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TABLES

17.0 CUMULATIVE AND COMBINED EFFECTS

17.1 Introduction

17.1.1 This Chapter of the Environmental Statement (ES) provides an assessment of the potential for cumulative and combined effects to occur as a result of the Proposed Development. Cumulative and combined effects are defined as follows:

- cumulative effects are those that accrue over time and space from a number of development activities – the impact of the Proposed Development is considered in conjunction with the potential impacts from other projects or activities which are both reasonably foreseeable in terms of delivery (i.e. have planning consent or relevant applications which have been submitted and are in the planning system) and are located within a realistic geographical scope where environmental impacts could act together with the Proposed Development to create a more significant overall effect; and
- combined effects are those resulting from a single development (the Proposed Development) on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and visual disturbance impacts during construction on birds).

17.1.2 The assessment presented in this Chapter draws on the assessment of impacts provided in Chapters 7 to 16, 18 and 19 of this ES, and information in the public domain relating to other known developments within the Study Area.

17.1.3 The cumulative impact assessment does not consider other developments that are already constructed and operating, as such existing developments are already accounted for in the baseline conditions established for the main assessments within Chapters 7 to 16, 18 and 19 of this ES.

17.1.4 As described in Chapter 1: Introduction, full planning permission for a 49.9 MW energy from waste power station at the Site was granted under the Town and Country Planning Act 1990 on 12th April 2019 (referred to as 'the Consented Development'). Since the grant of this planning permission ('the Planning Permission') the Applicant has been assessing potential opportunities to improve the efficiency of the Consented Development and now proposes an energy from waste power station of up to 95 MW electrical output (the Proposed Development). Cumulative effects of the Proposed Development and Consented Development are not relevant to the cumulative impact assessment because only one or the other could occur.

17.1.5 This Chapter is supported by Figure 17.1 – 17.3 in ES Volume II (Document Ref. 6.3).

17.2 Legislation and Planning Policy Context

17.2.1 The requirement for cumulative and combined impact assessments is stated in the relevant European Directive and domestic legislation, as detailed below:

- European Directive 2014/52/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of: "the direct

effects and any indirect, secondary, cumulative, transboundary, short-term, medium term and long-term, permanent and temporary, positive and negative effects of the project".

- Schedule 4 Part 5 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations') requires:

  "A description of the likely significant effects of the development on the environment resulting from, inter alia […] (e) the cumulation of effects with other existing and/ or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources". The EIA Regulations state that this description of likely significant effects "should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development";

- paragraph 4.1.3 of the Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change, 2011) states that:

  "In considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the IPC should take into account:

  - *its potential benefits including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and*
  - *its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.";*

- paragraph 4.2.5 of NPS EN-1 goes on to state that when considering cumulative effects, *"the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence) […]";* and

- paragraph 4.2.6 of NPS EN-1 states that consideration should be given to *"how the accumulation of, and interrelationship between, effects might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place may also have other evidence before it, for example from appraisals of sustainability of relevant NPSs or development plans, on such effects and potential interactions".*

- paragraph 107 of the Planning Act 2008: Guidance on the pre-application process (Department for Communities and Local Government, 2015) states that:

  "Applicants should consider the potential cumulative impacts on an area as a result of increasing development in the proposed area, as well as those developments which are:

  - *in the process of being built;*

- *permitted application(s), but not yet implemented;*
- *submitted application(s) not yet determined;*
- *projects on the National Infrastructure's programme of projects;*
- *identified in the relevant Local Plan (and emerging Local Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and*
- *identified in other plans and programmes (as appropriate) which set the framework for future development consents/ approvals, where such development is reasonably likely to come forward*."

17.2.2 Paragraph 108 of the same guidance states *"It may not always be easy for applicants to assess potential impacts fully due to lack of available information. In such circumstances, applicants should take a pragmatic approach when determining what is feasible and reasonable. They should satisfy themselves that they have made all reasonable efforts to identify the main impacts and to include mitigation measures in their draft Order. As with the parameters for the Rochdale Envelope, applicants should fully explain their options to the Secretary of State as part of their application. National Policy Statements provide a useful overview of common impacts and ways of mitigating them".*

17.3 Assessment Methodology

Impact Assessment and Significance Criteria

17.3.1 This assessment aims to identify the potential for cumulative and combined effects expected to occur during the construction and operation (including maintenance) of the Proposed Development, and where possible, identify the possibility for significant effects.

17.3.2 Construction effects are assessed assuming construction of the Proposed Development starts in 2020. This is the worst case because it is likely that more of the other developments identified for assessment are expected to be constructed in this period.

17.3.3 The cumulative operational assessment considers the total effects of the Proposed Development and the other identified developments operating concurrently.

17.3.4 Cumulative effects during decommissioning of the Proposed Development are not considered as there is no defined time at which decommissioning will take place and therefore no certainty of temporal overlap with other identified developments.

17.3.5 There is no standard prescriptive method for assessing cumulative and combined effects and, in relation to cumulative effects, the extent to which the effects of other developments can be assessed quantitatively depends on the level of information available about the other developments. Such effects are, therefore, assessed by professional judgment, although matrices and modelling are used where appropriate and where enough information regarding the other developments exists. Where environmental assessment information regarding

other developments is not available or uncertain, the assessment is necessarily qualitative.

Cumulative Effects Assessment Methodology

17.3.6 Whilst not a prescribed or statutory process, the Planning Inspectorate (PINS) Advice Note 17 'Cumulative effects assessment relevant to nationally significant infrastructure projects' (PINS, 2019) sets out a staged process which applicants may wish to follow when undertaking cumulative impact assessments for Development Consent Order applications. This sequential process is categorised in four stages:

- Stage 1: Establishing the long list;
- Stage 2: Establishing the short list;
- Stage 3: Information gathering; and
- Stage 4: Assessment.

17.3.7 This approach has been followed in undertaking the cumulative effects assessment for the Proposed Development. The other developments considered in this Chapter are either:

- approved projects (not yet constructed or operational); or
- projects submitted but not yet approved.

17.3.8 The ES also considers cumulative effects with development identified on relevant plans and programmes (i.e. identified on Local Plans), although it is noted that the available information on the environmental effects of the development of allocated land is very limited.

17.3.9 In determining the possible significance of cumulative effects, the location and timing of the identified other developments and their associated impacts/ effects have been taken into account wherever possible.

17.3.10 The cumulative effects assessment only considers those receptors that would experience a residual effect associated with the Proposed Development. For receptors where the Proposed Development's residual effects are deemed to be neutral/ negligible as reported in this ES, it is considered that such receptors could not experience cumulative effects.

17.3.11 A long list of other developments in the vicinity of the Proposed Development was identified following a search of the relevant planning databases (PINS, North East Lincolnshire Council (NELC), North Lincolnshire Council (NLC) and East Riding of Yorkshire Council (ERYC)). From this long list a refined short list of other developments was prepared that were considered to be of relevance to the cumulative effects assessment given the nature of the Proposed Development and the potential effects.

17.3.12 Following information gathering from available sources, the effects of the Proposed Development have been considered by each technical discipline in conjunction with the potential effects from the developments included in the short list where there is potential that environmental impacts could act together to

create an effect that is more (or less) significant overall than the effect of the individual developments alone.

17.3.13 In assessing cumulative effects it is important to acknowledge the relative contributions the different developments make to a cumulative effect and to consider whether a cumulative effect could occur at all.

Study Area

17.3.14 Cumulative effects are generally unlikely to arise unless the other development sites are in close proximity to the Proposed Development, recognising that actual distance varies with the nature of the potential effect and the nature of the receptor, e.g. cumulative air quality effects could occur for developments a greater distance apart than noise effects. Construction projects are, as a matter of routine, required to employ regulatory and managerial controls and follow best practice to mitigate construction impacts wherever possible. Nevertheless, consideration has been given to the presence of common pathways from nearby developments to a single receptor, and whether there is potential for impacts of a sufficient magnitude whereby a particular receptor could experience cumulative effects.

17.3.15 The study area for the consideration of cumulative and combined effects has been developed taking into account the predicted extent of impacts associated with the Proposed Development, and the point at which the associated effects become insufficient to contribute in any meaningful way to those of another development.

17.3.16 Information on the likely extent of impacts associated with other developments in the area has also been considered when determining the long and short list of other developments to be considered.

17.3.17 The study area for each environmental assessment topic is defined in the relevant ES technical chapters (Chapters 7 to 16, 18 and 19). A summary of each environmental topic and its Zone of Influence (ZoI) is included below within Table 17.1.

Table 17.1: Zone of Influence summary table

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
Air Quality	Construction dust (human health receptors): 350 m from Site boundary and 50 m from construction traffic route (up to 500 m from Site entrances). Construction dust (ecological receptors): 50 m from Site boundary and/ or construction traffic route (up to 500 m from Site entrances). Operational point-source emissions: 10 km. Traffic air quality: as per ZoI for Traffic and Transport assessment, as described below.

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
	Refer to Chapter 7: Air Quality for more information.
Noise and Vibration	Construction and Operation noise and vibration from Site: 1 km (this is presented as an appropriate indicative ZoI; as the assessment is based on individual receptors). Traffic noise: as per ZoI for Traffic and Transport assessment, as described below. Refer to Chapter 8: Noise and Vibration for more information.
Traffic and Transport	The ZoI for traffic and transportation is made up of several individual areas of the local road network where a potential impact or constraint has been identified. For this reason, a 'linear' set distance from the Site cannot be provided, however, the six links within the transport assessment study area are detailed below: • South Marsh Road (East of Hobson Way); • South Marsh Road (West of Hobson Way); • Hobson Way (North of South Marsh Road); • Kiln Lane (West of Hobson Way); • A1173 (West of North Moss Lane); and • A1173 (North of A180). Refer to Chapter 9: Traffic and Transport for more information.
Ecology and Nature Conservation	Construction and Operation (international statutory designations): 10 km. Construction and Operation (other statutory designations): 2 km. Construction and Operation (notable habitats and protected/ notable species): 1 km. Construction and Operation (ponds): 250 m. Refer to Chapter 10: Ecology and Nature Conservation for more information.
Landscape and Visual Amenity	Construction and Operation: 5 km Refer to Chapter 11: Landscape and Visual Amenity for more information.

ENVIRONMENTAL TOPIC	ZONE OF INFLUENCE
Geology, Hydrogeology and Land Contamination	Construction and Operation: 500 m Refer to Chapter 12: Geology, Hydrogeology and Land Contamination for more information.
Cultural Heritage	Construction and Operation: 5 km Refer to Chapter 13: Cultural Heritage for more information.
Water Resources, Flood Risk and Drainage	Construction and Operation: 750 m (this is an appropriate indicative ZoI as the assessment is based on individual receptors). The ZoI for water resources, flood risk and drainage is related to several specific features within the vicinity of the Site: • Oldfleet Drain (watercourse) – 140 m to the South of the Site; • Middle Drain (Ordinary watercourse) – 340 m to the north of the Site; • Oldfleet Drain (fluvial flood defences) – 270 m to the south-west of the Site; • Humber Estuary (tidal flood defences) – 160 m to the east of the Site; and • Humber Estuary – 175 m to the east of the Site. Refer to Chapter 14: Water Resources, Flood Risk and Drainage for more information.
Socio-Economics	Construction and Operation: ZoI covers the Grimsby Travel To Work Area (TTWA) (see Plate 15.2 in Chapter 15: Socio-Economics). Refer to Chapter 15: Socio-Economics for more information.
Waste Management	Construction and Operation: ZoI covers the Yorkshire and Humber region. Refer to Chapter 16: Waste Management for more information.
Human Health	Defined as per other related topics above.
Sustainability and Climate Change	Defined as per other related topics above.

17.3.18 As shown in Table 17.1 the largest study areas relate to the waste management and socio-economics assessments (Yorkshire and Humber region and Grimsby TTWA respectively).

17.3.19 The effects of waste generated from the Proposed Development on the regional capacity for waste management are at such a low level that no significant cumulative effects with other developments are anticipated, so the search for other developments to be considered by the cumulative effects assessment has not been extended this far.

17.3.20 The cumulative socio-economics effects are likely to be significantly beneficial and it is not considered appropriate or necessary to extend the search for other developments to be considered by the cumulative effects assessment to this extent.

17.3.21 The next largest study area (10 km), to inform the assessment of source-point air emissions on ecological and human receptors, has therefore defined the overall ZoI within which the search for other developments has been undertaken to inform the cumulative effects assessment.

Consultation

17.3.22 The Secretary of State provided comments on the scope of the cumulative assessment through the EIA Scoping process with PINS. Through this consultation process further developments were identified and have been included within this assessment where appropriate.

17.3.23 Section 42 consultation responses have also been received in respect of the PEI Report. No further developments were identified through this consultation process however any responses received relevant to this cumulative assessment have been reviewed and considered.

17.3.24 Table 17.2 below provides a summary of all consultation responses received regarding cumulative and combined effects as well as how this has been addressed by the Applicant.

Table 17.2: Consultation summary

CONSULTEE/ DATE	SUMMARY	ADDRESSED
Natural England 27 June 2018 (Pre-Application meeting in relation to the Consented Development)	A pre-application meeting was held between the Applicant and Natural England relating to the Consented Development. Several topics were discussed, including cumulative effects and projects which the Applicant should consider in the assessment. This discussion is also relevant to the Proposed Development assessment.	This meeting has informed the scope of the cumulative effects assessment for the Proposed Development.
Secretary of State October 2019 (Scoping Opinion)	The ES should explain how impacts can interact over different geographical scales depending on different environmental conditions and the sensitivity of the receptor under consideration.	Topic-specific geographical scales are provided within this Chapter. In line with the guidance in Advice Note 17 (PINS, 2019), individual ZoIs for each topic have been defined.
	The Scoping Report states that the cumulative effects of the extant planning permission and the Proposed Development will not be assessed. The assessment of the effects of the Proposed Development alone will encompass the effects from the extant planning permission. The Inspectorate agrees with this approach.	Chapters 7-16, 18 and 19 present assessments of the Proposed Development alone and also include comparison of the effects of the Proposed Development to the effects of the Consented Development, identifying any additional effects that may arise due to the Proposed Development. However, it is noted that whilst construction may be

CONSULTEE/ DATE	SUMMARY	ADDRESSED
		undertaken partly in accordance with the Planning Permission, and partly under the Development Consent Order, operation will be in accordance with one or other consent as it would be impossible to operate both the Proposed Development and the Consented Development at the same time.
	The Applicant should have regard to the advice in the Inspectorate's Advice Note 17 Cumulative Effects Assessment, when determining which developments to include in the CEA.	Advice Note 17 forms the basis for the approach to the cumulative effects assessment.
	The CEA should be quantitative rather than qualitative where it is necessary to provide confidence in the findings on likely significant effects.	A combination of quantitative and qualitative assessment is used to determine the presence or absence of any cumulative (or combined) effects. The professional judgment on this matter is dependent on the specialist topic.
Natural England	It will be important for any assessment to consider the potential cumulative effects of this proposal, including all	As described above Chapters 7-16, 18 and 19 present an

CONSULTEE/ DATE	SUMMARY	ADDRESSED
October 2019 (Scoping Opinion)	supporting infrastructure, with other similar proposals and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.	assessment of the Proposed Development alone as well as a comparison of the effects of the Proposed Development to the effects of the Consented Development, identifying any additional effects that may arise due to the Proposed Development.
	The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.	A long list of developments in the vicinity of the Proposed Development has been identified following a search of the relevant planning databases (National Infrastructure Planning, NELC, NLC and ERYC), which includes consideration of EIA scoping submissions.
	The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment (subject to available information): a. existing completed projects;	The cumulative effects assessment considers approved but uncompleted projects and projects for which an application has been made and is under consideration. Existing completed projects

CONSULTEE/ DATE	SUMMARY	ADDRESSED
	b. approved but uncompleted projects; c. ongoing activities; d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and e. plans and projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.	and ongoing activities are accounted for in the existing baseline conditions. The assessment also considers cumulative effects with other plans and programmes where sufficient environmental information is available to inform the assessment.
Public Health England October 2019 (Scoping Opinion)	The health and population impacts section should address any potential cumulative impacts as a result of the development, currently approved developments which have yet to be constructed, and proposed developments which do not currently have development consent.	A long list of developments in the vicinity of the Proposed Development was identified and effects on human receptors such as air quality and noise effects have been assessed.
	Any assessment of impacts arising from emissions or activities due to construction and decommissioning should consider potential impacts on all receptors and describe monitoring and mitigation during these phases. Construction and decommissioning will be associated with vehicle movements and cumulative impacts should be accounted for.	A topic-specific assessment of potential cumulative effects is provided within this Chapter; this includes emissions from the Site and associated road traffic.

CONSULTEE/ DATE	SUMMARY	ADDRESSED
	When considering a baseline (of environmental quality) and in the assessment and future monitoring of impacts these should identify cumulative and incremental impacts (i.e. assess cumulative impacts from multiple sources), including those arising from associated development, other existing and proposed development in the local area, and new vehicle movements associated with the proposed development; associated transport emissions should include consideration of non-road impacts (i.e. rail, sea, and air).	As described above, the cumulative effects assessment includes consideration of transport emissions from the Proposed Development and other developments proposed within the ZoI.
	Neither the EIA regulations nor the National Policy Statements provide a definition of what constitutes a 'significant' effect, and so Public Health England have derived a list of factors which it will take into consideration in the assessment of significance of effects: • Will the NSIP's impacts on this determinant combine with effects from other existing or proposed NSIPs or large-scale developments in the area, resulting in an overall cumulative effect different to that of the project alone? • What are the cumulative effects of the impacts of the scheme on communities or populations. Individual impacts individually may not be significant but in combination may produce an overall significant effect.	The significance of cumulative effects is derived from the topic-specific methodologies described in Chapters 7-16, 18 and 19 of this ES.
Natural England	We are aware that the assessment of cumulative impacts for the Preliminary Environmental Information Report	The cumulative air quality assessment has been updated

CONSULTEE/ DATE	SUMMARY	ADDRESSED
13 December 2019 (Section 42 response to PEI Report)	(dated October 2019) has not included a consideration of the emissions to air from the proposed Sustainable Transport Fuels Facility adjacent to the proposed site, or the proposed VPI Immingham Open Cycle Gas Turbine Development Consent Order which have been reported on since the assessment of this proposed development was undertaken. Therefore, we anticipate that these will be included in the final Environmental Statement. In addition, an updated in-combination assessment to include impacts from air quality should also be considered within the Habitats Regulations Assessment process.	to include these additional proposed developments, and this is reported in Appendix 7A (ES Volume III, Document Ref. 6.4) and summarised in this chapter. The Habitats Regulations Assessment (HRA) Signposting (Document Ref. 5.8 has also been updated accordingly. A meeting was subsequently held on 11th February 2020 under the Discretionary Advice Service (DAS) between AECOM and Natural England to discuss the findings of the updated HRA and cumulative air quality assessment.
North Lincolnshire Council 13 December 2019 (Section 42 response to PEI Report)	The relevant existing and proposed developments within North Lincolnshire that have the potential to generate cumulative environmental effects together with the proposed development have been identified.	Noted that no particular issues were raised.

Summary of Key Changes to Chapter 17 since Publication of the Preliminary Environmental Information (PEI) Report

17.3.25 The PEI Report was published for statutory consultation in October 2019, allowing consultees the opportunity to provide informed comment on the Proposed Development, the assessment process and preliminary findings through a consultation process prior to the finalisation of this ES.

17.3.26 The key changes since the PEI Report was published are summarised in Table 17.3 below.

Table 17.3: Summary of key changes to Chapter 17 since publication of the PEI Report

SUMMARY OF CHANGE SINCE PEI REPORT	REASON FOR CHANGE	SUMMARY OF CHANGE TO CHAPTER TEXT IN ES
Review and update of cumulative developments to be included since the PEI Report.	To ensure all required cumulative developments are included and appropriately assessed in the final ES.	Following a review of other potential developments two additional developments not previously included within the PEI Report (an industrial unit and a waste to energy plant, both in Immingham and both at an early stage in the planning process) were added to the long list of developments presented in Table 17.4. Following a review of the available environmental information these were then subsequently scoped out and not carried forward into the short list. In addition, a residential development in Immingham (Ref. DM/0728/18/OUT), which was scoped out of the short list in the PEI Report, has now been included on the short list because its traffic impacts are considered to be relevant to the assessment.
Update to the cumulative air quality assessment to include two other potential developments (Sustainable Transport Fuels Facility (Ref DM/0664/19/FUL)	To ensure all required cumulative developments are included and appropriately assessed in the final ES.	The updated air quality assessment results are summarised within this chapter and more detail is provided in Chapter 7: Air Quality in ES Volume I (Document Ref. 6.2) and Appendix 7A in ES Volume III (Document Ref. 6.4). The HRA Signposting (Document Ref. 5.8) has also been updated.

SUMMARY OF CHANGE SINCE PEI REPORT	REASON FOR CHANGE	SUMMARY OF CHANGE TO CHAPTER TEXT IN ES
and VPI Immingham OCGT DCO (PINS Ref EN010097)).		
Update of the assessment of cumulative effects with the electrical and gas connection works including identification of route options.	To ensure all required cumulative developments are included and appropriately assessed in the final ES.	Additional information on the potential electrical and gas connection works is provided in paragraphs 17.4.5 – 17.4.11 and route options are shown on Figures 17.2 and 17.3 (ES Volume II, Document Ref. 6.3). Cumulative effects are assessed in Sections 17.5 to 17.16.
Update of the assessment to include any potential for cumulative effects with relevant plans and programmes (i.e. identified on Local Plans).	To ensure all required cumulative developments are included and appropriately assessed in the final ES.	Consideration of potential cumulative effects with relevant plans and programmes is provided in paragraphs 17.4.12 – 17.4.17

17.4 Cumulative Effects Assessment Stages 1-3

Stage 1: Establishing the long list of other existing development and/ or approved development

17.4.1 An initial screening exercise has been undertaken to identify potential major developments and plans within the vicinity of the Proposed Development for consideration within the cumulative effects assessment. This process identified potential major and other developments considered relevant to the assessment within a 10 km radius to create an initial long list for consideration. This initial long list is included as Table 17.4 below.

Stage 2: Identification of Short List of Other Developments for Assessment

17.4.2 The long list was subsequently screened, based on the potential for impact (e.g. cumulative landscape and visual impacts have potential to occur over a greater distance than, for example, cumulative noise or archaeology impacts) and a refined short list was developed for further, more detailed consideration. This selection process and rationale for additional assessment, where required, is summarised in Table 17.5.

17.4.3 The short list of other developments identified for the cumulative effects assessment are presented in Table 17.5 below, with details of their current status and comments regarding likely timescales.

17.4.4 Where individual technical disciplines have scoped out assessment of developments included on the short list for the purposes of their cumulative assessment, the reasoning for this is set out in each section of this Chapter. The approved or proposed boundaries and locations of the other developments included on the short list are shown in relation to the Proposed Development boundary on Figure 17.1 (ES Volume II, Document Ref. 6.3).

Table 17.4: Long list of developments to be considered for inclusion within the assessment of cumulative effects

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0094/18 / FUL	Construction and modifications of a single carriageway highway link with shared cycle & footway from Moody Lane/ Woad Lane junction (to the south east) to Hobson Way Roundabout (to the north west) with associated works including drainage works, street lighting, fencing and landscaping.	Stalling-borough Link Road, Energy Park Way, Grimsby, North East Lincolnshire	Immediately adjacent to the south	Approved with Conditions (September 2018) Construction commenced early 2019	Air Quality Assessment, Ecological Assessment, Transport Assessment, Flood Risk Assessment, Visual Impact Assessment, Habitats Regulations Assessment, Tree Report, Lighting Report, Geo-environmental Interpretative Report.	Yes due to proximity – immediately adjacent to the Site.
DM/0147/16 / FUL	Engineering works and use of land for external car parking, internal site access works, boundary works, and other associated works.	Rear of Paragon House, Kiln Lane, Stallingborough, North East Lincolnshire	410 m to the west	Approved with Conditions (June 2016)	Environmental Statement, Transport Assessment, Flood Risk Assessment, Landscape and Visual Scoping Report, Air Quality Screening Assessment.	Yes due to proximity – within 1 km.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0195/17 /FUL & DM/0329/18 /FUL	Erection of industrial building and adjoined two storey office/ control room to create power plant (18 MW Energy from Waste) including construction of associated access, hardsurfacing, erection of 55 m chimney stack and installation of necessary plant and machinery. Great Coates Renewable Energy Centre.	Vireol Plc Energy, Park Way, Grimsby, North East Lincolnshire DN31 2TT.	560 m to the south	Approved with Conditions (August 2017) and minor changes approved with conditions (30th January 2019)	Environmental Statement, Transport Statement, Outline Traffic Management Plan, Transport Assessment, Noise Assessment, Human Health Risk Assessment, Habitat Regulations Assessment, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Desk Based Appraisal, Ecology Report, Landscape and Visual Appraisal, Air Quality Assessment.	No – application re-submitted with amended details under reference DM/0329/18/ FUL which states the revised application "*would operate in essentially the same way as set out in the original planning application; the changes would not result in any further significant environmental effects.*" On

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
						this basis DM/0329/18/ FUL has been included in the short list.
DM/1050/16 /FUL	Change of use to allow business (Use Class B1) and/ or general industrial (Use Class B2) and/ or storage and distribution (Use Class B8) across the site and reconfiguration of car parking.	Worldwide Way, Kiln Lane Trading Estate Access Road, Stalling-borough, Grimsby, North East Lincolnshire DN41 8DY.	1.22 km to the north-west	Approved with Conditions (March 2017) Developme nt completed.	Flood Risk Assessment.	No – development now completed.
DM/0848/14 /FUL	Development of a renewable power facility for the production of electricity using pre-treated fuel feedstocks including tyres and carpets	Plot Q, Kiln Lane Industrial Estate, Europa Way, Stalling-	1.60 km to the north-west	Approved with Conditions (April 2016)	Ecology and Protected Species Survey, Transport Assessment, Environmental Risk Assessment, Flood Risk Assessment, Drainage Presentation, Supporting Emissions	Yes due to type of development and proximity – within 2 km.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	processed on site with ancillary storage, lorry and car provision and widening of existing access off Europa Way.	borough, North East Lincolnshire			Statement, Permit Application, Emissions Evidence.	
DM/0449/17/FUL	Install 4 CHP boilers internally to include the erection of associated flues.	Selvic Shipping Ltd, Netherlands Way, Stalling-borough, Grimsby, North East Lincolnshire DN41 8DF.	1.79 km to the north-west	Approved with Conditions (August 2017)	Emissions Report, Flood Risk Assessment.	Yes due to proximity – within 5 km.
DM/0333/17/FUL	Develop waste tyre to energy pyrolysis plant at disused Immingham Railfreight Terminal. Erect industrial building and installation of various	Immingham Railfreight Terminal, Scandina-vian Way, Stalling-borough, Grimsby,	1.80 km to the north-west	Approved with Conditions (December 2017) This is the same site	Landscape and Visual Impact Assessment, Contaminated Land Appraisal, Surface Water Drainage Strategy, Air Quality Assessment, Transport and Traffic Assessment,	Yes due to type of development and proximity – within 5 km.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	plant and machinery across the site to include the creation of access, hardstanding/ parking, boundary fencing and balancing pond.	North East Lincolnshire		footprint as application DM/0628/18/FUL i.e. only one of these two developments is likely to be implemented.	Flood Risk Assessment, Ecological Appraisal.	
PA/2018/155	Planning permission to construct 9 lagoons for the storage of surface water associated with the dewatering of cable trenches for the Hornsea Project One Offshore Windfarm Project.	Fields north of Chase Hill Road, fields west of East Field Road and land east and west of Top Road, South Killingholme	4.8 km to the south-west	Approved with Conditions (March 2018)	Flood Risk Assessment, Ecological walkover technical note.	No due to distance and that the type of development is highly unlikely to result in significant cumulative effects.
DM/0153/17/FUL	Additional area to be added to the temporary site construction	Site of Wind Farm Compound, Grimsby	6.07 km to the south	Approved with Conditions (May 2017)	None.	No due to distance and that the type of

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	compound to support the onshore cable installation and HDD for Hornsea Project One.	Road, Laceby, North East Lincolnshire				development proposed is highly unlikely to result in significant cumulative effects.
PA/2018/918	Planning permission to construct a new gas-fired power station with a gross electrical output of up to 49.9 megawatts. VPI Immingham Energy Park A.	VPI-Immingham Energy Park A, Rosper Road, South Killingholme DN40 3DZ	6.73 km to the north-west	Approved with Conditions (September 2018)	Environmental Statement, Ecology Assessment, Air Quality Assessment, Noise and Vibration Assessment, Landscape and Visual Impact Assessment, Transport Statement, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Assessment, Cumulative and Combined Effects.	Yes, although beyond 5 km from the Site the type of development proposed has the potential to result in significant cumulative effects.
TWA 8/1/13	A160 – A180 Port of Immingham Improvement.	South Killingholme	5.93 km to the north-west	Development Consent granted (Feb 2015)	Environmental Statement, Air Quality Assessment, Cultural Heritage Assessment, Landscape and Visual	No due to the fact that the development has now been completed.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
				Developme nt completed.	Assessment, Ecology and nature Conservation Assessment, Geology and Soils Assessment, Materials Assessment, Noise and Vibration Assessment, Effects on All Travellers, Community and Private Assets Assessment, Road Drainage and Water Environment Assessment, Cumulative Effects Assessment.	
EN060004	River Humber Gas Pipeline Replacement Project.	River Humber	12.35 km to the north-west	Developme nt Consent granted (August 2016)	Environmental Statement, Habitats Regulations Assessment.	No due to distance.
DM/0329/18 /FUL (re-submission	Erection of industrial building and adjoined two storey office/ control room to create power plant (18MW	Vireol Plc Energy, Park Way, Grimsby, North East	560 m to the south	Approved with Conditions (January 2019)	Environmental Statement, Transport Statement, Outline Traffic management Plan, Noise	Yes due to type of development and proximity – within 1 km.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
of DM/0195/17 /FUL)	energy from waste) including construction of associated access, hardsurfacing, erection of 65m chimney stack and installation of necessary plant and machinery (AMENDED PLANS/DESCRIPTIO N). Great Coates Renewable Energy Centre.	Lincolnshire DN31 2TT			Assessment, Human Health Risk Assessment, Habitat Regulations Assessment, Flood Risk Assessment, Phase 1 Environmental Assessment, Cultural Heritage Desk Based Appraisal, Ecology Report, Landscape and Visual Appraisal.	
DM/0628/18 /FUL	Partially demolish existing building and erect 20MW waste to energy power generation facility and associated plant, machinery, parking and external works.	Immingham Railfreight Terminal, Scandina-vian Way, Stalling-borough, Grimsby, North East	1.80 km to the north-west	Approved with Conditions (December 2018) This is the same site footprint as application	Travel Plan, Transport Assessment, Noise Impact Assessment, Landscape and Visual Impact Assessment, Ecology Statement, Cultural Heritage Assessment, Socio-Economics, Major Accidents and	Yes due to type of development proposed and proximity – within 5 km.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
		Lincolnshire DN41 8DT		DM/0333/17 /FUL i.e. only one of these two developmen ts is likely to be implemente d.	Disasters, Flood Risk Drainage and Water, Noise, Human Health, Air Quality and Climate Change, Site Selection and Alternatives.	
DM/0026/18 /FUL	Erect an Energy Recovery Facility with an electricity export capacity of up to 49.5MW and associated infrastructure including a stack to 90m high, parking areas, hard and soft landscaping, access road, weighbridge facility and drainage infrastructure.	Land South of Queens Road, Immingham North East Lincolnshire	1.96 km to the north-west	Approved with Conditions (October 2018)	Landscape and Visual Impact Assessment, Ecology and Nature Conservation, Noise and Vibration, Air Quality and Human Health, Soils, Geology and Hydrogeology, Surface water and Flood Risk, Socio-Economics, Archaeology and Cultural Heritage.	Yes due to type of development proposed and proximity – within 5 km.
DM/0105/18 /FUL	Hybrid application seeking outline consent with access,	Land Off Stalling-borough	1.83 km to the west	Approved with Conditions	Transport, Noise and Vibration, Air Quality, Cultural Heritage,	Yes due to type of development

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	landscaping and scale to be considered for the development of a 62 ha Business Park comprising up to 120,176 sq. m for B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution), associated infrastructure and internal highways. Full application for the creation of a new roundabout, new access roads, associated highway works, substations, pumping stations, drainage and landscaping.	Interchange Kiln Lane, Stalling-borough, North East Lincolnshire		(October 2018)	Ecology and nature Conservation, Ground Conditions and Contamination, Water Quality, Flood Risk and Drainage, Landscape and Visual, Land Use and Agricultural, Socio-economics, Cumulative.	and proximity – within 2 km.
DM/1146/17 /FUL	Additional land for temporary dewatering areas (30m x 30m)	North East Lincolnshire Area,	4.76 km to the west	Approved with	Ecological Walkover Survey Report.	No, although just within 5 km the type of

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	including creation of bunding around a lagoon and the installation of a separate settlement tank and pump for Hornsea Project One Offshore Wind Farm (falls within Stallingborough, Laceby, Immingham, Habrough, Healing and Bradley Parishes).	Keelby Road, Stalling-borough, North East Lincolnshire		Conditions (May 2019)		development proposed is highly unlikely to result in significant cumulative effects and there is limited environmental information available.
EN010097	VPI-Immingham OCGT DCO.	Land north of VPI Power Station, Rosper Road, South Killingholme DN40 3DZ	6.85 km to the north-west	Development Consent application submitted April 2019, currently awaiting decision of the Secretary of State.	Environmental Statement, Transport Assessment, Flood Risk Assessment.	Yes due to type of development.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0664/19 /FUL	Development of a sustainable transport fuels facility, including various stacks up to 80 m high, creation of new accesses, installation of pipe lines, rail link, associated infrastructure and ancillary works.	Land at Hobson Way, Stalling-borough, North East Lincolnshire	Approx. 30 m to the west.	Pending consideratio n	Environmental Statement, Transport Assessment and Travel Plan, Flood Risk Assessment, Habitats Regulations Screening Report.	Yes due to the type of development and proximity adjacent to the Site.
DM/0902/18 /FUL	Erection of 3 storey office building and facilities block with associated car parking, access and landscaping.	Land off Pelham Road, Immingham North East Lincolnshire	Approx. 4.2 km to north-west	Approved with Conditions (February 2019)	Traffic Assessment and Travel Plan, Air Quality Assessment, Ecological Appraisal.	No due to the type of development and distance from Site (over 4 km away with no visibility of Site due to intervening screening).
DM/0728/18 /OUT	Outline planning application for the development of up to 525 residential	Highfield House, Stalling-borough	Approx. 4.5 km to west/ north-west	Pending Decision	Air Quality Assessment, Ecological Appraisal, Flood Risk Assessment, Heritage Assessment,	Due to the type of development and distance

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
	dwellings together with an extra care facility for the elderly with up to 80 units with access to be considered.	Road, Immingham North East Lincolnshire			Noise Assessment, Geo-environmental Assessment, Transport Assessment and Travel Plan.	from Site (approximately 4.5 km to the west/ north-west) this was not carried forward to the short list for the PEI Report, but has however since been included within the short list for the final ES due to the potential for cumulative traffic impacts.

APPLIC-ATION REF-ERENCE	NAME OF DEVELOPMENT/ DESCRIPTION	SITE ADDRESS	DISTANCE FROM SITE	STATUS (AT JANUARY 2020)	ENVIRONMENTAL INFORMATION AVAILABLE TO INFORM THE ASSESSMENT	CARRIED FORWARD TO SHORT LIST?
DM/0067/20/SCR	Screening Opinion for the construction of an industrial unit (Class B2) with associated access, parking, manoeuvring space and storage.	East Gate Port of Immingham Queens Road Immingham North East Lincolnshire	Approx. 2.5 km north	Pending Consideration	Ecological Report Outline Scheme information	No due to type of development and lack of environmental information available to inform an assessment of cumulative environmental effects.
DM/0033/20/SCO	Request for EIA Scoping Opinion – proposed development 2 x 20 MW waste to energy plants at Immingham Rail Freight Terminal	Immingham rail Freight Terminal Scandinavian Way Stalling-borogh Grimsby North East Lincolnshire DN41 8DT	Approx. 2 km to the north west	Pending Consideration	Basic project information and plan - no environmental information	No- due to lack of environmental information available to inform an assessment of cumulative environmental effects.

Table 17.5: Short list of developments to be considered for inclusion within the assessment of cumulative effects

DEVELOPMENT REFERENCE (SEE FIGURE 17.1)	APPLICATION REFERENCE	SHORT NAME	DISTANCE FROM PROPOSED DEVELOPMENT	STATUS (AT JANUARY 2020)	DEVELOPMENT TIMESCALES (IF KNOWN)
1	DM/0094/ 18/FUL	Stallingborough Link Road	Immediately adjacent (to the south)	Approved with Conditions (September 2018) Construction commenced early 2019	Project due to be completed late 2020
2	DM/0664/19/FUL	Sustain-able Transport Fuels Facility	30 m to the west.	Pending consideration	4 year construction programme, starting in 2021.
3	DM/0147/16/FUL	Engineering works - Paragon House	410 m to the west	Approved with Conditions (June 2016)	Timing details not available - assumed construction to start late 2019 due to planning condition.
4	DM/0848/14/FUL	Renewable power facility - Kiln Lane	1.60 km to the north-west	Approved with Conditions (April 2016)	The construction period for the development is forecast to be around 12 months.
5	DM/0449/17/FUL	Selvic Shipping CHP Boilers	1.79 km to the north-west	Approved with Conditions (August 2017)	Not known.

6	DM/0333/17/ FUL	Waste Tyre Pyrolysis – Immingham Rail-freight	1.80 km to the north-west	Approved with Conditions (December 2017) This is the same site footprint as application DM/0628/18/FUL[1]	Construction not yet started – application DM/0628/18/FUL is for the same site footprint.
7	PA/2018/918	VPI-Immingham Energy Park A	6.73 km to the north-west	Approved with Conditions (September 2018)	Anticipated construction start was early 2019 over 18 months to be completed mid-2020.
8	DM/0329/18/FUL (re-submiss-ion of DM/0195/17/FUL)	Great Coates Renewable Energy Centre	560 m to the south	Approved with Conditions (January 2019)	The construction period for the development is forecast to be around 30 months.

[1] Approved development reference DM/0333/17/FUL occupies the same space as approved development reference DM/0628/18/FUL. Whilst the cumulative effects assessment would conventionally consider only the approved development, construction has not yet begun (to the best of knowledge at the time of undertaking this assessment) and as they occupy the same site both developments cannot be progressed (should DM/0628/18/FUL be approved). Therefore the approach adopted in relation to this site is to assess the development that represents the potential worst case scenario in terms of cumulative effects for each technical discipline.

9	DM/0628/18/FUL	Waste to Energy – Immingham Railfreight	1.80 km to the north-west	Approved with Conditions (December 2018) This is the same site footprint as application DM/0333/17/FUL[1]	Construction planned 2019/ 2020 and fully operational from 2021 with design life of 20 years.
10	DM/0026/18/FUL	North Beck Energy Centre (NBEC)	1.96 km to the north-west	Approved with Conditions (October 2018)	The construction period for the development is forecast to be 39 months. The facility was programmed to open in early 2022 but construction has not yet started. Construction assumed to occur coincident with the Proposed Development (as a worst case).
11	DM/0105/18/FUL	Stallingborough Interchange – Business Park	1.83 km to the west	Approved with Conditions (October 2018)	Phase 1A (26,353 m^2) 2018 – 2022, Phase 1B (43,103 m^2) 2020 – 2024,

					Phase 2 (50,720 m^2) 2023 – 2032.
12	EN010097	VPI-Immingham OCGT DCO	6.85 km to the north-west	Development Consent application submitted April 2019, currently in Examination	3 year construction programme, earliest operation in 2023.
13	DM/0728/18/OUT	525 Unit Residential Development, Stallingborough Road.	Approximately 4.5 km to west/ north-west	Pending Decision	TA submitted with the planning application assessed against an opening year of 2020, a future assessment year of 2025 and 2028.- Therefore expected to be completed by 2025.

Off Site Connection Works for the Proposed Development

17.4.5 Chapter 4: The Proposed Development of the ES provides a description of the Proposed Development and includes a brief description of the electrical and gas connections that will be required. A foul sewage connection is also identified as an option for the discharge of domestic foul drainage.

Electrical and Gas Connection Works

17.4.6 Electricity will be exported either to the National Grid Electrical Transmission (NGET) system at the South Humber Bank Power Station 400 kV substation (located inside the South Humber Bank Power Station (SHBPS), although excluded from the Site) through underground or overground electrical cables and control systems cables from a new transformer compound, or to the Northern Powergrid 132 kV local distribution network (located off-site) through an on-site substation connected via a tower approximately 2 km west of the Site off South Marsh Road.

17.4.7 If a natural gas supply is required, this would be connected to the Proposed Development via a pipeline to either the National Grid gas network or the off-site Cadent Gas local distribution network. Connection to the National Grid gas network would be at the location of the adjacent SHBPS Above Ground Installation (AGI) (within the SHBPS but excluded from the Site) or to the SHBPS gas supply pipework (within the Site).

17.4.8 The parts of the electrical connection works and gas connection works lying within the Site form part of the Proposed Development. They have been assessed as part of the EIA presented in Chapters 7-16, 18 and 19.

17.4.9 Electrical connection works outside of the Site, if required do not form part of the Proposed Development. Potential route options are shown in Figure 17.2 in ES Volume II (Document Ref. 6.3). The relevant undertaker will rely either on their statutory powers or obtain express planning permission prior to connection. Similarly, if a connection to an off-site gas distribution network is required (potential routes are shown on Figure 17.3 (ES Volume II, Document Ref. 6.3)), this would also require a separate consent to be obtained by the relevant undertaker.

17.4.10 It is considered that the powers would only be exercisable, or express consent would only be granted for these works once the relevant authority was satisfied that the works could be undertaken, in their own right, without the potential for any likely significant effects. This would be demonstrated either through the planned implementation of best practice measures or by securing a commitment to any further mitigation measures deemed necessary by the consenting authority at that time.

17.4.11 Cumulative effects of the Proposed Development with the potential off-site electricity and gas connections are assessed in Sections 17.5 to 17.16 of this Chapter. Due to the nature of the grid and gas connections, there is considered to be no potential cumulative operational effects, so only cumulative construction effects are assessed.

Foul Sewage Connection Works

17.4.12 Although the Outline Drainage Strategy (Appendix 14B in ES Volume III, Document Ref. 6.4) describes that a package treatment plant discharging to a drainage ditch on Site is the most likely solution for the Proposed Development, a foul sewage connection option is identified in Chapter 4: The Proposed Development for the discharge of domestic foul drainage from the Proposed Development.

17.4.13 The connection point and route for a potential foul sewage connection is not known at this stage, but Anglian Water has indicated that the nearest water treatment plant is located at Queens Road, Immingham, approximately 2.2 km to the north-west of the Site. The works would be undertaken in public highways. As the potential connection point and pipeline route are not known at this stage, and the works would be undertaken in the public highway, the potential off Site foul sewage connection has been scoped out of the cumulative impact assessment.

17.4.14 If a foul connection was required, the relevant undertaker would rely either on their statutory powers or obtain planning permission for the works. As described above for the electrical and potential gas connections, the powers would only be exercisable, or express consent would only be granted for these works once the relevant authority was satisfied that the works could be undertaken, in their own right, without the potential for any likely significant effects.

Relevant Plans and Programmes

17.4.15 A high level review has been carried out in relation to other plans and programmes in close proximity to the Proposed Development. The NELC Local Plan (NELC, 2018) and the South Humber Bank Industrial Investment Programme (SHIIP) have been identified for further consideration as part of the cumulative effects assessment

17.4.16 Land adjacent to the Humber Estuary between the twin ports of Immingham and Grimsby was identified as being of strategic employment significance in the Local Plan. The SHIIP is an investment programme aimed at transforming this area (the South Humber Bank) into a highly attractive area for investment from business and industry. The SHIIP includes a number of development sites identified within the adopted Local Plan 2013-2032 (NELC, 2018) including Stallingborough Business Park, other Enterprise Zones, South Humber Bank Link Road and the South Humber Gateway Ecological Mitigation Project.

17.4.17 In addition to the beneficial socio-economic benefits of the SHIIP, the potential adverse effects of developing agricultural land along the South Humber Bank (which provides functionally linked habitat for Humber Estuary Special Protection Area (SPA) bird populations) have been considered by NELC in accordance with the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations).

17.4.18 Representatives from the unitary authorities of North and North East Lincolnshire, nature conservation bodies and industry representatives formed the South Humber Ecology Group to identify the requirements for strategic mitigation to safeguard the integrity of the Humber Estuary SPA/ Special Area for

Conservation (SAC)/ Ramsar site. They have published the South Humber Gateway Ecological Mitigation Delivery Plan which is part implemented, providing strategic mitigation habitat sites ahead of development identified within the Local Plan, with the costs being recouped through development contributions in accordance with Policy 9 of the Local Plan.

17.4.19 The developments that are coming forward from the SHIIP are assessed as part of the cumulative effects assessment in Sections 17.5 to 17.16 of this Chapter where sufficient information is available. For example, the Link Road has been included within the baseline for the transport assessment (see Chapter 9: Traffic and Transport) and is assessed in Sections 17.5 to 7.16 of this Chapter, and the South Humber Gateway strategic mitigation site at Cress Marsh provides mitigation for the loss of functionally linked habitat at the Main Development Area (see Chapter 10: Ecology).

17.4.20 It is acknowledged that other allocated development plots included within the Local Plan are also likely to be developed in future, but as details of these developments and their environmental effects are not yet available, they have been scoped out of the cumulative effects assessment. Each future scheme will be assessed as necessary through the planning process.

17.5 Cumulative Air Quality Effects

17.5.1 Table 17.6 below summarises how each of the developments included in the short list (Table 17.5) have been considered with regards to potential cumulative air quality effects.

Table 17.6: Scope of air quality cumulative assessment

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
1.Stallingborough Link Road	**Scoped out** No point sources associated with this development.	**Scoped in**
2. Sustainable Transport Fuels Facility	**Scoped in**	**Scoped in**
3. Engineering works – Paragon House	**Scoped out** Minimal point source emissions.	**Scoped in**
4. Renewable power facility – Kiln Lane	**Scoped out** Available information is not sufficient to enable replication of ADMS 5 dispersion modelling.	**Scoped in**
5. Selvic Shipping CHP Boilers	**Scoped out** Available information is not sufficient to enable replication of ADMS 5 dispersion modelling.	**Scoped out**

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
6. Waste Tyre Pyrolysis – Immingham Railfreight	**Scoped in**	**Scoped in**
7. VPI Immingham Energy Park A	**Scoped in**	**Scoped out** Traffic for this development is unlikely to affect the transport study area for the Proposed Development.
8. Great Coates Renewable Energy Centre	**Scoped in**	**Scoped out** Traffic for this development is unlikely to affect the transport study area for the Proposed Development.
9. Waste to Energy Immingham Railfreight	**Scoped out** This development occupies the same space as Development Ref: 6 and it is not possible for both developments to occur. Development Ref: 6 is included in the assessment on the basis that it represents the worst case scenario in terms of emissions.	**Scoped out** This development occupies the same space as Development Ref: 6 and it is not possible for both developments to occur. Development Ref: 6 is included in the assessment on the basis that it represents the worst case scenario in terms of traffic (see Section 17.7).
10. North Beck Energy Centre	**Scoped in**	**Scoped in**
11. Stallingborough Interchange – Business Park	**Scoped out** The information provided in the planning application is inadequate to undertake dispersion modelling.	**Scoped in**
12. VPI Immingham OCGT DCO	**Scoped in**	**Scoped in**

DEVELOPMENT REFERENCE	ADMS 5 DISPERSION MODELLING	ADMS ROADS MODELLING ASSESSMENT
13. 525 Unit Residential Development	**Scoped out**	**Scoped in** It is noted that although Development Ref 13 was included within the traffic numbers used within the traffic air quality assessment in Chapter 7: Air Quality it has not been scoped into the assessment of cumulative air quality effects due to the distance from the Proposed Development.

Construction Cumulative Effects – Human Receptors

Dust

17.5.2 The air quality assessment (see Chapter 7: Air Quality) concludes that, with appropriate mitigation in place, the dust and particulates arising as a result of activities undertaken during the construction phase would be likely to result in negligible effects at all of the identified human receptors and that the effect will not therefore be significant. On this basis there is no potential for a significant cumulative effect on human receptors outside of the Site as a result of dust and particulates due to the Proposed Development, associated off-site electrical and gas connection works (if required), and the short-listed other developments (see Table 17.5).

Construction Traffic

17.5.3 The magnitude of the change in pollutant concentrations due to construction traffic on the road network due to the Proposed Development is predicted to be imperceptible or very low for all pollutants at all receptor locations. A change of this magnitude is considered to have a negligible effect, which is considered to be not significant. On this basis there is no potential for a significant cumulative effect as a result of construction traffic due to the Proposed Development, associated off-site electrical and gas connection works (if required), and the short listed other developments (see Table 17.5).

Construction Cumulative Effects – Ecological Receptors

Dust

17.5.4 The Humber Estuary SPA/ SAC/ Ramsar site is over the screening distance of 50 m from the Proposed Development construction works; therefore, an assessment of construction dust impacts on ecological receptors has not been undertaken and it is predicted that there will be no significant effect on this receptor. On this basis there is no potential for a significant cumulative effect on this receptor as a result of construction dust from to the Proposed Development,

other short listed potential developments (see Table 17.5) and off-site electrical and gas connection works.). No other dust-sensitive habitats have been identified within 50 m of the Site, so there is no potential for cumulative effects on any other ecological habitats.

Operational Cumulative Effects - Human Receptors

Odour

17.5.5 The air quality assessment (see Chapter 7: Air Quality) concludes that fugitive odour emissions from the Proposed Development would be likely to result in very low or low impacts at all locations outside of the Site, producing effects of negligible significance. On this basis there is no potential for a significant cumulative effect on human receptors outside of the Site as a result of odour.

Proposed Development Stacks and Operational Road Traffic

17.5.6 The advanced dispersion modelling ADMS 5 modelled the potential cumulative effects from the Proposed Development alongside the operation of the developments as identified in Table 17.4 above. The technical findings of the modelling can be found in Annex D of Appendix 7A in ES Volume III (Document Ref. 6.4).

17.5.7 Annual mean nitrogen dioxide concentrations at all of the identified sensitive human receptor locations remain below the air quality standard. All receptors locations are predicted to experience a negligible effect in terms of the change in nitrogen dioxide concentrations due to the emissions from the other modelled developments.

17.5.8 Annual mean particulate matter and fine particulate matter concentrations at all of the identified sensitive human receptor locations remain below the air quality standard. All sensitive human receptor locations are predicted to experience a negligible change in particulate matter concentrations due to the emissions from the other identified developments.

17.5.9 The maximum cumulative process contribution within the modelled domain for sulphur dioxide, carbon monoxide, hydrogen chloride, hydrogen fluoride, lead, mercury, antimony, cadmium, chromium, copper, manganese and vanadium remain below their representative environmental standards at all identified sensitive human receptor locations. Dioxins and furans remain well below the background pollutant concentrations.

17.5.10 Arsenic, chromium (VI), nickel and Polycyclic Aromatic Hydrocarbons (PAH) as benzo[a]pyrene required more specific modelling due to their contribution from each assessed development being greater than one percent of the environmental standard. Modelling undertaken using emission concentrations from similar energy from waste plants identified in the short list resulted in the total concentrations remaining small and insignificant. The maximum concentrations of chromium, arsenic and nickel are located in the Humber Estuary far from the identified sensitive human receptor locations. The maximum concentrations of Polycyclic Aromatic Hydrocarbons (PAH) as benzo[a]pyrene are located adjacent to the Paragon House Engineering Works and North Beck Energy Centre so cannot be attributed to the Proposed Development; the Proposed Development

contribution at these locations represents 0.003% of the air quality standard, which can be screened as insignificant.

17.5.11 On the basis of the information available, the cumulative air quality assessment has not identified any significant cumulative air quality effects on human receptors as a result of the Proposed Development and the other developments identified and assessed.

Operational Cumulative Effects - Ecological Receptors

Proposed Development Stacks and Operational Road Traffic

17.5.12 The modelling results show that the predicted cumulative impacts cannot be screened out as insignificant at several ecological receptors, although total Critical Levels remain below the relevant criteria for all pollutants with the exception of E3_1 and E6_1 and 2 for annual mean oxides of nitrogen. At E3_1, the background concentration currently exceeds the criteria for annual mean oxides of nitrogen, while at E6 the Proposed Development's contribution to the change in annual mean oxides of nitrogen is 0.1%.

17.5.13 A cumulative Process Contribution (PC) of more than 1% of the long term Critical Load for nutrient nitrogen deposition has been predicted to occur at receptors E1, E6, E7, E8 and E9. At E1 and E6, the predicted deposition rates are not above the Critical Load, while at E7, E8 and E9 the background deposition rate is above the Critical Load. At these locations, the PC from the Proposed Development is approximately half of the cumulative PC.

17.5.14 A cumulative PC of more than 1% of the long term Critical Load for acid deposition has been predicted to occur at receptor, E4 within the Humber Estuary SAC (Acid Fixed Dunes) in an area which already exceeds the relevant standard, if all the identified developments are implemented.

17.5.15 At the acid fixed dunes, the cumulative PC from all the identified developments to acid deposition is 1.2% of the lower range Critical Load. The PC from the Proposed Development alone was 0.6% of the lower range Critical Load.

17.5.16 The significance of the potential cumulative air quality effects on sensitive ecological receptors is discussed in Section 17.8 below.

17.6 Cumulative Noise and Vibration Effects

17.6.1 The developments that have been scoped into the cumulative noise and vibration assessment are:

- Stallingborough Link Road (Development Ref. 1);
- Sustainable Transport Fuels Facility (Development Ref. 2);
- Engineering works – Paragon House (Development Ref. 3);
- Great Coates Renewable Energy Centre (Development Ref. 8);
- North Beck Energy Centre (Development Ref. 10); and
- Stallingborough Interchange - Business Park (Development Ref. 11).

17.6.2 Cumulative construction effects with the potential off-site electrical and gas connections associated with the Proposed Development are also assessed.

17.6.3 It is noted that although 525 Unit Residential Development (Development Ref. 13) was included within the traffic numbers used within the traffic noise assessment in Chapter 8: Noise and Vibration it has not been scoped into the assessment of cumulative noise and vibration effects due to the distance from the Proposed Development.

17.6.4 The other developments included on the short list (Table 17.5) have been scoped out of the noise and vibration cumulative assessment due to the distances from the Proposed Development Site and from the identified nearest sensitive receptors (NSRs) and/ or limited availability of information. Cumulative impacts have been considered at different receptor locations should individual developments be constructed and/ or operated at the same time as the Proposed Development. An assessment has also been undertaken of the potential for significant cumulative effects on the NSRs identified for the Proposed Development as a result of all of the aforementioned developments collectively being progressed in parallel with the Proposed Development.

17.6.5 It should be noted that the baseline flows used for the traffic noise assessment of the Proposed Development include 'Committed Development' traffic flows (see Chapter 9: Traffic and Transport), so the traffic noise assessment is inherently cumulative.

Stallingborough Link Road (Development Ref. 1)

Construction and Operational Noise

17.6.6 The noise assessment undertaken for the Stallingborough Link Road considers receptors within a series of defined Study Areas. The receptors assessed include residential dwellings at Woad Lane (to the south of the A180 on the edge of Grimsby) and on identified Greenfield areas 2 km from the high tide of the Humber Estuary and the Humber Estuary SPA.

17.6.7 The assessment predicts a negligible magnitude of impact at all of the residential receptors on Woad Lane except one where there is predicted to be no change as a result of the Proposed Development.

17.6.8 The assessment predicts that the noise impact on dwellings outside of the specified Study Areas is likely to be negligible and predicts that the noise impact of the Link Road development on both the Humber Estuary SPA and the Greenfield areas is negligible. Overall it is predicted that the noise effect on all receptors from the Link Road will not be significant.

17.6.9 The noise assessment undertaken for the Stallingborough Link Road predicts that noise levels ($L_{A10,18hr}$) in the short term or long term may increase by more than 1 dB or 3 dB because of the construction of a new link road – presumably within the defined Study Areas.

17.6.10 The NSRs identified for the Proposed Development, as detailed at Chapter 8: Noise and Vibration of this ES, fall outside of the Study Area for the Stallingborough Link Road. The NSR to the Proposed Development that is closest to the Study Area for the Stallingborough Link Road is R2.

17.6.11 On the basis that the noise assessment undertaken for the Proposed Development predicts that the magnitude of impact (for both construction and

operational noise) will be negligible at this location (R2) and therefore the effect will be negligible adverse (not significant), it is considered that the construction and operation of the Proposed Development at the same time as the construction or use of the new Link Road would not result in a significant cumulative noise effect.

Sustainable Transport Fuels Facility (Development Ref. 2)

Construction Noise

17.6.12 The noise assessment undertaken for the Sustainable Transport Fuels Facility (STFF) includes 2 receptors in common with the noise assessment included at Chapter 8: Noise and Vibration of this ES; R1 (Poplar Farm) and R2 (Cress Cottage).

17.6.13 The highest construction noise level predicted at Poplar Farm as a result of the STFF is 53 dB, which is assessed as not significant. The highest predicted noise level from the construction of the Proposed Development at Poplar Farm is 48 dB if drop hammer piling is undertaken, resulting in a cumulative construction noise level of 54 dB L_{Aeq}. This is equal to the measured ambient noise level resulting in an assessment of no significant cumulative operational effect should the construction of the STFF and the Proposed Development coincide.

17.6.14 The highest construction noise level predicted at Cress Cottage as a result of the STFF is 53 dB, which is assessed as not significant. The highest predicted noise level from the construction of the Proposed Development at Cress Cottage is 48 dB if drop hammer piling is undertaken, resulting in a cumulative construction noise level of 54 dB L_{Aeq}. This is substantially below the measured ambient noise level of 65 dB L_{Aeq}, resulting in an assessment of no significant cumulative effect should the construction of the STFF and the Proposed Development coincide.

17.6.15 No assessment of ecological sites was provided in the STFF ES. However, given the predicted noise levels at residential receptors, it is judged that noise levels to the ecological sites considered in this ES will not significantly add to those resulting from the Proposed Development.

Construction Vibration

17.6.16 The construction vibration assessment for the STFF concluded that there were no significant effects at surrounding residential receptors. No assessment of ecological sites was provided. However, given the predicted vibration levels at residential receptors, it is judged that vibration levels to the ecological sites considered in this ES will not significantly add to those resulting from the Proposed Development.

17.6.17 The construction vibration assessment included at Chapter 8 of this ES predicts that construction vibration levels for the Proposed Development will not result in any significant vibration at the residential NSRs. Consequently, no significant cumulative operational effects are anticipated to result if the construction of the STFF and the Proposed Development coincide.

17.6.18 Predicted effects as a result of construction vibration at the ecological NSR (Humber Estuary) and the fields to the north and south of the Site are assessed

as being of minor significance provided that mitigation is applied, either by seasonally restricting drop hammer piling or using alternative piling techniques.

Operational Noise

17.6.19 With regards to the operation of the STFF, the noise assessment undertaken predicts operational noise to be 37 dB LAeq(t) at Poplar Farm. The highest predicted noise level from the operation of the Proposed Development at R1 (Poplar Farm) is 35 dB, resulting in a cumulative operational noise level of 39 dB L_{Aeq}. The lowest typical background noise level at Poplar Farm during the day is 48 dB L_{A90}. With a +3 dB penalty for intermittency, the cumulative rating level from the operation of the STFF and the operation of the Proposed Development would fall below the measured background noise level resulting in an assessment of no significant cumulative operational effect.

Road Traffic

17.6.20 Changes in road traffic noise levels on the surrounding road network in relation to the construction and operation of the STFF were not specifically assessed in the submitted STFF ES noise chapter. However, given that the additional traffic generated is comparable to that generated by the Proposed Development (where the effect was assessed as negligible), the cumulative effect is assessed as negligible.

Engineering Works - Paragon House (Development Ref. 3)

17.6.21 A noise assessment was not undertaken in relation to the construction or use of the additional car parking areas at Paragon House. The ecological impact assessment undertaken considers the indirect effect of noise and vibration (at both the construction and operational phases) on designated and non-designated ecological features and on specific species. The residual effects of the proposed works on ecological receptors are considered to be not significant.

17.6.22 Condition 9 of permission DM/0147/16/FUL requires the submission of a Construction Management Plan (including noise mitigation measures) prior to the development commencing. Following submission of an application to discharge Condition 9, which was accompanied by a Construction Management Plan (including noise mitigation measures) (DM/0234/19/CND) this has since been discharged by the applicant of Development Ref. 3 on 3rd May 2019.

17.6.23 On the basis that a noise impact assessment was not required in support of this application, that the noise mitigation measures outlined within the Construction Management Plan were deemed appropriate by the Planning Authority, and that the ecological assessment considered the effects of noise and vibration on ecological features in the vicinity of the site to be negligible, it is considered reasonable to conclude that the potential for significant cumulative noise or vibration effects is highly unlikely.

Road Traffic

17.6.24 The Transport Assessment undertaken in relation to the construction and use of the Paragon House works assesses the impact of road traffic noise as a result of the works, namely the change in road noise as a result in increases in traffic volumes. The assessment predicts that the works and use of the site will result

in a predicted increase in road traffic noise at North Marsh Lane of 0.0 dB(A) and on the A1173 of 0.2 dB(A).

17.6.25 The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.2 dB at Poplar Farm and 0.2 dB at Mauxhall Farm (to the north of the A1173).

17.6.26 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, resulting in a negligible adverse (not significant) effect.

Great Coates Renewable Energy Centre (Development Ref. 8)

Construction Noise

17.6.27 The noise assessment undertaken for the Great Coates Renewable Energy Centre (GCREC) includes a receptor in common with the noise assessment included at Chapter 8: Noise and Vibration of this ES; R1 (Poplar Farm).

17.6.28 The highest construction noise level predicted at Poplar Farm as a result of the GCREC is 41 dB, which is assessed as not significant. The highest predicted noise level from the construction of the Proposed Development at Poplar Farm is 48 dB, if drop hammer piling is undertaken resulting in a cumulative construction noise level of 49 dB L_{Aeq}. This is 5 dB below the measured ambient noise level resulting in an assessment of no significant cumulative effect should the construction of the GCREC and the Proposed Development coincide.

Construction Vibration

17.6.29 A construction vibration assessment was not undertaken for the GCREC. Condition 9 of permission DM/0195/17/FUL requires the submission of a detailed specification of the type of piling or foundations to be used and a scheme to mitigate effects of piling with regard to noise and vibration.

17.6.30 The construction vibration assessment included in Chapter 8 of this ES predicts that construction vibration levels for the Proposed Development will not result in any significant vibration at the residential NSRs. Predicted effects as a result of construction vibration at the ecological NSR (Humber Estuary) and the fields to the north and south of the Site are assessed as being of minor significance provided that mitigation is applied, either by seasonally restricting drop hammer piling or using alternative piling techniques.

17.6.31 Therefore it is considered that based on the information available there will no significant cumulative vibration effects should the construction of the GCREC and the Proposed Development coincide.

Operational Noise

17.6.32 With regards to the operation of the GCREC, the noise assessment undertaken predicts operational noise to be 29 dB LAeq(t) at Poplar Farm. The highest predicted noise level from the operation of the Proposed Development at R1 (Poplar Farm) is 35 dB, resulting in a cumulative operational noise level of 36 dB L_{Aeq}. The lowest typical background noise level at Poplar Farm during the day is 48 dB L_{A90}. With a +3 dB penalty for intermittency, the cumulative rating level

from the operation of the GCREC and the operation of the Proposed Development would fall below the measured background noise level resulting in an assessment of no significant cumulative operational effect.

Road Traffic

17.6.33 Changes in road traffic noise in relation to the construction and operation of the GCREC were not assessed in the submitted GCREC ES (either in the Noise Assessment or the Transport Assessment), but no significant effects are anticipated on the basis that the only shared route for GCREC and Proposed Development traffic is the A180, and the traffic forecasts used for the noise assessment of the Proposed Development allow for GCREC traffic as part of background traffic growth.

North Beck Energy Centre (Development Ref. 10)

Construction Noise

17.6.34 The construction noise assessment undertaken for the proposed North Beck Energy Centre (NBEC) predicts that construction noise levels at all of the NSRs to the NBEC will result in a negligible impact, with a neutral significance of effect. None of the NBEC NSRs are identified as NSRs for the Proposed Development. As there is no overlap in the noise assessment study areas for NBEC and the Proposed Development, cumulative effects are assessed to be negligible.

17.6.35 The construction noise assessment included in Chapter 8 of this ES predicts that construction noise levels for the Proposed Development will result in no significant effect at the residential NSRs to the Proposed Development, with a neutral significance of effect.

17.6.36 During drop hammer piling works, the impact of increased noise levels at the field to the south of the Site is assessed as moderate adverse, however mitigation is proposed to reduce this effect to minor adverse as outlined above. In addition, due to the distance from the NBEC site to this field, no significant cumulative effect is anticipated.

17.6.37 On the basis of the above, should the construction phases of the proposed NBEC and the Proposed Development overlap then no significant cumulative construction noise effects are predicted.

Construction Vibration

17.6.38 The construction vibration assessment undertaken for the proposed NBEC predicts that the levels of vibration are likely to result in an impact magnitude of negligible, with a neutral significance of effect at all NSRs to the proposed NBEC.

17.6.39 The construction vibration assessment included at Chapter 8 of this ES predicts that construction vibration levels for the Proposed Development will not result in any significant vibration at the residential NSRs. Predicted effects as a result of construction vibration at the ecological NSR (Humber Estuary) are assessed as being of minor significance, while effects on the fields to the north and south of the Site are predicted to be minor adverse during piling works provided the outlined mitigation is applied.

17.6.40 On the basis of the above, should the construction phases of the proposed NBEC and the Proposed Development overlap then no significant cumulative construction vibration effects are predicted.

Operational Noise

17.6.41 The operational noise assessment undertaken for the proposed NBEC includes an assessment of daytime and night time noise. The NBEC operational daytime noise assessment predicts a negligible impact at all of the NSRs to the proposed NBEC, with a neutral significance of effect. The NBEC operational night time noise assessment predicts a negligible impact all of the NSRs to the proposed NBEC, with a neutral significance of effect.

17.6.42 The operational noise assessment included at Chapter 8 of this ES considers three scenarios:

- Scenario 1: worst-case hour during the day (09:00 – 10:00);
- Scenario 2: worst-case hour at night (06:00 – 07:00); and
- Scenario 3: typical one-hour at night (23:00 – 06:00).

17.6.43 The assessment predicts that operational noise levels for the Proposed Development in all three scenarios will result in a negligible impact with a negligible significance of effect at the residential NSRs. Predicted effects as a result of operational noise at the ecological NSRs (including the Humber Estuary) are also assessed as being of minor adverse or negligible significance.

17.6.44 On the basis of the above, it is predicted that the operation of the proposed NBEC and the Proposed Development would not result in a significant cumulative noise effect.

Operational Road Traffic

17.6.45 With regards to operational traffic along the A1173, an increase in road traffic noise levels of +0.1 dB $L_{A10,18h}$ is predicted as a result of the operation of the proposed NBEC. The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.2 dB at Mauxhall Farm (to the north of the A1173).

17.6.46 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, with a negligible significance of effect.

<u>Stallingborough Interchange – Business Park (Development Ref: 11)</u>

Construction Noise

17.6.47 The NSR to the proposed Business Park that is closest to one of the NSRs to the Proposed Development (R1 at Poplar Farm) is Location B (a residential receptor on North Moss Lane). These two locations are within 300 m of each other.

17.6.48 The noise assessment undertaken for the proposed Business Park predicts construction noise levels at North Moss Lane in the region of 49 dB L_{Aeq}. The highest predicted noise level from the construction of the Proposed Development at R1 (Poplar Farm) is 48 dB if drop hammer piling is undertaken, resulting in a

cumulative construction noise level of 52 dB L_{Aeq}. This is 2 dB below the measured ambient noise level.

17.6.49 It is therefore considered that the construction of the proposed Business Park at the same time as the construction of the Proposed Development would not result in a significant cumulative noise effect.

Construction Road Traffic Noise

17.6.50 The noise assessment undertaken for the proposed Business Park does not include a quantitative assessment of construction road traffic noise due to the lack of available data. The assessment predicts that the impact of construction traffic would be negligible when compared to the traffic volumes on the surrounding network and concludes that there will be no significant effect at dwellings.

Construction Vibration

17.6.51 The construction vibration assessment undertaken for the proposed Business Park concludes that because the distance between the proposed Business Park and all of the NSRs is greater than 100 m, the level of vibration is predicted to be well below levels at which there is a risk of causing damage to buildings or disturbance to residents.

17.6.52 On the basis of the above, and the predicted construction vibration impacts of the Proposed Development as previously outlined, even if the construction phases of the proposed Business Park and the Proposed Development overlap, no significant cumulative construction vibration effects are predicted.

Operational Noise

17.6.53 The noise assessment undertaken for the proposed Business Park does not provide a quantitative assessment of operation/ use noise from the units proposed as at the time of writing specific operators/ tenants of the units were not known. NELC would require individual operators to submit noise assessments to ensure operating levels do not exceed established criteria.

17.6.54 With regards to the operation of the Business Park, noise from on-site HGV movements and idling HGV refrigeration units is predicted to be in the region of 43 dB L_{Aeq} at Location B (North Moss Lane). The highest predicted noise level from the operation of the Proposed Development at R1 (Poplar Farm) is 35 dB, resulting in a cumulative operational noise level of 44 dB L_{Aeq}. The lowest typical background noise level at Poplar Farm during the day is 48 dB L_{A90}. With a +3 dB penalty for intermittency, the cumulative rating level from on-site HGV movements and idle HGV refrigeration units at the proposed Business Park and the operation of the Proposed Development would fall below the measured background noise level resulting in an assessment of no significant cumulative operational effect.

Operational Road Traffic Noise

17.6.55 The noise assessment undertaken for the proposed Business Park predicts that the development will result in a negligible increase in road traffic noise levels within the local area and therefore no significant effects have been identified.

17.6.56 With regards to operational traffic along the A1173, an increase in road traffic noise levels of +0.1 dB $L_{A10,18h}$ is predicted as a result of the operation of the proposed Business Park. The increase in road traffic flows as a result of the operation of the Proposed Development has been predicted to increase $L_{A10,18hr}$ noise levels by 0.2 dB at Mauxhall Farm (to the north of the A1173).

17.6.57 Cumulative noise levels from changes in road traffic flows from the operation of both developments are therefore likely to result in an increase of up to 0.5 dB which is assessed as a negligible impact, with a negligible significance of effect.

Potential Off-Site Electrical and Gas Connections Associated with the Proposed Development

17.6.58 The noise assessment identified that the highest anticipated noise level from the construction of the Proposed Development at Poplar Farm is 48 dB, which is 6 dB below the measured ambient noise level of 54 dB and is therefore not significant. Given the relatively minor nature of the works associated with the potential off-Site electrical and gas connections, and the likely short-term duration of the works, it is not anticipated that noise levels at Poplar Farm, the closest residential receptor approximately 120 m west of the off-Site electrical connection route and 2 km west of the off-Site gas connection route, will be significantly affected during construction. Construction vibration levels for the Proposed Development are unlikely to result in any significant effects at surrounding residential NSRs.

Cumulative Noise and Vibration Effects of All Developments

17.6.59 On the basis of the information available, the cumulative noise assessment does not identify any significant cumulative noise effects as a result of the Proposed Development and the other individual developments identified and assessed.

17.6.60 A qualitative assessment has been undertaken of the potential for significant cumulative effects on the NSRs identified for the Proposed Development as a result of all of the aforementioned developments collectively being progressed in parallel with the Proposed Development, the findings of which are summarised as follows:

- the construction noise assessment (see Chapter 8: Noise and Vibration) concludes that the Proposed Development will have a negligible effect on surrounding residential receptors. Consequently, no significant cumulative noise effects from construction are predicted;
- the construction noise assessment (see Chapter 8: Noise and Vibration and Chapter 10: Ecology and Nature Conservation) concludes that there will be minor adverse (i.e. not significant) effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, no significant cumulative noise effects resulting from construction are predicted;
- the construction traffic noise assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development.

Consequently, no significant cumulative noise effects resulting from construction traffic on public roads are predicted;

- the construction vibration assessment concludes that there will be negligible effects on surrounding residential receptors as a result of the Proposed Development. Consequently, no significant cumulative vibration effects resulting from site construction are predicted;
- the construction vibration assessment concludes that there will be minor (i.e. not significant) effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, no significant cumulative vibration effects resulting from site construction are predicted;
- the operational noise assessment (see Chapter 8: Noise and Vibration) concludes that there will be negligible effects on surrounding residential receptors as a result of the Proposed Development. Consequently, no significant cumulative noise effects resulting from site operation are predicted;
- the operational noise assessment concludes that there will be negligible effects on surrounding ecological receptors (Humber Estuary and fields immediately to the north and south of the Site) as a result of the Proposed Development. Given the distance between the other developments in the cumulative assessment and the ecological receptors, no significant cumulative noise effects resulting from site operation are predicted;
- the operational traffic noise assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development. Consequently, no significant cumulative noise effects resulting from operational traffic on public roads; and
- the operational vibration assessment concludes that there will be negligible effects on surrounding receptors as a result of the Proposed Development. Consequently, no significant cumulative vibration effects resulting from site operation are predicted.

Cumulative Noise Assessment Summary

17.6.61 On the basis of the information available, the cumulative noise and vibration assessment does not identify any significant cumulative noise and vibration effects as a result of the Proposed Development and the other developments identified and assessed – both individually and collectively.

17.7 Cumulative Traffic and Transport Effects

17.7.1 The Transport Assessment (TA) undertaken and reported in Chapter 9 of this ES incorporates other developments (defined as Committed Developments) into the assessment scenario for the future year analysis and as such the assessment presented in Chapter 9 is inherently a cumulative impact assessment.

17.7.2 The TA future year analysis includes project specific traffic data from the following developments (based on available information at the time of assessment):

- Sustainable Transport Fuels Facility (Development Ref. 2);

- Engineering works – Paragon House (Development Ref. 3);
- Renewable Power Facility – Kiln Lane (Development Ref. 4);
- Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6);
- North Beck Energy Centre (Development Ref. 10); and
- Stallingborough Interchange - Business Park (Development Ref. 11); and
- 525 Unit Residential Development (Development Ref. 13).

17.7.3 The TA takes into account the opening of the Stallingborough Link Road (Development Ref: 1) in 2020 within the future baseline, construction and operational traffic flows.

17.7.4 As noted earlier in this Chapter, Waste Tyre Pyrolysis (Development Ref: 6) and Waste to Energy - Immingham Railfreight (Development Ref. 9) are proposed to occupy the same area (red line boundaries are around the same site). The approach adopted for the TA was therefore to ascertain which of the developments represents the worst case scenario in terms of trip generation and include that development in the assessment. The Transport Statement submitted in support of Waste Tyre Pyrolysis (Development Ref. 6) as compared to the TA submitted in support of Waste to Energy - Immingham Railfreight (Development Ref. 9), shows that Waste Tyre Pyrolysis (Development Ref. 6) would generate slightly more traffic in the AM and PM Peak hours and is therefore included in the assessment.

17.7.5 The TA future year analysis incorporates the following developments within the background growth applied to the 2018 baseline flows:

- Selvic Shipping CHP Boilers (Development Ref. 5);
- VPI Immingham Energy Park A (Development Ref. 7);
- Great Coates Renewable Energy Centre (Development Ref. 8); and
- VPI Immingham OCGT DCO (Development Ref. 12).

17.7.6 The Committed Developments incorporated into the future year analysis in the TA also include some of the developments identified in the long list (see Table 17.4) as these developments have been specifically identified as contributing to future traffic flows in the area:

- Hornsea Project One – additional area (DM/0153/17/FUL);
- Change of Use – Worldwide Way (DM/1050/16/FUL);
- Construction of access road – Land Adj Kiln Lane (DM/0717/16/FUL);
- Additional temporary construction area – Site of Wind Farm Compound (DM0153/17/FUL);
- Construction of 9 Lagoons - South Killingholme (PA/2018/155);
- River Humber Gas Pipeline Replacement Project (EN060004); and
- A180 Port of Immingham Improvement (TWA 8/1/13).

17.7.7 Given the nature and locations of the potential off-Site gas and electrical connections, traffic and transport effects during their construction are not anticipated to be significant. It is noted that the construction of these connections would require some form of traffic management on South Marsh Road and Hobson Way but the duration of the works is anticipated to be short. As there are no sensitive receptors along the off-Site connection routes, the traffic and transport effects are not anticipated to be significant.

17.7.8 Chapter 9: Traffic and Transport concludes that, having taken into account the identified Committed Developments as part of the future year analysis; it is not considered that the Proposed Development will have a material impact in terms of highway capacity or safety and that the proposals represent acceptable development in highways and transport terms. There is therefore no potential for significant cumulative traffic effects.

Cumulative Traffic and Transport Assessment Summary

17.7.9 On the basis of the information available, the cumulative transport assessment does not identify any significant cumulative traffic effects as a result of the Proposed Development and the other developments identified and assessed.

17.8 Cumulative Ecology Effects

Construction

Losses of Functionally Linked Habitat

17.8.1 There is the potential for cumulative effects on waterbirds using functionally linked habitat surrounding the Estuary in the absence of mitigation, should multiple developments proceed that result in the loss of such habitat.

17.8.2 Only two of the developments considered on the cumulative effects shortlist (Table 17.5) were identified as potentially combining with the Proposed Development to result in a cumulative adverse effect through this pathway; these are the Stallingborough Link Road (Development Ref: 1) and the Sustainable Transport Fuels Facility (Development Ref: 2), which will result in the loss of waterbird habitat to the south and west of the Proposed Development. Both of these are located in North East Lincolnshire, and Policy 9 of the NELC Local Plan stipulates that for developments affecting such habitats full mitigation is provided, through a commuted sum secured via legal agreement to draw down from a dedicated strategic mitigation scheme (South Humber Gateway) being delivered directly by NELC ahead of the construction of the relevant development.

17.8.3 The applicant for the Stallingborough Link Road, NELC, has committed to commuting a sum of money that will draw down 6.3 ha of mitigation habitat. The applicant for the Sustainable Transport Fuels Facility also proposes to mitigate for the loss of habitat within the development site in accordance with NELC Local Plan Policy 9. With mitigation, there will therefore be no cumulative adverse effects on the Humber Estuary SPA/ Ramsar with the Proposed Development, as a result of the loss of functionally linked habitat.

Noise and Vibration Disturbance to Functionally Linked Habitats

17.8.4 The cumulative noise and vibration assessment (see Section 17.6 above) concludes that the construction of the Proposed Development at the same time

as the construction or use of the other developments (including the potential off-Site electrical and gas connections associated with the Proposed Development) would not result in a significant cumulative noise effect.

17.8.5 As described above the other developers will also be committed to commuting sums of money to enable mitigation habitat to be created. With this mitigation providing alternative bird habitat, and taking into account the proposed contribution to the SHG strategic mitigation scheme for the Proposed Development, there is therefore no potential for cumulative adverse effects the Humber Estuary SPA/ Ramsar as a result of construction disturbance to functionally linked habitat.

Operation

Changes in Air Quality

17.8.6 Cumulative effects on the Humber Estuary designated sites may occur where the cumulative PC exceeds the 1% screening threshold of the Critical Level and the Predicted Environmental Concentration (PEC) exceeds the relevant Critical Level/ Load. Unless both these criteria are exceeded, no likely significant effects on habitats within the designated sites would be predicted either because the relevant assessment threshold would not be breached, or because the other plans/ projects scoped into the cumulative effects assessment would collectively make an imperceptible contribution to emissions/ deposition.

Cumulative Emissions of Nitrogen Oxides (NOx)

17.8.7 The air quality assessment has identified that the cumulative process contribution of NOx at the nearest saltmarsh habitat to the Proposed Development (receptors E1_1, E1_2 and E1_3 in Chapter 7: Air Quality) is between 7.3 and 8.0%. This therefore exceeds the threshold for insignificance and indicates that further assessment is required.

17.8.8 On this basis, the total contribution from all developments to the habitat has been combined with the background concentration to determine total annual mean deposition rates. Using the background concentration from the APIS website, the cumulative PEC results in total annual mean NOx concentrations of 28.1 – 28.3 µg/m^3 at these locations, which is slightly below the Critical Level for all vegetation types from the effects of NOx of 30 µg/m^3. However, using a more precise background NO_X concentration derived from NO_2 project-specific measurement data recorded at the saltmarsh site itself (see Appendix 7A in ES Volume III, Document Ref. 6.4 for details), the total PEC is between 19.9 µg/m^3 and 20.1 µg/m^3, which is well below the Critical Level.

17.8.9 An additional saltmarsh habitat receptor within the Humber Estuary (receptor E3_1) slightly exceeds the 1% process contribution threshold (1.3%), although the total PEC results in a cumulative contribution of 45.1 µg/m^3. However, as the baseline levels of NOx at this receptor are already exceeding the Critical Level (baseline level is 44.7 µg/m^3), this small additional contribution is not reasonably considered to result in any adverse effects on the designated site, in combination with the other developments that have been assessed.

Cumulative Nutrient Nitrogen (N) Deposition

17.8.10 The air quality impact assessment has concluded that the annual N deposition rate (kg N/Ha/year) process contribution at the nearest saltmarsh habitat would be between 3.9% and 4.2% of the Critical Load at receptors E1_1, E1_2 and E1_3. As this is above the 1% insignificance screening threshold, it is therefore necessary to examine the output from the modelling in greater detail to establish whether this elevation in N deposition would result in any significant effects on the saltmarsh habitat.

17.8.11 The total cumulative annual N deposition predicted at these three receptors is 0.8 kg N/ha/yr, resulting from NOx and ammonia (NH_3). When combined with the background deposition of 15.5 kg N/ha/yr the cumulative PEC for nitrogen deposition will remain below the Critical Load for saltmarsh; being a maximum of 16.3 kg N/ha/yr compared to a Critical Load range of 20 – 30 kg N/ha/yr. This is therefore assessed as a neutral cumulative effect on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI (not significant).

17.8.12 Moreover, it is important to note that the experimental studies that underlie conclusions regarding the sensitivity of saltmarsh to nitrogen deposition, and the selection of 20 kg N/ha/yr as the minimum Critical Load have "… *neither used very realistic N [nitrogen] doses nor input methods i.e. they have relied on a single large application more representative of agricultural discharge*" (APIS website), which is far in excess of anything that would be deposited from atmosphere. For coastal saltmarshes such as those for which Humber Estuary SAC is partly designated, nitrogen inputs from air are not as important as nitrogen effects from other sources because the effect of any deposition of nitrogen from the atmosphere is likely to be dominated by much greater flushes of more readily utilized nitrogen from marine, fluvial or agricultural sources. This is reflected on APIS itself, which states regarding saltmarsh that "*Overall, N deposition [from the atmosphere] is likely to be of low importance for these systems as the inputs are probably significantly below the large nutrient loadings from river and tidal inputs*". In addition, the nature of intertidal saltmarsh in this area means that there is flushing by tidal incursion twice per day. This is likely to further reduce the role of nitrogen from atmosphere in controlling botanical composition.

Cumulative Acid Deposition

17.8.13 For acid deposition (keq/Ha/year), the air quality impact assessment identified that at the nearest sensitive receptors (sand dune habitats at E4_1, E4_2, E4_3, E4_4 and E4_5, E4_6) the cumulative process contribution would slightly exceed the 1% insignificance screening threshold for potential adverse effects on sensitive habitat types within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI (predicted to be between 1.1 and 1.2%). However, given the very small process contribution resulting from these developments, it is assessed that there would be no significant effects on the Humber Estuary designated site as a result of acid deposition in combination with the other developments as outlined in Table 17.5.

Cumulative Emissions of Sulphur Dioxide (SO_2)

17.8.14 For SO_2, the air quality impact assessment identified that there would be exceedances of the 1% Critical Level insignificance screening threshold at

receptors E1_1, E1_2 and E1_3 (nearest saltmarsh habitat) within the Humber Estuary SAC/ SPA/ Ramsar/ SSSI of 2.4 – 2.7%. However, the PEC for sulphur dioxide is not exceeded, and therefore it is concluded that there will be a neutral effect on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI in combination with developments as outlined in Table 17.5.

17.8.15 As a result of the Air Dispersion Modelling used to inform the air quality assessment (see Appendix 7A in ES Volume III, Document Ref. 6.4) and the cumulative air quality assessment undertaken, it is concluded that there would be no adverse cumulative air quality effects on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI.

Noise Disturbance to Functionally Linked Habitat

17.8.16 The cumulative noise and vibration assessment (see Section 17.6) concludes that the operation of the Proposed Development at the same time as the operation of other developments would not result in a significant cumulative noise effect. The other developers will also be required to commit to commuting a sum of money via Local Plan Policy 9 to the South Humber Gateway strategic mitigation scheme. With this mitigation in place for other developments and the Proposed Development, providing alternative bird habitat (see Chapter 10: Ecology), there is therefore no potential for cumulative adverse effects the Humber Estuary SPA/ Ramsar as a result of operational disturbance to functionally linked habitat.

Cumulative Ecological Assessment Summary

17.8.17 On the basis of the information available, the cumulative ecology assessment does not identify any significant cumulative ecology effects as a result of the Proposed Development and the other developments identified and assessed within this Chapter.

17.9 Cumulative Landscape and Visual Amenity Effects

17.9.1 The landscape cumulative effects assessment considers the cumulative effects on identified landscape and visual receptors within the Study Area. Receptors that have been assessed in the landscape and visual impact assessment (see Chapter 11: Landscape and Visual Amenity) as experiencing negligible adverse effects as a result of the Proposed Development have not been included in the assessment of cumulative effects, as it is considered unlikely that the addition of negligible adverse effects would lead to a significant cumulative impact.

Cumulative Effects on Landscape Character

17.9.2 The other developments potentially giving rise to cumulative effects with the Proposed Development are listed in Table 17.5. They are located within Landscape Type (LT) 1: Industrial Landscape (NELC, 2015) and as such this LT is likely to experience cumulative effects. The detailed landscape cumulative assessment is contained within Table 17.7 below.

17.9.3 For the assessment of operational effects, the anticipated year 1 of operation has been selected as a worst case for cumulative landscape assessment (because there would be a greater amount of built development present in the landscape).

17.9.4 Cumulative effects on landscape character are assessed at identified landscape receptors within the 5 km ZoI. Landscape receptors that have been assessed as experiencing negligible effects as a result of the Proposed Development have not been included in the assessment of cumulative effects as set out above.

Table 17.7: Assessment of cumulative landscape effects

LANDSCAPE TYPE	**NORTH EAST LINCOLNSHIRE LANDSCAPE CHARACTER ASSESSMENT 2015**	Industrial Landscape: LT1
CONSTRUCTION		
Sensitivity of receptor		Low
Description of impact	Other proposed developments will introduce further construction activities within the Landscape Type (LT). These will introduce additional mobile plant including piling rigs, heavy plant machinery and cranes and require further removal of grassland and vegetation within the LT. Construction activities related to the other developments will increase the geographical extent in which construction activity occurs and the density and massing of large scale structures under construction in relation to the Proposed Development. Additional indirect effects resulting from construction traffic will occur. Due to the amount of construction activity introduced, there is potential to affect the tranquillity, perceptive qualities and landscape character of the LT. Such effects will be temporary, short term and reversible but will occur across a considerable proportion of the LT. The magnitude of impact on the landscape character is assessed as medium, reflecting the geographical extent of change and the introduction of uncharacteristic landscape elements required by construction.	
Predicted magnitude of impact		Medium
Classification of effect		Minor adverse (not significant)
OPERATION		
Sensitivity of receptor		Low
Description of impact	Areas of industrial and commercial land use will be extended. Some agricultural land will be lost to extended large scale car parking behind Paragon House off Kiln Lane; agricultural land off Stallingborough Interchange will be lost to the proposed Business Park; a waste to energy plant will occupy the former Immingham Railfreight Terminal site with an adjacent energy recovery facility; an Energy From Waste plant will be introduced at Vireol PLC Energy Park Way; a Sustainable Transport Fuels Facility will be located directly to the west of the Site; and a single carriageway from the Moody Lane/ Woad Lane to Hobson Way Roundabout will extend the road network within the LT. The other developments will extend the presence of large scale built form and associated hard and soft landscaping; road infrastructure; energy infrastructure including ancillary structures; hardstanding and car parking	

LANDSCAPE TYPE	**NORTH EAST LINCOLNSHIRE LANDSCAPE CHARACTER ASSESSMENT 2015**	Industrial Landscape: LT1
	within the LT. A habitat area including storage lagoons will be introduced as part of a mitigation area. Several tall elements will be introduced by the other developments including structures of up to 90 m in height. Changes resulting from the other developments will be long term and reversible. These will occur over an area larger than the Proposed Development in isolation and as a result, will have a larger effect on landscape character. As the LT is characterised by industry and the other developments are generally similar in nature and scale to existing developments and structures, the LT is considered to have low sensitivity to the other developments. The potential cumulative impacts on landscape character are considered to be low. Overall, due to these considerations, the cumulative effect on landscape character is regarded as minor adverse and not significant.	
Predicted magnitude of impact		Low
Classification of effect		Minor adverse (not significant)

Cumulative Effects on Visual Amenity

17.9.5 For the assessment of cumulative visual impacts the following other developments have been scoped out as a result of no intervisibility with the Proposed Development, the scale of the cumulative development (mass/ height) or distance:

- Selvic Shipping CHP Boilers (Development Ref. 5) – due to small scale of the proposed works;
- VPI Immingham Energy Park A (Development Ref. 7) – due to distance from the Proposed Development and lack of inter-visibility; and
- VPI Immingham OCGT DCO (Development Ref. 12) – due to distance from the Proposed Development and lack of intervisibility.

17.9.6 The potential off-Site gas and electrical connections have also been scoped out of the cumulative visual assessment due to their underground nature and small scale.

17.9.7 Potential cumulative visual effects of the Proposed Development in comparison with the future baseline visual context are considered in Table 17.8 to 17.15 below by reference to representative viewpoints. The assessments contained within these tables should be read in conjunction with Figures 11.6 to 11.15 (ES Volume II, Document Ref. 6.3) which illustrate the baseline conditions at each viewpoint.

17.9.8 Visual receptors that have been assessed as experiencing a negligible effect due to the Proposed Development have not been included in the assessment of cumulative effects, as it is considered unlikely that the addition of a negligible effect to the cumulative effects of other developments within the study area would lead to a significant cumulative effect. This applies to Viewpoint 6: Sunk Island Footpath Public Right of Way (PRoW).

Table 17.8: Assessment of cumulative effects on visual amenity – Viewpoint 1

VIEWPOINT 1: FARMSHOP HOTEL, A180				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
518804, 411844	Hotel and Business users	13.4	4.40	East-north-east
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Renewable power facility - Kiln Lane (Development Ref. 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6) • Great Coates Renewable Energy Centre (Development Ref. 8) • Waste to Energy – Immingham Railfreight (Development Ref. 9) • North Beck Energy Centre (NBEC) (Development Ref. 10) • Stallingborough Interchange – Business Park (Development Ref. 11)				
CONSTRUCTION				
Visual susceptibility to change at construction	**Value of view**	**Sensitivity of receptor**		
Medium.	Low	Medium		
Size/ scale, duration and reversibility of impact at construction				
Medium range views of construction activities will be limited to upper level activities as a result of intervening low level vegetation. Construction activities will be visible to the front and right of the existing SHBPS in the far distance. Construction of the proposed Stallingborough Interchange Business Park will largely be screened by intervening vegetation. Construction of the stack within the Great Coates Renewable Energy Centre will be seen as separate from that related to the Proposed Development and viewed in the context of surrounding farmland extending from the near to far distance. Construction of the Sustainable Transport Fuels Facility will be visible in front of the Proposed Development, increasing visible upper level construction activities. Progressive construction of tall structures will increase their visual impact. The additional developments will result in a cumulative impact during the construction phase that due to distance and the presence of existing industrial structures is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction		Low		
Significance of effect at construction	Hotel/ Farm shop visitors	Minor adverse (not significant)		

OPERATION		
Visual susceptibility to change at operation	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
Views of ground level structures will be limited by intervening vegetation. The Proposed Development and the Sustainable Transport Fuels Facility will increase the massing of structures in proximity to the existing SHBPS. The stacks associated with the Proposed Development and the additional developments will be new elements visible against the skyline. The stack at Great Coates Renewable Energy Centre will be isolated but prominent within the view. To the north, built form within the proposed Stallingborough Interchange Business Park will be largely characteristic of the existing skyline view extending south with large power lines on the horizon the north. The additional developments will result in a cumulative impact during the operation phase that due to distance and the presence of existing industrial structures in the distance is no greater than the Proposed Development assessed in isolation. Impacts will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Hotel/ Farmshop visitors	Minor adverse (not significant)

Table 17.9: Assessment of cumulative effects on visual amenity – Viewpoint 2

VIEWPOINT 2: BRICKFIELD HOUSE, SOUTH MARSH RD				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
521293, 412788	Residential	8.7	1.75	East-north-east
Other Developments • Stallingborough Link Road (Development Ref.1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Engineering Works – Paragon House (Development Ref. 3) • Great Coates Renewable Energy Centre (Development Ref. 8)				
CONSTRUCTION				
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**		
High	Low	Medium		
Size/ scale, duration and reversibility of impact at construction				
Oblique views of ground level construction activities in the far distance within the Proposed Development, Sustainable Transport Fuels Facility, Great Coates Renewable Energy Centre and North East Lincolnshire Link Road would be limited by intervening vegetation while those in the middle ground at the mitigation area and car parking will be largely obscured by a close proximity garden boundary beech hedge. The tallest structures to be constructed will progressively become more visible from upper storey gable end window. The additional developments will result in a cumulative impact during the construction phase due to the presence of existing industrial structures within the view is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction		Low		
Significance of effect at construction	Residents	Minor adverse (not significant)		

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
High	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The Proposed Development, Sustainable Transport Fuels Facility and Great Coates Renewable Energy Centre will extend the presence of industrial structures in the view. These will be largely characteristic of the type of industry locally. The extended car parking at Paragon House to the north will largely be screened by roadside planting. The Sustainable Transport Fuels Facility will screen parts of the Proposed Development. The additional developments will result in a cumulative impact during the operation phase that due to the presence of existing industrial structures within the view and the screening effects of the Sustainable Transport Fuels Facility is no greater than the Proposed Development assessed in isolation. Impacts will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Residents	Minor adverse (not significant)

Table 17.10: Assessment of cumulative effects on visual amenity – Viewpoint 3

VIEWPOINT 3: CARR LANE PUBLIC RIGHT OF WAY				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
521096, 412143	Footpath users	4.3	2.25	North-east
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Great Coates Renewable Energy Centre (Development Ref. 8)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Views of ground level construction activities would be limited by the A180 road embankment and associated scattered trees. Impacts would slightly increase as a result of the introduction of the stack within Great Coates Renewable Energy Centre and the structures associated with the Sustainable Transport Fuels Facility. The additional developments will result in a cumulative impact during the construction phase due to the presence of existing industrial structures within the view and the screening effects of intervening vegetation is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Footpath users		Minor adverse (not significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
Visual impacts will largely remain the same as at construction. The Proposed Development, Great Coates Renewable Energy Centre and the Sustainable Transport Fuels Facility will increase the presence of industrial elements on the skyline. The additional developments will result in a cumulative impact during the operation phase that due to the presence of existing industrial structures within the view and the screening effects of intervening vegetation is no greater than the Proposed Development assessed in isolation. Impacts will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Footpath users	Minor adverse (not significant)

Table 17.11: Assessment of cumulative effects on visual amenity – Viewpoint 4

VIEWPOINT 4: CRESS COTTAGE				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
521902, 412050	Residential	1.4	1.65	North-east
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Engineering Works – Paragon House (Development Ref. 3) • Renewable power facility - Kiln Lane (Development Ref. 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6) • Great Coates Renewable Energy Centre (Development Ref. 8) • North Beck Energy Centre (NBEC) (Development Ref. 10)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
High		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Views of low level construction activities would be screened by property boundary trees and intervening vegetation to the north east but more open to views of developments located to the north west. The additional developments will result in a cumulative impact during the construction phase that due to the presence of existing industrial structures within the view and the screening effects of intervening vegetation is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Residents		Minor adverse (not significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
High	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The completed Proposed Development, Sustainable Transport Fuels Facility, Great Coates Renewable Energy Centre and the cluster of developments to the north-west of the property will increase the massing and size of structures within the view while increasing the dominance of industrial structures. Great Coates Renewable Energy Centre will be visually assimilated into existing structures. The additional developments will result in a cumulative impact during the operation phase that due to the presence of existing industrial structures within the view and the screening effects of intervening vegetation is no greater than the Proposed Development assessed in isolation. Impacts will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Residents	Minor adverse (not significant)

Table 17.12: Assessment of cumulative effects on visual amenity – Viewpoint 5

VIEWPOINT 5: BEECHWOOD FARM CARVERY				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
523357, 411478	Inn/ Restaurant	15.3	1.85	North
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Engineering Works – Paragon House (Development Ref. 3) • Renewable power facility - Kiln Lane (Development Ref. 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6) • Great Coates Renewable Energy Centre (Development Ref. 8) • North Beck Energy Centre (NBEC) (Development Ref. 10)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Views of low level construction operations would be screened by the existing Lenzing Fibres buildings and intervening vegetation. Clear views of activities above this level at the Proposed Development, the Sustainable Transport Fuels Facility and Great Coates Renewable Energy Centre would be available. The additional construction activities will be readily apparent within a medium section of the view as a result of an increase of construction activities visible across the view. There will be a cumulative impact greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction				Medium
Significance of effect at construction		Visitors/ Customers		Moderate adverse (significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The completed Proposed Development, Sustainable Transport Fuels Facility and Great Coates Renewable Energy Centre will increase the massing and size of structures within the view while increasing the dominance of industrial structures. Great Coates Renewable Energy Centre will be visually assimilated into existing structures. The additional developments will increase massing of structures, resulting in the appearance of a continuous visible development that will be readily apparent over a medium section of the view. There will be a cumulative impact greater than the Proposed Development assessed in isolation.		
Magnitude of impact at operation		Medium
Significance of effect at operation	Visitors/ Customers	Moderate adverse (significant)

Table 17.13: Assessment of cumulative effects on visual amenity – Viewpoint 7

VIEWPOINT 7: IMMINGHAM SOUTH, PROW				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
518577, 413771	Residents and footpath users	6.7	4.35	East-south-east
Other Developments • Sustainable Transport Fuels Facility (Development Ref. 2) • Renewable power facility - Kiln Lane (Development Ref. 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6) • Waste to Energy – Immingham Railfreight (Development Ref. 9) • North Beck Energy Centre (NBEC) (Development Ref. 10) • Stallingborough Interchange – Business Park (Development Ref. 11)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Long range views of construction will be limited to upper level activities as a result of intervening vegetation. Sustainable Transport Fuels Facility, Waste to Energy, Immingham Railfreight and North Beck Energy Centre will be the most visible developments, due to their mass, height of structures and close proximity. The views beyond to the Renewable power facility at Kiln Lane and the Waste Tyre to Energy Pyrolysis Plant will be partially screened by these developments. The additional developments will result in a cumulative impact during the construction phase due to the extent that construction activities will be visible across the view and is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Residents and footpath users		Minor adverse (not significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The Proposed Development and Sustainable Transport Fuels Facility will be partially visible as separate entities to the left of the existing South Humber Bank Power Station. The Waste to Energy, Immingham Railfreight and North Beck Energy Centre developments will increase the presence of industrial elements on the skyline to the north. These developments will extend the presence of industrial structures in the view. These will be largely characteristic of the type of industry locally. The additional developments will result in a cumulative impact during the operation phase that is no greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Residents and footpath users	Minor adverse (not significant)

Table17.14: Assessment of cumulative effects on visual amenity – Viewpoint 8

VIEWPOINT 8: MAUXHALL FARM, PROW				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
519177, 413200	Residents and footpath users	3.6	3.75	East
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Engineering Works – Paragon House (Development Ref. 3) • Great Coates Renewable Energy Centre (Development Ref. 8) • Stallingborough Interchange – Business Park (Development Ref. 11)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
Medium		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Construction activity at ground level will largely be obscured by intervening vegetation and landform. Progressive construction of the tallest structures within the Stallingborough Interchange Business Park will extend across a large proportion of the view with Engineering Works, Paragon House and the Proposed Development behind. The stack at Great Coates Renewable Energy Centre will be visible in the far distance and isolated from other development. Once construction activity associated with the Business Park commences, no views of the Proposed Development will be available. At construction the cumulative impact for receptors at this location will be as a result of the presence of the Business Park development which screens views of the Proposed Development. The impact will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Residents and footpath users		Minor adverse (not significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The presence of the operational Business Park will screen views towards the Proposed Development. There will be no cumulative impact resulting from the Proposed Development and the additional developments for receptors at this location.		
Magnitude of impact at operation		No cumulative effect
Significance of effect at operation	Residents and footpath users	No cumulative effect

Table 17.15:Assessment of cumulative effects on visual amenity – Viewpoint 9

VIEWPOINT 9: MIDDLE DRAIN PROW				
Grid reference	**Receptor type**	**Elevation (mAOD)**	**Distance from Site (km)**	**Direction of view**
522276, 413642	Footpath users	5.0	0.65	East-south-east
Other Developments • Stallingborough Link Road (Development Ref. 1) • Sustainable Transport Fuels Facility (Development Ref. 2) • Engineering Works – Paragon House (Development Ref. 3) • Renewable power facility - Kiln Lane (Development Ref. 4) • Waste Tyre Pyrolysis – Immingham Railfreight (Development Ref. 6) • Great Coates Renewable Energy Centre (Development Ref. 8) • Waste to Energy – Immingham Railfreight (Development Ref. 9) • North Beck Energy Centre (NBEC) (Development Ref. 10)				
CONSTRUCTION				
Visual susceptibility to change		**Value of view**		**Sensitivity of receptor**
Medium.		Low		Medium
Size/ scale, duration and reversibility of impact at construction				
An open view of construction activities in the near to middle distance will be observed. Activities related to the Proposed Development will be seen to the immediate left of the existing SHBPS. Construction activities associated with the Sustainable Transport Fuels Facility will be clearly visible to the right of the existing SHBPS. Construction of the uppermost parts of the stack within Great Coates Renewable Energy Centre will be viewed within the context of existing industrial development. The additional construction activities will be readily apparent within a large section of the view. There will be a cumulative impact greater than the Proposed Development assessed in isolation. The impact will be short term and reversible.				
Magnitude of impact at construction				High
Significance of effect at construction		Footpath users		Major adverse (significant)

OPERATION		
Visual susceptibility to change	**Value of view**	**Sensitivity of receptor**
Medium	Low	Medium
Size/ scale, duration and reversibility of impact at operation		
Views of the operational developments will result in the increased presence of industrial structures across a large proportion of the skyline. The additional developments will increase the overall massing of structures within the view, although will continue to be visible as individual developments as a result of the angle of the view. The developments will be readily apparent over a large section of the view. There will be a cumulative impact greater than the Proposed Development assessed in isolation.		
Magnitude of impact at operation		High
Significance of effect at operation	Footpath users	Major adverse (significant)

Cumulative Landscape and Visual Amenity Assessment Summary

17.9.9 The cumulative viewpoint assessment identifies significant effects at two viewpoints, as a result of both the Proposed Development and the other identified developments that may be seen from these locations:

17.9.10 Viewpoint 5 (visitors and customers) would experience moderate adverse (significant) cumulative effects during construction and operation as a result of the introduction of the Sustainable Transport Fuels Facility and the Proposed Development. The effects are assessed to be greater than those assessed for the Proposed Development in isolation (see Chapter 11: Landscape and Visual Amenity). No potential mitigation has been identified.

17.9.11 Viewpoint 9 (footpath users) would experience major adverse (significant) cumulative effects during construction and operation as a result of the introduction of the Sustainable Transport Fuels Facility and the Proposed Development. The effects are assessed to be greater than those assessed for the Proposed Development in isolation (see Chapter 11: Landscape and Visual Amenity). Given the close proximity of the receptor, no potential mitigation has been identified.

17.9.12 Minor adverse cumulative effects that are not significant are predicted at Industrial Landscape LT1, Viewpoints 1, 2, 3, 4, 5, 7 and 8. These cumulative effects are generally similar to the effects of the Proposed Development in isolation and are therefore not considered to result in a significant cumulative effect.

17.10 Cumulative Geology, Hydrogeology and Land Contamination Effects

17.10.1 The following developments have been considered and are all anticipated to result in negligible geological, hydrogeological and land contamination effects individually:

- Stallingborough Link Road (Development Ref. 1);
- Sustainable Transport Fuels Facility (Development Ref. 2);
- Engineering works – Paragon House (Development Ref. 3);
- Great Coates Renewable Energy Centre (Development Ref. 8); and
- potential off-Site electrical and gas connections associated with the Proposed Development.

17.10.2 It is therefore considered that there is no potential for significant cumulative geological, hydrological or land contamination effects with the Proposed Development.

17.10.3 The following developments are located further than 1 km away from the Proposed Development and it is considered that there is therefore no potential for significant cumulative geological, hydrological or land contamination effects.

- Renewable power facility – Kiln Lane (Development Ref. 4);
- Shipping CHP Boilers (Development Ref. 5);
- Waste Tyres Pyrolysis – Immingham Railfreight (Development Ref. 6);
- VPI Immingham Energy Park A (Development Ref. 7);
- Waste to Energy Immingham Railfreight. (Development Ref. 9);
- North Beck Energy Centre (Development Ref. 10);
- Stallingborough Interchange – Business Park (Development Ref. 11); and
- VPI Immingham OCGT DCO (Development Ref. 12).

17.11 Cumulative Cultural Heritage Effects

17.11.1 The following two developments were given further consideration with regards to the potential for cumulative effects on archaeology due to their proximity to the Proposed Development and the available information for each development was reviewed:

- Stallingborough Link Road (Development Ref. 1); and
- Sustainable Transport Fuels Facility (Development Ref. 2).

17.11.2 All other developments in Table 17.5, and the potential off-Site electrical and gas connections associated with the Proposed Development, have been scoped out of the cumulative archaeology assessment due to their nature, scale and location.

17.11.3 The Stallingborough Link Road shares a common boundary with the Proposed Development Site, and is located approximately 250 m to the south-west of the Main Development Area.

17.11.4 An aerial photograph (see Appendix 13B in ES Volume III, Document Ref. 6.4), displayed at the entrance of the existing SHBPS, shows the Main Development Area during the construction of the existing SHBPS. In this photograph the Main Development Area is shown to have been subject to a topsoil strip and appears to have been used as a laydown area and construction compound. Due to the nature of the archaeological features identified in the adjacent field, it is considered that any features extending into this area would have been disturbed by the works relating to the construction of the power station. This is supported by the findings of a ground investigation undertaken in 2019. As a consequence, there will not be any effect on archaeology, resulting in a neutral effect.

17.11.5 The application for the Stallingborough Link Road did not include a Cultural Heritage Assessment and the consultation response from the NELC Archaeologist (dated 28/03/2018) states that "*the potential damage to archaeological deposits by this scheme will be minimal*". Planning permission DM/0094/18/FUL does not require the submission of any further details in relation to archaeology.

17.11.6 The application for the Sustainable Transport Fuels Facility included a Heritage ES chapter. The ES identified potential effects on the setting of several designated assets (listed buildings). The identified impacts are 'slight adverse' or less and therefore not significant. No effects on buried archaeology were identified.

17.11.7 On this basis it is considered that there is no potential for significant cumulative effects on archaeology arising from either the construction or the operation of the Proposed Development.

17.11.8 With regards to setting of heritage assets, cumulative impacts can arise where the above ground built elements of a development, when viewed alongside the above ground built elements of the Proposed Development, contribute to changes to setting that affect an asset's significance (importance). The cultural heritage assessment at Chapter 13 of this ES concludes that the Proposed Development will have either no impact or minimal impact on all the heritage assets identified. In all cases the residual significance of effect is either minor or negligible adverse i.e. not significant.

17.11.9 The location and scale of the other developments identified in the area have been assessed and it is considered that due to the existing industrial context, the Proposed Development would not result in any significant cumulative effects with them upon the setting of any designated heritage assets within the study area.

17.12 Cumulative Water Resources, Flood Risk and Drainage Effects

17.12.1 The majority of the other developments included on the short list (Table 17.5) have been scoped out of the water resources cumulative assessment due to the distances from the Proposed Development Site and/ or the lack of connectivity to water resource receptors.

17.12.2 The following three developments were given further consideration due to their proximity to the Proposed Development and the available information for each development was reviewed:

- Stallingborough Link Road (Development Ref. 1);
- Sustainable Transport Fuels Facility (Development Ref. 2); and
- Engineering works – Paragon House (Development Ref. 3).

17.12.3 All developments are required to accord with the National Planning Policy Framework (NPPF) (Ministry for Housing, Communities and Local Government (MHCLG), 2019) and local drainage policies to ensure the risk of flooding from all sources does not increase. On this basis no further cumulative assessment of flood risk has been undertaken.

17.12.4 Potential cumulative impacts to water resources during construction processes are associated with the generation of sediments and the release into the sewer drainage network, spillage and leakages, disturbance of contaminated land, suspended sediments, and disturbance to groundwater and foul drainage. It is assumed that such potential impacts will be managed for each development in accordance with legislation and good practice, and no significant adverse effects are anticipated.

17.12.5 There is also the potential that changes to water resources and drainage arrangements, as a result of the identified developments, could result in additional discharges into local watercourses and changes in overall water quality. However, existing regulatory controls at both the planning and permitting (if relevant) stage would require sufficient measures to be in place during construction and operation to manage the risk of accidents and to mitigate any potential effects to an acceptable level. All developments proposing to discharge into a watercourse are required to have a discharge permit from the Environment Agency. Through the Environment Agency's permitting procedures, and in conjunction with engagement with NELC and North East Lindsey Internal Drainage Board, any issues compromising the safeguarding of water quality would be addressed at that point and monitoring controls put in place to ensure ongoing compliance.

17.12.6 Construction of the potential off-site electrical and gas connections associated with the Proposed Development would require ditch crossings, so the statutory undertakers would be expected to consult with North East Lindsey Internal Drainage Board to agree details of the proposed works and to confirm there will be no impact on water flow in the ditches, and to employ measures to prevent contamination of the ditches during construction. No significant cumulative effects with the Proposed Development are predicted.

17.12.7 On this basis it is not considered that the construction or operation of the Proposed Development will give rise to any significant cumulative effects in conjunction with the other developments identified.

17.13 Cumulative Socio-Economics Effects

17.13.1 It is assumed that all the developments cumulatively will generate additional employment opportunities and associated socio-economic benefits to add to the benefits of the Proposed Development during both construction and operation.

17.13.2 In addition, it has been assumed that all of the other developments considered constitute development that is broadly in line with the Local Plan employment

designations. The Local Plan was recently adopted and formed a comprehensive development framework for the area, and included the necessary housing requirements.

17.13.3 Whilst there might be a short-term risk of temporary labour shortage or local accommodation shortage should multiple projects progress simultaneously, the cumulative socio-economic effects of the other developments in the short list, together with the Proposed Development, are considered to be significantly beneficial overall.

17.14 Cumulative Waste Management Effects

17.14.1 As part of its regional planning responsibilities, NELC (as the Waste Disposal Authority) has a responsibility to plan for waste management and to ensure that sufficient sites are available to provide the necessary capacity during the planning period. Further capacity may also be provided on a regional basis by waste transfers within the wider region.

17.14.2 Within this wider context, the effects of waste generated from the Proposed Development on the regional capacity for waste management are at such a low level that no significant cumulative effects with other developments are anticipated.

17.15 Cumulative Human Health Effects

17.15.1 Cumulative effects on human health are considered in Sections 17.5 (air quality), 17.6 (noise and vibration), 17.7 (traffic and transport), 17.10 (land contamination), 17.12 (water quality) and 17.13 (socio-economics) above. No significant adverse cumulative effects are identified and the socio-economic benefits arising from the cumulative employment opportunities are assessed to be significantly beneficial.

17.15.2 The potential for cumulative electro-magnetic field (EMF) health effects of the Proposed Development together with its associated electrical connection (to be progressed by the relevant statutory undertaker and not forming part of the Application), which may extend off Site, are assessed in Chapter 18: Human Health. No significant EMF health effects are identified.

17.16 Cumulative Sustainability and Climate Change Effects

17.16.1 Cumulative effects on sustainability and climate change considerations are considered in Sections 17.7 (traffic and transportation), 17.8 (biodiversity), 17.12 (flood risk), 17.13 (socio-economics) and 17.14 (waste management). No significant adverse cumulative effects are identified and the socio-economic benefits arising from the cumulative employment opportunities are assessed to be significantly beneficial.

17.16.2 All the identified developments will generate greenhouse gas emissions (GHGs) during construction, including those from the embodied carbon in construction materials and transport emissions. However, the GHGs assessment presented in Appendix 19A in ES Volume III (Document Ref. 6.4) concludes that the net GHGs from the construction and operation of the Proposed Development will not be significant because the Proposed Development will displace GHGs from landfill and non-renewable forms of electricity generation. As such there is no

potential for the Proposed Development to contribute to significant adverse cumulative effects on GHGs.

17.16.3 All developments have the potential to be affected by climate change, and through the planning process all will be required to demonstrate adequate surface water attenuation, greenfield runoff rates and flood risk resistance and/ or resilience where relevant. Health and safety legislation and building regulations also require consideration of safety and sustainability in design.

17.17 Comparison with Consented Development Cumulative Effects

17.17.1 The shortlist of other developments that are considered to be relevant to the cumulative effects assessment has been updated since the EIA for the Consented Development was completed, so the cumulative effects assessment presented in the Consented Development ES is not directly comparable. The main changes have been the removal of the Cress Marsh habitat mitigation scheme (which has now been completed and has no potential for cumulative effects during its operational phase) from the shortlist, and the addition of the Sustainable Transport Fuels Facility (Development Ref. 2), VPI Immingham OCGT (Development Ref. 12), and the 525 Residential Development in Stallingborough (Development Ref. 13). More detailed consideration has also been given to the potential for cumulative effects with the potential off-Site electrical and gas connections associated with the Proposed Development.

17.17.2 The cumulative effects reported in Sections 17.5 to 17.16 above would be the same as the cumulative effects of the Consented Development with the current shortlist of other developments – i.e. the Proposed Development would have no additional cumulative effects compared to the Consented Development.

17.18 Combined Effects Assessment

17.18.1 Combined effects are defined as those resulting from a single development, in these circumstances the Proposed Development, on any one receptor that may collectively cause a greater effect (such as the combined effects of noise and air quality/ dust impacts during construction on local residents). Mitigation of combined effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts themselves and therefore reduce the likelihood of such interactions occurring. Table 17.16 below provides a qualitative assessment of the potential for combined effects.

Table 17.16: Potential for combined effects

POTENTIAL COMBINED EFFECT	ASSESSMENT
Combined effects of air quality, noise, traffic and visual amenity impacts on human receptors	<u>Construction</u> The assessment of dust impacts on human receptors during the construction of the Proposed Development finds the residual effect to be negligible (not significant) in all cases. Noise effects at all residential receptors during construction of the Proposed Development are predicted to be negligible (not significant) and noise effects as a result of changes in road traffic levels during construction are also predicted to be negligible (not significant). Traffic related effects on roadside receptors during construction (severance, pedestrian amenity, fear and intimidation, highway safety and driver delay) are predicted to either be minor adverse (not significant) or negligible adverse (not significant). The assessment of visual impact on identified receptors finds that there will be a moderate adverse (significant) effect on users of the footpath at Viewpoint 9 (Middle Drain PRoW) during construction activities. On the basis of these findings and taking into account that the construction phase is short-term it is considered that human/ residential receptors will experience no significant combined effects as a result of dust, noise, road traffic and visual during the construction phase with the exception of users of the footpath at Viewpoint 9 (Middle Drain PRoW) where the visual effect in isolation is predicted to result in a moderate adverse (significant effect). It is not considered however that the combined effects considered here would alter that finding or worsen the effect. <u>Operation</u> The air quality assessment undertaken finds the effect of the operation of the Proposed Development on the identified human receptors to be either minor adverse (not significant) or negligible (not significant). Noise effects at all residential receptors during the operation of the Proposed Development are predicted to be negligible (not significant) and noise effects as a result of changes in road traffic levels during operation are predicted to be negligible (not significant). Traffic related effects on roadside receptors during operation (severance, pedestrian amenity, fear and intimidation, highway safety and driver delay) are predicted to either be minor adverse (not significant) or negligible adverse (not significant). The assessment of visual impact on identified

POTENTIAL COMBINED EFFECT	ASSESSMENT
	receptors finds that there will be a moderate adverse (significant) effect on users of the footpath at Viewpoint 9 (Middle Drain PRoW) during the operation of the Proposed Development. On the basis of these findings it is considered that human/ residential receptors will experience no significant combined effects as a result of dust, noise, road traffic and visual during the operation of the Proposed Development with the exception of users of the footpath at Viewpoint 9 (Middle Drain PRoW) where the visual effect in isolation is predicted to result in a moderate adverse (significant effect). It is not considered however that the combined effects considered here would alter that finding or worsen the effect. <u>Decommissioning</u> The combined effects of decommissioning on human receptors would be similar to the combined effects reported above for construction.
Combined effects of air quality/ dust, noise, water quality impacts on ecological receptors	<u>Construction</u> The ecological assessment presented in Chapter 10: Ecology considers the combined effects of noise, air quality, visual and water quality impacts on ecological receptors in the vicinity of the Site during construction, as well as habitat loss. Potential for a significant noise effect on birds if piling is undertaken during the winter period has been identified and appropriate mitigation will be implemented (such as using Continuous Flight Auger piling techniques or applying seasonal restrictions) to reduce the effect. The loss of semi-improved grassland from the Site is also identified as a significant adverse effect, which will be mitigated by the creation of species-rich grassland within the Site to reduce the effect. No significant residual effects are identified and no significant combined effects on ecological receptors are identified. <u>Operation</u> The ecological assessment considers the combined effects of noise, air quality, visual and water quality impacts on ecological receptors in the vicinity of the Site during operation. No significant effects or significant combined effects on ecological receptors are identified as a result of the operation of the Proposed Development.

POTENTIAL COMBINED EFFECT	ASSESSMENT
	Decommissioning The ecological assessment concludes that the effects of decommissioning on ecological receptors will be similar or less than the effects of construction. Pre-works surveys will be undertaken and appropriate impact avoidance or mitigation measures will be implemented as necessary. No significant residual effects are predicted.

17.19 Limitations

17.19.1 Any limitations that were encountered during the individual assessments are detailed within each of the Chapters referenced.

17.19.2 The cumulative assessment is based on the currently available information on other potential or committed developments in the vicinity of the Proposed Development.

17.20 Conclusions

17.20.1 The assessment of cumulative effects has considered a number of other developments within the vicinity of the Site and the potential for significant cumulative effects to arise from the other identified developments together with the Proposed Development.

17.20.2 Through the consideration of the information available (at the time of assessment) it is concluded that there is the potential for the following significant residual cumulative effects:

- significant adverse cumulative visual effects at two receptor locations (Viewpoint 5: Beechwood Farm Carvery and Viewpoint 9: Middle Drain PRoW) during construction mainly due to the cumulative effect of the Sustainable Transport Fuels Facility and the Proposed Development construction phases (assuming as a worst case that they overlap); and
- significant adverse cumulative visual effects at two receptor locations (Viewpoint 5: Beechwood Farm Carvery and Viewpoint 9: Middle Drain PRoW) during operation, mainly due to the cumulative effect of the Sustainable Transport Fuels Facility and the Proposed Development.

17.20.3 As these effects are due to the scale and massing of the built form of the Sustainable Transport Fuels Facility and the Proposed Development, which is unavoidable for these types of development, no potential mitigation has been identified.

17.20.4 All other assessment topics have concluded that there is no potential for significant cumulative effects to arise as a result of the construction or operational phases of the Proposed Development when considered alongside the other identified developments.

17.20.5 The assessment of combined effects has not identified any significant combined effects where the combination of effects would result in a different rating of effect to that already predicted in the individual technical assessment.

17.21 References

Department for Communities and Local Government (2015) *Planning Act 2008: Guidance on the pre-application process*

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