/datasets/fuel-mix-disclosure-data-table). This can be shown to confirm the impact intensity figure for CCGT used by the Applicant in its assessment. It also demonstrates the continuing contribution made by high carbon-

intensity coal-fired generation, the retirement of which could be accelerated by the development and similar capacity.

- 11) Were the DCO to fall on the single matter of carbon balance, that would be to give weight to an outcome that, on a worst case and representing a very low probability, shows little or no benefit in terms of reduction of greenhouse gas emissions and in UKWIN's opinion, a minor net increase. It would be to give no weight to the majority of likelihoods of a carbon benefit that becomes increasingly significant as one replaces the worst-case assumptions with those that are more representative of reality.
- 12) UKWIN seeks to portray this matter as one of uncertainty, and so, to conflate it with the Kemsley decision. However, whilst precision is difficult to provide, this is not an uncertain matter. We can be confident that the development will deliver net carbon benefits of significance.

Regulation 12 of the Waste Regulations 2011 and requirement 15

2.43 At paragraph 66 of REP4-045 UKWIN state that Regulation 12 applies only 'on the transfer of waste' and so cannot be relied upon to guarantee waste is collected and processed to prevent reusable and/or recyclable material being used in as incinerator feedstock.

2.44 Regulation 12 states:

Duty in relation to the waste hierarchy

12.—(1) *An establishment or undertaking which imports, produces, collects, transports, recovers or disposes of waste, or which as a dealer or broker has control of waste must, on the transfer of waste, take all such measures available to it as are reasonable in the circumstances to apply the following waste hierarchy as a priority order—*

- (a) prevention;*
- (b) preparing for re-use;*
- (c) recycling;*
- (d) other recovery (for example energy recovery);*
- (e) disposal.*

2.45 It is clear from the wording above that the regulation applies to all parties in the waste chain from producers to disposers of waste. This is also clear from Defra's guidance on applying the waste hierarchy June 2011 published pursuant to regulation 15(1) of the 2011 Regulations – see in particular paragraph 3.1 of that guidance (Guidance on applying the waste hierarchy - GOV.UK (www.gov.uk)).

- 2.46 The point at which the regulation bites is 'on the transfer of waste' and at this point they must 'apply' the waste hierarchy. In the decision making process leading up to the particular transfer the relevant party in the chain will need to determine how they are going to demonstrate compliance with regulation 12 and specifically how they will apply the priority order. Whilst UKWIN's point that the receiving party for the waste (in this case the EfW operator) cannot 'guarantee' that the waste it collects will exclude reusable and/or recyclable material forming part of the waste accepted as feedstock for an EfW may be correct, the permit will include a standard condition that provides waste shall only be accepted if it is of a type and quality that is specified in the permit and importantly that waste shall only be accepted if 'it having been separately collected for recycling, it is subsequently unsuitable for recovery by recycling.' An EfW operator is obliged to 'take all such measures available to it as are reasonable in the circumstances' to apply the waste hierarchy. An EfW operator is not in a position to singularly control and ensure that as much waste as possible is recycled further up the waste supply the chain – this is primarily within the control of waste producers and the separate collection and, pre-treatment of wastes where the residual component will become fuel.
- 2.47 An Operator's responsibility to apply the requirements of both the Waste Framework Directive, Waste Hierarchy and also Duty of Care obligations will be set within the conditions of the permit usually within Section 1 – Management and Section 2 – Operations. Additionally, the assessment and application of Best Available Techniques will also require operational practices to be disclosed to the Regulator and be implemented by the operator subject to the Regulator's approval and agreement with the defined industry's identified best practice, that would usually be implemented within the Operating Techniques table of an environmental permit, and will place responsibility on an Operator to apply the relevant legislation in practice through an approved means, this may include activities such as; Waste Characterisation Audits, Waste Stream Assessments and Duty of Care Inspections and Auditing.
- 2.48 That said, the Applicant has proposed requirement 15 in order to demonstrate the reasonable measures that it can take "which aim to minimise recyclable and reusable waste received at the authorised development". We have suggested a slight amend to this wording in requirement 15 to make it clear that it is minimising the amount of recyclable and reusable waste that is contained in the residual waste. It is accepted that there is only so far that the Applicant can go to ensure waste suppliers have complied with the waste hierarchy and it is for the EA to enforce compliance with regulation 12 on all parties in the waste chain. However, the existence of a scheme pursuant to requirement 15 would provide an additional layer of influence above what will be stipulated by

the EA in the Permit and the Applicant considers these measures to be reasonably available to it and would, at the very least, demonstrate its own compliance with regulation 12.

- 2.49 In terms of the points raised by UKWIN on the aspect of requirement 15 dealing with waste compositional analysis, we have given this some further thought and also considered NLC's comments on requirement 15 too. We suggest that paragraph (e) of requirement 15 is deleted from the wording. As part of demonstrating Best Available Techniques (BAT) required for the grant of the Permit, BAT 9 and BAT 11 in the Best Available Techniques (BAT) Reference Document for Waste Incineration 2019 [REDACTED] require waste stream management and monitoring of waste deliveries as part of the waste acceptance procedures along with periodic sampling of wastes. As such, we do not consider it is necessary to include this compositional analysis in the requirement as it would largely duplicate the necessary controls that the Environment Agency would include in the Permit.
- 2.50 As for the Defra Avoidance Classification Scheme referred to by UKWIN, this is more relevant to classifying the parts of the waste streams produced that are capable of being reused and/or recycled and to support initiatives for the increase in recycling to meet the Government targets.

3.0 NORTH LINCOLNSHIRE COUNCIL

3.1 At Deadline 4, North Lincolnshire Council submitted the following documents:

- NLC Actions following ISH 3 [REP4-031];
- A copy of Historic England's 'The Setting of Heritage Assets – Historic Environment Good Practice Advice in Planning Note 3' [REP4-032]; and
- A copy of the 1996 planning permission referred to at ISH 3 in respect of a noise condition [REP4-030].

3.2 In response to NLC's point at para 2.1 of REP4-031 the Applicant does not agree with the statement that the Axholme Fens is 'the highest-level category of the Lincolnshire Historic Landscape Characterisation survey data'. It is a Historic Character Zone within 'The Confluence' Historic Character Area. Using the smallest historic landscape units provided by Council's own historic landscape assessment process seems entirely appropriate and proportionate.

3.3 Furthermore, there is no published guidance for assessing impacts on historic landscape, at council or national level. In a landscape that is so homogenous and open, breaking it down into further sub-zones would involve a disproportionate amount of effort for a category of receptor that has no designated or even broadly accepted value at regional or national level.

3.4 NLC also draw attention to the need to refer to 'The Isle of Axholme, Historic Landscape Characterisation Project 1997' (Countryside Commission, Leeds). The ERM team did consult this document, which only covers the area to the west of the Trent. This did not change ERM's overall view of impact and homogenous character units.

3.5 Regarding section 4 of the REP4-031, as set out in para 2.49 of this document, following UKWIN's and NLC's deadline 4 responses the Applicant has reconsidered requirement 15 and in particular suggested the deletion of the requirement to provide waste compositional analysis given the duplication of control in the permit. The Applicant will liaise further with NLC prior to the dDCO ISH 7 March 2023 to consider requirement 15 and whether any further revised wording for this requirement is appropriate.

4.0 RESIDENTS AGAINST INCINERATORS (RAIN)

- 4.1 Additional to their oral comments following the Issue Specific Hearings, RAIN also submitted supplementary questions and statements at Deadline 4 relating to Ecology and Flood Risk.

Response to Ecology Points

- 4.2 In response to RAIN comments that the wildlife observed in the area appears to be 'very strange', the Applicant notes that the application initially used desk study data issued by the Greater Lincolnshire Nature Partnership (GLNP), the local species record centre for the area, supplemented by survey information (see below). The list referred to be RAIN is the HLNP record and includes species records held within their database, which is not intended to represent a comprehensive list of species (or numbers of individuals) present within a given area.
- 4.3 Regarding RAINs comments on badgers, the desk study identified a high number of setts within the 5 km search buffer and noted numerous records of activity associated with Dragonby. These findings were further informed by walkover surveys (using a standard buffer of 50 m) to identify setts at risk of direct impacts or disturbance due to the proposed reinstatement works. Appropriate mitigation, including possible need for licensing, is detailed within ES Chapter 10: Ecology and Nature Conservation (APP-058).
- 4.4 Addressing RAINs comments on birds, GLNP data returned over 5000 records of birds within the 5 km search area, of which protected and priority species (Species of Principal Importance; Schedule 1; and Red and Amber Birds of Conservation Concern) are summarised. Breeding and wintering bird surveys were carried out to supplement desk study information, and a further 26 wintering and migratory surveys were carried out between August 2021 and April 2022 following a request by Natural England. These results have informed the assessment of likely significant effects.

Response to Flooding Points

- 4.5 RAIN has queried local historic flood events not captured in the FRA. Section 4.2 of the FRA [APP-070] provides commentary on major tidal surge events that have been recorded by the EA and NLC and these have been reported on within the assessment.
- 4.6 RAIN also comments that the 2016 NLC Flood Risk Strategy is not controlled by mitigation but reactionary due to its unpredictable regularity. As part of the design for the proposed development set out in the FRA [APP-070], flood mitigation measures are being incorporated to ensure the site is at a low risk of flooding for the lifetime of the development.

4.7 RAIN indicates that the Humber 2100+ Flood Planning project includes a flood map that is a direct copy of the Climate Central Map doubting the use of the EA mapping in the FRA. It is not clear where reference to this map is made in the documentation. However, the Applicant does not have further comments to those set out in the Written summaries of oral submissions put at Issue Specific Hearing 3 (Day 2) issued February 2023 at Deadline 4 [REP4-029].

5.0 ENVIRONMENT AGENCY

- 5.1 Additional to their oral comments following the Issue Specific Hearings, the EA also submitted a letter commenting on information submitted at Deadline 3.
- 5.2 Within this letter the EA confirmed that the revisions to Appendix K of the Code of Construction Practice, submitted at Deadline 3, adequately addressed their concerns previously raised in respect of controlled waters and that this matter is now agreed. This agreement is captured in the SoCG submitted at this deadline.
- 5.3 Within their Oral comments the EA noted that they were still concerned with the wording of Requirement 12 of the dDCO and that they did not consider that the additional assessment required to inform the flood mitigation work is secured yet. The Applicant notes that since the EA submitted this comment, they have amended this requirement and agreed wording with the EA. This agreement is captured within the SoCG submitted at this deadline.
- 5.4 The Applicant also notes confirmation from the EA in their Deadline 4 submission that they have no concerns in respect of water quality, monitoring and treatment or the Water Framework Directive. This has been captured within the SoCG submitted at this deadline.



6.0 RESPONSE TO THE RULE 17 REQUEST FOR FURTHER INFORMATION

- 6.1 A Rule 17 letter dated 14 February 2023 [PD-010] was received from the Examining Authority (ExA), requesting further information on two points.
- 6.2 The below responses have been drafted in consultation with the Environment Agency and NLC who confirmed their agreement.

Response to Point 1

6.3 As noted by the ExA in point 1 of the Rule 17 letter, the Applicant and NLC both set out their position in relation to article 43 (operational land for purposes of the 1990 Act) in their respective responses to ExQ1 question 7.1.25. Following receipt of the Rule 17 letter, the Applicant has discussed this further with NLC and has agreed in principle some amendments to the article to reflect NLC’s remaining concern that the article would apply to wetland/habitat creation areas on which there is intended to be no “built” development. The Applicant is producing an amended draft of the article to exclude these areas (ie the land in respect of which Work Nos. 12 and 12A are authorised) for sharing with NLC and will provide an update to the ExA at ISH4 on the dDCO.

Response to Point 2

6.4 Point 2 requested further information relating to the Applicants proposed use of a package treatment plant as an alternative to a mains connection for dealing with foul water. Table 1 below sets out the response to each question asked.

Table 1: Response to Point 2 questions

Rule 17 Letter Question	Applicant’s Response
<p>The Applicant confirmed in their response that a package treatment plant has not specifically been assessed within the ES, do the parties consider there could be any significant effects from either plant or any cumulative effects which would need to be addressed. In responding, please set out a justification in support of your submission.</p>	<p>Since receipt of this request for further information, Severn Trent Water has informed the Applicant that the Project’s domestic effluent can be accepted by its system. Therefore, a packaged sewage treatment plant will no longer be required.</p> <p>Trade effluent water from the Project will be recycled on site for reuse within the facility. Plant for the treatment and pumping of this water will be included within the ERF facility. No additional buildings are required to incorporate the equipment and therefore it will have no significant effects either alone or cumulatively as described below. As the water</p>

	<p>will be reused on site, no discharge into the sewer or wetland areas will be required.</p> <p>Due to the current disposal strategies, flow from the development into the Severn Trent Water system will not exceed the existing flow rates and thus the Applicant does not consider that there will be any likely significant effects. As such, no further assessment is required.</p>
<p>The Applicant’s description of the sewage treatment plant (STP) as ‘small’, is not precise and the level of effect in these circumstances is equally imprecise, do the parties agree that the scale of each plant and the potential effects would need to be defined for each plant?</p>	<p>As noted above, a packaged sewage treatment plant for domestic effluent will no longer be required.</p>
<p>Clarity is required from the Applicant on the two plants, the scale that they would operate at, and the methods they would use for the disposal of waste water. Do the parties consider parameters are required for each plant so that their scale, capacity and potential effect is understood?</p>	<p>As noted above, a packaged sewage treatment plant for domestic effluent will no longer be required. The domestic effluent will discharge to the Severn Trent Water sewer and will not exceed the existing flow from the site. No additional plant is required to treat the domestic effluent flow.</p> <p>As also described above, the treatment of trade effluent flow will take place within the main ERF building and assessed as such in the ES, therefore it is not necessary to present parameters for the structures and equipment involved in such water treatment. As the trade effluent flow will be reused on site, it will not be disposed of into the Severn Trent Water sewer or to the wetlands.</p>
<p>If one of the plants is a closed system, how is this secured?</p>	<p>The technical detail and performance of the water treatment facility will be developed during detailed design. The strategy for disposal of both trade and domestic effluent is explained in the Indicative Drainage Strategy (see updated document submitted at this deadline) and compliance with this is secured by requirement 9 in the dDCO for the foul water drainage with the Environment Agency as a consultee.</p>
<p>In light of the Environment Agency concern raised at ISH3 that a long term solution would be required, how the potential for a conflict between the DCO and any Environmental Permit might be addressed. Should the DCO</p>	<p>As noted above, a packaged sewage treatment plant for domestic effluent will no longer be required.</p>



<p>have a time limit built into it limiting the time period that a plant or plants could operate prior to a permanent solution?</p>	
<p>Should the ES now be updated to provide clear descriptions of these works, both within Chapters 3 and 9 or any other relevant chapter</p>	<p>As noted above, a packaged sewage treatment plant for domestic effluent will no longer be required.</p> <p>REP4-007 describes how the trade effluents will be dealt with. Since the management of trade effluents does not result in any direct releases to the water environment there are no effects to assess on natural waters in the context of ES Chapter 9: Water Resources and Flood Risk [APP-057]. Since the trade effluent treatment system will be wholly contained within the main ERF building there are no likely significant effects (e.g. landtake, visual impact) associated with its physical presence.</p>
<p>Whether as a consequence, the changes now described in Schedule 1 of the latest version of the dDCO should have formed part of a change request as set out within the Planning Inspectorate (PINS) Advice Note 16 and be subject to consultation.</p>	<p>As the Applicant is no longer proposing a package sewage treatment plant to treat domestic effluent the reference to ‘domestic flow treatment plant’ has been removed from the dDCO submitted at deadline 5.</p> <p>In terms of the trade effluent plant, this has been added as a specific work to Work No1. The reuse of trade effluent as part of the proposed development was already contemplated as part of the Project Description and so there is no change to the proposed development as such, rather it was an omission from the wording in Work No1 in the dDCO. As explained above this will not give rise to any materially new or materially different environmental effects or consequential changes to the Works Plans, or other application documents. The Indicative Drainage Strategy has been updated at this deadline to confirm the details for the trade effluent and this will be secured via requirement 9.</p> <p>As such, we do not consider that there is a need to request a change to the Application or carry out any further consultation. The Environment Agency, North Lincolnshire Council and Severn Trent Water have been consulted in any event on this matter.</p>