

VPI Immingham OCGT Project

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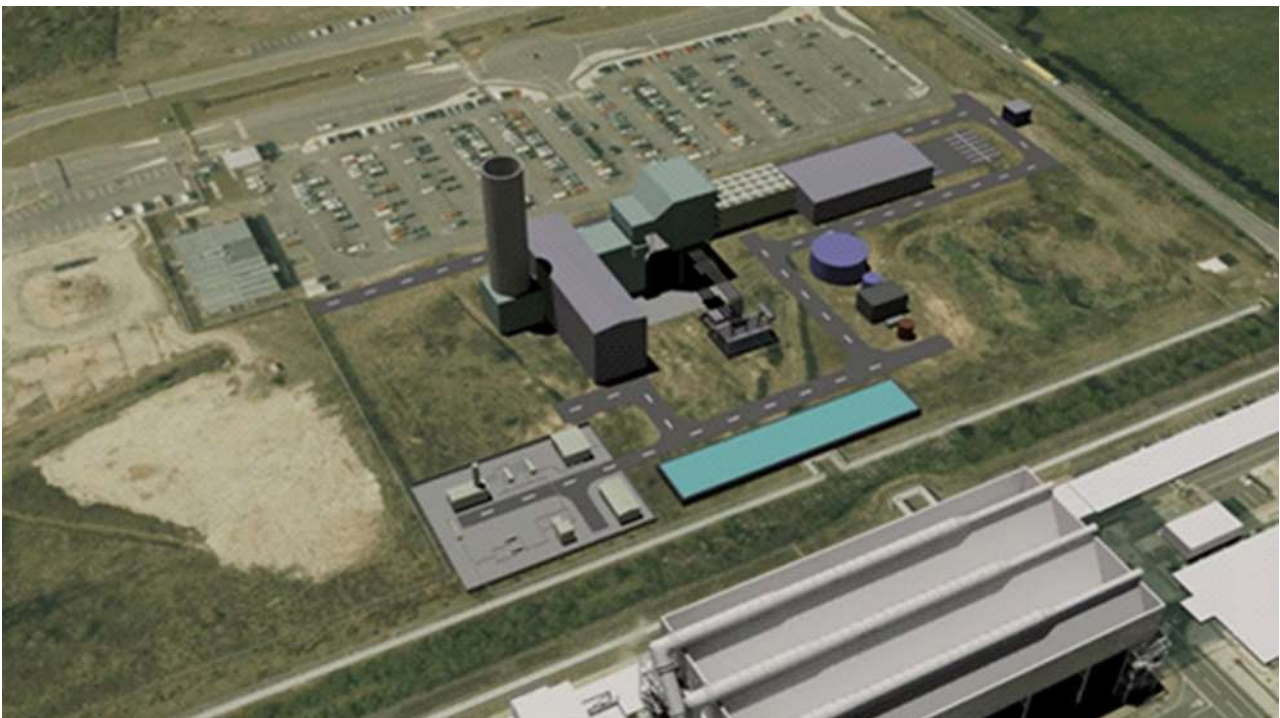
The Immingham Open Cycle Gas Turbine Order

Land to the north of and in the vicinity of the VPI Immingham Power Station, Rosper Road, South Killingholme, Lincolnshire, DN40 3DZ

No Significant Effects Report

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(g)



Applicant: VPI Immingham B Ltd

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GLOSSARY

Abbreviation	Description
AMEP	Able Marine Energy Park
CCGT	Combined Cycle Gas Turbine
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
DCO	Development Consent Order
EC	European Commission
EclA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
GWTE	Groundwater Dependent Terrestrial Ecosystem
ha	Hectare
HRA	Habitat Regulations Assessment
HMWGS	Halton Marshes Wet Grassland Scheme
IROPI	Imperative Reasons of Overriding Public Interest
MW	Megawatt
MWe	Megawatt electric
NKHP	North Killingholme Haven Pits
NSER	No Significant Effects Report
OCGT	Open Cycle Gas Turbine
ODPM	Office of Deputy Prime Minister
PINS	The Planning Inspectorate
SAC	Special Area of Conservation
SHG	South Humber Gateway
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TLOR	Total Lindsey Oil Refinery

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1.0 INTRODUCTION

1.1 Overview

- 1.1.1 This No Significant Effects Report (NSER) has been prepared on behalf of VPI Immingham B ('VPIB' or the 'Applicant'). It forms part of the application (the 'Application') for a Development Consent Order (a 'DCO'), that has been submitted to the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy, under Section 37 of 'The Planning Act 2008' (the 'PA 2008').
- 1.1.2 VPIB is seeking development consent for the construction, operation and maintenance of an open cycle gas turbine ('OCGT') generating station of up to 299 megawatts ('MW') gross electrical output capacity, including electrical and gas supply connections and other associated development (the 'Proposed Development' or 'Project') on land to the north of and in the vicinity of the Existing VPI Combined Heat and Power (CHP) Power Station, Rosper Road, South Killingholme, Immingham, Lincolnshire, DN40 3DZ.
- 1.1.3 A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under Sections 14 and 15(2) of the PA 2008.
- 1.1.4 The DCO, if made by the SoS, would be known as the 'Immingham Open Cycle Gas Turbine Order' (the 'Order').

1.2 The Proposed Development Site

- 1.2.1 The Site is primarily located on land immediately to the north of the Existing VPI Combined Heat and Power (CHP) Plant Site, as previously stated. Immingham Dock is located approximately 1.5 kilometres ('km') to the south east of the Site at its closest point. The Humber ports facility is located approximately 500 metres ('m') north and the Humber Refinery is located approximately 500m to the south.
- 1.2.2 The villages of South Killingholme and North Killingholme are located approximately 1.4 km and 1.6 km to the west of the Site respectively, and the town of Immingham is located approximately 1.8 km to the south east. The nearest residential property comprises a single house off Marsh Lane, located approximately 325 m to the east of the Site.
- 1.2.3 The Site comprises the following main parts:
- OCGT Power Station Site;
 - Access Site;
 - Temporary Construction and Laydown Site;
 - Gas Connection Site;
 - Electrical Connection Site; and
 - Utilities and Services Connections Site.
- 1.2.4 The Site is located entirely within the boundary of the administrative area of North Lincolnshire Council ('NLC'), a unitary authority. The different parts of the Site are illustrated in the Works Plans (Application Document Ref: 4.3). A more detailed description of the Site is provided in Chapter 3 'Description of the Site' of the Environmental Statement ('ES') Volume I (Application Document Ref. 6.2).

1.3 The Proposed Development

1.3.1 The main components of the Proposed Development are summarised below, as set out in the draft DCO (Application Document Ref: 2.1):

- Work No. 1 – an OCGT power station (the ‘OCGT Power Station’) with a gross capacity of up to 299MW;
- Work No. 2 – access works (the ‘Access’), comprising access to the OCGT Power Station Site and access to Work Nos. 3, 4, 5 and 6;
- Work No. 3 – temporary construction and laydown area (‘Temporary Construction and Laydown’) comprising hard standing, laydown and open storage areas, contractor compounds and staff welfare facilities, vehicle parking, roadways and haul routes, security fencing and gates, gatehouses, external lighting and lighting columns;
- Work No. 4 – gas supply connection works (the ‘Gas Connection’) comprising an underground and/or overground gas pipeline of up to 600 millimetres (nominal internal diameter) and approximately 800 m in length for the transport of natural gas from the Existing Gas Pipeline to Work No. 1;
- Work No. 5 – an electrical connection (the ‘Electrical Connection’) of up to 400 kilovolts and associated controls systems; and
- Work No 6 – utilities and services connections (the ‘Utilities and Services Connections’).

1.3.2 It is anticipated that subject to the DCO having been made by the SoS and a final investment decision by VPIB, construction work on the Proposed Development would commence in early 2021. The overall construction programme is expected to last approximately 21 months and is anticipated to be completed in late 2022, with the Proposed Development entering commercial operation later that year or early the following year

1.3.3 A more detailed description of the Proposed Development is provided at Schedule 1 ‘Authorised Development’ of the draft DCO (Application Document Ref: 2.1) and Environmental Statement (ES) Volume 1, Chapter 4 ‘The Proposed Development’ (Application Document Ref: 6.2).

1.3.4 The areas within which each of the main components of the Proposed Development are to be built are shown by the coloured and hatched areas on the Works Plans (Application Document Ref: 4.3).

1.4 The Purpose and Structure of this Document

1.4.1 The purpose of this No Significant Effects Report is to establish whether there are any Likely Significant Effects (LSE) which may arise from the Proposed Development on any European designated site (see Section 3.2 for further information), either alone or in combination with other plans or projects.

1.4.2 For this purpose and as a result of case law, ‘likely’ means ‘possible’.

2.0 LEGISLATIVE CONTEXT AND OVERVIEW OF HABITATS REGULATIONS ASSESSMENT PROCESS

2.1 Legislative Context

- 2.1.1 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, which is more commonly known as the ‘Habitats Directive’, requires Member States of the European Union to take measures to maintain or restore, at favourable conservation status, natural habitats and wild species of fauna and flora of Community interest. The provisions of the Habitats Directive require that Member States designate Special Areas of Conservation (‘SAC’) for habitats listed on Annex I and for species listed on Annex II. Similarly, Directive 2009/147/EC on the conservation of wild birds (more commonly known as the ‘Birds Directive’) provides a framework for the conservation and management of wild birds. It also requires Member States to identify and classify Special Protection Areas (‘SPA’) for rare or vulnerable species listed on Annex I of the Directive, as well as for all regularly occurring migratory species.
- 2.1.2 Under Article 6(3) of the Habitats Directive, any plan or project which is not directly connected with or necessary to the management of a Natura 2000 site (which comprise all SACs and SPAs), but would be likely to have a significant effect on such a site, either individually or in combination with other plans or projects, must be subject to an ‘Appropriate Assessment’ (AA) of its implications for the SAC / SPA and its nature conservation objectives. This is known as Habitats Regulations Assessment (‘HRA’). Specifically, Article 6(3) states:

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.”

The requirements of the Habitats Directive are implemented by the Conservation of Habitats and Species Regulations 2017 (as amended), more commonly referred to as the ‘Habitats Regulations’. Regulation 63 states:

“A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site or a European Offshore Marine Site (either alone or in combination with other plans or projects) ... must make an appropriate assessment of the implications for the site in view of that site’s conservation objectives ... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site ...”

- 2.1.3 In the past, the term ‘Appropriate Assessment’ has been used to describe both the overall process and a stage of that process. The term Habitats Regulations Assessment has come into use in order to refer to the process that leads to an Appropriate Assessment, thus avoiding confusion. Throughout this report, HRA is used to refer to the overall procedure required by the Habitats Regulations, while Appropriate Assessment is a specific stage of that procedure.

2.2 Overview of HRA Process

- 2.2.1 The Habitats Regulations set out a stepwise process, including an Appropriate Assessment, to consider the impacts and effects of a plan or project on a Natura 2000

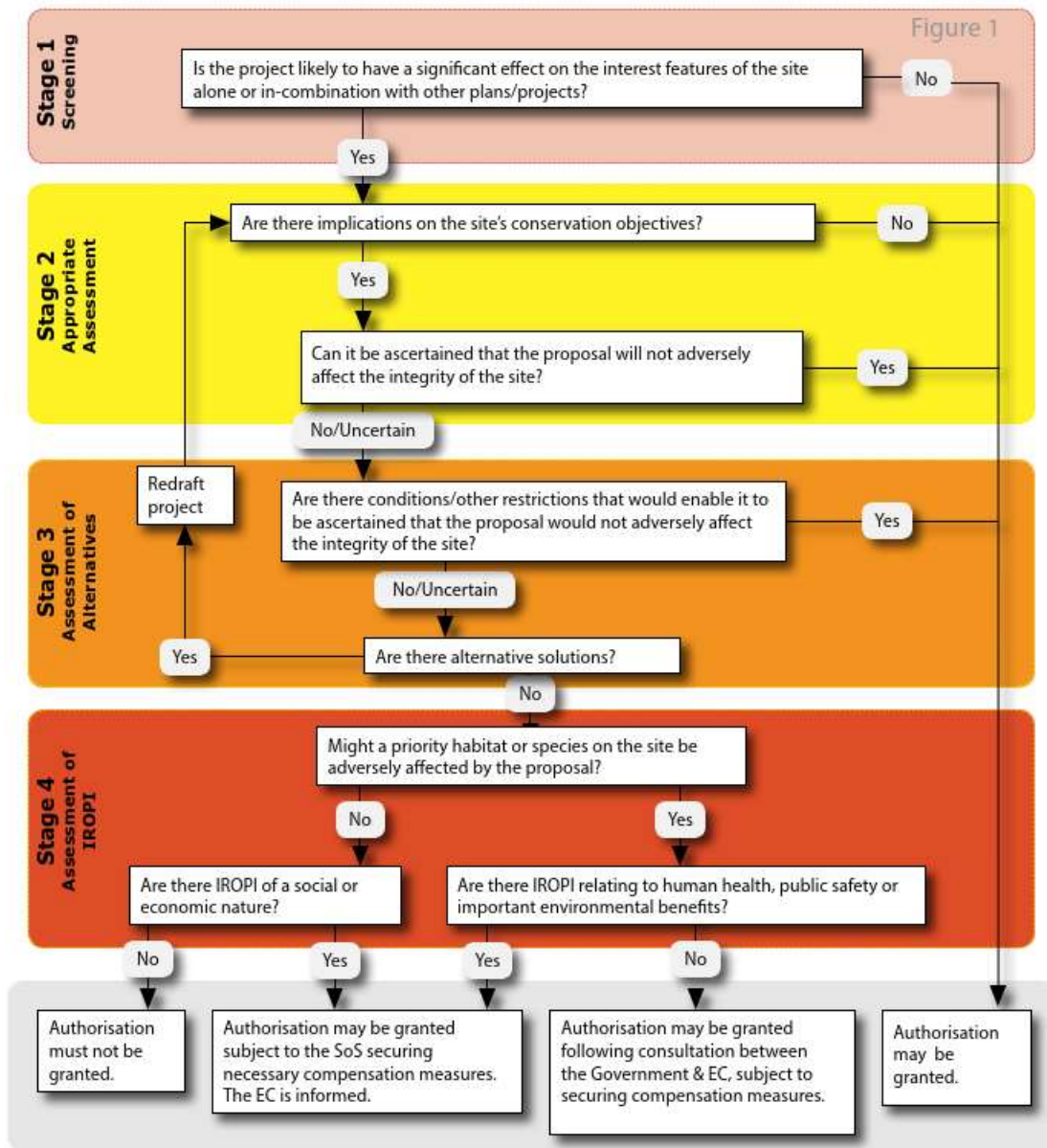
site. This document represents the first stage of the HRA process and serves to 'screen' the Proposed Development for Likely Significant Effects on any Natura 2000 site.

2.2.2 Office of Deputy Prime Minister (ODPM) Circular 06/2005 (Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System) provides guidance on how the Habitats Regulations should be implemented. This is interpreted and summarised as follows:

- Determination of whether the proposal is likely to have a significant effect, either alone or in combination with other plans or projects, on a European site;
- If a significant effect is likely, the competent authority must conduct an Appropriate Assessment of the implications for the European designated site in view of its conservation objectives;
- In considering the plan or project's effects on the site's conservation objectives, the competent authority must determine whether it can ascertain that the proposal will not adversely affect the integrity of the site;
- Taking account of the way in which works are proposed to be carried out, and the site conditions or other restrictions;
- Being satisfied that there are no alternative solutions which would have a lesser effect on site integrity; and
- Considering whether there are Imperative Reasons of Overriding Public Interest (IROPI) to justify granting of permission for the development despite a potentially negative effect on site integrity.
- In the absence of alternatives, and where the importance of the proposal outweighs the harm to a European site, consideration of proposed compensatory measures (to ensure that the overall coherence of the network of Natura 2000 sites is protected).

2.2.3 A flow chart of the HRA process (showing the decisions that are required at each stage) is provided in Figure 2.1 below (this has been reproduced from Advice Note 10 (Planning Inspectorate 2017). A four-stage methodology for HRA would therefore include:

- HRA Stage 1: Screening (including a 'likely significant effect' judgement);
- HRA Stage 2: Appropriate Assessment;
- HRA Stage 3: Assessment of Alternative Solutions; and
- HRA Stage 4: Assessment where no alternative solutions exist and where adverse effects remain (i.e. consideration of Imperative Reasons of Overriding Public Interest).

Figure 2.1: Consideration of Development Proposals Affecting Internationally Designated Nature Conservation Sites


- 2.2.4 Whilst HRA must be undertaken by a competent authority, the information needed to undertake the necessary assessments is generally provided by the proposer of the plan or project. The information needed for the competent authority to establish whether there are any LSE from the Proposed Development is therefore provided in this Report.
- 2.2.5 This report has been prepared having regard to all relevant case law relating to the Habitats Regulations. In particular, the recent ruling by the Court of Justice of the European Union (CJEU) in the case of *People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17)* has been taken into account, because it influences the approach to the first stage of HRA – screening.
- 2.2.6 This case held that; *"it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site"* (paragraph 40). This establishes that 'mitigation measures' cannot be taken into

account at the screening stage, but it is important to note that not all mitigation measures are excluded from consideration, only those; "*intended to avoid or reduce the harmful effects of the... project on that site*". Mitigation measures which are, for example, intended to avoid effects on a local watercourse outside a European site designated boundary but which outfalls into the European designated site, can be taken into account as the benefit conveyed to the European site is coincidental and the measures would be delivered to ensure compliance with other legislative requirements relating to pollution of the water environment, irrespective of whether or not a European designated site was present. It is reasonable for a competent authority to consider such mitigation at the screening stage of HRA, when determining the requirement for further Appropriate Assessment.

- 2.2.7 Where mitigation measures are mentioned in this report, they are therefore those which may reduce or avoid harmful effects on certain (local) habitats or species, but are not relied upon to directly avoid or reduce harmful effects on the European sites that are the subject of this Report.

3.0 BASELINE EVIDENCE GATHERING

3.1 Proposed Development and Consideration of Alternatives

- 3.1.1 A summary of the Proposed Development is provided in Section 1 of this report. A more detailed description of the Proposed Development is provided in Chapter 3: Description of the Site and Chapter 4: The Proposed Development, in ES Volume I (Application Document Ref.6.2).
- 3.1.2 Consideration of the different alternatives to the Proposed Development is provided in Chapter 6: Need and Alternatives in ES Volume I.
- 3.1.3 A comprehensive description of the rationale for the Proposed Development is presented in Chapter 5: Need and Alternatives in ES Volume I.

3.2 Relevant Designated Sites

- 3.2.1 Guidance published by the Environment Agency (<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>) recommends that for power generation developments greater than 50 MW, a radius of search of 15km should be used when identifying relevant European designated sites which may be affected. All European designated sites within 15km of the Proposed Development were therefore identified and included within the scope of this exercise.
- 3.2.2 Two European designated sites were identified within the 15km search radius: the Humber Estuary SPA and the Humber Estuary SAC.
- 3.2.3 In addition, the Humber Estuary Wetland of International Importance (Ramsar site) also lies within the 15km search radius (the boundary of this designation is, in the vicinity of the Development, also coincident with the SPA and SAC of the same name). Although Ramsar sites are not part of the Natura 2000 network of designated sites, National Planning Policy Framework ('NPPF') in England requires that Ramsar sites are given the same level of protection as SPAs and SACs. Throughout this report, and for the sake of simplicity, where reference is made to 'European designated sites', unless otherwise stated this also includes the Humber Estuary Ramsar site, giving a total of three sites within the search radius that are considered in this assessment.
- 3.2.4 A summary of the qualifying features of each of the three sites, and their distance from the Proposed Development, is summarised in Table 1, below. The location of each site in relation to the Proposed Development is illustrated on Figure 2.

Table 3.1: Description of Relevant European Designated Sites

Designated site	Approximate distance from Proposed Development	Total area	Primary reasons for site selection	Other qualifying features
Humber Estuary SAC	1.4km north-east	36,657.15 ha	Estuaries Mudflats and sandflats not covered by seawater at low tide	Sandbanks which are slightly covered by seawater all the time Coastal lagoons Salicornia and other annuals colonizing mud and sand Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) Embryonic shifting dunes Shifting dunes along the shoreline with European marram grass (<i>Ammophila arenaria</i>) (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with common sea buckthorn (<i>Hippophae rhamnoides</i>) River lamprey (<i>Lampetra fluviatilis</i>) Sea lamprey (<i>Petromyzon marinus</i>) Grey seal (<i>Halichoerus grypus</i>)
Humber Estuary SPA	1.4km north-east	37,630.24	Populations of European importance of Annex I and Annex II over-wintering wildfowl and wading birds Internationally important assemblage of migratory and wintering birds	N/A

Designated site	Approximate distance from Proposed Development	Total area	Primary reasons for site selection	Other qualifying features
Humber Estuary Ramsar site		37,987.80	Estuarine habitats including dune systems, intertidal mud and sand flats, saltmarshes and brackish lagoons Grey seal Natterjack toad (<i>Bufo calamita</i>) Internationally important populations of non-breeding wildfowl and waders Migrating river lamprey and sea lamprey	N/A

3.2.5 The conservation objectives of the Humber Estuary SAC are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the favourable conservation status of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats and qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

3.2.6 The conservation objectives of the Humber Estuary SPA are to ensure the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;

- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

3.2.7 There are no explicit conservation objectives available for the Humber Estuary Ramsar site, but these are assumed to be consistent with those described above for the SAC and SPA.

4.0 TEST OF LIKELY SIGNIFICANT EFFECTS

4.1 Background

4.1.1 When reading this section it is important to note the difference between ‘impacts’ and ‘effects’. Impacts are actions which result in changes to an ecological feature (including a designated site), while effects are the outcome to that ecological feature. In the case of HRA, the aim is to identify whether the predicted impacts will result in adverse effects which affect the integrity of the European designated site and its ability to meet its conservation objectives.

4.2 Impacts Screened out of Assessment

4.2.1 As the Proposed Development is approximately 1.4km from the nearest boundary of the European designated sites, there is no potential for direct habitat loss or direct physical damage during the construction, operational or decommissioning phases. Furthermore, there are no groundwater pathways over this distance through which the Proposed Development could give rise to any effects on groundwater dependent terrestrial ecosystems (GDWTEs) within the European designated sites.

4.2.2 The Proposed Development is more than 1km from the nearest point of the Humber Estuary SPA / Ramsar site. At this distance there is no potential for noise or visual disturbance to birds using habitats within the boundary of these designated sites, during construction, operation or decommissioning.

4.2.3 Similarly, there is no potential for noise generated during construction, operation or decommissioning to propagate into the water environment more than 1km away which could cause disturbance to qualifying species of the Humber Estuary SAC or Ramsar site.

4.2.4 No further consideration is given here to any of the above impact pathways.

4.3 Potential Impacts

4.3.1 For each of the designated sites considered as part of this assessment, the potential impacts which could arise from the Proposed Development are considered, with reference to the conservation objectives of each site, to test for Likely Significant Effects.

4.3.2 When carrying out the test of Likely Significant Effects, cognisance was given to the ruling of the CJEU in November 2018 in the case of *Holohan and Others v An Bord Pleanála (C-461/17)*. The conclusions of the Court in that case now require that during the course of a HRA, consideration must be given to:

- Likely Significant Effects on the qualifying habitats and/or species of a SAC / SPA, outside of the boundary of the designated site, if these are relevant to the site meeting its conservation objectives; and
- Effects on non-qualifying habitats and/or species on which the qualifying habitats and/or species depend and which could result in Likely Significant Effects on the qualifying features.

4.3.3 The potential impacts of the Proposed Development which could result in significant effects on the qualifying features of the European designated sites, and which are considered in more detail below, are as follows:

- Changes to surface water quality – potential for sediment run-off during construction or for spills of polluting material either during construction or operation. Surface water pollution could enter drains on and surrounding the Site and ultimately reach the European designated sites, with potential effects on the qualifying habitats and/or species;
- Changes to air quality - emissions to air during the operational phase of the Proposed Development may increase concentrations of oxides of nitrogen ('NO_x') and/or nitrogen ('N') deposition, with potential effects on sensitive habitats of the Humber Estuary SAC / SPA / Ramsar site; and
- Noise and/or visual disturbance of qualifying species - activities during the construction and/or operational phases could result in disturbance to waterbirds feeding, roosting and/or loafing in arable fields east of the Proposed Development (between Rosper Road and the estuary). These fields, although outside of the boundary of the European designated sites, are likely to be 'functionally linked'¹ to the Humber Estuary SPA / Ramsar site. South Killingholme Marshes, which are situated further east than these fields, also represents functionally linked habitat to the European designated sites. As this area is more distant to the Proposed Development than the fields immediately east of Rosper Road, the assessment made in relation to potential effects on birds occupying those fields is conservatively considered to be relevant and applicable to birds at South Killingholme Marshes.

4.3.4 Each of the above potential impact pathways is considered individually under the following sections.

Changes to Surface Water Quality

4.3.5 There is no direct water pathway from the Proposed Development to the identified receptors, with water discharges proposed into the nearby land drains which ultimately discharge to the Estuary. Potential changes in surface water quality (with sediment or contaminants) arising from surface water run-off from within the Site during construction will be controlled through the adoption of best practice pollution prevention methods, in order to meet environmental requirements. Impacts to the adjacent drainage ditch as part of the surface water drainage network for the Proposed Development will be similarly controlled. These measures will be detailed in a Construction Environmental Management Plan (CEMP).

4.3.6 Similarly, the on site operational drainage infrastructure will be designed to attenuate flow and prevent the potential migration of contaminants into the wider drainage network. The storage of all potentially polluting materials will be in accordance with relevant legislation to minimise the risk of spill and in accordance with the environmental permit required for the operation of the Proposed Development.

¹ Areas of land outside of the boundary of a European designated site may be important ecologically in supporting the populations for which the site has been designated or classified. Occasionally impacts to such habitats can have a significant effect upon the qualifying species of such sites. In this case, the habitats are considered to be 'functionally linked' to the designated site (Chapman, C. and Tyldesley, D. (2016).

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- 4.3.7 The CEMP will include a plan for dealing with accidental pollution and will be approved by the Environment Agency. It is important to note, in the context of HRA and with specific reference to recent case law (see Section 2.2), such measures do not constitute mitigation to avoid or reduce harmful effects on the European designated sites; rather they will be implemented to ensure compliance with other legislative requirements such as the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2016. Further details are provided in Chapter 12: Surface Water, Flood Risk and Drainage (Paragraphs 12.6.8 – 12.6.19) of ES Volume I.
- 4.3.8 With these measures in place, there is no surface water pathway by which the Proposed Development could impact on the qualifying habitats of the Humber Estuary SAC / SPA / Ramsar site or the qualifying species they support (including river lamprey, sea lamprey and grey seal) during construction or operation.
- 4.3.9 It is therefore concluded that, in considering this potential impact pathway, there are no Likely Significant Effects from the Proposed Development on the Humber Estuary SAC / SPA / Ramsar sites.

Changes to Air Quality

- 4.3.10 Changes in air quality are only relevant to the operational phase of the Proposed Development as there will be no significant changes to air quality beyond a distance of 350m from the Site during the construction phase, based on the screening distances for construction air impacts set out in appropriate guidance – see Chapter 6.
- 4.3.11 An air quality impact assessment has been undertaken and is presented in Chapter 6: Air Quality of ES Volume I (Application Document Ref. 6.2),
- 4.3.12 There are two measures of particular relevance when considering the potential for significant effects on habitats to result from changes in air quality arising from the Proposed Development. The first is the concentration of NO_x in the atmosphere. The main importance is as a source of nitrogen, which is then deposited on adjacent habitats either directly (known as dry deposition, including directly onto the plants themselves) or washed out in rainfall (known as wet deposition). The deposited nitrogen can then have a range of effects, primarily growth stimulation or inhibition, but also biochemical and physiological effects such as changes to chlorophyll content. NO_x may also have some effects which are unrelated to its role in total nitrogen intake (such as the acidity of the gas potentially affecting lipid biosynthesis) but the evidence for these effects is limited and they do not appear to occur until high annual concentrations of NO_x are reached.
- 4.3.13 The guideline atmospheric concentration of NO_x advocated by Government for the protection of vegetation is 30 micrograms per cubic metre (µgm⁻³, 75 µgm⁻³ 24 hour average) known as the ‘critical level’, below which it is unlikely that there will be any adverse effects (unless there are other sources of nitrogen, such as ammonia). This is driven by the role of NO_x in N deposition and in particular in growth stimulation and inhibition. However, based on available studies, the physiological and biochemical effects of NO_x do not appear to occur until much higher annual concentrations are reached. This is reflected in WHO (2000) which states that the ‘*general effect threshold ... would be substantially higher [than 30 µgm⁻³] if biomass production [i.e. growth stimulation] ... is not assumed to be an adverse effect*’. Reference to the data provided within WHO (2000) suggests that exposure to annual average concentrations below 100 µgm⁻³ are unlikely to cause direct biochemical or physiological effects based on the available studies and it

may be that concentrations considerably above $100 \mu\text{g m}^{-3}$ would be required in the field before an effect was observed.

- 4.3.14 The second important metric is a direct determination of the rate of the resulting N deposition, which is habitat-specific because different habitats have varying tolerance to nitrogen. For many habitats there are measurable effects in the form of published dose-response relationships for N deposition, which do not exist for NO_x . Unlike NO_x , the N deposition rate below which current evidence suggests that effects should not arise is different for each habitat. The rate (known as the 'critical load') is provided on the UK Air Pollution Information System website (www.apis.ac.uk) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year (kg N/ha/yr).
- 4.3.15 For completeness, rates of acid deposition were also calculated. Acid deposition derives from both sulphur and nitrogen. It is expressed in terms of kiloequivalents (keq) per hectare per year. The thresholds against which acid deposition is assessed are referred to as the 'critical load function'.
- 4.3.16 The air quality impact assessment concluded that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.3% of the critical level for the Humber Estuary SAC / SPA / Ramsar sites. This is well below the 1% screening threshold below which an adverse effect on the designated habitats (and therefore the species they support) is considered to be insignificant.
- 4.3.17 Furthermore, the air quality impact assessment concluded that the annual N deposition rate would be substantially below 1% of the critical load (<0.1%), and therefore well below the 1% screening threshold below which adverse effects on habitats is considered to be insignificant (see ES Volume I, Chapter 6: Air Quality (Application Document Ref. 6.2)).
- 4.3.18 For acid deposition, the air quality impact assessment similarly identified that the process contribution of sulphur deposition is expected to be negligible because emissions of SO_2 from natural gas combustion are negligible (ES Volume I, Chapter 6: Air Quality (Application Document Ref. 6.2)).
- 4.3.19 The nearest air-quality sensitive habitat for which the Humber Estuary SAC and Ramsar site is designated is saltmarsh. The closest saltmarsh habitat within the boundary of these designated sites is approximately 1.5km from the Proposed Development. The most sensitive habitat for which the Humber Estuary SAC is designated irrespective of location is various forms of sand dune. The closest area of this habitat is located over 10km from the Proposed Development.
- 4.3.20 Although there are established critical levels for NO_x concentrations in relation to vegetation², these are intentionally generic and not calibrated to the sensitivity of different habitats. Research indicates that NO_x critical levels (whether long-term (i.e. annual), or short-term (i.e. 24 hour)) are not particularly relevant to saltmarsh. A study undertaken for Countryside Council for Wales (now Natural Resources Wales) reviewed the effects of atmospheric nitrogen deposition on saltmarsh, including the relative importance of NO_x concentrations as distinct from nitrogen deposition rates. The review concluded that '*... the robustness of the salt marsh nutrient system might suggest that the application of the*

² Short-term critical level of $75 \mu\text{g m}^{-3}$, long-term critical level of $30 \mu\text{g m}^{-3}$.

critical load limits [as opposed to critical level] may afford sufficient protection ... it seems likely that the cumulative effects of these short term impacts [of elevated NO_x] would, in general, be adequately covered by the application of the critical load approach' [i.e. by focussing on nitrogen deposition rather than NO_x concentrations] (Boorman, L.A. and Hazelden, J. (2012)). This would support the view that, given the regular tidal inundation experienced, nitrogen inputs to the substrate are likely to have a greater influence on the structure and composition of this habitat than the concentration of NO_x in the atmosphere.

- 4.3.21 In addition, the general view is that exceedance of the short-term (24 hour) mean for NO_x is of less importance than the annual mean. Vegetation exposed to levels of NO_x above the critical level will be more likely to recover from that exposure if the exceedance is for a short duration. The short-term critical level for protection of vegetation was only lowered from 200µgm⁻³ in 2000 to reflect the fact that, globally, short-term episodes of elevated NO_x concentrations are generally combined with elevated concentrations of ozone ('O₃') or sulphur dioxide ('SO₂'), which cause effects to be observed at lower NO_x concentrations. However, very high concentrations of SO₂ are now rarely recorded in the UK. As such, there is reason to consider that in the UK the specific figure of 75µgm⁻³ is not necessarily appropriate for the short-term NO_x concentration. Several important sources recommend that the short-term critical level is not given great weight in ecological assessments. Specifically, Sutton *et al* (2011) state that the '*UN/ECE Working Group on Effects strongly recommended the use of the annual mean value [as opposed to the short-term mean], as this parameter is much more reliable than shorter-term averages, and the long-term effects of NO_x are thought to be more significant than the short-term effects*'. This statement is repeated in the UN/ECE Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels.
- 4.3.22 Given the available research regarding the relative importance of nitrogen deposition versus NO_x concentrations for saltmarsh, the fact that 200µgm⁻³ may be a more appropriate short-term critical level in the UK and the 'strong recommendation' from the UN/ECE working group to focus on annual average NO_x concentrations rather than exceedance of the short-term critical level, it is considered that in this case the exceedance of either the long-term or short-term critical level is unlikely to result in adverse effects on the structure or botanical composition of saltmarsh..
- 4.3.23 The existing nitrogen deposition rate at the closest area of saltmarsh according to APIS is 15.0kgN/ha/yr, and the process contribution from the Proposed Development represents 0.1% of the lower end of the critical load at the worst case location. The current deposition rate is therefore 25% below the minimum part of the critical load range. With the Proposed Development predicted to contribute a further 0.06kgN/ha/yr, this would be well within the normal variation expected in deposition rates, and would not result in the critical load being exceeded.
- 4.3.24 The predicted changes in critical level (NO_x) and critical load (N deposition) of less than 1% will be therefore be imperceptible and there will be no impacts to sand dunes from air quality changes.
- 4.3.25 In view of the above, it is concluded that, in considering this potential impact pathway, there are no Likely Significant Effects from the Proposed Development on the Humber Estuary SAC / SPA / Ramsar sites.

Noise and/or Visual Disturbance of Qualifying Species

- 4.3.26 Assessment of the potential for noise disturbance to waterbirds roosting / loafing / foraging in the functionally linked fields on the east side of Rosper Road is presented in the noise impact assessment (Chapter 8: Noise and Vibration of ES Volume I). A qualitative soundscape assessment of ambient sources of noise currently experienced by waterbirds feeding, loafing and roosting on the fields east of Rosper Road was undertaken by an AECOM noise specialist on 20 July 2018. A summary note of this assessment is provided in Annex A of this report.
- 4.3.27 The fields are surrounded by industrial development, with the Able Marine Energy Park (AMEP) car storage area to the north, a fuel bunkering facility to the east (between the fields and the estuary), and a bulk handling facility to the south and east (between the fields and the estuary). Further east along the estuary frontage are oil tanker jetties (including Humber International Terminal). Rosper Road forms the western boundary of the fields.
- 4.3.28 The soundscape within the Rosper Road fields has contributions from several sources:
- Ships - both those moored on jetties serving the various port operations along the river and those moving along the river itself. The sources of this sound included the ship's engines and the operations associated with loading and offloading of bulk materials and vehicles. The engine sound was typical of large diesel engines and at some locations included an audible low frequency tonal element. This sound was most significant along the north-eastern edge of the study area closest to the river;
 - Bulk handling facility - this included transient noise from material movements and steady noise from conveyors. This sound was most significant at the eastern corner of the study area;
 - Vehicle movements on Rosper Road - this was a busy road with heavy goods vehicles and car movements principally serving the car import / export areas. This was the dominant source of ambient (average) sound (L_{Aeq}) in the western parts of the study area near Rosper Road;
 - Vehicle movements on the AMEP car import / export site - this sound was transient in nature and was present along the north western edge of the study area;
 - The Existing VPI CHP Plant - operational noise from equipment including fan sound, stack sound etc. This was the dominant source of background (underlying) sound in the parts of the study area close to Rosper Road, but was not audible above the ship and bulk handling sound along the eastern edge; and
 - The Total Lindsey Oil Refinery (TLOR): Operational noise from the oil refinery including periodic loud sirens, which were audible at most locations surrounding the Rosper Road fields.
- 4.3.29 It was also noted that lighting to some parts of the car import / export areas appeared to be provided by diesel powered lighting towers. These were not operating during the soundscape survey (which was undertaken in the daytime) but it is likely that they will operate at night. The resulting sound would be expected to be audible at the northern corner of the Rosper Road fields (i.e. those closest to the AMEP development).
- 4.3.30 There is a rail line running along the north-eastern edge of the Rosper Road fields. There were no rail movements on the line during the soundscape assessment. It is however, understood that the line is still in occasional use.

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- 4.3.31 The measured sound levels across the Rosper Road fields ranged from 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge. These are daytime levels and the L_{Aeq} (ambient) values include contributions from some sources that are likely to be less significant at night. The L_{AF90} (background) values were dominated by steady sources which are likely to be present during the day and night.
- 4.3.32 Other than piling, discussed below, none of the construction activities associated with the Proposed Development will generate noise that would be discernible above the ambient noise environment of the industrial sites surrounding the Rosper Road fields. It is therefore reasonable to conclude that construction activities will not result in any displacement or disturbance of birds from the Rosper Road fields (see ES Volume I, Chapter 8: Noise and Vibration (Application Document Ref. 6.2)).
- 4.3.33 Construction of the Proposed Development may require the use of piling techniques. Any potential noise or vibration impacts arising from the use of these techniques would be controlled through measures to be included in the detailed Construction Environmental Management Plan (CEMP). A framework CEMP is included with this Application (ES Volume III, Appendix 4A, Application Document Ref 6.4). any noise impacts associated with piling would be short term and only undertaken during daytime.
- 4.3.34 Noise modelling was carried out for the operational phase of the Proposed Development (see ES Volume I Chapter 8: Noise and Vibration, Application Document Ref. 6.2). A noise contour plot for operational noise was provided and this confirms that that noise levels arising from the operation of the Proposed Development will have attenuated to below 50dB L_{Aeq} across the majority of the fields, with only the most eastern edge (along the boundary to Rosper Road) experiencing worst case operational noise levels of 57dB L_{Aeq} . The Proposed Development sound level along the eastern edge of the fields will be below 40dB L_{Aeq} . These levels are well within the ambient range of noise levels across these fields, which was between 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road at the closest point of the field nearest to the Proposed Development, to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge.
- 4.3.35 Based on the results of noise modelling, operational noise from the Proposed Development will not result in any increase in the baseline levels experienced by waterbirds that may be using the fields east of Rosper Road.
- 4.3.36 In terms of visual impacts, the nature and scale of the temporary construction activities associated with the Proposed Development are not significantly different from on-going industrial activities within the area surrounding the Rosper Road fields. This includes temporary construction activities in the AMEP DCO site to the north, and the structures associated with the Existing VPI CHP Plant to the west of Rosper Road. It is envisaged that the plant, machinery, vehicles and structures used during construction will not result in any material change in the conditions currently surrounding the Rosper Road fields.
- 4.3.37 Similarly, the nature and scale of the Proposed Development during its operational phase is similar to the surrounding industrial areas, which includes TLOR and the Existing VPI CHP Plant.
- 4.3.38 It is therefore reasonable to assume that any SPA / Ramsar site waterbirds roosting, loafing and/or foraging in fields on the east side of Rosper Road are habituated to the industrial nature (and its associated noise and visual impact from chimney stacks, pipe racks, buildings etc.) of the surrounding area.

4.3.39 It is therefore concluded that, in considering this potential impact pathway, there are no Likely Significant Effects from the Proposed Development on the Humber Estuary SAC / SPA / Ramsar site.

4.4 Potential Impacts Acting In Combination

4.4.1 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM (2018)).

4.4.2 It is considered that of the impacts described above, there is only the potential for significant adverse effects to arise in combination with the impacts of other projects as a result of changes in air quality or due to noise or visual disturbance of qualifying species using functionally linked land outside of the boundaries of the European designated sites. There is no possibility of in combination effects from changes to water quality as water quality will be protected by the implementation of standard pollution prevention techniques, ensuring compliance with relevant legislation.

4.4.3 An assessment of impacts acting in combination with other projects to result in significant adverse effects on the European designated sites is given under the following sections. A review of relevant plans and/or projects in the vicinity of the Proposed Development, and the potential for in combination effects to occur, is provided in Annex C of this Report.

In Combination Impacts due to Changes in Air Quality

4.4.4 Given that the size of the other developments in the vicinity of the Proposed Development are of a similar scale, it is likely that they will have similar level of impacts in terms of changes to air quality. It is predicted that the Proposed Development will result in an increase in N deposition of 0.06kgN/ha/yr. Background deposition levels in the area are, according to APIS, 15 kgN/ha/yr. An increase of approximately 83 times the increase predicted from the Proposed Development would therefore be required to reach the critical load of 20kgN/ha/yr for nearby saltmarsh. It is therefore highly improbable that there could be any in combination increase of such a magnitude from other projects in the vicinity of the Proposed Development.

4.4.5 Also considering the locations of the other developments the worst case impacts for all the developments will occur at different locations and therefore the in combination impacts of the other developments would be lower at the point of worst case impact for the Proposed Development.

4.4.6 It is therefore concluded that there will be no Likely Significant Effects on any European designated site due to in combination changes to air quality.

In Combination Impacts due to Noise and/or Visual Disturbance of Qualifying Species

4.4.7 Potential cumulative disturbance to the fields to the east of the Proposed Development (between Rosper Road and the estuary) has been included in the assessment of in combination effects due to the fact that there are several other projects either proposed, consented or under construction around this part of the estuary (including the adjacent consented VPI Immingham Energy Park A power plant). Disturbance / displacement caused by multiple projects therefore has the potential to result in adverse effects on waterbirds in high tide feeding, roosting and loafing habitat in fields bordering the estuary.

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- 4.4.8 The AMEP development will result in the loss of large areas of farmland at North Killingholme adjacent to the North Killingholme mudflats, which support important assemblages of black-tailed godwits (*Limosa limosa*) and other wintering / passage bird species. This project has not yet been constructed, however a substantial package of mitigation was agreed with North Lincolnshire Council and Natural England to create alternative high tide feeding, roosting and loafing waterbird habitat at Killingholme Marshes (referred to as Mitigation Area A). This is at Rosper Road fields, to the east of the Proposed Development.
- 4.4.9 There is currently a separate planning application under consideration by North Lincolnshire Council to shift Mitigation Area A further north to East Halton Skitter (referred to as the 'Halton Marshes Wet Grassland Scheme (HMWGS)'), to accommodate the development of that area into car storage (Marsh Lane Car Storage Area). The delivery of mitigation at North Killingholme (or East Halton Skitter) is part of the South Humber Gateway ('SHG') mitigation strategy, that has developed requirements for a package of 80ha of wet grassland mitigation for waterbirds (four 20ha blocks with 150m 'buffers') in order to facilitate development in the South Humber Gateway region that is HRA compliant.
- 4.4.10 There are therefore two scenarios: waterbird mitigation for the project(s) will either be delivered at the consented AMEP Mitigation Area A at Rosper Road fields, or at East Halton Skitter in the HMWGS (if the application is approved). If waterbird mitigation is to be delivered at Mitigation Area A (Rosper Road fields), there is feasibly the potential for in combination effects with the Proposed Development. However, as described above, the Proposed Development will not result in construction or operational noise levels above ambient conditions. It is therefore considered that there would be no in combination impacts, even if waterbird mitigation were to be delivered in Mitigation Area A at Rosper Road fields.
- 4.4.11 There is no potential for in combination effects with the Marsh Lane Car Storage Area because, should this project be consented, it would necessitate a relocation of Mitigation Area A to Halton. The Rosper Road fields would therefore be permanently lost as a high tide feeding, loafing and roosting resource to the scheme, and would be compensated through the delivery of mitigation at HMWGS.
- 4.4.12 The Ecological Impact Assessment and HRA undertaken for the adjacent VPI Immingham Energy Park A development (consented) concluded that there would be no significant noise or visual disturbance to waterbirds using Rosper Road fields to the east. There is therefore no potential for significant adverse effects to arise due to in combination impacts with this development.
- 4.4.13 It is therefore concluded that there will be no Likely Significant Effects on any European designated site due to in combination noise or visual disturbance of qualifying species using functionally linked habitat.

5.0 CONCLUSIONS

- 5.1.1 The Proposed Development has been screened for Likely Significant Effects on the qualifying habitats and species of the Humber Estuary SAC, SPA and Ramsar site. No Likely Significant Effects have been identified, either alone or in combination with other plans or projects.
- 5.1.2 The assessment has taken into account embedded mitigation measures that have been designed in to the Proposed Development to reduce the likelihood of water quality impacts on the drainage ditch to the south of the Proposed Development. This ditch is outside the boundary of the SAC / SPA / Ramsar site, and the embedded mitigation has not been included primarily to mitigate for potential effects on the designated site, but because the measures are required to comply with other relevant legislation. Therefore the consideration of this embedded mitigation at the HRA screening stage is considered acceptable in light of the *People over Wind* ruling.
- 5.1.3 In combination air quality effects have also been assessed (including with the adjacent consented VPI Immingham Energy Park A scheme), and the assessment has concluded that there would be no likely significant in combination effects on any of the sensitive features of the designated sites.
- 5.1.4 The in combination effects assessment has considered the implications of the delivery of mitigation for the AMEP DCO at Rosper Road fields (referred to as 'Mitigation Area A'), and found that there would be no likely significant in combination disturbance / displacement effects to waterbirds using the fields for feeding, roosting and loafing should the Proposed Development be consented.
- 5.1.5 Summary screening matrices for each of the European designated sites are provided in Annex B of this report.

6.0 REFERENCES

The Planning Inspectorate (2017). *Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects*.

Chapman, C. and Tyldesley, D. (2016) *Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – a review of authoritative decisions*. Natural England Commissioned Reports, Number 207.

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Boorman, L.A. and Hazelden, J. (2012) *Impacts of Additional Aerial Inputs of Nitrogen to Saltmarsh and Transitional Habitats*. Page 35. *CCW Science Report No: 995, pp44*. Countryside Council for Wales, Bangor, Wales.

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Annex A: Noise Assessment Technical Note – Rosper road Fields

On 20 July 2018 AECOM undertook a qualitative soundscape assessment of the area of fields to the north east of the site. This area is understood to be of potential ecological significance particularly as a result of its use by migratory birds. The study area was bounded by Marsh Lane, Rosper Road, Station Road and the railway line as shown on the figure below.

The assessment involved measurements and observations of the existing sound climate in the area, with a view to assessing the potential changes that might result from the operation of the proposed development.



The soundscape within the study area has contributions from several sources:

- Ships, both those moored on jetties serving the various dock operations along the river and those moving along the river itself. The sources of this sound included the ship's engines and the operations associated with loading and offloading of bulk materials and vehicles. The engine sound was typical of large diesel engines and at some locations included an audible low frequency tonal element. This sound was most significant along the north eastern edge of the study area closest to the river;
- Bulk handling noise from the site to the south east of the study area. This included transient noise from material movements and steady noise from conveyors. This sound was most significant at the eastern corner of the study area;
- Vehicle movements on Rosper Road. This is a very busy road with HGV and car movements principally serving the car import/export areas. This was the dominant source of ambient (average) sound (L_{Aeq}) in the western parts of the study area near Rosper Road;

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- Vehicle movements on the car import/export site. This sound was transient in nature and was present along the north western edge of the study area;
 - Aircraft overhead;
 - The Existing VPI CHP Plant equipment, including fan sound, stack sound etc. This was the dominant source of background (underlying) sound (L_{AF90}) in the parts of the study area close to Rosper Road, but was not audible above the ship and bulk handling sound along the eastern edge;
 - The refineries. This sound was audible at several locations across the study area; and
 - It was also noted that lighting to some parts of the car import/export areas appeared to be provided by diesel powered lighting towers. These were not operating during the survey (daytime) but it is likely that they will operate at night. The resulting sound would be expected to be audible at the northern corner of the study area

The measured sound levels across the study area ranged from 61 dB L_{Aeq} and 51 dB L_{AF90} along Rosper Road to 48 dB L_{Aeq} and 43/46 dB L_{AF90} along the eastern edge. These are daytime levels and the L_{Aeq} (ambient) values include contributions from some sources that are likely to be less significant at night. The L_{AF90} (background) values were dominated by steady sources which are likely to be present during the day and night.

The Proposed Development will add new sound sources to the area. The nature of this sound will be that of attenuated diesel engines. This will be very similar to several of the sources which form significant parts of the existing soundscape, including heavy goods vehicles on Rosper Road and ships on the river.

The predicted sound levels due to the proposed development range from 57 dB L_A at the closest point of the study area (on Rosper Road) to 36 dB L_A at the most distant (along the railway line). The predicted distribution of sound from the proposed development is shown on the figure below.

Annex B: Summary Screening Matrices

Annex B.1: Effects Considered Within the Screening Matrices

Designation	Effects Described in Submission Information	Presented in Screening Matrices As
Humber Estuary SAC	Deterioration in water quality during construction or operation Deterioration in air quality	Water quality Air quality
Humber Estuary SPA	Deterioration in water quality during construction or operation Deterioration in air quality Disturbance of qualifying species using functionally linked habitat	Water quality Air quality Noise / visual disturbance
Humber Estuary Ramsar site	Deterioration in water quality during construction or operation Deterioration in air quality Disturbance of qualifying species using functionally linked habitat	Water quality Air quality Noise / visual disturbance

The European sites included within this screening assessment are:

- Humber Estuary SAC;

- Humber Estuary SPA; and
- Humber Estuary Ramsar site.

Evidence for, or against, likely significant effects on the European site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrices below.

Matrix key:

- ✓ = Likely significant effect **cannot** be excluded
- ✗ = Likely significant effect **can** be excluded
- C = construction
- O = operation
- D = decommissioning

Table Annex B.2: Screening Matrix for Humber Estuary SAC

Qualifying features	Likely effects of Proposed Development																				
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects					
Effect	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D			
Stage of Proposed Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Estuaries	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe
Mudflats and sandflats not covered by seawater at low tide	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe
Sandbanks which are slightly covered by seawater all the time	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe
Coastal lagoons	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe
Salicornia and other annuals colonizing mud and sand	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe	Xe

Qualifying features	Likely effects of Proposed Development																	
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects		
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Embryonic shifting dunes	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Shifting dunes along the shoreline with European marram grass (white dunes)	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Fixed coastal dunes with herbaceous vegetation (grey dunes)	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Dunes with common sea buckthorn	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe

Qualifying features	Likely effects of Proposed Development																	
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects		
River lamprey	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Sea lamprey	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Grey seal	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe

- a. Section 4.3.5 – 4.3.7 states that the embedded mitigation for construction and operation (to be secured under the Construction Environmental Management Plan) will include measures to control pollution, storage of potential pollutants, and precautionary measures will help to limit the likelihood and effects of pollution incidents and/or runoff in line with best practice and guidelines.
- b. There will be no significant changes to air quality during either construction or decommissioning of the Proposed Development.
- c. Section 4.3.15 – 4.3.17 states that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.3% of the critical level for the Humber Estuary SAC. This is well below the 1% screening threshold at which an adverse effect on the designated habitats (and therefore the species they support) may occur. Furthermore, the air quality impact assessment concluded that the annual N deposition rate would be substantially below 1% of the critical load (<0.1%), and therefore well below the 1% screening threshold at which adverse effects on habitats may occur. For acid deposition, the air quality impact assessment similarly identified that the process contribution of sulphur deposition is expected to be negligible because emissions of SO₂ from natural gas combustion are negligible.

- d. Section 4.4 states that given that the size of the other developments in the vicinity of the Proposed Development are of a similar scale, it is likely that they will have similar level of impacts in terms of changes to air quality. It is predicted that the Proposed Development will result in an increase in N deposition of 0.06kgN/ha/yr. Background deposition levels in the area are, according to APIS, 15 kgN/ha/yr. An increase of approximately 83 times the increase predicted from the Proposed Development would therefore be required to reach the critical load of 20kgN/ha/yr for nearby saltmarsh. It is therefore highly improbable that there could be any in combination increase of such a magnitude from other projects in the vicinity of the Proposed Development. Also considering the locations of the other developments, and the prevailing wind direction, the worst case impacts for all the developments will occur at different locations and therefore the in combination impacts of the other developments would be lower at the point of worst case impact for the Proposed Development.
- e. Section 4.2.3 concludes that there is no potential for noise generated during construction or operation to propagate into the water environment more than 1km away which could cause disturbance to qualifying species of the Humber Estuary SAC.

Annex B.3: Screening Matrix for Humber Estuary SPA

Qualifying features	Likely effects of Proposed Development																	
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects		
Effect	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Stage of Proposed Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Populations of European importance of Annex I and Annex II non-breeding wildfowl and wading birds	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe, g	Xf, g	Xe, g	Xh	Xh	Xh
Internationally important assemblage of migratory and wintering birds	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe, g	Xf, g	Xe, g	Xh	Xh	Xh

- a. Section 4.3.5 – 4.3.7 states that the embedded mitigation for construction and operation (to be secured under the Construction Environmental Management Plan) will include measures to control pollution, storage of potential pollutants, and precautionary measures will help to limit the likelihood and effects of pollution incidents and/or runoff in line with best practice and guidelines.

- b. There will be no significant changes to air quality during either construction or decommissioning of the Proposed Development.
- c. Section 4.3.15 – 4.3.17 states that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.3% of the critical level for the Humber Estuary SPA. This is well below the 1% screening threshold at which an adverse effect on the designated habitats (and therefore the species they support) may occur. Furthermore, the air quality impact assessment concluded that the annual N deposition rate would be substantially below 1% of the critical load (<0.1%), and therefore well below the 1% screening threshold at which adverse effects on habitats may occur. For acid deposition, the air quality impact assessment similarly identified that the process contribution of sulphur deposition is expected to be negligible because emissions of SO_2 from natural gas combustion are negligible.
- d. Section 4.4 states that given that the size of the other developments in the vicinity of the Proposed Development are of a similar scale, it is likely that they will have similar level of impacts in terms of changes to air quality. It is predicted that the Proposed Development will result in an increase in N deposition of 0.06kgN/ha/yr. Background deposition levels in the area are, according to APIS, 15 kgN/ha/yr. An increase of approximately 83 times the increase predicted from the Proposed Development would therefore be required to reach the critical load of 20kgN/ha/yr for nearby saltmarsh. It is therefore highly improbable that there could be any in combination increase of such a magnitude from other projects in the vicinity of the Proposed Development. Also considering the locations of the other developments, and the prevailing wind direction, the worst case impacts for all the developments will occur at different locations and therefore the in combination impacts of the other developments would be lower at the point of worst case impact for the Proposed Development.
- e. Section 4.3.32 and 4.3.33 states that the measured sound levels across the Rosper Road fields ranged from 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge. These are daytime levels and the L_{Aeq} (ambient) values include contributions from some sources that are likely to be less significant at night. The L_{AF90} (background) values were dominated by steady sources which are likely to be present during the day and night. None of the construction activities will generate noise that would be discernible above the ambient noise environment of the industrial sites surrounding the Rosper Road fields. It is therefore reasonable to conclude that construction activities will not result in any displacement or disturbance of birds from the Rosper Road fields.
- f. A noise contour plot for operational noise was provided and this confirms that that noise levels arising from the operation of the Proposed Development will have attenuated to below 50dB L_{Aeq} across the majority of the fields, with only the most eastern edge (along the boundary to Rosper Road) experiencing worst case operational noise levels of 57dB L_{Aeq} . The Proposed Development

sound level along the eastern edge of the fields will be below 40dB L_{Aeq} . These levels are well within the ambient range of noise levels across these fields, which was between 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road at the closest point of the field nearest to the Proposed Development, to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge. Based on the results of noise modelling, operational noise from the Proposed Development will not result in any increase in the baseline levels experienced by waterbirds that may be using the fields east of Rosper Road. See Section 4.3.35 and 4.3.36.

- g. In terms of visual impacts, the nature and scale of the temporary construction activities associated with the Proposed Development are not significantly different from on-going industrial activities within the area surrounding the Rosper Road fields. This includes temporary construction activities in the AMEP DCO site to the north, and the Existing VPI CHP Plant to the west of Rosper Road. It is reasonable to assume that the plant, machinery, vehicles and structures used during construction will not result in any material change in the conditions currently surrounding the Rosper Road fields. Similarly, the nature and scale of the Proposed Development during its operational phase is similar to the surrounding industrial areas, which includes TLOR and the existing VPI CHP Plant.
- h. Section 4.4.7 – 4.4.12 considers the potential for in combination disturbance effects arising with other projects. It concludes that as there is no possibility of noise or visual disturbance from the Proposed Development, because all other development is of a similar scale and nature and because of the existing background levels of human activity, there is no potential for significant in combination effects. A summary of in combination effects is also provided in Annex C.

Table Annex B.4: Screening Matrix for Humber Ramsar site

Qualifying features	Likely effects of Proposed Development																	
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects		
Effect	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Stage of Proposed Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Estuarine habitats including dune systems, intertidal mud and sand flats, saltmarshes and brackish lagoons	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe, g	Xf, g	Xe, g	Xh	Xh	Xh
Grey seal	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe, g	Xf, g	Xe, g	Xh	Xh	Xh
Natterjack toad	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe
Internationally important populations of non-breeding wildfowl and waders	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe, g	Xf, g	Xe, g	Xh	Xh	Xh

Qualifying features	Likely effects of Proposed Development																	
	Water quality			Water quality in combination effects			Air quality			Air quality in combination effects			Noise / visual disturbance			Noise / visual disturbance in combination effects		
Migrating river lamprey and sea lamprey	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xc	Xb	Xb	Xd	Xb	Xe	Xe	Xe	Xe	Xe	Xe

- a. Section 4.3.5 – 4.3.7 states that the embedded mitigation for construction and operation (to be secured under the Construction Environmental Management Plan) will include measures to control pollution, storage of potential pollutants, and precautionary measures will help to limit the likelihood and effects of pollution incidents and/or runoff in line with best practice and guidelines.
- b. There will be no significant changes to air quality during either construction or decommissioning of the Proposed Development.
- c. Section 4.3.15 – 4.3.17 states that the process contribution resulting from the maximum annual mean NO_x emissions from the stack is 0.3% of the critical level for the Humber Estuary Ramsar site. This is well below the 1% screening threshold at which an adverse effect on the designated habitats (and therefore the species they support) may occur. Furthermore, the air quality impact assessment concluded that the annual N deposition rate would be substantially below 1% of the critical load (<0.1%), and therefore well below the 1% screening threshold at which adverse effects on habitats may occur. For acid deposition, the air quality impact assessment similarly identified that the process contribution of sulphur deposition is expected to be negligible because emissions of SO₂ from natural gas combustion are negligible.
- d. Section 4.4 states that given that the size of the other developments in the vicinity of the Proposed Development are of a similar scale, it is likely that they will have similar level of impacts in terms of changes to air quality. It is predicted that the Proposed Development will result in an increase in N deposition of 0.06kgN/ha/yr. Background deposition levels in the area are, according to APIS, 15 kgN/ha/yr. An increase of approximately 83 times the increase predicted from the Proposed Development would therefore be required

to reach the critical load of 20kgN/ha/yr for nearby saltmarsh. It is therefore highly improbable that there could be any in combination increase of such a magnitude from other projects in the vicinity of the Proposed Development. Also considering the locations of the other developments, and the prevailing wind direction, the worst case impacts for all the developments will occur at different locations and therefore the in combination impacts of the other developments would be lower at the point of worst case impact for the Proposed Development.

- e. Section 4.3.32 and 4.3.33 states that the measured sound levels across the Rosper Road fields ranged from 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge. These are daytime levels and the L_{Aeq} (ambient) values include contributions from some sources that are likely to be less significant at night. The L_{AF90} (background) values were dominated by steady sources which are likely to be present during the day and night. None of the construction activities will generate noise that would be discernible above the ambient noise environment of the industrial sites surrounding the Rosper Road fields. It is therefore reasonable to conclude that construction activities will not result in any displacement or disturbance of birds from the Rosper Road fields.
- f. A noise contour plot for operational noise was provided and this confirms that that noise levels arising from the operation of the Proposed Development will have attenuated to below 50dB L_{Aeq} across the majority of the fields, with only the most eastern edge (along the boundary to Rosper Road) experiencing worst case operational noise levels of 57dB L_{Aeq} . The Proposed Development sound level along the eastern edge of the fields will be below 40dB L_{Aeq} . These levels are well within the ambient range of noise levels across these fields, which was between 61dB L_{Aeq} and 51dB L_{AF90} along Rosper Road at the closest point of the field nearest to the Proposed Development, to 48dB L_{Aeq} and 43/46dB L_{AF90} along the eastern edge. Based on the results of noise modelling, operational noise from the Proposed Development will not result in any increase in the baseline levels experienced by waterbirds that may be using the fields east of Rosper Road. See Section 4.3.35 and 4.3.36.
- g. In terms of visual impacts, the nature and scale of the temporary construction activities associated with the Proposed Development are not significantly different from on-going industrial activities within the area surrounding the Rosper Road fields. This includes temporary construction activities in the AMEP DCO site to the north, and the Existing VPI CHP Plant to the west of Rosper Road. It is reasonable to assume that the plant, machinery, vehicles and structures used during construction will not result in any material change in the conditions currently surrounding the Rosper Road fields. Similarly, the nature and scale of the Proposed Development during its operational phase is similar to the surrounding industrial areas, which includes TLOR and the Existing VPI CHP Plant.

- h. Section 4.4.7 – 4.4.12 considers the potential for in combination disturbance effects arising with other projects. It concludes that as there is no possibility of noise or visual disturbance from the Proposed Development, because all other development is of a similar scale and nature and because of the existing background levels of human activity, there is no potential for significant in combination effects. A summary of in combination effects is also provided in Annex C of this report.

Annex C: In-Combination Effects – Summary of Plans and Projects

Table Annex C.1: Summary of Plans and Projects Included in Assessment of In Combination Effects

Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
VPI Immingham Energy Park A (consented) PA/2018/918	49.9MW gas fired power station	<p><u>Potential In Combination Air Quality Impacts</u></p> <p>The impacts of the Proposed Development have been assessed through dispersion modelling together with the impacts of the adjacent VPI Gas Engine project, in order to determine the overall impacts of both developments.</p> <p>The results of the assessment showed that the short-term impacts at all receptors are dominated by the emissions from the gas engine sources, due to their lower stack heights, lower emission temperature and higher NOx emission concentration. No additional impact over that described in the ES submitted for the Gas Engine project is predicted for the Proposed Development.</p>	No
		<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>The Ecological Impact Assessment and HRA for this project concluded that there would be no likely significant disturbance or displacement of waterbirds from adjacent Rosper Road fields; the nature and scale of the development is the same as that which surrounds it (e.g. TLOR, Existing VPI CHP Plant), and construction and operational noise levels reaching the fields were predicted to be within ambient levels.</p>	No

Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
Killingholme Power Station (consented) PA/2016/1240	14 gas reciprocating engine generators with electrical output of 23Mwe	<p><u>Potential In Combination Air Quality Impacts</u></p> <p>The power station gas engines would be approximately 1.5km north of the Proposed Development, and would be of a similar nature and scale to the Proposed Development.</p> <p>The air quality impact assessment for Killingholme Power Station concluded that for all designated sites, the mean annual process contribution from NO_x deposition was well below the screening threshold of 1% of the critical level. Similarly, for nitrogen deposition the mean annual change was well below the screening threshold of 1% of the critical load.</p> <p>The prevailing south-westerly wind direction means that peak emissions from both developments operating together would not impact upon the same parts of the European designated sites. There is therefore no reasonable pathway by which in-combination effects could occur.</p>	No
North Killingholme Power Project (consented)	Combined Cycle Gas Turbine (CCGT) power plant with 470MWe output	<p><u>Potential In Combination Air Quality Impacts</u></p> <p>The CCGT would be approximately 2 km north of the Proposed Development. There is therefore the potential for in-combination air quality effects resulting from acid and nitrogen deposition to the European designated sites.</p> <p>As above, the prevailing wind and much higher stack than the Proposed Development means that any changes in NO_x emissions, acid and nitrogen deposition would be imperceptible. There is therefore no reasonable pathway by which in-combination effects could occur.</p>	No

Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
Reserve Power Plant at Land South Side of Queens Road, Immingham (decision pending) DM/0100/18/FUL	12 gas reciprocating engine generators	<p><u>Potential In Combination Air Quality Impacts</u></p> <p>This development is approximately 5km from the Proposed Development, and the air quality impact assessment concluded that cumulative effects would be minimal based on distance. It is therefore reasonable to conclude that there is no potential for likely significant in combination effects on the Humber Estuary SPA / SAC / Ramsar site as a result of changes in air quality.</p>	No
Energy Recovery Facility at Land South of Queens Road, Immingham (decision pending) DM/0026/18/FUL	Energy recovery facility	<p><u>Potential In Combination Air Quality Impacts</u></p> <p>This development is approximately 5km from the Proposed Development, and the air quality impact assessment concluded that cumulative effects would be minimal based on distance. It is therefore reasonable to conclude that there is no potential for likely significant in combination effects on the Humber Estuary SPA / SAC / Ramsar site as a result of changes in air quality.</p>	No

Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
Able Marine Energy Park (AMEP) Development Consent Order (under construction)	New deepwater quay and terrestrial facilities	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>The AMEP development will result in the loss of large areas of farmland at North Killingholme adjacent to the North Killingholme mudflats, which support important assemblages of black-tailed godwits and other wintering / passage bird species.</p> <p>The delivery of mitigation at North Killingholme (or East Halton Skitter) is part of the South Humber Gateway mitigation strategy, that has developed requirements for a package of 80ha of wet grassland mitigation for waterbirds (four 20ha blocks with 150m 'buffers') to facilitate development in the South Humber Gateway region that is HRA compliant.</p> <p>For the AMEP DCO, a package of mitigation was agreed to be delivered at 'Mitigation Area A', which is at Rosper Road fields, to the east of the Proposed Development. However, the EclA for the Proposed Development concluded that there would be no noise or visual impacts resulting in displacement / disturbance of waterbirds from these fields, which are considered to be 'functionally linked' to the Humber Estuary. Therefore no likely significant in combination effects were identified.</p> <p>There is no potential for in combination effects on waterbirds in the AMEP DCO mitigation area, should this be delivered at East Halton Skitter, because this is several kilometres north of the Proposed Development.</p>	No

Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
Marsh Lane Car Storage Area for Able UK (pending decision) PA/2017/141	Car storage and distribution facility, port related storage	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>This development would result in the loss of fields currently proposed for the delivery of AMEP's Mitigation Area A (i.e. which are mitigating for the loss of high tide feeding, roosting and loafing habitat within the AMEP footprint at North Killingholme). As part of the development, AMEP Mitigation Area A would be moved north to Halton Marshes (HMWGS) if the project is consented.</p> <p>There is therefore no potential for in combination disturbance with the Proposed Development, and in any case the EclA concluded that there would be no noise or visual disturbance of water birds from these fields.</p>	No
Land off Marsh Lane – Change of Use for Temporary Car Storage (pending decision) PA/2018/114	Application for change of use from that previously consented under AMEP DCO (and enabling works, which have been implemented) to temporary car storage, construction and operation of electricity substation and new junction off Rosper Road	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>This development would result in the loss of fields between Rosper Road and the Estuary. However, all of the land is within the boundary of the consented AMEP DCO, and the application relates only to a change of use. Given that the loss of these fields to high tide feeding, roosting and loafing waterbirds has already been assessed (as part of the consented AMEP DCO), and mitigation agreed with Natural England and North Lincolnshire Council, there is no potential for in-combination effects with the Proposed Development.</p>	No
Land east of Rosper Road – Change of Use for Temporary Car Storage PA/2017/27 (consented)	Application for change of use from that previously consented under AMEP DCO (and enabling works, which have been implemented) to temporary car storage	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>This development would result in the loss of fields between Rosper Road and the estuary. However, all of the land is within the boundary of the consented DCO, and the application relates only to a change of use. Given that the loss of these fields to high tide feeding, roosting and loafing waterbirds has already been assessed (as part of the consented AMEP DCO), and mitigation agreed with Natural England and North Lincolnshire Council, there is no potential for in combination effects with the Proposed Development.</p>	No

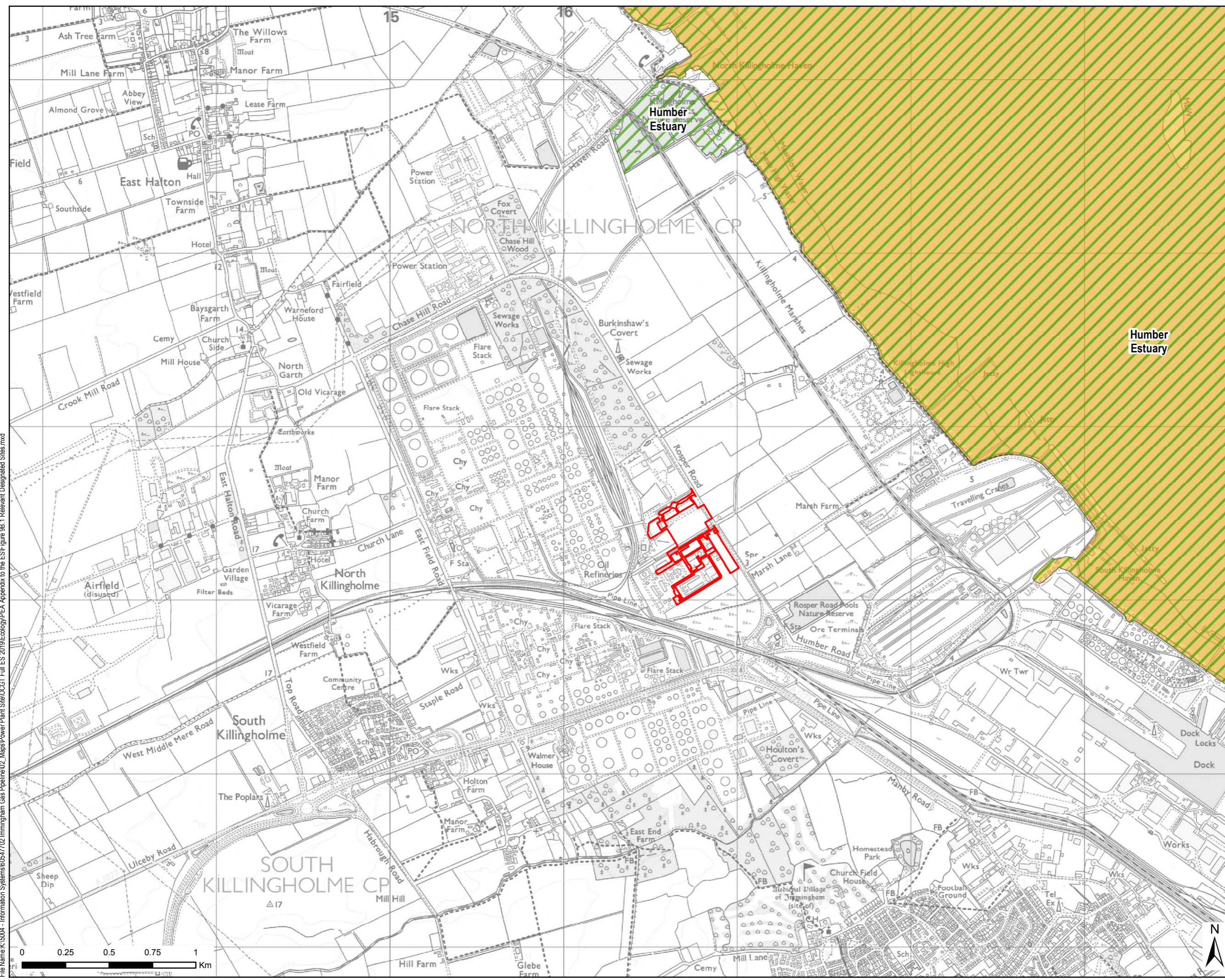
Plan or project	Description	Potential in combination impacts	Likely Significant Effects in combination with Proposed Development?
Fields north of Chase Hill Road, fields west of East Field Road and land east and west of Top Road, South Killingholme (consented) PA/2018/155	Surface water storage lagoons (associated with the dewatering of cable trenches for the Hornsea Project One Offshore Windfarm Project)	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>This development will extend the DCO area for the Hornsea Project One Offshore Windfarm (currently under construction) to include small temporary water storage lagoons for dewatering purposes. All works will be located on the west side of TLOR and therefore there is no potential for in combination noise and visual effects with the Proposed Development.</p>	No
Land north of Chase Hill road (consented) PA/2017/1745 PA/2017/1927	Two applications for an minor extension to the Hornsea Project One Offshore Windfarm DCO area	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>Both extension areas are more than 1 km from the Proposed Development, and on the western side of the LOR. There is therefore no potential for in combination noise and visual disturbance to waterbirds with the Proposed Development.</p>	No
Demolition of North Killingholme A Power Station (consented) PA/2017/189	Power station demolition	<p><u>Potential In Combination Disturbance / Displacement Impacts</u></p> <p>HRA report concluded that there would be noise increases to the North Killingholme Haven Pits (NKHP) Site of Special Scientific Interest (SSSI), which is an important high tide roost site for black-tailed godwits, and is within the SPA / Ramsar site boundary. However, given that no pathways for noise and visual disturbance to NKHP as a result of the Proposed Development have been identified, there is no potential for in combination effects on qualifying bird species as a result of noise and visual impacts.</p>	No

Figure 2: Relevant Designated Sites

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

Legend

- Proposed Development
- Special Area of Conservation - Humber Estuary
- Special Protection Area - Humber Estuary



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Purpose of Issue
ENVIRONMENTAL STATEMENT

Client
VPI IMMINGHAM B LTD

Project Title
PROPOSED 299MW OCGT POWER STATION

Drawing Title
**DESIGNATED SITES
 FIGURE 2**

Drawn EC	Checked JW	Approved HW	Date 03/04/2019
AECOM Internal Project No. 60547702		Scale @ A3 1:20,000	

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File Name: K15004 - Information Systems\60547702\Immingham Gas Pipeline\02_Maps\Power Plant Site\OCGT Full ES 2019\Ecology\PEA Appendix to the ES\Figure 9B.1 Relevant Designated Sites.mxd