ABLE MARINE ENERGY PARK

DEVELOPMENT CONSENT ORDER

7 YEAR EXTENSION

RESPONSE TO SECRETARY OF STATE'S LETTER 24TH OCTOBER 2025

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1	Issued to SoS
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CONTENTS

ATTACHMENTS

1.0 - AMEP DRAFT CONSULTATION HRA, March 2025

1.1 - AMEP DRAFT CONSULTATION HRA, March 2025, Parts 1 *(Track Changed)*

1.2 - AMEP DRAFT CONSULTATION HRA, March 2025, Parts 2 *(Track Changed)*

1.3 - AMEP DRAFT CONSULTATION HRA, March 2025, Parts 3 & 4

1.4 - AMEP DRAFT CONSULTATION HRA, March 2025, Parts 5 *(Track Changed)*

2.0 - UPDATE TO APPENDIX UES11-2

3.0 - DRAFT CEMMP Rev D *(Track Changed)*

1 INTRODUCTION

1.1 This is the response of Able Humber Ports Ltd ('the Applicant') to the decision letter from the Department for Transport ('the DfT') dated 28 October 2024 ('the Decision Letter') in relation to an application to extend the time limit by seven years for completion of the development consented under the Able Marine Energy Park Development Consent Order ('the DCO'). At paragraph 12 of the Decision Letter, the DfT sets out a request for information in order to further consider the application. In the interim period, pending the Applicant's provision of this further information, the 10-year time limit specified in Article 7 of the DCO was extended for 1 year, although no new works may start in that period.

1.2 Specifically, paragraph 12 of the Decision Letter states:

"12. To address the concerns raised by Natural England set out above, the Secretary of State requests the following information:

- *Updated ecological survey work*
- *Update HRA to include a detailed in combination assessment*
- *Provide a timeline in relation to the delivery of the overcompensation site at Cherry Cobb Sands*
- *Provide a timeline in relation to the delivery of the benthic modelling for update of the CEMMP. "*

Each of these is addressed in detail in sections below.

1.3 NE had provided three responses to the Planning Inspectorate during the consultation period, viz.

1. Letter dated 6 June 2024 (5 pages) ('Letter 1')
2. Letter dated 13 August 2024 (1 page) ('Letter 2')
3. Letter dated 1 October 2024 (9 pages) ('Letter 3')

1.4 To respond to the Decision Letter, the Applicant has consulted further with Natural England (NE) as follows:

a) Entered into an Agreement for Natural England to provide its Discretionary Advice Service.

b) Attended TEAMS meeting with NE staff on 27 November 2024.

c) Submitted draft documents to NE for comment on 19 December 2024.

d) Attended TEAMS meeting with NE staff on 6 March 2024.

e) Received and reviewed NE written comments on the December draft documents on 6 March.

f) Submitted revised draft documents to NE for comment on 25 March 2025

g) Received and reviewed NE written comments on the March draft documents on 8 April.

h) Submitted revised draft documents to NE for comment on 22 April 2025

i) NE declined to comment further as in their '*opinion .. sufficient information/evidence was provided in the last round of documents for you to respond to the request submitted by DfT on 28 October 24. Comments made in our last response dated 08 April 25 were primarily recommendations around clarifications that could be made for the ease of the reader'.*

1.5 Further to these consultations, the Applicant responds to each bullet point of paragraph 12 of the Decision Letter in turn below.

2 UPDATED ECOLOGICAL SURVEY WORK

2.1 The only specific survey data that NE requested be updated in their three consultation responses were the WeBS core counts. The Applicant has obtained this information and used it to update their shadow Habitats Regulations Assessment (sHRA), which is Attachment 1 to this response.

2.2 Relevantly, between June 2023 and May 2024, the Applicant undertook a 12-month survey of over-wintering birds using the Cherry Cobb Sands (CCS) and North Killingholme Marshes (NKM) foreshore. This information has also been used to update the sHRA.

2.3 With regard to surveys of other species relevant to the HRA:

a) **Grey Seal:** The nearest principal haul out site to AMEP for seals is at Donna Nook at the mouth of the Humber (English Nature Research Report No. 547[1]). There have never been any site-specific seal surveys as this species is only

[1] The Humber Estuary: A comprehensive review of its nature conservation interest - ENRR547

rarely present within the project site and their sporadic presence does not justify survey effort;

b) **Sea and River Lamprey:** Intertidal and subtidal fish surveys were last undertaken by the Applicant in October/December 2013[2]. A single river lamprey was recorded from the otter trawl survey. A previous fish survey in Spring 2013[3], yielded no lamprey. A 2010 fish survey reported in the original ES[4] also yielded a single river lamprey.

Further to this, the results of the most recently available Environment Agency TraC fish monitoring surveys for two sites nearest to AMEP (Seine netting/beam trawl surveys at Foulholme Sands and Otter Trawls at Burcom) are summarised in the table below for Lamprey. The surveys only yielded a single specimen of river lamprey.

Year	River Lamprey (No.)			Sea Lamprey (No.)		
	Burcom Otter Trawl	Foulholme Sands Seine Net	Foulholme Sands Beam Trawl	Burcom Otter Trawl	Foulholme Sands Seine Net	Foulholme Sands Beam Trawl
2012	-	No Survey	No Survey	-	No Survey	No Survey
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	-	No Survey	No Survey	-	No Survey	No Survey
2017	-	-	-	-	-	-
2018	1	No Survey	No Survey	-	No Survey	No Survey
2019	-	No Survey	No Survey	-	No Survey	No Survey

2.4 It has therefore been established, and is agreed with NE, that neither Seal nor Lamprey are present in significant numbers in proximity to the project site. Nevertheless, any individuals that are present will be protected by mitigation measures already embedded in the Deemed Marine Licence at Schedule 8 of the DCO, which require the presence of a marine mammal observer during piling works, soft start procedures and restricts the timing of piling operations in order to protect all fish and mammal species. Because of this, it has been agreed with NE that no further surveys of these species is required for the purposes of the

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000167-TR030006-APP-6A-10-6A.pdf

[3] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000165-TR030006-APP-6A-10-5A.pdf

[4] Microsoft Word - Humber Terminal Benthic Report 070910 v4 21-01-11.docx

present application. Pre-commencement surveys will still be undertaken in accordance with the Environmental Management and Monitoring Plans (EMMPs) consented pursuant to Schedule 11, paragraph 19 of the DCO. Three EMMPs have been approved as detailed below:

- Compensation EMMP – approved by NE 15 January 2016;
- Marine EMMP – latest approval by MMO 15 May 2021;
- Terrestrial EMMP – latest approval by NE 20 March 2024.

2.5 Regarding habitats, in Letter 3 NE wrote:

'Whilst we acknowledge that there are unlikely to be significant changes in habitat and species' distributions since the MC2 consultation, when the habitat and species data were re-assessed, we consider that with the proposed 7-year extension, there could potentially also be roughly up to a 10-year gap between when the data was collected and when the habitat loss occurs. It is important to have an accurate audit trail of habitat losses and gains related to the development. Therefore, we advise that Appendix UES11-2 should be re-assessed to reflect the proposed 7-year extension,' (underline added).

2.6 Appendix UES11-2 formed part of the application for AMEP Material Change 2 and can be accessed here: Updated version of UES 11-2.

2.7 It has been agreed with NE, that since the changes to the North Killingholme foreshore are predictable (mudflat is slowly converting to saltmarsh, due to accretion occurring in the lee of the HIT Terminal), at this time aerial imagery could be used to approximate those particular habitat changes in order to update the data in Appendix UES11-2. A further update to Appendix UES 11-2 is included as Attachment 2 of this report. In accordance with the Marine EMMP a detailed saltmarsh survey of the North Killingholme Marsh (NKM) foreshore will be undertaken before commencement of the quay construction in order to establish targets for monitoring of the compensation measures.

2.8 With regard to updating the ecological baseline more generally, Table 1 below lists the further pre-construction surveys that are to be carried out pursuant to the DCO and the approved EMMP's.

TABLE 1: LIST OF PRE-CONSTRUCTION SURVEYS	
Development Consent Order	
Schedule 11, Req 31	**31.**— (1) No stage of the authorised development is to commence until it has been established by existing or further survey work whether any European protected species or nationally protected species is present. (2) Where a European protected species is shown to be present, that stage must only be commenced following appropriate consultation with Natural England and after any necessary licence has been obtained from Natural England pursuant to regulation 53 (licences for certain activities relating to animals or plants) of the Conservation of Habitats and Species Regulations 2010(**a**). (3) "European protected species" has the same meaning as in regulations 40 (European protected species of animals) and 44 (European protected species of plants) of the Conservation of Habitats and Species Regulations 2010.
Compensation Environmental Management and Monitoring Plan (CEMMP)	
Objective C1	Pre-construction survey of suitable habitat for reptiles and water voles
Objective C2	Pre-construction survey of suitable habitat for nesting birds
Objective C3	Pre-construction surveys for badgers
Objective C4	Pre-construction bird surveys to be agreed with NE.
Objective COMP6	Pre-construction surveys of benthos at North Killingholme Marshes (NKM) foreshore
Marine Environmental Management and Monitoring Plan (MEMMP)	
Paragraph 2.4.4	*'Given the potential for further change to saltmarsh extent and associated changes/impacts to adjacent habitat status, a pre-construction reference survey of saltmarsh extent and composition will be undertaken* (on NKM foreshore)'
Appendix 3	*Saltmarsh extent, community, zonation and diversity will be ascertained following EA WFD guidance e.g. OI 200_07 or any subsequent relevant revisions.*
Objective M4	Pre-construction surveys of intertidal benthic invertebrate fauna during Spring and Autumn
Objective M6	Pre-construction surveys of subtidal benthic invertebrate fauna during Spring

Objective M8	Pre-construction intertidal seine net and beam trawl survey of fish communities during Spring and Autumn
ObjectiveM9	Pre-construction subtidal otter trawl survey of fish communities during Autumn
Objective M15	Bathymetric and Lidar surveys of NKM foreshore that will not be lost by reclamation and the CCS foreshore.
Terrestrial Environmental Management and Monitoring Plan (TEMMP)	
Objective C1	Pre-construction surveys of suitable habitat for water vole, bats and great crested newts.
Objective C2	Pre-construction surveys for breeding birds

2.9 The principal reasons for the pre-construction surveys is to establish a contemporaneous baseline for monitoring of the compensation and mitigation measures. Given the dynamic nature of the Humber eco-system, together with the obligations on the Applicant that are already embedded in the DCO and the EMMPs to carry out further baseline surveys at the material time, it has been agreed with NE that no further surveys of any protected species or habitats are required for the purposes of this application.

3 UPDATED HRA TO INCLUDE A DETAILED IN-COMBINATION ASSESSMENT

3.1 The Applicant's proposal does not amend any construction or operational details of the AMEP development ('the Project'); it merely permits a later start than was originally permitted.

3.2 An updated shadow HRA is provided at Attachment 1 of this document. The document is in five parts, *viz*.

Part 1: Assessment of Likely Significant Effects

Part 2: Appropriate Assessment

Part 3: Assessment of Alternative Solutions

Part 4: The Case for Imperative Reasons of Overriding Public Interest

Part 5: Compensation Measures

3.3 An updated in-combination assessment is included in Part 2 but is partly repeated below for ease of reference.

3.4 In short, there are four broad impacts on the Humber Estuary SPA/SAC/Ramsar site habitats and species that arise from the Project alone, viz.

a) The loss of terrestrial fields on Killingholme Marshes which, without mitigation, would have a significant impact on Curlew.

b) Disturbance to North Killingholme Haven Pits, which, without mitigation, would have a significant impact on roosting birds.

c) Raised levels of turbidity from dredging in the estuary which, without mitigation, could have consequential impacts on habitats and species.

d) The direct loss of intertidal and subtidal habitat due to the reclamation of part of the Humber Estuary to construct the quay. This habitat provides a food resource for SPA species, in particular the Black-tailed godwit. Functional loss of adjacent areas of intertidal habitat, also providing a food resource, due to disturbance during construction and operation of the quay will also occur. It has been agreed with NE that these impacts cannot be mitigated and that the Project will give rise to an adverse effect on the integrity (AEoI) of the protected site.

3.5 Whilst these are the impacts of the Project alone, The Habitats Regulations also require an assessment of a project in-combination with the impacts of other plans and projects. This is to avoid a situation arising whereby a series of other projects' impacts that are not significant in themselves become significant when taken together. The in-combination assessment of environmental impacts is undertaken at the appropriate assessment stage; that is, following the implementation of mitigation measures. In this case therefore , it is the **residual effects** of the AMEP project alone that are to be considered in-combination with the **residual effects** of other relevant plans and projects. As it is normal practice to consider only plans and projects for which an application has actually been submitted, it is the reported **mitigated** impacts of the other plans and projects that are to be combined with the **mitigated** impacts of AMEP.

3.6 The in-combination assessment is greatly simplified when a plan or project fully mitigates its impacts on SPA/SAC features as there are then no residual impacts to consider in combination with other plans or projects; the in-combination assessment then becomes, by and large, superfluous. Even where this is not the case, the potential for in-combination effects is often limited by the mere separation distances between projects; noise, for example, which may cause disturbance to SPA species, decays over distance from its source and a large noise

generated on the AMEP site will completely mask the same noise source (eg. piling) generated at a more distant project.

3.7 Relevantly also, the AMEP application is not a completely new application; it was first submitted in 2011, examined in 2012 and determined in 2014. Any plan or project that came forward after 2011 which had a likely significant effect on the Humber Estuary SPA/SAC would have been obliged to undertake an appropriate assessment and consider its own residual impacts in-combination with the mitigated impacts of AMEP. These combined impacts would then have to be reported in that project's HRA and the decision maker would have been obliged to consult with NE on the HRA. This process is tightly regulated (and is justiciable) and the conclusion of other projects' HRAs can be rightly taken as a trusted record of an in-combination assessment of AMEP with those subsequent plans or projects.

3.8 In Letter 3, Natural England has specifically requested that the Applicant's updated shadow HRA consider the impacts of the following projects in-combination with the residual impacts of AMEP:

a) Immingham Eastern Ro-Ro Terminal (IERRT). The HRA for this consented project is here: TR030007-001347-20240815-Immingham_HRA_clean_10.24.pdf

b) Immingham Green Energy Terminal (IGET). The HRA for this consented project is here: TR030008-001434-HRA - Clean Template 2025_Immingham Green-Final.pdf

3.9 Both projects were submitted by Associated British Ports (ABP).

3.10 Letter 3 further asserted the following:

'The Applicant has stated that these projects (IERRT and IGET) "are supported by an HRA which found no in-combination effects with AMEP*". We do not consider that this justification is sufficient in this case, because the in-combination assessments for these two projects* ***did not take into account*** *the currently proposed time extension application for the AMEP DCO'*, (page 3, emphasis added).

3.11 The Applicant finds no evidence for the assertion that the IERRT and IGET assessments were based on the AMEP consent lapsing in October 2024.

3.12 In the case of IERRT, this was consented by the Secretary of State for Transport on 4 October 2024. The Applicant has reviewed both the IERRT HRA and ABP's

own shadow HRA document[5]. Relevantly, in ABP's shadow HRA, AMEP is specifically identified in Figure 5 as a development that is '*relevant to the in-combination assessment'*, and AMEP is specifically mentioned on 34 occasions; for brevity, a typical extract is reproduced below:

'The AMEP project will result in a direct loss of intertidal habitat (mudflat and saltmarsh) as a result of the reclamation of the proposed quay (33 ha). Compensation for this loss will be provided at the Cherry Cobb Sands compensation site. Direct loss of intertidal as a result of the proposed IERRT development will be de minimis (i.e., negligible and ecologically inconsequential) and therefore, with the provision of the compensatory habitat required for AMEP project, there is no additional cumulative effect from the IERRT project that could compromise any of the conservation objectives, and it is concluded that there is no potential for AEOI on qualifying interest features', (Table 37).

It is clear from this extract (and, in fact, from the other 33 references to AMEP within the document) that ABP's shadow HRA does, in fact, contemplate the construction and operation of the AMEP scheme in full at some point in the future and if the timeframe for AMEP were extended this would not affect the conclusion.

3.13 In the SoS's HRA dated 4 October 2024, AMEP is mentioned twice in relation to the in-combination assessment of IERRT with other projects. The HRA states:

'The other pressures NE referred to were considered in the in combination assessment of .. (ABP's) *HRA Report, the Applicant* (ABP) *stressed, and concluded the effects were either insignificant or have already been (or would be) compensated for (in the case of AMEP…)',* (paragraph 5.115).

It is therefore evident that the IERRT HRA had regard to the future development of AMEP in full, including the compensation proposals. The Applicant therefore disagrees with NE that the IERRT HRA in combination assessment has not considered the future development of AMEP. AMEP has been considered and it has been concluded that IERRT has no significant adverse effect on the Humber Estuary SPA/SAC/RAMSAR site in-combination with the effects of AMEP. It invariably follows that the converse is true; AMEP has no adverse effect on the integrity of the protected sites in-combination with IERRT either.

[5] Immingham Eastern Ro-Ro Terminal

3.14 In relation to IGET, this scheme was consented by the Secretary of State for Transport on 6 February 2025. Table 35 of the IGET shadow HRA[6] identified AMEP as a project that was relevant to the in-combination assessment. AMEP is referenced on 36 occasions with the shadow HRA but no significant in-combination effects were concluded. On 18 December 2024, Natural England wrote to the Transport Infrastructure Planning Unit confirming that:

'Natural England's previous concerns about potential ***cumulative and in-combination*** *impacts for this project have been sufficiently addressed in the further information provided* ***within the updated shadow Habitats Regulations Assessment*** *(HRA) and associated documents*

Natural England agree *with the Applicant's conclusions of* ***no adverse effects*** *on integrity of the Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites,* ***both alone and in-combination****',* (emphasis added)[7].

3.15 Plainly, as NE (aware of the proposed extension to AMEP) agrees that IGET has no adverse effects on the integrity Humber Estuary SPA/SAC/Ramsar sites in combination with other projects, then it follows that AMEP has no adverse effect on the integrity of the protected sites in-combination with IGET either.

In-combination Assessment of the Loss of Terrestrial Habitat on Killingholme Marshes

3.16 At the time of the original application, the only SPA feature present on Killingholme Marshes in significant numbers was the Curlew. The TEMMP (Section 3.6) approved by NE pursuant to Schedule 11 Requirement 19(c) of the DCO records that a maximum of 123 Curlew were present on the terrestrial fields in September 2010. To mitigate for the loss of the fields caused by the development of AMEP, an area of wet grassland was to be developed to ensure that all 123 birds could continue to use an ecologically enhanced area of Killingholme Marshes. In other words, the wet grassland would **fully mitigate** for the impacts of the development on the Curlew by providing an undisturbed area of optimal habitat of sufficient

[6] IGET sHRA Deadline 7 Submission

[7] NE Letter to TIPU 181224

size. The enhanced area is known as Mitigation Area A. The original 2014 HRA[8], concluded the following:

'9. The Secretary of State notes Natural England's opinion that Mitigation Area A, taken with the management and monitoring measures to be agreed under the Terrestrial EMMP, is sufficient to avoid an adverse effect on the site integrity of the SPA (PR 10.68). He notes also the Panel's view that the draft Terrestrial EMMP submitted at the end of the examination formed a firm basis for finalising measures that would ***fully mitigate*** ***the impacts on habitats and species of the AMEP development on land at North Killingholme*** *(PR 10.76-78). Since the details of this and the other EMMPs have now been agreed between the applicant and Natural· England, the Secretary of State is satisfied that the Terrestrial EMMP will ensure that the objectives of the mitigation measures relevant to the SPA (as well as other habitats and species) will be achieved'*, (paragraph 9, emphasis and underline added).

3.17 In September 2018, the Applicant sought a non-material change to the DCO, so that mitigation for the Curlew could be provided by wet grassland at Halton Marshes (the Halton Marshes wet grassland scheme or 'HMWG') rather than on Killingholme Marshes.

3.18 On 8 December 2020 NE confirmed, following consultation on the Applicant's proposals, that they were satisfied that '*HMWG is capable of delivering the required mitigation*'[9].

3.19 On 13 May 2021, the SoS approved the non-material change. Before consenting the Change, the SoS undertook a HRA which can be viewed here: TR03001 - NMC - Test for Likely Significant Effects Report

3.20 The HRA contained the following assessment of in-combination effects:

3.22 'The Applicant's Revised sHRA identifies three consented schemes included for consideration as part of an in-combination assessment (Figure 6). The plans and projects identified and considered by the Applicant are:

- *AMEP DCO (S.I. 2014/2935);*

[8] PLANNING ACT 2008

[9] TR030001-003503-201208 Natural England NMC consultation response.pdf

- *ABLE Logistics Park (PA/2015/1264); and*
- *North Killingholme Power Project ("NKPP") (SI2014/3331).*

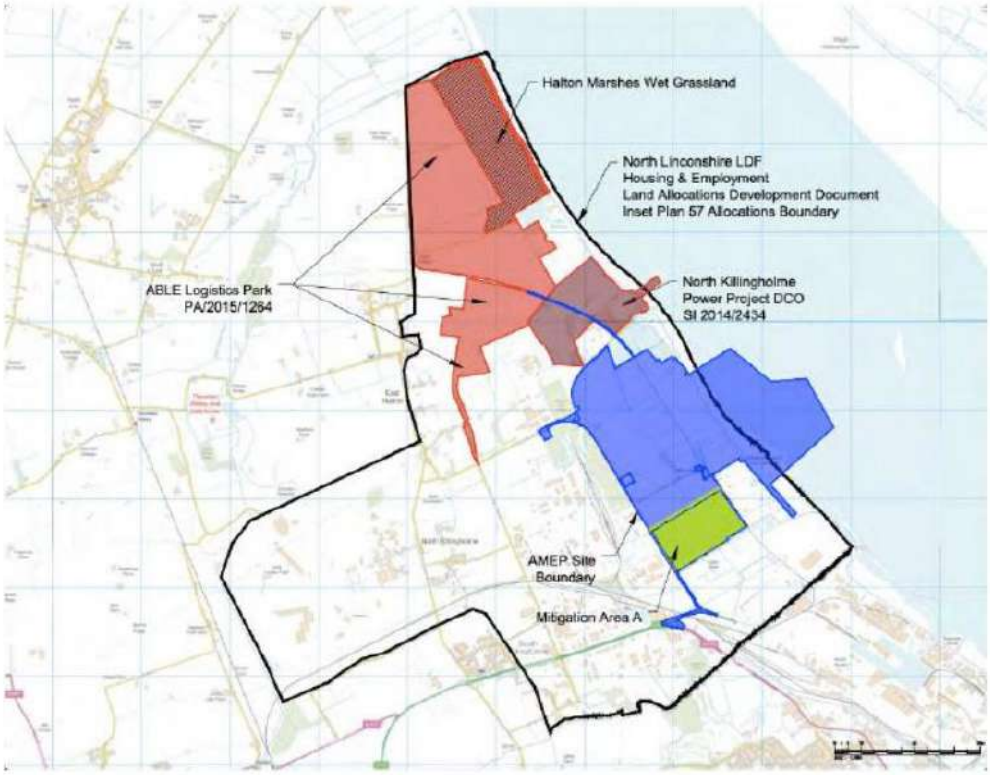


Figure 6. Sites included for in-combination assessment within the Applicant's Revised sHRA

3.23 *The Applicant's Revised sHRA concluded that there would be in-combination effects due to construction disturbance. However, Natural England in their consultation response dated 8 December 2020 concluded that, as the Applicant's Revised sHRA identified no disturbance effects as a result of the Change Application to SPA/Ramsar Site qualifying features (as the construction works at HMWG have already been completed), then it follows that there can be no in-combination LSE. The Secretary of State agrees with Natural England's position and concludes that there are no in-combination effects due to construction disturbance.*

3.24 *In addition to the three consented schemes detailed within the Applicant's Revised sHRA, the Secretary of State has considered within this in-combination assessment the proposed application by Able UK for a monopile factory that currently lies within the current AMEP DCO boundary and Order limits, submitted to North Lincolnshire Council (PA/SCO/2020/3). Part of the development footprint for this proposal extends into Area A (Figure 7). In terms of the Habitats Regulations, the scoping response by North Lincolnshire Council commented that the works are likely to displace*

wintering and passage birds such as curlew using the site for feeding, roosting and loafing, representing a loss of functionally linked land, and the applicant should provide sufficient information to enable North Lincolnshire Council to carry out a HRA. Of note was the request for details of the provision of compensatory habitat at HMWG and confirmation of approval of the Change Application associated with this report. In their scoping response, Natural England supported the comments of North Lincolnshire Council, in particular on gaining confirmation of approval of the Change Application.

Figure 7. Boundary of PA/SCO/2020/03 in relation to Area A

3.25 *The Secretary of State considers that should the Change Application be granted, Area A would no longer be required to be managed as a habitat enhancement area under the AMEP DCO. However, the grant of the Change Application would not authorise the development of Area A. Any impacts arising from PA/SCO/2020/3 or any other future proposal to develop Area A, alone or in combination, will require a separate HRA.*

3.26 *The Secretary of State has concluded, taking into account the position of Natural England (in their responses dated 8 December 2020 and 21 December 2020), that the combination of HMWG already being in situ and*

the nature and current agricultural land use of Area A remaining unchanged within the Change Application indicates that there is no pathway for LSE on any European site alone and this lack of pathways for LSE alone therefore also applies for the in combination assessment.

3.27 ***Therefore, the Secretary of State is content that all plans and projects with the potential to have significant in-combination effects with the Change Application in terms of the HRA have been identified, and that there are no in-combination LSE for the Humber Estuary SAC, SPA or Ramsar Site.'***

3.21 Since the baseline surveys in 2010, the terrestrial fields on Killingholme Marshes have been developed in accordance with planning permissions obtained from North Lincolnshire Council (NLC) (planning references PA/2013/0519 and PA/2014/0512). This has depleted the available grassland habitat at North Killingholme and subsequent bird counts, including counts in 2023, have always recorded fewer than 123 Curlew.

3.22 HMWG was actually constructed in 2018/19 pursuant to NLC planning permission PA/2016/649, and the site is now functional. Regular monitoring of the HMWG site, including bird counts, is being undertaken in accordance with the TEMMP. Counts undertaken since 2019 have established that HMWG is already supporting more than 123 Curlew.

3.23 In summary there are no residual adverse effects on SPA species that used to rely on Killingholme Marshes for roosting and foraging as full mitigation has been established at HMWG and is proven to be effective. IERRT and IGET are both far too remote to cause disturbance to the mitigation site at Halton Marshes and do not need to, and don't, include any mitigation for potentially disturbing effects of birds using the HMWG site.

3.24 In a sentence: the conclusions of the original 2014 AMEP HRA remain valid; impacts on Curlew historically using Killingholme Marshes are fully mitigated, and there are no possible in-combination effects on Curlew with other plans and projects.

In-combination Assessment of Disturbance to North Killingholme Haven Pits

3.25 North Killingholme Haven Pits provides an important roost site for SPA species. The approach by the Applicant in the original application was to avoid disturbing the birds using this Site. Schedule 11 the DCO contains requirements that protect the Pits from disturbance. Specifically, Requirement 42 states the following:

Mitigation site requirements

***42.**—(1) During the construction and operation of the authorised development, no storage, use of plant or other development is to take place—*

(a) at a height greater than 3 metres from ground level within 70 metres of the North

Killingholme Haven Pits Site of Special Scientific Interest; or

(b) at a height greater than 6 metres from ground level between 70 metres and 150 metres from the North Killingholme Haven Pits Site of Special Scientific Interest; or

(c) at a height greater than 9 metres from ground level between 150 metres and 200 metres from the North Killingholme Haven Pits Site of Special Scientific Interest; or

(d) at a height greater than 10 metres from ground level within the 60 metre operational buffer strip adjacent to Mitigation Area 'A' (identified in the terrestrial environmental monitoring and management plan),

unless otherwise agreed by the relevant planning authority in consultation with Natural England.

(2) Before any activity referred to in sub-paragraph (1) takes place on the Order land, the buffer areas referred to in sub-paragraph (1) must be clearly marked on-site (by pegs or otherwise) to the written satisfaction of the relevant planning authority.

(3) Noise resulting from the construction and operation of the authorised development must not exceed 65 dB (A) at the boundary of the North Killingholme Haven Pits Site of Special Scientific Interest, unless otherwise agreed by Natural England based on the findings of the monitoring programme and taking account of the noise level duration.

…

(5) The terrestrial environmental management and monitoring plan must include a monitoring programme to ensure compliance with the noise levels and the container storage locations and heights specified in this paragraph.

3.26 The original 2014 AMEP HRA recorded that:

'in order to safeguard the significant numbers of SPA bird populations supported by the North Killingholme Haven Pits SSSI from visual and noise disturbance,

measures to control the use of land adjacent to the SSSI will be secured by requirement 42 in Schedule 11 to the Order', (paragraph 8). And,

*'With regard to the **disturbance effects on SPA birds** during the construction and operational phases of the AMEP development as a result of noise, lighting and visual effects, the Secretary of State notes from section 4.3 of the SoCG that Natural England and the MMO agree that those adverse effects **can be avoided by the inclusion of appropriate mitigation**. He is satisfied that **appropriate mitigation** of those effects **will be secured by the control**s on piling under conditions 37 to 43 of the DML, and by the controls **on lighting and noise and the proposed operational buffers adjacent to** Mitigation Area A and **North Killingholme Haven Pits** provided for in requirements 22, 24, 25 and 42 of Schedule 11 to the Order'*, (paragraph 14, emphasis added).

3.27 At the time of the original HRA there were no other projects proximate enough to NKHP to add to the effects generated from the AMEP scheme (Paragraph 6.7.4 of the Applicant's HRA Report[10]). However, subsequent to AMEP being consented the North Killingholme Power Project (NKPP) was consented. This project includes activities that could also potentially disturb NKHP.

3.28 Relevantly therefore, the NKPP HRA[11] records the following:

*'NE advised that potential disturbance to North Killingholme Haven Pits from the Project should be considered **in combination with** potential disturbance from **AMEP.** However following the further mitigation applied where necessary, **NE** then **agree that there are no** longer any **significant in-combination effects**'*, (paragraph 8.2).

3.29 This particular extract both records that only AMEP needed to be considered in combination with NKPP in relation to disturbance at NKHP and that with NKPP mitigation secured, there was no significant in-combination effect with AMEP. No other projects have come forward since NKPP was consented that are sufficiently proximate to NKHP to add to the disturbance effects of NKPP and AMEP, so the extant NE advice remains valid. Any future projects will, of course, need to make their own assessment of impacts on NKHP.

[10] Normal template

[11] EN010038-001489-Habitats Regulations Assessment.pdf

3.30 In summary there are no effects of other projects that might cause disturbance to NKHP in-combination with AMEP. For the avoidance of doubt, both IERRT and IGET are far too remote to cause disturbance to NKHP.

In-combination Assessment of Capital and Maintenance Dredging

3.31 Dredging and dredge disposal operations create sediment plumes that cause increased concentrations of suspended sediment within the Humber waterbody. These sediment plumes could have consequential impacts on habitats and species that are features of the SPA/SAC. Notably however, the estuary already has high levels of suspended sediment and the original 2014 HRA reported:

*'11. The Secretary of State agrees with the Panel that the **AMEP** development **will not have adverse effects on the qualifying features** of the European sites (including the SPA and Ramsar site) **directly from capital dredging**. He agrees also that the potential for adverse **in-combination or cumulative effects** over the long-term from maintenance dredging and the disposal of materials **from capital and maintenance dredging can be avoided** by compliance with the monitoring regime under the Marine EMMP. This will be secured by condition 15 of the proposed Deemed Marine Licence in Schedule 8 to the Order ("the DML") and requirement 17 in Schedule 11 to the Order'*, (Paragraph 11, emphasis added)

3.32 In 2021, Appendix UES8-1[12], *'Sediment Plume Dispersion from Dredging'* submitted as part of the Material Change 2 application reported the effects from dredging as follows:

*'Except for the dredging location itself, all of the predicted increases in suspended sediment concentration caused by the dredging activity are **small compared with the natural variation in suspended sediment concentrations** which has been measured to be up to 3,300 mg/l on spring tides',* (Executive Summary, penultimate bullet point, emphasis added).

3.33 The HRA for Material Change 2[13] confirmed that:

*'On the basis that the Proposed Changes **have not resulted in any materially different effects** to the AMEP DCO, the Secretary of State agrees with the ExB and sees no reason to either amend the existing mitigation or secure any further*

[12] TR030006-000151-TR030006-APP-6A-8-1.pdf

[13] MC2 HRA

additional mitigation. The Secretary of State agrees with the ExB's conclusions', (Section 5.4, final paragraph, emphasis added).

3.34 In relation to IERRT , it has already been noted above that the HRA found no significant effect of that project in-combination with any other projects. This conclusion obviously includes the in-combination effects of dredging. There should be no need for the Applicant to repeat that assessment exercise and rehearse the arguments afresh, as that assessment has been subject to extensive consultation with NE already. The conclusion can be taken as read.

3.35 In relation to IGET, the shadow HRA repeatedly refers to elevated suspended sediment concentrations due to capital and maintenance dredging as being '*localised and temporary',* and '*of a magnitude that can occur naturally'*. The Applicant's own assessment detailed in Appendix UES8-1 (noted above), fully concurs with this assessment. The localised and temporary nature of the impacts of elevated suspended sediment concentrations, and the fact that such concentrations lie within or very close to natural levels, plainly militates against adverse in-combination effects. The HRA concluded:

'94. The Secretary of State agrees with the conclusion drawn in Table C within Appendix C of the Recommendation Report that concluded no AEoI, alone or in combination with any other plans or projects for any of the European sites discussed, where no IPs disputed this conclusion during the Examination.

95.The Secretary of State has also had regard to those issue which were disputed during the Examination, and has had regard to the additional representations from the Applicant and the relevant IPs. ***She is content to conclude no AEoI on these impact pathways on all designated sites identified, alone or in combination with other plans or projects****.'*

3.36 In summary, there are no significant effects that arise from dredging activity at AMEP in combination with dredging activities elsewhere in the estuary because the activities will be separated by distance and because, remote form the dredger itself, the effects will be within the natural range.

In-combination Assessment of the loss of Intertidal and Subtidal Habitat

3.37 AMEP **alone** results in a significant loss of SAC/SPA habitat from the NKM foreshore. This is recorded in the original 2014 HRA as follows:

'The Secretary of State agrees with the Panel that the AMEP development is likely to have a significant adverse effect on the Humber Estuary SPA and Ramsar site, having regard to the core purpose of their designations, namely the protection of

habitats of importance for migratory birds. He notes that construction of the new quay will lead to a reduction in the extent and distribution of estuarine and inter-tidal habitat, including the loss of food supply from 31.5 hectares of inter-tidal mudflat; and that an additional 11.6 hectares of mudflats is likely to have reduced functionality as a result of disturbance', (paragraph 12).

3.38 In addition to these impacts, the HRA (paragraph 6) noted that 13.5 hectares of subtidal (estuarine) habitat would be lost. This loss was reduced to 10.4 ha, pursuant to Material Change 2.

3.39 These impacts, **both the habitat loss and the consequential displacement of over-wintering birds**, cannot be mitigated and compensatory measures were therefore agreed with Natural England for these particular adverse impacts of AMEP alone. The compensation measures do not prevent the AEoI. Compensation measures are intended to offset the residual negative effects of AMEP so that the overall ecological coherence of the National Site Network is maintained. There is no requirement for an in-combination assessment of these impacts as it is agreed that AEoI arises from the project alone and will inevitably persist as it cannot be mitigated. Compensation to address this impact alone has been agreed.

3.40 The original 2014 HRA reviews various risks that might arise from permitting the development and adopting the compensation measures but concludes that the risks are acceptable, refer to the extract below:

'*49. The Secretary of State notes and agrees with Natural England's advice that there is a residual risk that the applicant's compensatory measures might not work. He is however satisfied that the risk has been adequately mitigated'*, (paragraph 49).

3.41 It is to be expected that risks arise from any compensation proposal as compensation proposals do not guarantee that a project will not adversely affect the integrity of a protected site. They are, in fact, required precisely because the project will have an AEoI. With that in mind, the risks identified by NE in their consultation correspondence are no different or greater than those considered in the original 2014 HRA.

4 TIMELINE FOR DELIVERY OF THE OVER COMPENSATION SITE AT CHERRY COBB SANDS

4.1 East Riding of Yorkshire Council granted a new planning permission for the overcompensation site at Cherry Cobb sands on 1 November 2024, planning reference 23/01384/STPLF.

4.2 The Applicant has agreed with Natural England that development of this site will commence at least 7 months before Work No.1, in line with the timeline for the compensation site.

4.3 A draft update of the CEMMP, which incorporates the changes arising from the new planning permissions and the proposed benthic modelling is included at Attachment 3 of this response.

5 TIMELINE FOR DELIVERY OF BENTHIC MODELLING FOR THE CEMMP

5.1 The Applicant has agreed the following timeline with Professor Richard Stillman of Bournemouth University.

a. Agree Brief with NE– Q2/25

b. Undertake modelling – Qs 3&4/25

c. Reporting Q1/26

d. Update CEMMP Q2/26

ATTACHMENT 1.0 AMEP DRAFT CONSULTATION HRA, MARCH 2025

1.1 - AMEP DRAFT CONSULTATION HRA; PART 1

(Tracked changes from submission in 2024)

Able Marine Energy Park: Article 7 Extension of Time

Habitats Regulations Assessment Report

Part 1: Likely Significant Effect (LSE) Test

DRAFT FOR CONSULTATION v.4

Ecology Consulting Report to Able UK Ltd

~~*February 2024*~~

April 2025

Executive Summary

This document sets out the assessment of the likely significant effects of the proposed Article 7 extension of time for the Able Marine Energy Park Project on the network of Natura 2000 European protected ecological sites, also known as "the National Site Network". It provides the necessary information to enable Natural England, as the Government's statutory nature conservation body, to advise on the potential impacts of the project and, in particular, whether an appropriate assessment is required.

This proposed time extension is to allow the development consented under the AMEP Material Change 2 application in July 2022 to be completed, or substantially commenced, within 17 years from the coming into force of the DCO (a time extension of 7 years). The original DCO came into force on 29 October 2014.

The requirement for this Assessment is set out under Article 6 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, (the 'Habitats Directive'). Article 6 requires that any plan or project which is not directly connected to, or necessary to the management of the National Site Network and which is likely to have a significant effect on the conservation objectives of the site, either individually or in combination with other plans and projects, should be subject to an appropriate assessment. Article 6(3) is fully transposed in English law by Requirement 63 of the Conservation of Habitats and Species Regulations 2017 (SI2017/1012).

This Assessment has been prepared with due consideration given to the information provided in Planning Inspectorate's (PINS) tenth advice note on 'Habitat Regulations Assessment relevant to nationally significant infrastructure projects (NSIP)'.

The proposed time extension to the Able Marine Energy Park Project was considered to have the potential to have effects on the Humber Estuary SPA, the Humber Estuary Ramsar site and the Humber Estuary SAC. It [E11][SP2]concludes Likely Significant ~~Effects~~Effect (LSE) for eight of the qualifying SPA/Ramsar species (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, shelduck and redshank) and for six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal).

There would also be LSE for the Humber Estuary SAC, for its (a) estuarine habitat; (b) intertidal mudflat, (c) *Salicornia* and other annuals colonising mud and sand; (d) Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*); (e) grey seal and (f) river lamprey and sea lamprey populations. These are also qualifying features of the Humber Estuary Ramsar site.

The same conclusions were reached in the HRA Information Report for the original consented application[1] and for the consented Material Change 2[2].

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000572-16%20-%20Habitat%20Regulations%20Assessment%20Report%20(15).pdf

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000531-TR030006%20-%20HRA%20Report.pdf

1. Introduction and Background

1.1. This report forms part of the application for a time extension to the consented Able Marine Energy Park Development (referred to hereafter as the 'Project'). It addresses the nature conservation issues raised by the Project, specifically in relation to the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). It comprises the first part of the information to inform the Habitat Regulations Assessment (HRA) for the project, and considers the proposal's potential to have likely significant effects (LSE) on relevant sites of international nature conservation importance.

1.2. The document is set out as follows:

- A brief overview of the Project;
- An outline of the HRA process;
- A summary of information on the designated sites of nature conservation interest to be included in the HRA;
- An update to the baseline for all of the SPA/Ramsar/SAC populations/communities, including:
  - Changes to baseline habitats
  - Changes to baseline bird numbers
  - Changes to development baseline for cumulative
- An assessment of whether the proposed Time Extension to the Project would have a likely significant effect with regard to the designated features of the international sites under consideration, or on any designated feature's supporting habitats and species.

1.3. The purpose of the report is to ~~update~~re-assess the ~~previous HRA that was undertaken~~likely significant effects of the scheme determined for ~~the DCO and for the~~ Material Change 2~~. Those HRAs~~ (MC2). The MC2 HRA could not rule out LSE for a range of qualifying features of the Humber Estuary SPA/Ramsar site, so ~~Appropriate Assessments were~~an appropriate assessment was undertaken by the Secretary of State for Transport. ~~They~~This concluded that an adverse effect on integrity could not be discounted with the required degree of certainty. The Project was determined to be both needed and having imperative reasons of overriding public interest (IROPI), and a compensation scheme was agreed. [3]

1.4. Brexit has made no change to the process of HRA so far, so for simplicity the previous language and references to EU Directives are retained in this assessment.

Outline of the Habitats Regulations Assessment Process

1.5. The EU Directive 92/43/EEC on the conservation of habitats and of wild flora and fauna (known as the 'Habitats Directive') protects habitats and species of European nature conservation importance. Together with Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive'; European Commission 2009), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation (SACs) and Sites of Community Importance (SCIs) are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and

[3] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002225-SoS%20Decision%20letter%20with%20annexes.pdf~~
MC2 HRA

migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites, which are hereafter referred to as 'European Sites'. The term 'European Site' also includes European Marine Sites.

1.6. The Habitats Regulations incorporate all SPAs into the definition of 'European sites' and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

1.7. In addition to sites designated under European nature conservation legislation, it is UK Government policy that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them. The Government also affords the same level of protection to potential SPAs (pSPAs) and proposed SACs (pSACs).

1.8. Regulation 63 of the 2017 Conservation of Habitats and Species Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if the proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 63(1)).

1.9. The Planning Inspectorate (PINS, November 2017) published version 8 of its tenth advice note, on '*Habitat Regulations Assessment relevant to nationally significant infrastructure projects*'[4]. The note sets out non-statutory advice, information and recommendations on the approach to the Habitats Regulations assessment. The note should be also read in conjunction with the Habitats Directive, the Habitats Regulations (as amended), relevant Government Planning Policy, and non statutory European guidance applicable in English law before 31.12 20 (exit day). It recommends a four-stage process:

i. Screening: Determining whether the plan or project '*either alone or in-combination with other plans or projects*' is likely to have a significant effect on a European site (or sites);

ii. Appropriate Assessment: Determining whether, in view of the European site's conservation objectives, the plan or project *'either alone or in-combination with other plans or projects*' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed; and

iii. Mitigation and Alternatives: Where the plan or project is assessed as having an adverse effect (or risk of this) on the integrity of a site, there should be an examination of mitigation measures and alternative solutions. Mitigation should be considered first, so as to avoid an adverse effect if possible.

iv. If it cannot be proven that there is no adverse effect on site integrity, it must be demonstrated that no alternatives to the proposal exist and then imperative reasons of overriding public interest (IROPI) can be considered. This is not considered a standard part of the process and will only be carried out in exceptional circumstances. If consent is granted at this stage compensation is required to ensure the coherence of the Natura site network.

1.10. All four stages of the process are referred to cumulatively as the Habitats Regulations Assessment, to clearly distinguish the whole process from the step within it referred to as the 'Appropriate Assessment'.

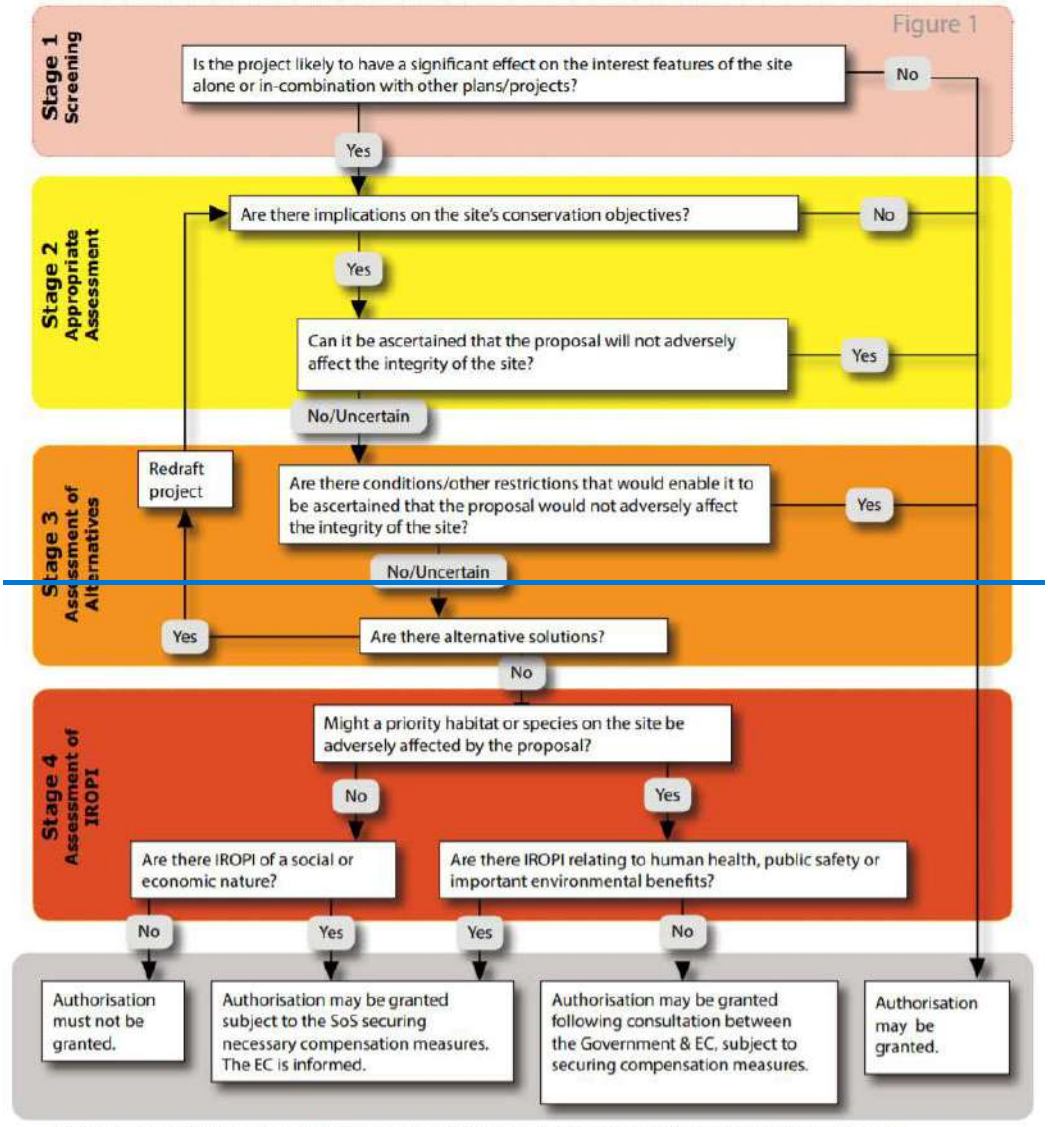
1.11. Non statutory guidance is further provided ~~in Natural England's Standard: HRA Habitats Regulations Assessment (HRA) (NESTND026),~~by DEFRA (2024)[5], including on the 'Determination

[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf

[5] https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-habitats-regulations-assessments

of Likely Significant Effects under the Habitats Regulations'~~–~~. This involves a preliminary consideration of whether a qualifying feature is likely to be directly, or indirectly, affected (in which case there is a procedural presumption that a significant effect is likely). In such a case, a fuller consideration should then be applied, using further analysis and information, to confirm and justify the presence or absence of Likely Significant Effects. A Likely Significant Effect is, in this context, any effect that may be reasonably predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated~~,~~ but excluding trivial or inconsequential effects. The English courts have also clarified that likely involves real risk and probability, not hypothetical scenarios, which is also captured in Defra's Guidance (Habitats Regulation Assessment: Protecting a European Site).

1.12. Figure 1 is reproduced from ~~Advice Note Ten~~DEFRA (2024) guidance and shows how effects on European sites are considered.



Adapted from Defra (2012) Report of the Wild Birds and Habitats Directives Implementation Review (Annex E) - It is assumed for the purposes of this advice note that the project is not directly connected with or necessary to the management of the site.

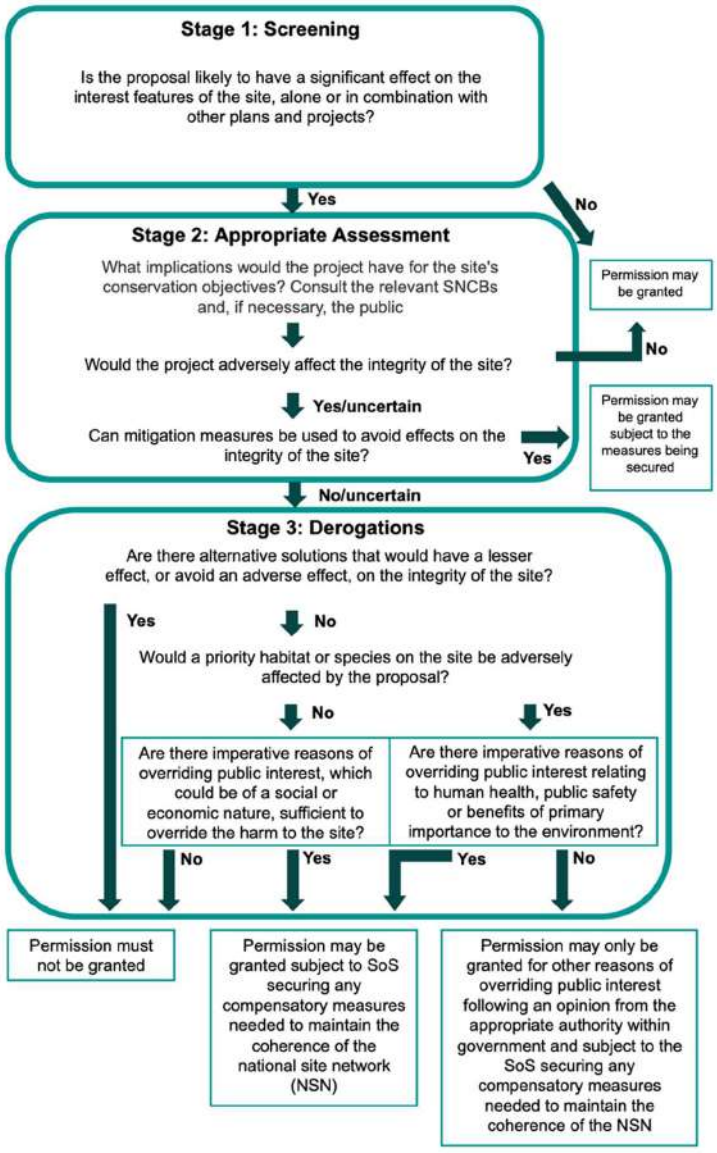


Figure 1. Consideration of projects affecting European sites

2. Project Description

Introduction

2.1. A description of the consented Project is set out in (1) Chapter 2 of the shadow HRA Information Report submitted by the Applicant with the original application in December 2011[6] ~~(see footnote 1),~~ and (2) the proposed material changes in Chapter 4 of the Updated Environmental Statement (UES) submitted with that application[7].[E13][SP4] Further information on the proposed time extension is given in the Environmental Review Report[8] submitted with this application.

2.2. The proposed Time Extension would make no changes to the Material Change 2 scheme as consented in July 2022~~, but~~. It simply ~~extend~~extends the time period over which that project would be constructed by an additional 7 years to 29 October 2031. This would allow ~~the~~ development to be completed, or substantially commenced, within 17 years from the coming into force of the Order.

~~2.3. No changes are proposed to the compensation measures already consented by the Secretary of State for the loss of intertidal and estuarine habitat and its possible consequential effects on the waterbird assemblage.~~

~~2.4. No new operations are proposed as part of the Time Extension, and consequently, there would be no additional noise disturbance.~~

[6] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000572-16%20-%20Habitat%20Regulations%20Assessment%20Report%20(15).pdf~~ 2011 Shadow HRA

[7] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000126-TR030006-APP-6-4.pdf~~ MC2 UES CHAPTER 4 - DESC OF CHANGES TO DEV

[8] ~~https://www.ableuk.com/sites/port-sites/humber-port/able-dco-extension/~~

3. Consultation

3.1. Able Humber Port Ltd has consulted widely on this proposed time extension~~, including;~~ the ~~production of an Environmental Review. The~~ consultation material is available at: https://www.ableuk.com/sites/port-sites/humber-port/able-dco-extension/.

3.2. Natural England ~~did not respond~~submitted three written responses to the consultation~~, but North Lincolnshire Council confirmed that~~ as recorded below:

a) Letter dated 6 June 2024 (5 pages)[9]

b) Letter dated 13 August 2024 (1 page)[10]

c) Letter dated 1 October 2024 (9 pages)[11]

~~3.2.~~3.3. The Department for Transport ('the ~~"local planning authority has no objections to raise with respect to~~DfT') issued a decision on the ~~proposed time extension", and that "~~application on 28 October 2024. At paragraph 12 of their decision letter, the ~~LPA agrees with~~DfT set out a request for information in order to further consider the ~~conclusions of~~ application. In the ~~review in that the proposed extension to the implementation~~interim period ~~is unlikely to result~~, pending the Applicant's provision of this further information, the 10-year time limit specified in ~~new or materially different environmental impacts and that~~Article 7 of the ~~necessary mitigation is already secured and/or is~~DCO was extended for 1 year, although no new works may start in ~~situ.~~"that period.

3.4. ~~ABP recommended~~Specifically, paragraph 12 of the ~~inclusion~~decision letter states:

12. To address the concerns raised by Natural England set out above, the Secretary of State requests the following information:

Updated ecological survey work

Update HRA to include a detailed in combination assessment

Provide a timeline in relation to the delivery of the overcompensation site at Cherry Cobb Sands

Provide a timeline in relation to the delivery of the benthic modelling for update of the CEMMP.

3.5. Following receipt of the decision, a meeting was held between NE and Able Humber Ports Ltd on 27 November 2024 to agree the scope of additional ~~Wetland Bird Survey (WeBS) data for~~ works necessary to respond to the DfT Subsequent to that, NE has provided further comments on updated draft submissions in letters dated 5 March and 8 April 2025. The Applicant has sought to address all NE comments~~2020/21 and 2021/22. These have been included~~ in this report (~~see Tables 3,~~version 4~~, 10 and 11 below).~~).

~~3.3.~~

[9] Natural England Response 1
[10] Natural England Response 2
[11] Natural England Response 3

4. Site Screening Methodology

4.1. The screening process has initially considered all European sites (SPAs, SACs and Ramsar sites, including potential SPAs and proposed SACs as well as fully designated ones) within a ~~20km~~20 km search zone from the Project. Further consideration of more distant sites was undertaken to investigate where there could be any ecological link to the Project.

4.2. For avifauna**,** a worst-case approach has been adopted, assuming that all birds using the Humber Estuary and its functionally linked habitat within ~~1km~~1 km of the Project site could potentially be affected by the proposed development. This represents a worst case for the purposes of this report at this stage of the assessment.

4.3. For features considered under the term 'benthic ecology' a screening range of 20km is considered to be sufficient at this stage.

4.4. For marine mammals, it is standard practice to apply different screening ranges together with consideration of potential for site connectivity. For seals, such ranges are linked to potential foraging ranges/project level modelling (primarily underwater noise modelling), together with consideration of site connectivity determined from at sea usage data. For cetaceans, interest would be limited to the Southern North Sea SAC – which at ~~35km~~35 km distance is located further from the project than the maximum screening range (~~26km~~26 km) that applies to the site (JNCC 2020).

4.5. ~~Up to date~~Available baseline data have been used to determine which qualifying features occur within potential impact zone of the Project, and the importance of those features in the context of their European site populations. No new information has been brought forward for the benthic fauna, seals or lamprey. Whilst the age of the existing benthic data is acknowledged, it has been agreed with Natural England that pre-construction surveys will be carried out to establish a baseline that will inform targets for benthos in the compensation measures, as set out in the CEMMP. Numerous fish surveys have established the absence of lamprey on most occasions and further surveys would prove no useful purpose. Finally, the main haul out area for seals is at Donna Nook at the mouth of the Humber. Whilst seals are occasional visitors within the Humber, they are not present in sufficient numbers to justify bespoke survey effort within the environs of the Project site.

4.6. The categories used to report the conclusions of the screening assessment were as follows:

- **No Likely Significant Effect** - based on available information on the Project and its potential effects, it is considered that there would be no reasonable scientific doubt about the absence of a likely significant effect, either alone or in combination, with respect to the identified feature and site. This determination is based on a number of factors, but mainly the distance between the Project and the designated area and the lack of any direct or indirect impact pathways that could affect the site's designated features;
- **Likely significant effect** – based on available information the Project would have an impact, either alone or in combination, upon designated features and could lead to significant adverse temporary or long-term change.

5. Plans and Projects to be Considered In-Combination

5.1. The projects considered in-combination in the Time Extension application are as follows (those considered in the original application were as set out in the HRA information Report at Section 4.12 (see footnote 1), and those for the Material Change 2 in Section 5.1 of that HRA):

- Able Logistics Park – PA/2015/1264 – North Lincolnshire Council
- North Killingholme Generating Station (DCO Application) - Development of a thermal generating station
- Hornsea Offshore Wind Farm (Zone 4) Project 2 (DCO Application)
- Yorkshire Energy Park (17/01673/STOUTE – East Riding of Yorkshire Council)
- Outstrays to Skeffling Managed Realignment Site;
- South Humber Gateway Mitigation Areas (including Cress Marsh, Novartis and the former Huntsman Tioxide site).
- The Immingham Open Cycle Gas Turbine Order 2020 (DCO) – Construction of a new Open Cycle Gas Turbine Power Station.
- Erection of a monopile manufacturing facility – PA/2021/1525 (consented).
- AHP Ltd Enabling Works South – PA/2023/502 – North Lincolnshire Council.
- VPI Power – post-combustion carbon capture plant – PA/2023/421
- ABP Westgate Immingham – PA/2022/1223.

5.2. Consideration has also been given to the possible inter-related effects of construction and operation on the Project site at the same time (as part may become operational at the same time as construction continues in other parts).

[E15][E16][SP7]

~~6.~~5. Designated Sites Potentially Affected by the Project

~~6.1.~~5.1. All European protected sites (designated and proposed) within 20km of the Project have been considered in this assessment. Further consideration has also been given to more distant sites where there could possibly be an ecological link to the Project site. There has been no change to the list of European protected sites considered in the original application and the Material Change 2.

Humber Estuary SPA

~~6.2.~~ The AMEP Project lies partly within the Humber Estuary SPA.

5.2. The SPA qualifying features, as set out in its citation, are given in Table ~~2~~1.

Table 1. Information on populations of internationally important species of birds under the Birds Directive using the Humber Estuary European marine site.

ARTICLE 4.1 QUALIFICATION (79/409/EEC): Internationally important populations of regularly occurring Annex 1 species:

Species	Population (5-yr mean of peaks)	Period	International and national importance
Avocet	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff	128 individuals – passage	5 year peak mean 1996-2000	1.4%
Bittern	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern	51 pairs – breeding	5 year mean 1998-2002	2.1%

ARTICLE 4.2 QUALIFICATION (79/409/EEC): Internationally important populations of regularly occurring migratory species:

Species	Population (5-yr mean of peaks)	Period	International and national importance
Shelduck	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *brittanica*
Knot	18,500 individuals – passage	5 year peak mean 1996 – 2000	4.1% *islandica*
Dunlin	20,269 individuals – passage	5 year peak mean 1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank	7,462 individuals – passage	5 year peak mean 1996 – 2000	5.7% *brittanica*

ARTICLE 4.2 QUALIFICATION (79/409/EEC): Internationally important assemblage of waterbirds:

Importance	Population (5-year mean of peaks 1996/97 – 2000/01)
Humber Estuary SPA supports large populations (>20,000) of wintering waterbirds	In the non-breeding season, the area regularly supports 153,934 individual waterbirds, including dark-bellied brent goose, shelduck, wigeon, teal, mallard, pochard, scaup, goldeneye, bittern, oystercatcher, avocet, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, ruff, black-tailed godwit, bar-tailed godwit, whimbrel, curlew, redshank, greenshank and turnstone.

~~6.3.~~5.3. The conservation objectives for this site are:

- *"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, and subject to natural change:*
  Ensure that the integrity of the site is maintained or restored as appropriate, and ensure

that the site contributes to achieving the aims of the Wild 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 populations of the qualifying features;*
- *The distribution of the qualifying features within the site."*

~~6.4.~~5.4. Further details on these conservation objectives are contained in the Supplementary Advice on Conservation Objectives[12].

~~6.5.~~5.5. In addition to the above bird species, the SPA also affords protection to their supporting habitats, which have been identified by Natural England in their Advice on Operations[13] as follows:

- Annual vegetation of driftlines (sand and shingle)
- Artificial structures such as derelict pier/jetty structures, flood defences
- Coastal lagoons
- Freshwater and coastal grazing marsh
- Freshwater and tidal reedbeds
- Freshwater wetlands
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal mixed sediments
- Intertidal sand and muddy sand
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Sand dunes
- Supralittoral sand and shingle
- Tidal reedbeds
- Water column

~~6.6.~~5.6. This includes functionally linked habitat outside SPA boundary as well as areas within the SPA.

Humber Estuary Ramsar site

~~6.7.~~5.7. The Humber Estuary Ramsar site is largely coterminous with the SPA, and the Project lies partly within the Ramsar site. Its qualifying features include:

[12] https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9006111&SiteName=humber&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&HasCA=1&NumMarineSeasonality=15&SiteNameDisplay=Humber%20Estuary%20SPA#hlco

[13] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/520290/SAC-feature-descriptions.pdf

- Range of important estuarine habitats;
- Internationally important non-breeding waterbird assemblage;
- Internationally important non-breeding populations of shelduck, golden plover, knot, dunlin, bar-tailed godwit, black-tailed godwit and redshank;
- Important migration route for river lamprey and sea lamprey;
- Breeding grey seals;
- Natterjack toad.

~~6.8.~~5.8. The citation for the Humber Estuary SPA is given in Appendix 1, and that for the Ramsar site in Appendix 2.

Greater Wash SPA

~~6.9.~~5.9. This marine SPA lies 18km from the project at its nearest point. Its qualifying features comprise three breeding bird species (Sandwich tern, common tern and little tern) and three non-breeding species (red-throated diver, little gull and common scoter).

~~6.10.~~5.10. Given its qualifying features, its distance from the Project and the nature of the proposed project, together with the clear lack of any ecological link, it can be safely concluded that there would be no LSE on this SPA, so it is not considered further in this report.

Humber Estuary SAC

~~6.11.~~5.11. AMEP lies partly within the Humber Estuary SAC. Annex I habitats that are a primary reason for the designation of the site include:

- estuaries (including sub-tidal habitat); and
- mudflats and sandflats not covered by seawater at low tide.

~~6.12.~~5.12. Other Annex I habitats that are present as qualifying features but are not a primary reason for the designation include:

- sandbanks which are slightly covered by seawater all the time;
- coastal lagoons;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*);
- embryonic shifting dunes;
- shifting dunes along the shoreline with *Ammophilia arenaria (*'white dunes');
- fixed dunes with herbaceous vegetation ('grey dunes'); and
- dunes with *Hippophae rhamnoides*.

~~6.13.~~5.13. Grey seals *Halichoerus grypus*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* are Annex II species present in the Humber Estuary and are a qualifying feature, but not a primary reason for the site selection.

~~6.14.~~5.14. The Humber Estuary SAC Conservation Objectives are as follows:

- 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 of 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.

~~6.15.~~5.15. The citation for the Humber Estuary SAC is given in Appendix 3.

Southern North Sea SAC

~~6.16.~~5.16. The Southern North Sea SAC lies approximately ~~35km~~35 km from the project at its nearest point and has been designated for the Annex II species harbour porpoise only. The distance between the SAC and the project exceeds the maximum screening range of ~~26km~~26 km (JNCC 2020). Given the available information, it can be safely concluded that there would be no potential for LSE on the harbour porpoise feature of the SAC and the site is not considered further in this report.

Wash and North Norfolk Coast SAC

~~6.17.~~5.17. The Wash and North Norfolk Coast SAC lies approximately 68km from the project at its nearest point and has been designated for a number of Annex I habitats, together with the Annex II species harbour seal as a primary reason for site selection. The distance between the SAC and the project is within the likely foraging range of harbour seal (120km, Thomson *et al* 2016, MMO 2018), though at sea usage data does not indicate any site connectivity between the SAC and the Humber (MMO 2018). Given the available information, it can be safely concluded that there would be no potential for LSE on the harbour seal feature of the SAC and the site is not considered further in this report.

Berwickshire and North Northumberland Coast SAC

~~6.18.~~5.18. The Berwickshire and North Northumberland Coast SAC, located about 210km from the project, includes the Annex II species grey seal as a primary reason for selection of the site. The distance between the SAC and the project lies well beyond the likely maximum foraging range of grey seal (145km, Thompson *et al*, 1996, MMO 2018). Further, at sea usage data does not indicate any site connectivity between the SAC and the Humber (MMO 2018). Given the available information, it can be safely concluded that there would be no potential for LSE on the grey seal feature of the SAC and the site is not considered further in this report.

~~6.19. Additional consideration has also been given to the shipping routes that would be used to service the Project. This included an assessment of the possible noise and visual disturbance effects on any SPAs/SACs through which these routes may pass in UK waters.~~

~~6.20. Given that the large majority of shipping movements related to the Project would be directly to/from Europe or the offshore wind development sites, they would not likely to pass regularly through any other UK SPAs or SACs, and would not therefore result in any LSE.~~

~~7.~~6. Description of the Baseline Environment

Benthic and Marine Habitats

The Humber Estuary

~~7.1.~~6.1. The Humber is an extensive macrotidal estuary on the east coast of England, characterised by a large tidal range and high levels of suspended sediment, with hydrodynamic processes creating a dynamic rapidly changing system with accretion and erosion of intertidal and sub-tidal habitats.

~~7.2.~~6.2. The Humber is a dynamic estuarine system with changes in currents, tidal inundation, salinity etc. that create a difficult environment for many invertebrate organisms to flourish. The invertebrate community that colonises such areas can therefore be restricted to a relatively low number of species that are able to adapt to these environmental rigours.

~~7.3.~~6.3. The same physical conditions also allow for those species that can tolerate them, to be present in very large numbers in the deposited soft sediments, e.g. intertidal soft sediment mudflats. The physico-chemical conditions make estuaries highly productive and through a complex food web are able to support very large numbers of invertebrate organisms such as worms and molluscs, which are able to feed on lower trophic guilds and other available organic material as well as on each other.

~~7.4.~~6.4. Productivity from these communities has been estimated at over ~~500kg~~500 kg per ha per year on the Humber (IECS, 1994), and forms an important food resource for primary predators such as fish and birds. The importance of the Humber Estuary for birds and fish, and the habitats supporting these, is recognised in a series of International/European conservation designations.

Intertidal Invertebrate Communities

~~7.5.~~6.5. Allen (2006) describes the intertidal benthic community of the middle estuary south shore to be less diverse than in outer estuary, being dominated by *Corophium volutator, Streblospio shrubsolii, Hediste diversicolor* and the Spionid polychaete *Pygospio elegans*. Low abundances of *Macoma balthica* were also present with numbers increasing towards the outer estuary and in mid shore areas. These communities are typical for an estuarine habitat and primarily structured according to salinity, shore height and presumably sediment type. Whilst some communities are relatively impoverished these appear to be typical for such habitats and some variation in community structure is expected in a dynamic estuary.

~~7.6.~~6.6. The increase in intertidal elevation and colonisation by saltmarsh communities at the AMEP site has led to a loss of mudflat extent and influenced the distribution of several key species of invertebrate such as ~~*Hediste diversicolor.*~~ *Hedistse diversicolor*. This has resulted primarily from the construction of the Humber International Terminal downstream of the Project site. However, in the muddier areas, the 2015 and 2016 surveys recorded a broadly similar assemblage to that recorded in the baseline of 2010 for the original ES supporting the DCO application in 2011.

~~7.7.~~6.7. The original ES baseline commonly recorded *Tubificoides benedii*, Nematoda, the polychaete *Streblospio shrubsolii* and the amphipod crustacean *Corophium volutator* from the intertidal survey. The bivalve *Macoma* (*Limecola*) *balthica* was widespread and the polychaete *Hediste diversicolor* was present at most of the upper shore stations.

~~7.8.~~6.8. A broadly similar intertidal invertebrate assemblage was recorded in 2015 and 2016 at the AMEP site, although with some restrictions in the extent of the typical intertidal mudflat community correlating to saltmarsh community colonisation.

~~7.9.~~6.9. Allen (2017 & 2020, reporting the Autumn 2015 and Spring 2016 benthic surveys) concluded that the intertidal component of the AMEP development area supports an invertebrate assemblage that is characteristic of the site's location in the middle estuary, '*typical for muddy or sandy intertidal sediments and adjacent subtidal habitats in the mid to outer Humber and generally correspond to those recorded in previous surveys'* (Allen, 2017) and '*the results of the 2016 intertidal benthic survey indicate that the North Killingholme mudflats maintain a variety of infaunal invertebrates including good examples of mid estuary mud assemblages'* Allen, 2020).

~~7.10.~~6.10. ~~It is considered likely that the~~The increase in elevation and saltmarsh colonisation seen in 2015 and 2016 has continued to the present day, with a substantial extent of the AMEP development intertidal frontage now featuring saltmarsh in the upper to mid shore. As such, it is likely that the extent and/or composition of the intertidal invertebrate community recorded in this area will have reduced in response to the increase in elevation and associated saltmarsh development.

~~7.11.~~6.11. On this basis, it is concluded that there is the probability of natural variation in community composition over time, reflecting changes in estuarine dynamics, but given the community adaptation and continued active utilisation of the ~~dredge areas and deposit grounds~~foreshore, no significant change outwith these parameters is reasonably expected to have occurred.

Subtidal Benthic Ecological Data

~~7.12.~~6.12. A range of mud, sands and gravels are present within the subtidal area of middle estuary, these with associated biological communities, and with biotopes describing these in Chapter 10 Table 10-2 of the UES.

~~7.13.~~6.13. The 2016 subtidal survey (Allen, 2020) reported the subtidal bed to feature a very impoverished faunal community typical for the middle Humber and in line with findings from previous surveys (e.g. as described in the DCO ES and supporting documentation e.g. Appendices UES10-3 and UES10-4), including species such as *Capitella* sp., *Arenicolidae* sp. (*Arenicola marina*), *Eurydice pulchra, Gammarus salinus*, *Corophium volutator*, *Nematoda* spp., *Polydora cornuta, Pygospio elegans, Streblospio shrubsolii* and *Tubificoides benedii*.

6.14. Allen (2020) concluded that the infaunal communities recorded during the 2015 subtidal survey around the potential dredge disposal areas were typical for dynamic mud, sand or mixed sediment subtidal sediments in the mid to outer Humber Estuary.

~~7.14.~~6.15. Though no further baseline benthic data are currently available, pre-construction surveys will be carried out to update the baseline and ensure that the targets for the compensation measures are informed by as up-to-date data as possible, as set out in the approved MEMMP and CEMMP.

~~7.15.~~6.16. The area within which AMEP will directly impact tends to exhibit muddier sediments with muddy sands or sandy muds sometimes with small quantities (<1%) of gravel (slightly gravelly sandy mud or slightly gravelly muddy sand). Additional surrounding habitats that could be affected by the development include included muddy habitats including sandy muds or muddy sands (or slightly gravelly muddy sand/sandy muds) and two sandier sites (Allen, 2020).

~~7.16.~~6.17. The direct impact and surrounding areas were also characterised by low numbers of *Capitella* sp. but included modest numbers of species such *Corophium volutator* and *Streblospio shrubsolii*. However, many of the taxa present in these areas were recorded at relatively few

sites. In terms of biomass the direct impact area was dominated by *Carcinus maenas* (1 site only), *Limecola balthica, Corophium volutator, Arenicolidae* sp. (*Arenicola marina*) and *Gammarus salinus* these species collectively accounting for over 90% of total biomass.

Saltmarsh Communities

~~7.17.~~6.18. At the time of the original baseline work, there was little or no evidence of substantial saltmarsh vegetation occurring across the central mudflat of the AMEP development, other than some fringing communities on the upper shore adjacent to the flood bank, upstream adjacent to North Killingholme.

~~7.18.~~6.19. However, the potential for accretion of the intertidal mudflat and associated increase in elevation and potential colonisation by saltmarsh was identified in the Examining Authority's Report (2013, paragraph 10.79)[14].

~~7.19.~~6.20. A clear expansion in the extent of saltmarsh communities and corresponding reduction in intertidal mudflat, e.g. as surveyed in 2020 and 2021, has occurred on the intertidal frontage of the proposed AMEP development site since the original ES baseline work of the DCO. This change resulted primarily from the construction of the Humber International Terminal. This saltmarsh accretion has continued to date – this report includes data from October 2024 Google Earth aerial imagery to update the current baseline cover of saltmarsh and intertidal mudflat that would be affected by the proposed development (Table 18).

6.21. Given the dynamic nature of these habitats and the ongoing changes, further pre-construction surveys will be carried out (as set out in the CEMMP) to ensure that the baseline used to inform the compensation measures is as up-to-date as possible.

Fish Assemblage

~~7.20.~~6.22. Two species of fish are qualifying features of the Humber Estuary SAC and hence are relevant to the HRA, sea lamprey and river lamprey.

~~7.21.~~6.23. The direct comparison between the different fish baseline data is limited by the use of different sampling methods, with different selectivity, used in different habitats and with variable sampling effort (e.g. within and between seasons). Also, the natural variability in population dynamics (e.g. inter-annual fluctuations in recruitment) may affect the fish species occurrence and abundance in the catches over time.

~~7.22.~~6.24. Considering these factors, and in the context of the wider knowledge of fish assemblages and their distribution in the lower Humber Estuary, ~~there were no significant changes in the baseline for fish at the AMEP site,~~ and the relevant receptors remain the same, including for the two SAC qualifying species, sea lamprey and river lamprey.

~~7.23.~~6.25. The fish fauna recorded at the AMEP site and in the surrounding areas has ~~remained~~been shown in the DCO and MC2 applications to be a reflection of the typical assemblage of intertidal and subtidal areas of this part of the estuary, and of the role of these habitats in supporting young stages of estuarine and marine migrant fish (especially gobies and flatfish), also through provision of abundant food resources. There was no evidence of preferred use of these areas by migratory fish, confirming earlier observations. All of the available evidence

[14] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002249-The%20Able%20Marine%20Energy%20Park%20Order%20201X%20Panel's%20Findings%20and%20Recommendations%20with%20Appendices.zip

including TraC fish counts undertaken periodically by the Environment Agency[15], indicates that the site is not important for either sea lamprey or river lamprey.

Marine Mammals

~~7.24.~~6.26. One marine mammal species is a qualifying feature of the Humber Estuary SAC and hence is relevant to the HRA, grey seal.

~~7.25.~~6.27. Due to the low frequency of occurrence and high mobility of marine mammals in the low to middle estuary, dedicated surveys were not conducted for the original ES nor to support ~~this~~the material change 2 amendment or this time extension. The occasional presence of these species in the vicinity of the AMEP development relates to the potential presence of prey items (see text on Fish and Invertebrate Communities), and the populations of the species in the wider region e.g. Southern North Sea. The main seal haulout area is located at Donna Nook at the mouth of the estuary, 22 km from the AMEP site.

Ornithology

~~7.26.~~6.28. Ornithological data to update the baselines for the Project ~~and for the Material Change 2~~Time Extension have been obtained from a range of sources, including the following:

- BTO Wetland Bird Survey (WeBS) high tide (core) counts (~~2016-17~~2018-19 to ~~2021-22~~2022-23) - the most up-to-date 5-year mean peak core high tide counts currently available, for the Killingholme Marshes and Foreshore, and for the North Killingholme Havev Pits ~~WreBS~~WeBS count sectors;
- Additional surveys of Killingholme Marshes and Foreshore, the North Killingholme Haven Pits and the AMEP DCO development site were undertaken by Ecology Consulting for Able UK during winter 2022-23. This survey work comprised through the tide' counts repeated regularly through the day to cover a range of tidal conditions ~~(i.e. ').~~. Forty-eight surveys were undertaken over 12 survey days from October 2022 to March 2023.
- Further surveys of the Killingholme Marshes and Foreshore and the North Killingholme Haven Pits were carried out by Cutts and Hemingway Estuarine Ecology and Management Ltd. for Able UK between June 2023 and May 2024. Two surveys per month were conducted around low and high water, giving a total of 48 surveys.

~~7.27.~~6.29. The data are presented first for the Killingholme Marshes Foreshore and then for North Killingholme Haven Pits.

Killingholme Marshes Foreshore

BTO WeBS Data

~~7.28.~~6.30. Table ~~3~~2 summarises the most recently available five-year mean peak counts from the Killingholme Marshes Foreshore (KMFS) sector, giving the peak for each winter, the mean annual peak over the last five years for which data are currently available, 2018/19 – 2022/23, and the % that this comprises of the mean annual peak of the whole Humber Estuary population of each species over the same five-year period. As an example, for teal the mean annual peak count for 2018/19 – 2022/23 was 389 individuals. The mean annual peak total Humber Estuary WeBS count over the same period was 5,710, giving a % of the SPA population at KMFS of 389/ 5,710= 6.8%.

[15] https://environment.data.gov.uk/ecology/explorer/

Table ~~3~~2. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the Killingholme Marshes Foreshore sector and the percentage this makes up of whole Humber Estuary SPA, ~~2017/18 - 2021/22~~[TE18][SP9]. 2018/19 - 2022/23. (Note: * Q = qualifying species, A = assemblage species)

Species	SPA ~~specie ssp~~*	~~2017/18~~ 2018/19	2019/20 ~~2018/19~~	2020/21 ~~2019/20~~	~~2020/21~~ 2021/22	~~2021/22~~ 2022/23	Mean peak 18/19-22/23	% SPA mean peak 18/19-22/23
Mute Swan		~~0~~7	~~7~~4	~~4~~3	~~3~~2	~~2~~1	3.4	2.1%
Pink-footed Goose	A	0	0	0	0	1	0.2	<0.1%
Greylag Goose		~~34~~41	~~41~~23	~~23~~180	~~180~~185	~~185~~14	~~93~~89	~~5.2~~4.1%
Canada Goose		0	0	0	~~0~~42	~~42~~11	~~8~~11	1.~~2~~5%
Shelduck	Q	~~110~~58	~~58~~93	~~93~~55	~~55~~27	~~27~~40	~~69~~55	~~1.1~~0.6%
Wigeon	A	~~1~~0	~~0~~31	~~31~~12	~~12~~16	~~16~~8	~~12~~13	0.~~3~~2%
Gadwall		~~17~~18	~~18~~64	~~64~~61	~~61~~30	~~30~~48	~~38~~44	~~15.3~~14.9%
Teal	A	~~376~~428	~~428~~192	~~192~~463	~~463~~432	432	~~378~~389	~~7.2~~6.8%
Mallard	A	~~41~~64	~~64~~98	~~98~~68	~~68~~114	~~114~~63	~~77~~81	6.~~9~~6%
Pintail		~~2~~6	~~6~~8	~~8~~6	~~6~~8	~~8~~10	7.6	~~6.1~~4.4%
Shoveler	A	~~78~~70	~~70~~93	~~93~~43	~~43~~31	~~31~~26	~~63~~53	~~21.4~~16.7%
Pochard	A	0	0	0	0	0	0	0.0%
Tufted Duck		2	2	2	~~2~~0	~~0~~3	~~2~~1.8	0.7%
Goldeneye	A	0	0	0	0	1	0.2	0.1%
Little Grebe		~~1~~0	~~0~~4	4	4	~~4~~2	~~3~~2.8	4.~~6~~4%
Great Crested Grebe		0	~~0~~1	~~1~~0	0	0	0.2	1.~~1~~3%
Cormorant		~~2~~0	~~0~~2	~~2~~1	1	~~1~~2	1.2	0.~~3~~2%
Little Egret		~~2~~1	1	~~1~~0	~~0~~1	~~1~~0	~~1~~0.6	0.~~5~~3%
Grey Heron		~~1~~3	~~3~~1	1	1	1	1.4	3.~~7~~4%
Water Rail		~~1~~0	0	0	0	0	0	~~1.4~~0.0%
Moorhen		~~2~~4	~~4~~18	~~18~~5	~~5~~7	~~7~~11	~~7~~9	~~13.8~~14.3%
Coot		~~14~~26	~~26~~31	~~31~~29	~~29~~7	~~7~~4	~~21~~19	~~7.7~~6.3%
Oystercatcher	A	~~7~~3	~~3~~8	~~8~~3	~~3~~5	~~5~~3	~~5~~4.4	0.1%
Avocet	Q	~~29~~60	~~60~~131	~~131~~32	~~32~~82	~~82~~129	~~67~~87	~~2~~3.6%
Little Ringed Plover		~~1~~2	~~2~~1	1	1	~~1~~0	1	~~20.0~~6.3%
Ringed Plover	A	~~5~~2	~~2~~22	~~22~~94	~~94~~9	~~9~~53	~~26~~36	~~2.5~~3.1%
Grey Plover	A	0	0	0	0	0	0	0.0%
Lapwing	A	193039 ~~7~~	876~~193 0~~	~~876~~141 8	~~141~~812 97	~~129~~727 1	~~1184~~1158	7.~~8~~3%
Knot	Q	0	~~0~~12	~~1~~20	0	0	2.4	0.0%
Sanderling	A	0	0	~~0~~3	~~3~~0	0	~~1~~0.6	0.1%
Dunlin	Q	~~245~~349	~~349~~100 0	~~100~~38 0	~~380~~187	~~187~~115	~~432~~406	2.~~5~~2%
Ruff	Q	~~1~~0	0	0	0	0	0	0.~~3~~0%
Snipe		~~3~~4	~~4~~0	0	~~0~~5	~~5~~2	2.2	~~2.2~~1.3%
Black-tailed Godwit	Q	112016 ~~50~~	2400~~11 20~~	2240~~24 00~~	1150~~22 40~~	115078 0	~~1712~~1538	~~30.3~~24.2%
Bar-tailed Godwit	Q	~~6~~0	0	0	0	0	~~1~~0	0.~~1~~0%
Whimbrel	A	0	0	0	0	1	0.2	0.4%
Curlew	A	~~97~~120	~~120~~34	~~34~~64	~~64~~115	~~115~~34	~~86~~73	3.~~4~~2%
Common Sandpiper		~~0~~1	~~1~~0	~~0~~2	~~2~~0	~~0~~2	1	3.1~~.4~~%
Green Sandpiper		0	0	0	~~0~~1	~~1~~0	0.2	1.~~7~~4%
Redshank	Q	~~210~~86	~~86~~145	~~145~~92	~~92~~32	~~32~~74	~~113~~86	~~4.2~~3.3%
Turnstone	A	~~0~~16	~~16~~5	~~5~~2	~~2~~0	0	~~5~~4.6	1.~~6~~8%

~~* Q = qualifying species, A = assemblage species.~~

~~7.29.~~6.31. Table ~~4~~3 compares the WeBS five-year mean peak counts presented in the original ES (2004/05 – 2008/09), for the Material Change 2 (2015/16-2019/20) and for the most recently available five years (~~2017/18 – 2021/22~~2018/19 – 2022/23). The Table also gives the percentages that these comprised of the whole Humber Estuary population for each time period. ~~Overall, there have been no notable changes in any species' status since the Material Change 2 application.~~As an example, black-tailed godwit had a mean count of 50 over the five-year period of 2004/05 – 2008/09, 1,524 during 2015/19-2019/20 and 1,538 during 2018/19 – 2022/23. The equivalent Humber Estuary SPA mean peaks over the same periods were 3,887, 4,548 and 6,346 respectively, giving the % of the SPA for each as 1.3%, 33.5% and 24.2%.

Table ~~4~~3. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the Killingholme Marshes Foreshore sector and % of the whole Humber Estuary for 2004-08 (as presented in the original ES), for 2015-16 - 2019-20 (Material Change 2) and for the more recent ~~2017/18 – 2021/22~~2018/19 – 2022/23.

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (~~17-21~~18-22)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE (18-22)
Mute ~~swan~~Swan		3	2	3	1.0%	1.5%	2.1%
Pink-footed Goose	A	0	0	0	0.0%	0.0%	0.0%
Greylag Goose		0	0	89	0.0%	0.0%	4.1%
Canada Goose		0	0	11	0.0%	0.0%	1.5%
Shelduck	Q	9	75	~~69~~55	0.2%	1.7%	~~1.1~~0.6%
Wigeon~~Shoveler~~	A	~~11~~0	~~5~~30	~~6~~313	~~8.9~~0.0%	~~24.7~~0.0%	~~21.4~~0.2%
Gadwall		4	21	~~38~~44	2.9%	9.6%	~~15.3~~14.9%
Teal	A	13	244	389	0.5%	6.6%	6.8%
Mallard	A	13	45	~~77~~81	0.6%	4.3%	6.~~9~~6%
Pintail		0	0	8	0.0%	0.0%	4.4%
Shoveler~~Teal~~	A	~~13~~11	~~244~~53	~~378~~53	~~0.5~~8.9%	~~6.6~~24.7%	16.7~~.2~~%
Pochard	A	1	0	0	0.3%	0.0%	0.0%
Tufted Duck		4	2	2	1.0%	0.7%	0.7%
Goldeneye~~Tufted duck~~	A	~~4~~0	~~2~~0	0.2	~~1~~0.0%	0.~~7~~0%	0.~~7~~1%
Smew		1	0	0	50.0%	0.0%	0.0%
Little ~~grebe~~Grebe		2	1	3	2.2%	2.1%	4.~~6~~4%
~~Grey heron~~		~~1~~	~~1~~	~~1~~	~~2.3%~~	~~3.6%~~	~~3.7%~~
Great Crested Grebe~~Little egret~~		0	~~1~~0	~~1~~0	0.0%	0.~~7~~0%	~~0.5~~1.3%
Cormorant		0	1	1	0.0%	0.2%	0.~~3~~2%
~~Water rail~~Little Egret		0	~~0~~1	~~0~~1	0.0%	0.~~0~~7%	~~1.4~~0.3%
Grey Heron		1	1	1	2.3%	3.6%	3.4%
Water Rail		0	0	0	0.0%	0.0%	0.0%
Moorhen		4	6	~~7~~9	2.7%	13.1%	~~13.8~~14.3%
Coot		31	31	~~21~~19	2.7%	11.9%	~~7.7~~6.3%
Oystercatcher	A	1	4	~~5~~4	0.0%	0.1%	0.1%
Avocet	Q	0	49	~~67~~87	0.0%	2.0%	~~2~~3.6%

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (~~17-21~~18-22)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE (18-22)
Little Ringed Plover~~Lapwing~~	~~A~~	~~15~~0	~~730~~1	~~1184~~1	0.~~1~~0%	~~4.4~~18.2%	~~7.8~~6.3%
Ringed ~~plover~~Plover	A	0	68	~~26~~36	0.0%	9.3%	~~2.5~~3.1%
~~Little ringed plover~~Grey Plover	A	0	~~1~~0	~~1~~0	0.0%	~~18.2~~0.0%	~~20~~0.0%
Lapwing~~Curlew~~	A	~~61~~15	~~66~~730	~~861~~1158	0.1~~.4~~%	~~2.5~~4.4%	7.3~~.4~~%
~~Bar-tailed godwit~~	~~Q~~	~~0~~	~~1~~	~~1~~	~~0.0%~~	~~0.1%~~	~~0.1%~~
~~Black-tailed godwit~~	~~Q~~	~~50~~	~~1524~~	~~1712~~	~~1.3%~~	~~33.5%~~	~~30.3%~~
~~Turnstone~~	~~A~~	~~1~~	~~4~~	~~5~~	~~0.2%~~	~~1.8%~~	~~1.6%~~
Knot	Q	1	2	2	0.0%	0.0%	0.0%
Sanderling~~Ruff~~	~~Q~~A	0	0	~~0~~1	0.0%	0.~~2~~0%	0.~~3~~1%
Dunlin	Q	87	326	~~432~~406	0.5%	2.0%	2.~~52~~%
Ruff~~Snipe~~	Q	0	~~10~~	~~20~~	0.0%	~~1.1~~0.2%	~~2.2~~0.0%
Snipe~~Common sandpiper~~		0	~~0~~1	~~1~~2	0.0%	~~0.6~~1.1%	1.4~~3~~%
Black-tailed Godwit	Q	50	1524	1538	1.3%	33.5%	24.2%
Bar-tailed Godwit	Q	0	1	0.0	0.0%	0.1%	0.0%
Whimbrel	A	0	0	0.2	0.0%	0.0%	0.4%
Curlew	A	61	66	73	1.4%	2.5%	3.2%
Common Sandpiper		0	0	1	0.0%	0.6%	3.1%
Green Sandpiper		0	0	0.2	0.0%	0.0%	1.4%
Redshank	Q	83	116	~~113~~86	1.6%	4.0%	~~4.2~~3.3%
Turnstone	A	1	4	5	0.2%	1.8%	1.8%

* Q = qualifying species, A = assemblage species.

~~7.30.~~6.32. The BTO Low Tide Counts from 2011-12 (the most recent available data as no further BTO low tide surveys have been undertaken since 2012) are summarised in Table ~~5~~4. It should be noted that these surveys did not cover the main mid-winter period, which may also explain the lower numbers of some species in comparison with the other data sets.

Table ~~5~~4. BTO Low Tide Count totals for the Killingholme Marshes Foreshore sector (CH066), 2011-12.

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Greylag Goose	0	2	2	4	0	0	0	0	**4**
Shelduck	0	12	2	1	2	0	0	0	**12**
Mallard	3	2	2	4	7	0	0	5	**7**
Teal	11	4	0	0	0	0	0	0	**11**

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Grey Heron	0	0	0	0	1	0	2	0	**2**
Little Egret	0	1	0	0	2	2	2	0	**2**
Cormorant	2	0	0	0	0	0	2	0	**2**
Moorhen	0	0	1	1	0	1	0	0	**1**
Oystercatcher	0	0	0	0	1	0	0	2	**2**
Avocet	0	2	5	0	0	0	0	0	**5**
Little Ringed Plover	0	0	0	0	0	0	1	0	**1**
Curlew	4	3	0	0	0	0	0	0	**4**
Black-tailed Godwit	0	0	0	0	0	0	2000	650	**2000**
Redshank	0	0	0	0	1	0	0	0	**1**
Black-headed Gull	0	0	0	0	3	4	0	0	**4**
Common Tern	0	0	0	0	0	1	0	0	**1**

JBA Data

~~7.31.~~6.33. The results of the 2017-18 JBA surveys are summarised in Table ~~6~~5 for the Killingholme Marshes Foreshore (KMFS). The Table gives peak count recorded each month.

Table ~~6~~5. Monthly peak counts from Killingholme Marshes Foreshore, September 2017-May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Greylag goose	0	0	21	16	12	2	17	11	5	21
Pink-footed goose	0	0	0	0	0	0	0	0	0	0
Mute swan	0	0	0	0	0	0	0	1	0	1
Shelduck	5	168	102	105	64	74	96	41	20	168
Shoveler	0	0	4	0	0	0	0	0	0	4
Gadwall	0	0	0	0	0	0	0	0	0	0
Wigeon	0	125	0	0	0	0	0	0	0	125
Mallard	1	3	2	0	0	0	0	3	0	3
Teal	29	310	298	71	122	173	133	32	0	310
Pochard	0	0	0	0	0	0	0	0	0	0
Little grebe	0	0	0	0	0	0	0	0	0	0
Grey heron	1	0	1	1	0	0	0	0	0	1
Little egret	0	2	1	0	0	0	0	1	0	2
Cormorant	0	0	3	0	0	1	2	1	0	3
Marsh harrier	0	0	0	0	0	0	0	0	0	0
Oystercatcher	0	0	0	0	0	0	7	7	7	7
Avocet	0	36	16	0	0	15	34	15	4	36
Lapwing	0	200	212	342	665	233	18	2	1	665
Grey plover	0	45	0	0	0	0	0	0	0	45
Ringed plover	33	18	0	0	0	5	11	39	28	39
Whimbrel	0	0	0	0	0	0	0	0	0	0
Curlew	4	35	70	60	65	119	136	30	2	136
Bar-tailed godwit	0	0	5	0	0	0	0	0	0	5

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Black-tailed godwit	362	267	24	0	6	2	1	0	538	538
Turnstone	2	17	26	0	0	0	1	0	0	26
Knot	0	0	67	0	0	0	0	0	0	67
Ruff	0	0	0	0	0	0	0	0	0	0
Sanderling	0	0	0	0	0	0	0	0	0	0
Dunlin	18	376	503	156	501	12	80	26	42	503
Little stint	0	3	0	0	0	0	0	0	0	3
Snipe	0	3	5	1	0	0	0	0	0	5
Redshank	70	806	284	292	370	135	115	111	0	806
Greenshank	0	2	0	0	0	0	0	0	0	2

ABP DATA 2018-19 and 2019-20

~~7.32.~~6.34. Data were obtained from ABP from their monitoring surveys undertaken over several sites, including KMFS. The recent data from 2018-19 and 2019-20 for KMFS are summarised in Table ~~7~~6, which gives the monthly peak counts over this survey period, and the annual peaks for each of the two years. Of particular note are the higher numbers of teal, lapwing and avocet than recorded in the baseline surveys for the original DCO application.

Table ~~7~~6. ABP Survey Data for Killingholme Marshes Foreshore sector, October-March 2018-19 and 2019-20: monthly peak counts and annual peaks.

Species	Oct	Nov	Dec	Jan	Feb	Mar	Peak 2018-19	Peak 2019-20
Greylag goose	0	25	27	0	3	6	**0**	**27**
Mute swan	4	0	0	0	0	0	**4**	**0**
Shelduck	31	44	56	48	51	76	**76**	**56**
Wigeon	0	2	0	0	4	0	**0**	**4**
Mallard	22	3	0	0	1	10	**22**	**10**
Teal	413	915	510	828	1064	888	**1064**	**828**
Little egret	1	0	0	0	0	0	**1**	**0**
Cormorant	4	3	2	1	2	1	**0**	**4**
Oystercatcher	0	0	0	0	2	8	**8**	**4**
Avocet	251	33	23	0	76	152	**104**	**251**
Lapwing	65	372	1642	1550	2374	6	**2374**	**1254**
Golden plover	0	0	0	0	1	0	**0**	**1**
Grey plover	1	0	0	0	0	0	**0**	**1**
Ringed plover	24	16	1	3	6	7	**19**	**24**
Curlew	49	62	96	68	63	63	**68**	**96**
Bar-tailed godwit	0	0	2	3	14	0	**2**	**14**
Black-tailed godwit	2183	22	220	162	372	271	**2070**	**2183**
Turnstone	12	37	1	2	7	8	**17**	**37**
Sanderling	0	0	0	0	0	2	**0**	**2**
Dunlin	455	512	659	680	381	136	**680**	**512**
Snipe	4	0	15	5	0	0	**4**	**15**
Redshank	184	140	156	170	117	204	**204**	**140**

Able Data 2020-21

~~7.33.~~6.35. The data collected for Able UK by Nick Cutts during December 2020 – March 2021 from the Killingholme Marshes Foreshore are summarised in Table ~~8~~7, where the total counts from each survey are presented. The surveys commenced in December 2020, so no data were available from autumn 2020, though the autumn period is covered in other years by the other data sets described in this section. As for the ABP surveys, higher peak numbers of teal, lapwing and avocet were recorded in this area than previously.

Table ~~8~~7. Count totals Killingholme Marshes Foreshore sector, December 2020- March 2021 (Source: Nick Cutts). *Note: partial coverage of north end of sector only during Dec-Jan).*

Species	09/12/2020	23/12/2020	07/01/2021	21/01/2021	04/02/2021	18/02/2021	05/03/2021	PEAK
Greylag Goose	0	0	0	0	0	13	0	13
Shelduck	8	0	2	0	20	34	13	34
Mallard	2	2	14	4	13	4	8	14
Teal	1466	994	470	520	431	212	354	1466
Oystercatcher	0	0	0	0	0	0	13	13
Avocet	0	0	0	0	0	0	205	205
Lapwing	980	950	310	1121	240	0	0	1121
Golden Plover	0	0	0	0	14	0	0	14
Ringed Plover	0	2	0	0	0	0	0	2
Curlew	6	3	11	2	28	26	29	29
Black-tailed Godwit	0	0	0	0	170	0	0	170
Dunlin	75	35	40	0	22	232	10	232
Redshank	13	71	42	7	53	52	43	71

Able Data 2022-23

~~7.34.~~6.36. The Killingholme Marshes foreshore held a range of important wintering waterbird populations during the October 2022-March 2023 surveys, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit, curlew and redshank (Table ~~9).~~8). The % SPA value given in this Table is the peak count overall from these surveys as a % of the whole Humber Estuary SPA five-year mean annual peak count up to 2022/23. For example, for teal, the overall peak was 1,666, which represents 29.2% of the five-year mean peak SPA population of 5,710.

Table ~~9~~8. Peak counts of the autumn/winter non-breeding bird populations within the Killingholme Marsh Foreshore.

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Whooper Swan	3	48	-
Pink-footed Goose	40	10	0.2%
Greylag Goose	24	0	-
Canada Goose	1	5	-
Shelduck	10	2	0.~~2~~1%
Wigeon	1	2	<0.1%
Gadwall	2	0	-
Teal	1666	358	~~31.5~~29.2%
Mallard	14	2	1.~~3~~1%
Tufted Duck	45	0	-
Cormorant	3	0	-
Little Egret	2	1	-

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Grey Heron	1	3	-
Marsh Harrier	1	0	-
Sparrowhawk	1	0	-
Buzzard	2	0	-
Peregrine	1	0	-
Water Rail	1	0	-
Oystercatcher	5	0	0.1%
Avocet	220	2	~~8.~~59.2%
Grey Plover	2	0	0.1%
Lapwing	956	38	6.~~3~~0%
Dunlin	205	346	~~2.0~~1.8%
Snipe	5	2	-
Black-tailed Godwit	3313	75	~~58.7~~52.2%
Curlew	84	47	3.~~3~~7%
Spotted Redshank	1	0	-
Redshank	147	74	5.~~5~~7%
Common Gull	34	0	-
Lesser Black-backed Gull	2	0	-
Herring Gull	20	1	-
Great Black-backed Gull	8	0	-
Black-headed Gull	17	150	-
Kingfisher	1	0	-

Able Data 2023-24

6.37. The data collected for Able UK by Cutts and Hemingway during June 2023 – May 2024 from the Killingholme Marshes Foreshore are summarised in Table 9, which gives the monthly peak count. As for the other recent surveys, higher peak numbers of teal, lapwing and avocet were recorded in this area than previously The % SPA value given in this Table is the peak count overall from these surveys as a % of the whole Humber Estuary SPA five-year mean annual peak count up to 2022/23. For example, for teal, the overall peak was 2,810, which represents 29.2% of the five-year mean peak SPA population of 5,710.

Table 9. Monthly peak counts of Killingholme Marshes Foreshore sector, June 2023 – May 2024 (Source: Cutts and Hemingway).

Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK	% SPA
Canada Goose	0	0	0	1	0	0	0	0	0	0	0	0	1	0.1%
Greylag Goose	0	0	0	0	0	0	14	14	0	25	0	2	25	1.2%
Pink-footed Goose	0	0	0	0	0	0	24	0	0	0	0	0	24	0.1%
Shelduck	52	64	13	13	4	4	0	6	22	26	19	4	64	0.7%
Mallard	2	15	1	6	20	4	58	28	1	9	2	0	58	4.7%
Teal	0	0	7	0	1230	1500	2810	1532	694	263	46	0	2810	49.2%
Grey Heron	0	0	0	0	0	0	0	0	1	0	0	0	1	2.4%

Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK	% SPA
Little Egret	0	0	2	0	0	0	0	0	0	0	0	0	2	0.9%
Cormorant	2	1	0	1	0	0	0	0	0	0	1	0	2	0.3%
Oystercatcher	6	9	4	0	3	0	0	0	7	8	5	3	9	0.1%
Avocet	51	42	341	277	0	60	127	56	130	24	43	0	341	14.3%
Lapwing	28	15	82	0	0	60	505	825	124	0	0	0	825	5.2%
Grey Plover	1	0	0	0	0	0	0	0	0	0	0	0	1	<0.1%
Ringed Plover	5	0	0	18	0	0	0	0	12	17	7	3	18	1.6%
Whimbrel	0	0	1	0	0	0	0	0	0	0	2	3	3	6.0%
Curlew	14	31	108	58	28	102	163	104	108	19	48	16	163	7.1%
Black-tailed Godwit	1	1621	2973	862	48	11	0	22	40	0	0	0	2973	46.8%
Turnstone	0	3	0	0	1	0	0	0	0	0	0	0	3	1.2%
Ruff	0	0	0	0	0	0	0	0	0	0	2	1	2	3.1%
Curlew Sandpiper	0	4	0	0	0	0	0	0	0	0	3	0	4	25.0%
Dunlin	0	7	0	0	58	284	19	517	52	18	21	0	517	2.7%
Redshank	2	212	47	35	24	15	33	98	73	50	9	0	212	8.2%
Common Sandpiper	0	4	3	0	0	0	0	0	0	0	3	3	4	12.5%

North Killingholme Haven Pits

BTO WeBS Data

~~7.35.~~6.38. Table 10 summarises the most recently available five-year mean peak counts from the North Killingholme Haven Pits, giving the peak for each winter, the mean peak over the last five years, and the % that this comprises of the whole Humber Estuary SPA population over the same period~~.~~ (five-year mean peak, 2018/19 – 2022/23).

Table 10. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the North Killingholme Haven Pits sector and ~~and~~ the percentage this makes up of whole Humber Estuary SPA, ~~2017/18 - 2021/22..~~2018/19 - 2022/23.

Species	SPA sp.*	2017/18 2018/19	2018/19 2019/20	2019/20 2020/21	2020/21 2021/22	2021/22 2022/23	Mean NKHP 5-yr mean peak	% SPA
Mute Swan		20	0	0	01	10	0.62	0.41%
Greylag Goose		1116	166	62	23	3	7.6	0.43%
Canada Goose		0	0	0	04	42	0.81.2	0.12%
Shelduck	Q	1324	2410	107	716	165	1412.4	0.21%
Gadwall		0	0	0	0	2	0.4	0.1%
Teal	A	13316	1658	5861	6195	9572	7360.4	1.41%
Mallard	A	816	1623	2324	2412	1214	16.617.8	1.54%
Shoveler		345	50	08	80	0	9.43	3.20.8%
Pochard	A	0	0	0	0	0	0	0.0%
Little Grebe		0	0	0	01	10	0.2	0.43%
Cormorant		10	0	01	10	02	0.46	0.1%
Bittern	Q	0	0	0	01	10	0.2	6.7%
Little Egret		78	84	45	57	76	6.2	3.12.8%
~~Grey Heron~~		~~2~~	~~2~~	~~1~~	~~1~~	~~1~~	~~1.4~~	~~3.7%~~
Water Rail		1	10	0	01	10	0.64	43.3%
Moorhen		10	0	0	0	0	0.2	0.40%
Coot		0	0	0	0	0	0	0.0%
Oystercatcher	A	23	31	12	2	2	2	0.0%
Avocet	Q	1245	45205	205286	286122	122237	134179	7.5.2%
Ringed Plover	A	10	02	21	10	02	0.81	0.1%
Golden Plover	Q	0	0	01	10	01	0.24	0.0%
Grey Plover	A	0	0	02	20	0	0.4	0.0%
Lapwing	A	128360	360246	2462580	2580548	548114	772770	5.14.8%
Knot	Q	0	0420	4201050	105022	226	298300	1.13%
Curlew Sandpiper		0	04	40	0	0	0.8	8.95.0%
Dunlin	Q	1845	452950	29501290	1290165	16549	926900	5.34.8%
Ruff	Q	70	0	0	0	0	1.40	1.80.0%
Snipe		529	9102	10225	2515	1512	4132.6	37.919.6%
Black-tailed Godwit	Q	27703810	54002770	29505400	37002950	3700470	37263904	66.061.5%
Bar-tailed Godwit	Q	0	0	0	01	10	0.2	0.0%
Curlew	A	37	74	423	234	42	8.2	0.3%
Common Sandpiper		01	10	0	0	0	0.2	0.56%
Green Sandpiper		0	0	0	01	10	0.2	1.74%
Spotted Redshank		0	0	0	03	31	0.68	1.92.8%
Greenshank	A	0	0	01	10	075	015.2	0.426.2%
Redshank	Q	157251	251220	220320	32092	92185	208214	7.8.3%
Turnstone	A	0	01	10	0	0	0.2	0.1%

* Q = qualifying species, A = assemblage species.

~~7.36.~~6.39. Table 11 compares the NKHP WeBS five-year mean peak counts presented in the original ES (2004/05 – 2008/09), for the Material Change 2 (2015/16-2019/20) and for the most recently available five years (~~2017/18 – 2021/22~~2018/19 – 2022/23). The Table also gives the percentages that these comprised of the whole Humber Estuary population for each time period. Overall, there have been no notable changes in any species' status since the Material Change 2 application.

Table 11. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the North Killingholme Haven Pits sector and % of the whole Humber Estuary for 2004/05 - 2008/09 (as presented in the original ES), for 2015/16 – 2019/20 (Material Change 2) and for the most recent five winters (~~2017/18 – 2021/22~~2018/19 – 2022/23) (Time Extension).

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (~~17-21~~18-22)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE (18-22)
Mute Swan		1	1	<1	0.2%	0.5%	0.41%
Greylag Goose		0	25	~~8~~6	0.0%	1.6%	0.43%
Canada Goose		1	0	1	0.1%	0.0%	0.~~1~~2%
Shelduck	Q	7	9	~~14~~12	0.1%	0.2%	0.~~2~~1%
Gadwall		<1	0	~~0~~<1	0.3%	0.0%	0.~~0~~1%
Teal	A	30	43	~~73~~60	1.1%	1.2%	1.41%
Mallard	A	71	13	~~17~~18	3.4%	1.2%	1.~~5~~4%
Shoveler		29	8	~~9~~3	23.4%	3.7%	~~3.2~~0.8%
Pochard	A	0	0	0	0.0%	0.0%	0.0%
Tufted Duck		1	0	0	0.2%	0.0%	0.0%
Little Grebe		1	0	<1	0.9%	0.0%	0.43%
Cormorant		1	<1	<1	1.0%	0.1%	0.1%
Bittern	Q	0	0	<1	0.0%	0.0%	6.7%
Little Egret		0	5	6	0.0%	2.2%	~~3.1~~2.8%
Grey Heron		3	1	~~1~~0	7.7%	3.6%	~~3.7~~0.0%
Water Rail		0	<1	<1	0.0%	2.5%	43.3%
Moorhen		3	<1	~~<1~~0	1.8%	0.4%	0.40%
Coot		3	0	0	0.2%	0.0%	0.0%
Oystercatcher	A	2	2	2	0.0%	0.0%	0.0%
Avocet	Q	27	54	~~134~~179	5.4%	2.2%	7.5~~.2~~%
Ringed Plover	A	1	1	1	0.1%	0.1%	0.1%
~~Lapwing~~	~~A~~	~~276~~	~~288~~	~~772~~	~~1.6%~~	~~1.8%~~	~~5.1%~~
~~Knot~~Golden Plover	Q	0	~~8~~40	~~29~~8<1	0.0%	0.40%	~~1.1~~0.0%
~~Curlew Sandpiper~~Grey Plover	A	0	~~1~~0	<1	0.0%	~~8~~0.0%	~~8.9~~0.0%
Lapwing	A	276	288	770	1.6%	1.8%	4.8%
Knot	Q	0	84	300	0.0%	0.4%	1.3%
Curlew Sandpiper		0	1	<1	0.0%	8.0%	5.0%
Dunlin	Q	390	663	~~926~~9000	2.2%	4.2%	~~5.3~~4.8%

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (~~17-~~ ~~21~~18-22)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE (18-22)
Ruff	Q	1	1	~~1~~0	1.6%	1.7%	~~1.8~~0.0%
Jack Snipe		<1	0	0	5.9%	0.0%	0.0%
Snipe		4	33	~~41~~33	3.4%	25.4%	~~37.9~~19.6%
Black-tailed Godwit	Q	3338	3336	~~3726~~3904	85.9%	73.4%	~~66.0~~61.5%
Bar-tailed Godwit	Q	0	0	<1	0.0%	0.0%	0.0%
Curlew	A	12	4	8	0.3%	0.1%	0.3%
Common Sandpiper		0	<1	<1	0.0%	0.6%	0.~~5~~6%
Green Sandpiper		0	0	<1	0.0%	0.0%	1.~~7~~4%
Spotted Redshank		0	0	<1	0.0%	0.0%	~~1.9~~2.8%
Greenshank	A	0	0	~~<1~~15	0.0%	0.0%	~~0.4~~26.2%
Redshank	Q	215	230	~~208~~214	4.2%	8.0%	~~7.~~8.3%
Turnstone	A	0	<1	<1	0.0%	0.1%	0.1%

* Q = qualifying species, A = assemblage species.

~~7.3~~7.6.40. The BTO Low Tide Counts from 2011-12 (the most recent available data as no further BTO low tide surveys have been undertaken since 2012) for the NKHP sector are summarised in Table 12. These show lower peak count than WeBS core counts for probably reflecting the timing of the counts at low, rather than high, tide (NKHP is generally more important as a high tide roost), though high numbers of black-tailed godwit were also seen during the low tide counts of that sector. It should be noted that these surveys did not cover the main mid-winter period, which may also explain the lower numbers of some species in comparison with the other data sets.

Table 12. BTO Low Tide Count totals for the North Killingholme Haven Pits sector (CH017), 2011-12.

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Shelduck	120	89	61	78	138	54	51	72	**138**
Gadwall	0	2	0	0	0	0	0	0	**2**
Mallard	0	8	6	4	10	0	10	5	**10**
Teal	0	6	0	0	0	0	0	0	**6**
Great Crested Grebe	0	0	0	0	1	0	0	0	**1**
Cormorant	0	0	0	0	2	0	0	0	**2**
Oystercatcher	0	8	12	2	8	9	5	0	**12**
Avocet	0	8	0	0	0	0	0	0	**8**
Lapwing	0	0	0	0	0	0	0	3	**3**
Golden Plover	0	0	0	0	0	2	0	0	**2**
Ringed Plover	0	2	0	4	0	0	0	0	**4**
Curlew	22	109	4	13	76	106	88	42	**109**
Bar-tailed Godwit	0	35	0	0	0	0	0	0	**35**
Black-tailed Godwit	530	219	0	0	288	816	1	21	**816**

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Turnstone	0	0	0	0	0	0	1	0	**1**
Dunlin	289	0	3	0	0	0	0	71	**289**
Common Sandpiper	0	0	0	0	0	1	2	0	**2**
Redshank	33	38	17	2	0	23	3	17	**38**
Black-headed Gull	0	5	1	0	37	100	203	94	**203**
Great Black-backed Gull	0	0	2	2	2	7	0	0	**7**
Herring Gull	0	0	0	8	0	2	0	3	**8**
Lesser Black-backed Gull	0	0	0	0	0	0	1	4	**4**

JBA Data

~~7.38.~~6.41. The results of the 2017-18 JBA surveys for North Killingholme Haven Pits (NKHP) are summarised in Table 13. The Table gives peak count recorded each month.

Table 13. Monthly peak counts from North Killingholme Haven Pits, September 2017- May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Greylag goose	5	0	1	7	16	0	0	3	12	**16**
Pink-footed goose	0	100	0	0	0	0	0	0	0	**100**
Mute swan	0	0	0	0	0	0	1	1	0	**1**
Shelduck	0	3	0	0	3	0	6	5	8	**8**
Shoveler	0	0	0	0	0	0	1	4	0	**4**
Gadwall	0	0	0	0	0	2	0	0	0	**2**
Wigeon	0	0	0	0	0	0	0	0	0	**0**
Mallard	9	7	40	18	15	4	8	2	0	**40**
Teal	2	29	24	53	104	23	45	24	0	**104**
Pochard	0	0	0	2	4	0	0	0	0	**4**
Little grebe	0	0	0	0	0	0	5	0	0	**5**
Grey heron	0	1	2	2	1	0	1	1	1	**2**
Little egret	10	8	4	0	0	0	5	9	4	**10**
Cormorant	0	0	0	3	3	0	1	0	0	**3**
Marsh harrier	0	1	0	0	0	0	1	1	0	**1**
Oystercatcher	0	0	0	0	0	0	2	2	2	**2**
Avocet	3	23	44	0	0	0	33	8	2	**44**
Lapwing	100	180	269	202	38	5	11	0	0	**269**
Grey plover	0	0	0	0	0	0	0	0	0	**0**
Ringed plover	0	0	0	0	0	0	0	0	0	**0**
Whimbrel	0	0	0	0	0	0	0	0	0	**0**
Curlew	2	4	4	2	0	0	1	0	0	**4**
Bar-tailed godwit	0	0	0	0	0	0	2	0	0	**2**
Black-tailed godwit	655	500	2	0	0	0	0	20	1	**655**
Turnstone	0	0	0	0	0	0	0	0	0	**0**
Knot	0	0	0	0	0	0	0	0	0	**0**
Ruff	0	2	0	0	0	0	0	0	0	**2**

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Sanderling	0	0	12	0	0	0	0	0	0	**12**
Dunlin	20	450	32	24	0	0	0	0	0	**450**
Little stint	0	0	0	0	0	0	0	0	0	**0**
Snipe	0	24	18	9	8	26	0	12	0	**26**
Redshank	0	450	112	24	12	2	227	160	0	**450**
Greenshank	0	0	0	0	0	0	0	0	0	**0**

Able Data 2022-23

~~7.39.~~6.42. The North Killingholme Haven Pits held a range of important wintering waterbird populations during the October 2022-March 2023 surveys, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit and redshank (Table 14).

Table 14. Peak counts of the autumn/winter non-breeding bird populations within the North Killingholme Haven Pits during the day and night counts, October 2022 - March 2023.

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Greylag Goose	2	39	~~2.2%~~
Canada Goose	2	0	~~0.3%~~
Shelduck	7	4	0.1%
Gadwall	2	0	~~0.8%~~
Teal	196	75	3.~~7~~4%
Mallard	206	8	~~18.6~~16.7%
Shoveler	1	0	0.3%
Tufted Duck	1	0	~~0.4%~~
Goldeneye	2	0	0.~~7~~6%
Little Grebe	1	0	~~1.8%~~
Cormorant	1	0	~~0.2%~~
Little Egret	2	1	~~1.0%~~
Grey Heron	1	2	~~5.3%~~
Marsh Harrier	1	0	>1%
Water Rail	1	0	~~7.1%~~
Oystercatcher	2	0	<0.~~0~~1%
Avocet	175	6	~~6.8~~7.3%
Ringed Plover	1	0	0.1%
Lapwing	340	0	2.~~2~~1%
Dunlin	22	2	0.1%
Snipe	9	1	~~8.4%~~
Black-tailed Godwit	3650	2955	~~64.6~~57.5%
Curlew	24	12	1.0.~~9~~%
Redshank	181	290	~~10.9~~11.3%
Common Gull	7	0	~~0.5%~~
Lesser Black-backed Gull	2	0	~~1.9%~~

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Herring Gull	5	0	~~0.4%~~
Black-headed Gull	290	340	~~2.6%~~

Able Data 2023-24

6.43. The data collected for Able UK by Cutts and Hemingway during June 2023 – May 2024 from the North Killingholme Haven Pits are summarised in Table 15, which gives the monthly peak counts.

Table 15. Monthly peak counts North Killingholme Haven Pits sector, June 2023 – May 2024 (Source: Cutt and Hemingway).

Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK	% SPA
Canada Goose	0	0	0	0	0	0	0	0	2	0	2	0	2	0.3%
Greylag Goose	0	0	0	0	0	0	14	0	2	4	21	7	21	1.0%
Mute Swan	0	0	0	1	0	0	0	0	0	0	0	0	1	0.6%
Shelduck	5	3	0	0	0	0	0	4	6	2	3	8	8	0.1%
Shoveler	0	0	0	0	9	0	0	0	0	0	0	0	9	2.9%
Gadwall	0	0	0	4	10	0	0	0	0	0	0	0	10	3.4%
Mallard	10	2	2	12	18	0	1	2	0	1	2	7	18	1.5%
Pintail	0	0	0	0	24	0	0	0	0	0	0	0	24	13.8%
Teal	0	0	1	17	768	20	0	0	4	38	0	0	768	13.5%
Tufted Duck	0	0	0	0	0	0	0	0	0	0	3	0	3	1.1%
Little Grebe	0	1	1	0	0	0	0	0	2	1	0	0	2	3.1%
Great Crested Grebe	0	0	0	0	0	0	0	0	1	0	0	0	1	6.7%
Grey Heron	0	0	1	1	1	0	0	0	0	0	1	0	1	2.4%
Little Egret	1	3	1	6	1	0	1	0	2	0	0	0	6	2.8%
Cormorant	0	0	7	1	1	0	0	0	2	0	0	0	7	1.2%
Oystercatcher	2	4	3	0	0	0	0	0	2	2	0	1	4	0.1%
Avocet	32	103	445	339	702	32	4	102	158	228	75	0	702	29.4%
Lapwing	11	0	366	160	101	580	450	250	68	2	0	0	580	3.6%
Curlew	0	4	62	14	21	0	19	0	12	1	23	2	62	2.7%
Bar-tailed Godwit	7	0	2	0	0	0	0	0	0	0	0	0	7	0.4%
Black-tailed Godwit	7	2432	5609	5575	470	55	1302	140	40	0	7	0	5609	88.4%
Knot	0	0	5	0	0	0	0	0	0	0	0	0	5	0.0%
Ruff	0	2	2	0	0	0	0	0	0	0	6	0	6	9.4%
Curlew Sandpiper	0	0	0	2	0	0	0	0	0	0	0	0	2	12.5%
Dunlin	0	0	0	14	36	107	22	0	0	0	0	0	107	0.6%
Snipe	0	0	0	0	0	0	22	0	0	0	0	0	22	13.3%
Redshank	2	97	244	361	110	264	120	76	56	42	4	0	361	14.0%
Common Sandpiper	0	0	1	0	0	0	0	0	0	0	0	0	1	3.1%

Summary of Baseline Survey Data

~~7.40.~~6.44. The data sources on waterbird numbers within the area that could be affected by the proposed development are summarised in Tables ~~15~~16 (Killingholme Marshes and Foreshore) and ~~16~~17 (North Killingholme Haven Pits), which give the peak count for each key species from each source. Overall, there is broad agreement between the sources with regard to the important waterbird populations in this zone, i.e. shelduck, teal, avocet, lapwing, ringed plover, curlew, bar-tailed godwit, black-tailed godwit, dunlin and redshank were all recorded regularly in important numbers in the context of the SPA/Ramsar site. 'Important' numbers were identified on the basis of the proportion of the SPA/Ramsar population recorded using the area regularly exceeding 1%. Whilst peak numbers of some other species did on some occasions exceed this 1% criterion, the large majority of records were of numbers well below this threshold, so were not, applying professional judgement, deemed to be 'important' in this context.

~~7.41.~~6.45. Though most of the new baseline survey data were obtained through the main winter period (and hence did not cover the late spring or early autumn passage periods), these periods were covered by the WeBS data update and this is not considered to have had any material effect on the conclusions reached.

~~7.42.~~6.46. There are some changes apparent since the original AMEP application, notably a recent increase in peak counts of teal, lapwing and avocet on both the Killingholme Marshes Foreshore and North Killingholme Haven Pits. The site has continued to be of major importance for black-tailed godwits. The North Killingholme Haven Pits has also continued to be a very important site for black-tailed godwits (primarily as a high tide roost), and has continued to support a range of other waterbird species, though with no major changes apparent in comparison with the original DCO application baseline.

Table ~~15~~16. Overall peak waterbird counts for the Killingholme Marshes Foreshore

Species	~~**SPA sp**~~**ES ~~TTTC~~ WeBS**	**ES ~~TTTC~~ WeBS**	***% Humber ES ~~WeBS~~***	~~***% Humber ES***~~**WeBS Core 15-19**	**WeBS ~~Core 15-19~~Low 11-12**	**~~WeBS Low 11-12~~Other 17-21**	***~~Other 17-21~~% Humber MC2***	~~***% Humber MC2***~~**WeBS Core 18-22**	**~~WeBS Core 17-21~~Able 22-23-24**	**Able ~~22-~~23-24**	***% Humber TE***
Whooper swan	0	0	*0~~.~~0%*	0~~.0%~~	0	0	*0~~.~~0%*	0~~.0%~~	0~~4~~8	~~4~~80	~~59.3~~36.4%
Mute swan	~~-~~2	~~2~~3	~~3~~1.0%	~~1.0%~~2	~~2~~0	~~0~~4	~~4~~2.7%	~~2.7%~~3	~~3~~0	0	2.1%
Brent goose [A]	~~A~~0	0	*0.0%*	0~~.0%~~	0	0	*0.0%*	0~~.0%~~	0	0	0.0%
Canada goose	~~-~~0	0	*0.0%*	0~~.0%~~	0	0	*0.0%*	*~~0.0%~~*1 1	0~~5~~	~~5~~1	~~0.7~~1.5%
Greylag goose	~~-~~0	0	*0.0%*	0~~.0%~~	0	0~~2~~7	~~2~~7*1.7%*	~~1.7%~~8 9	0~~2~~4	~~24~~25	4.1~~.3~~%
Pink-footed goose	~~-~~0	0	*0.0%*	0~~.0%~~	0	0	*0.0%*	0~~.0%~~	0~~4~~0	~~4~~024	0.2%
Shelduck [Q]	~~Q~~109	~~1~~099	~~9~~2.4%	~~2.4%~~75	~~75~~138	~~138~~168	~~168~~3.7 %	~~3.7%~~5 5	~~6~~910	~~1~~064	~~1.1~~0.7%
Shoveler	~~-~~0	0~~1~~1	~~11~~8.9%	~~8.9%~~5 3	~~5~~30	0~~4~~	~~4~~24.7%	~~24.7%~~ 53	~~6~~30	0	~~21.4~~16.7%
Gadwall	~~-~~0	0~~4~~	~~4~~2.9%	~~2.9%~~2 1	~~2~~12	2~~0~~	0~~9~~.6%	~~9.6%~~4 4	~~3~~82	2~~0~~	~~15.3~~14.9%
Wigeon [A]	~~A~~24	~~2~~40	*0.7%*	0~~.7%~~	0	0125	~~125~~4.7 %	~~4.7%~~1 3	0~~2~~	2~~0~~	0.~~1~~2%

Species	SPA sp ES TTTC	ES TTTC WeBS	% Humber ES WeBS	% Humber ES WeBS Core 15-19	WeBS Core 15-19 Low 11-12	WeBS Low 11-12 Other 17-21	Other 17-21 % Humber MC2	% Humber MC2 WeBS Core 18-22	WeBS Core 17-21 Able 22-23	Able 22-23-24	% Humber TE
Mallard A	A14	1413	130.7%	0.7%45	4510	1022	224.3%	4.3%81	7714	1458	6.96%
Pintail	0	0	0.0%	0	0	0	0.0%		8	0	0	4.4%
Teal A	A12	1213	130.5%	0.5%	06	14666	39.6%1466	38939.6%	16663 78	281001666	31.549.2%
Pochard	A0	01	10.3%	0.3%	0	0	0.0%	0.0%	0	0	0.0%
Tufted duck	-0	04	41.0%	1.0%2	20	0	0.7%	0.7%2	245	450	18.316.9%
Scaup A	A0	0	0.0%	0.0%	0	0	0.0%	0.0%	0	0	0.0%
Goldeneye A	A0	0	0.0%	0.0%	0	0	0.0%	0.0%	0	0	0.01%
Smew	-0	01	150.0%	50.0%	0	0	0.0%	0.0%	0	0	0.0%
Great crested grebe	-0	0	0.0%	0.0%	01	10	04.3%	4.3%0	0	0	0.01.3%
Little grebe	-0	02	2.2%	2.2%1	10	0	02.1%	2.1%3	30	0	4.64%
Grey heron	-0	01	12.3%	2.3%0	0	01	13.0%	3.0%1	13	31	7.93%
Little egret	-0	0	0.0%	0.0%1	10	02	21.0%	1.0%	12	2	1.0.9%
Cormorant	-2	20	01.4%	1.4%	12	24	41.2%	1.2%	13	32	0.75%
Water rail	-0	0	0.0%	0.0%	0	0	0.0%	0.0%	01	10	7.18.3%
Moorhen	-0	04	42.7%	2.7%6	60	0	013.1%	13.1%9	70	0	13.814.3%
Coot	-2	231	312.7%	2.7%31	310	0	011.9%	11.9%19	210	0	7.76.3%
Oystercatcher A	A12	121	10.4%	0.4%	412	1213	130.2%	0.2%4	5	59	0.1%
Avocet Q	Q0	0	0.0%	0.0%49	498	8251	25110.1%	10.1%87	67220	220341	8.514.3%
Lapwing A	A325	32515	151.8%	1.8%0	03	32374	23714.4%	14.4%1158	1184956	956825	7.83%
Golden plover Q	Q0	0	0.0%	0.0%	02	214	140.0%	0.0%	0	0	0.0%
Grey plover A	A0	0	0.0%	0.0%	0	045	451.5%	1.5%0	02	21	0.1%
Ringed plover A	A210	2100	17.0%	17.0%68	684	439	399.3%	9.3%36	260	018	2.53.1%
Little ringed plover	-0	0	0.0%	0.0%1	10	0	018.2%	18.2%1	10	0	20.06.3%
Whimbrel A	A2	20	02.8%	2.8%0	0	0	0.0%	0.0%	0	03	06.0%
Curlew A	A158	15861	613.7%	3.7%66	66109	109136	1365.1%	5.1%73	8684	84163	3.47.1%
Bar-tailed godwit Q	Q123	1230	04.4%	4.4%1	135	3514	142.4%	2.4%0	10	0	0.10%
Black-tailed godwit Q	2566 Q	50256 6	5066.0%	1524 6 6.0%	816 15 24	816 21 83	218348.0%	48.0% 1538	3313 1 712	29733 313	58.752.2%
Turnstone A	A0	01	10.2%	0.2%4	41	137	3715.5%	15.5%	50	03	1.68%
Knot Q	Q0	01	10.0%	0.0%2	20	067	670.4%	0.4%2	20	0	0.0%
Ruff Q	Q1	10	01.6%	1.6%0	0	0	0.2%	0.2%	0	02	0.3.1%
Sanderling A	A0	0	0.0%	0.0%	0	02	20.3%	0.3%1	0	0	0.01%

Species	SPA spES TTTC	ES TTTC WeBS	% Humber ES WeBS	% Humber ESWeBS Core 15-19	WeBS Core 15-19Low 11-12	WeBS Low 11-12Other 17-21	Other 17-21% Humber MC2	% Humber MC2 WeBS Core 18-22	WeBS Core 17-21Able 22-23	Able 22-23-24	% Humber TE
Curlew Sandpiper	0	0	0.0%	0	0	0	0.0%		0	0	4	25.0%
Dunlin [Q]	1029 Q	87102 9	875.7%	5.7%326	32628 9	28968 0	6804.3 %	4.3%406	43234 6	34651 7	2.57%
Little stint	0	0	0.0%	0.0%	0	03	346.9%	46.9% 0	0	0	0.0%
Snipe	0	0	0.0%	0.0%1	10	015	1511.7 %	11.7% 2	25	50	4.73.0%
Common sandpiper	3	30	12.0%	12.0%	02	20	05.8%	5.8%1	10	04	1.412.5 %
Redshank [Q]	Q540	54083	8310.5 %	10.5% 116	11638	38806	80628.0 %	28.0% 86	113147	147212	5.58.2%
Spotted redshank	0	0	0.0%	0.0%	0	0	0.0%	0.0%	01	10	3.24%
Greenshank [A]	A0	0	0.0%	0.0%	0	02	24.3%	4.3%0	0	0	0.0%

Table 1617. Overall peak waterbird counts for the North Killingholme Haven Pits.

Species	SPA spES TTTC	ES TTTC WeBS	% Humber ES WeBS	% Humber ESWeBS Core 15-19	WeBS Core 15-19Low 11-12	WeBS Low 11-12JBA 17-18	JBA 17-18% Humber MC2	% Humber MC2 WeBS Core 18-22	WeBS Core 17-21Able 22-23	Able 22-23-24	% Humber TE
Canada goose	0	01	10.2%	0.2%	0	0	0.0%	0.0%1	12	2	0.3%
Greylag goose	0	0	0.0%	0.0%	04	416	161.0%	1.0%6	839	3921	2.21.8%
Pink-footed goose [A]	0	0	0.0%	0.0%	0	0100	1000.8%	0.8%	0	0	0.0%
Mute swan	1	1	10.3%	0.3%1	10	01	10.7%	0.7%	10	01	0.46%
Shelduck [Q]	Q9	97	70.2%	0.2%9	912	128	80.3%	0.3%12	147	78	0.21%
Shoveler	61	6129	2949.5%	49.5% 8	80	04	43.7%	3.7%	91	19	3.2.9%
Gadwall	0	0	0.0%	0.0%	0	02	20.9%	0.9%	02	210	0.83.4%
Mallard [A]	A34	3471	713.4%	3.4%13	137	740	403.8%	3.8%18	17206	20618	18.616.7%
TealPintail	A0	460	300.0%	1.7%0	0	110	1040.0%	2.8%0	730	19624	3.713.8 %
PochardTeal [A]	A46	030	01.7%	0.0%	011	0104	42.8%	5.0%60	0196	0768	0.013.5 %
Tufted duckPochard [A]	0	10	10.0%	0.2%	0	04	5.0%	0.0%	0	10	0.40%
Tufted duckGoldeneye	A1	01	0.2%	0.0%	0	0	0.0%	0.0%	01	23	0.71.1%
Goldeneye ASmew	0	10	0.0%	50.0%	0	0	0.0%	0.0%	02	0	0.6%
SmewLittle grebe	1	0	150.0%	1.1%0	0	0	50.0%	10.3% 0	0	10	1.80.0%

Species	~~SPA sp~~ES ~~TTTC~~ WeBS	ES ~~TTTC~~ WeBS	% *Humber ES* ~~WeBS~~	~~% *Humber ES*~~WeBS ~~Core 15-19~~Low 11-12	WeBS ~~Core 15-19~~Low 11-12	~~WeBS Low 11-12~~JBA 17-18	~~JBA 17-18%~~ *Humber MC2*	~~% *Humber MC2*~~ WeBS Core 18-22	~~WeBS Core 17-21~~Able 22-23	Able ~~22-~~23-24	% *Humber TE*
~~Bittern~~Little grebe	~~Q~~0	~~0~~1	~~0~~1.1%	0~~.0%~~	0	~~0~~5	~~0~~10.3%	0~~.0%~~	~~0~~1	~~0~~2	~~6.7~~3.1%
~~Grey heron~~Bittern [Q]	0	~~3~~0	~~3~~0.0%	~~6.8%~~0	0	~~2~~0	~~2~~0.0%	~~6.1%~~0	~~1~~0	~~2~~0	~~5.3~~6.7%
~~Little egret~~Grey heron	3	~~1~~3	~~0~~6.8%	~~2.6%~~0	~~5~~2	2	~~10~~6.1%	~~4.9%~~0	~~6~~2	~~2~~1	~~3.1~~4.9%
Little egret~~Cormorant~~	1	~~1~~0	~~1~~2.6%	~~0.7%~~5	~~0~~2	~~2~~10	~~3~~4.9%	~~0.9%~~6	~~0~~2	~~1~~6	~~0.~~2.8%
~~Marsh harrier~~Cormorant	~~Q~~1	~~0~~1	0.7%	0	~~0~~2	~~0~~3	~~1~~0.9%	1	~~0~~1	~~1~~7	~~>~~1.2%
Water rail	2	~~2~~0	~~0~~33.3%	~~33.3%~~0	0	0	~~0~~2.5%	~~2.5%~~0	1	~~1~~0	~~7.1~~8.3%
Moorhen	4	~~4~~2	2.7%	~~2.7%~~0	~~0~~1	~~1~~0	2.0%	~~2.~~0%	0	0	0.4~~0~~%
Coot	2	~~2~~3	0.3%	0~~.3%~~	0	0	0.0%	0~~.0%~~	0	0	0.0%
Oystercatcher [A]	~~A~~4	4~~2~~	~~2~~0.1%	~~0.1%~~2	2	2	~~2~~0.0%	~~0.0%~~2	2	~~2~~4	0.~~0~~1%
Avocet [Q]	~~Q~~16	~~16~~27	~~27~~5.3%	~~5.3%~~5 4	~~5~~45	~~5~~44	~~4~~42.2%	~~2.2%~~1 79	~~13~~4175	~~175~~702	~~6.8~~29.4 %
Lapwing [A]	~~A~~5	~~5~~276	~~276~~1.6%	~~1.6%~~0	0	~~0~~269	~~269~~1.6%	~~1.6%~~7 70	~~77~~2340	~~340~~580	~~5.1~~4.8%
Golden plover [Q]	~~Q~~1	~~1~~0	<0.1%	~~<~~0.1%	0	0	0.0%	0~~.0%~~	0	0	0.0%
Ringed plover	0	~~0~~1	0.1%	~~0.~~1%	~~1~~0	0	0.1%	~~0.~~1%	1	~~1~~0	0.1%
Little ringed plover	2	~~2~~0	~~0~~52.6%	~~52.6%~~0	~~0~~1	~~1~~0	~~0~~22.7%	~~22.7%~~0	0	0	0.0%
Curlew [A]	~~A~~7	~~7~~12	~~12~~0.3%	~~0.3%~~4	4	4	~~4~~0.2%	~~0.2%~~8	~~8~~24	~~24~~62	~~0.9~~2.7%
Bar-tailed godwit [Q]	~~Q~~1	~~1~~0	<0.1%	0~~.0%~~	0	~~0~~2	~~2~~0.1%	0~~.1%~~	0	~~0~~7	0.~~0~~4%
Black-tailed godwit Q	3800~~Q~~	3338~~3 800~~	97.8%~~33 38~~	3336~~9 7.8%~~	~~3336~~2 000	~~2000~~655	~~655~~73.4 %	~~73.4%~~ 3904	3650~~3 726~~	5609~~3 650~~	~~66.0~~88.4%
Turnstone [A]	~~A~~0	0	0.0%	0~~.0%~~	0	0	0.1%	0~~.1%~~	0	0	0.1%
Knot [Q]	~~Q~~12	~~12~~0	<0.1%	~~0.0%~~8 4	~~8~~40	0	0.4%	~~0.4%~~3 00	~~29~~80	~~0~~5	1.~~1~~3%
Ruff [Q]	~~Q~~0	~~0~~1	1.6%	1~~.6%~~	~~1~~0	~~0~~2	2.5%	~~2.5%~~0	~~1~~0	~~0~~6	~~1.8~~9.4%
Sanderling [A]	~~A~~0	0	0.0%	0~~.0%~~	0	~~0~~12	~~12~~2.1%	~~2.1%~~0	0	0	0.0%
~~Dunlin~~Curlew Sandpiper	~~Q~~0	~~27~~00	~~38~~00.0%	~~2.1%~~0	~~66~~30	0	~~45~~00.0%	~~4.2%~~1	~~92~~60	~~22~~0	5.3~~0~~%
~~Little stint~~Dunlin [Q]	270	~~0~~380	~~0~~2.1%	~~0.0%~~6 63	0	~~0~~450	~~0~~4.2%	~~0.0%~~9 00	~~0~~22	~~0~~107	~~0.0~~4.8%
Snipe	6	~~6~~4	~~4~~5.1%	~~5.1%~~3 3	~~3~~30	~~0~~26	~~26~~25.4%	~~25.4%~~ 33	~~41~~9	~~9~~22	~~37.9~~19.6%
Common sandpiper	0	0	0.0%	0~~.0%~~	0	0	0.6%	0~~.6%~~	0	~~0~~1	~~0.5~~3.1%
Redshank [Q]	~~Q~~249	~~249~~215	~~215~~4.8%	~~4.8%~~2 30	~~23~~01	~~1~~450	~~450~~15.6 %	~~15.6%~~ 214	~~208~~290	~~290~~361	~~10.9~~14.0%
Greenshank [A]	~~A~~0	0	0.0%	0~~.0%~~	0	0	0.0%	~~0.0%~~1 5	0	0	~~0.4~~26.2 %

~~7.43.~~6.47. The Supporting Habitats that could be affected by the Project include:

- Coastal lagoons
- Freshwater and coastal grazing marsh
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

~~8.~~7. Assessment of Potential for Likely Significant Effect

~~8.1.~~7.1. The Project will result in a range of likely environmental impacts including, during construction:

- Direct loss of intertidal habitat within the Humber Estuary SPA/Ramsar/SAC through construction of project infrastructure;
- Indirect Loss of intertidal habitat within the Humber Estuary SPA/Ramsar/SAC;
- Loss of fish habitat within the Humber Estuary SPA/Ramsar/SAC;
- Loss of terrestrial habitat functionally linked to the Humber Estuary SPA/Ramsar/SAC;
- Disturbance to birds, fish and marine mammals (noise and visual);
- Underwater noise disturbance affecting fish and marine mammals;
- Dredging and other construction effects on water quality;
- Disposal of dredge spoil.
- Cumulative/in-combination effects.

~~8.2.~~7.2. Environmental impacts during operation will likely include:

- Disturbance to birds (noise and visual)
- Maintenance dredging impacts, including boat disturbance;
- Lighting impacts
- Maintenance dredging;

7.3. Operational impacts from vessel/shipping movements travelling to and from the AMEP quay are not considered in the assessment as they would be assessed by specific developments with which they were associated in the future (and which are currently unknown, e.g. future offshore wind farms).

~~8.3.~~7.4. The habitat losses that would occur as a result of the Time Extension are given in Table ~~13.~~18. The Time Extension losses were updated from the original Time Extension application to reflect updated baseline data on habitats within the site (with mudflats being further encroached by saltmarsh). This gives the loss of area from the current proposed Time Extension, , the original consented scheme (the losses predicted in the original ES are given in UES11-2 'Change in Habitat Losses within the Designated Site'~~)~~), and the consented Material Change 2. ~~The Time Extension would give the same habitat loss as the consented Material Change 2~~[E110][SP11]~~.~~

Table ~~13~~18. Habitat loss from the consented and the updated Projects.

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE Dec '24 update)	Notes
Direct - reclamation to construct quay	1130	Estuaries	13.5	10.4	10.4	Within the reclamation site. The set back berth has reduced the area of subtidal loss
	1140/1310	Mudflat/sandflat not covered by seawater at low tide Mudflat with pioneer saltmarsh	31.5	31.3	~~31.3~~29.8	Within the reclamation site - supports a range of waterfowl. Quay redesign for MC2 has led to slightly reduced loss.

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE Dec '24 update)	Notes
	1330	Saltmarsh	0	1.9	~~1.9~~3.4	New loss as this community has recently colonised this area.
Indirect functional loss through disturbance	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	11.6	7.7	7.~~7~~2	To the south of the reclamation site - potentially disturbed by operational activity on the quay following completion of construction (275m disturbance zone)
	1330	Saltmarsh	0	4.7	~~4.7~~5.2	New loss as this community has recently colonised this area.
Compensation Area Changes	1330	Saltmarsh	1.8	2.0	2.0	At Cherry Cobb Sands to form the channel across the foreshore from the existing flood defence to Cherry Cobb Sands Creek - this habitat would become mudflat offsetting the loss of Habitat type 1140. Area increased from 1.8 to 2ha in SoCG.

~~8.4.~~7.5. There would be no change in the extent of the noise disturbance resulting from the proposed Time Extension, or any other forms of potential disturbance.

~~8.5.~~7.6. Pressures identified by Natural England in their Advice on Operations relating to 'Construction of Port and Harbour Structures' comprise the following:

~~8.6.~~7.7. Medium-high risk

- Above water noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement
- Changes in suspended solids (water clarity)
- Emergence regime changes, including tidal level change considerations
- Habitat structure changes - removal of substratum (extraction)
- Introduction of light
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Physical change (to another seabed type)
- Physical change (to another sediment type)
- Physical loss (to land or freshwater habitat)
- Removal of non-target species
- Smothering and siltation rate changes (Heavy)
- Smothering and siltation rate changes (Light)

- Underwater noise changes
- Vibration
- Visual disturbance
- Water flow (tidal current) changes, including sediment transport considerations
- Wave exposure changes

~~8.7.~~7.8. Low Risk

- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
- Collision below water with static or moving objects not naturally found in the marine environment
- Deoxygenation
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Nutrient enrichment
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)
- Transition elements & organo-metal (e.g. TBT) contamination

~~8.8.~~7.9. Pressures identified by Natural England in their Advice on Operations relating to 'Operation of Ports and Harbours' comprise the following:

Medium-high risk

- Introduction of light

Low Risk

- Above water noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement
- Changes in suspended solids (water clarity)
- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
- Collision below water with static or moving objects not naturally found in the marine environment
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Smothering and siltation rate changes (Light)
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)
- Transition elements & organo-metal (e.g. TBT) contamination
- Underwater noise changes

- Visual disturbance

~~8.9.~~7.10. Medium-high risks are described by Natural England as follows: “Pressure is commonly induced by activity at a level that needs to be considered further as part of an assessment”; and low risks as “Unless there are evidence based case or site specific factors that increase the risk, or uncertainty on the level of pressure on a receptor, this pressure generally does not occur at a level of concern and should not require consideration as part of an assessment.”

~~8.10.~~7.11. All of these have been considered during the LSE assessment. Assessment matrices are given in Appendices 4 and 5 (which have taken into account consideration of all these risks for each qualifying species/feature, particularly those identified as ‘medium-high’). These impacts will be investigated in further detail during the appropriate assessment stage, for the qualifying features for the species/populations where LSE could not be ruled out.

~~9.~~8. Screening Statement

~~9.1.~~8.1. The only European Protected Natura 2000 sites that could be affected by the proposed development are the **Humber Estuary SPA**, the **Humber Estuary Ramsar site** and the **Humber Estuary SAC**.

~~9.2.~~8.2. This screening statement updates the one presented in the original 2011 application (agreed with the Applicant, Natural England and the MMO in the Statement of Common Ground on Shadow Habitats Regulations Assessment (HRA SoCG)[16]) and the one that formed part of the Material Change 2 application (agreed in that SoCG[17]).

~~9.3.~~8.3. That agreed approach determined that there could be LSE for all species that occurred in numbers ≥1% of the Humber Estuary population, and will be affected by loss/changes in habitat and/or disturbance, and this remains the approach undertaken here. No LSE was concluded for species not recorded during the baseline surveys, those not reliant on the habitats affected by the AMEP site, species resilient to impacts (e.g. through their use of cover at NKHP) and species recorded in very low numbers or their percentage of Humber Estuary population recorded is so low as to be insignificant. The results of the LSE screening exercise are given in full in Appendix 4.

~~9.4. No LSE was concluded in the original consented application for the following species:~~

- ~~Not recorded by Through The Tide Count surveys at KMFS/NKHP – arctic tern, barnacle goose, Bewick's swan, bittern, black-throated diver, brent goose, common scoter, common tern, curlew sandpiper, eider, great white egret, garganey, goosander, green sandpiper, greenshank, greylag goose, goldeneye, great crested grebe, hen harrier, jack snipe, kittiwake, little stint, long tailed duck, little tern, pink footed goose, pintail, red throated diver, roseate tern, sanderling, shag, scaup, spotted redshank, whooper swan, wood sandpiper, woodcock.~~
- ~~Not reliant on habitats at KMFS /NKHP – black headed gull, common gull, coot, grey heron, herring gull, gadwall, great black backed gull, lesser black backed gull and Mediterranean gull.~~
- ~~Species that although they occurred in numbers ≥ 1% their ecology makes them resilient to impacts (e.g. through their use of cover at NKHP) - moorhen, snipe.~~
- ~~Only one or two birds recorded by TTTC, or percentage of Humber Estuary population recorded is so low as to be insignificant – Canada goose, cormorant, golden plover, grey plover, little ringed plover, little grebe, little egret, knot, mute swan, oystercatcher, pochard, ruff, smew, tufted duck, turnstone, water rail, whimbrel, wigeon and yellow legged gull.~~

~~9.5.~~8.4. LSE was excluded for the loss of sub-tidal habitat in respect of the SPA and the bird interests of the Ramsar site, as none of the bird species significantly affected are reliant on the sub-tidal habitat.

[16] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001606-SOCG009%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20Natural%20England%20and%20the%20Marine%20Management%20Organisation.pdf~~2012 SoCG

[17] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000496-(TR030006.D6.SOCG.NE)%20Statement%20of%20Common%20Ground%20with%20Natural%20England.pdf~~ MC2 SoCG

~~9.6.~~8.5. LSE was also excluded in respect of the effects of lighting on the remaining intertidal habitats at KMFS (given the location and effect of the lighting shown on the figures in Supplementary Information EX19.1 - Lighting Lux Plans[~~18~~]).

~~9.7.~~8.6. LSE on birds was excluded in respect of the construction of the compensation site at Cherry Cobb Sands and the loss of the arable fields, on the basis that there will be no difference between the existing situation and the proposed situation (i.e. SPA birds still being able to utilise arable land adjacent to the compensation site) and work will only be undertaken between April to October when bird numbers are lowest and environmental conditions (food availability, daylight length and temperatures) most benign. Effects will be further mitigated by the diversion of the footpath, and screening of the existing intertidal habitats provided by the existing embankment.

~~9.8.~~8.7. In-combination effects were concluded not to occur for the remaining non-LSE bird species for one of the following reasons:

- they were not reliant on the habitats lost (including coot, heron and gadwall);
- there were only records of one or two birds; or
- they occurred in a such a small percentage of the Humber Estuary population as to be insignificant.

Update to baseline for Material Change 2 Application

~~9.9.~~8.8. Whilst there were some population changes since the original consent was issued, including increased numbers of teal, lapwing and avocet using the Killingholme Marshes Foreshore, in terms of the criteria agreed for LSE in the SoCG, there were no additional species reaching the originally agreed criteria for potential LSE for the Material Change 2 application.

Update to baseline for proposed Time Extension

~~9.10.~~8.9. The baseline bird surveys carried out since the Material Change 2 application have recorded very similar distribution and abundance as those for that application. The increases in teal, lapwing and avocet have been sustained ~~but there have been no major changes. ..~~ In terms of the criteria agreed for LSE in the 2011 SoCG, there were no additional species reaching the originally agreed criteria for potential LSE.

~~9.11.~~8.10. The Likely Significant Effect tests for the Humber Estuary SPA are summarised in Appendix 4.

Supporting Habitat Loss

~~9.12.~~8.11. There would be a direct loss of intertidal habitat within the SPA along the south shore of the river Humber through the construction of AMEP (see Table ~~13~~18 above). As any direct loss of SPA supporting habitat would be considered as an LSE, this has been taken forward for Appropriate Assessment. The Supporting Habitats that could be affected by the Project include:

- Coastal lagoons
- Freshwater and coastal grazing marsh

~~18~~ ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001612-OS-003_TR030001_Able%20UK%20Ltd_Supplementary%20Environmental%20Information_File%202%20of%202.zip~~

- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- Salicornia and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

~~9.13.~~8.12. There has been a change in the baseline habitat at Killingholme foreshore since the original application, with an ongoing process of accretion followed by saltmarsh colonisation, though this does not have an adverse effect on the quantum of habitat compensation, and changes since the Material Change 2 will have been negligible given the short time since that consent (in July 2022).

Additional Ramsar Qualifying Features

~~9.14.~~8.13. The Ramsar citation does not identify any additional ornithological qualifying features.

~~9.15.~~8.14. Non-avian Ramsar features include river lamprey, sea lamprey and grey seals (which are also features of the Humber Estuary SAC) and natterjack toad. LSE could not be ruled out for grey seal, sea lamprey and river lamprey, so these have been taken forward for Appropriate Assessment.

SAC

~~9.16.~~8.15. The Likely Significant Effect tests for the Humber Estuary SAC are summarised in Appendix 5. The following LSE are identified:

- Permanent direct loss of estuarine habitat (H1130)
- Permanent direct loss of intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)
- Permanent direct loss of saltmarsh (H1330)
- Indirect effects on estuarine habitat (H1130).
- Indirect effects on intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)
- Indirect effects on saltmarsh (H1330)
- Disturbance to grey seal, sea lamprey and river lamprey (S1364 and S1099).

In-combination Effects

8.16. The projects considered in-combination in the Time Extension application are as follows (those considered in the original application were as set out in the HRA information Report at Section 4.12 (see footnote 1)):

Considered in the MC2 HRA (Section 3.3 of the SoS's HRA[19])

- Able Logistics Park – PA/2015/1264 – North Lincolnshire Council (implemented but not completed);

[19] MC2 HRA Report

- North Killingholme Power Project (NKPP)- Development of a thermal generating station (not implemented);
- Hornsea Offshore Wind Farm (Zone 4) Project 2 – fully August 2022;
- Yorkshire Energy Park (17/01673/STOUTE) – East Riding of Yorkshire Council);
- Outstrays to Skeffling Managed Realignment Site;
- South Humber Gateway Mitigation Areas (including Cress Marsh, Novartis and the former Huntsman Tioxide site);

New Projects Submitted/Approved since MC2

- Erection of a monopile manufacturing facility – PA/2021/1525 (consented);
- AHP Enabling Works South – PA/2023/502 – North Lincolnshire Council (consented);
- VPI Power – post-combustion carbon capture plant – PA/2023/421 (submitted, decision pending);
- ABP Westgate Immingham – PA/2022/1223 (submitted, decision pending);
- Immingham Eastern Ro-Ro Terminal (IERRT, DCO, consented); and
- Immingham Green Energy Terminal (IGET, DCO, consented).

8.17. Consideration has been given as to whether there could be any interactive/synergistic effects with these other developments, and also to the possible inter-related effects of construction and operation on the Project site at the same time (as part may become operational at the same time as construction continues in other parts).

~~9.17.~~8.18. The qualifying interest habitats listed on the Humber Estuary SAC citation for which LSE was not identified for AMEP alone (e.g. sandbanks which are slightly covered by the sea at all times and various dune communities) will not be affected at all by AMEP, and hence an in-combination assessment for them is not necessary (this remains the same position as agreed for the consented DCO statement of common ground (ERM 2012) and for the ~~consented DCO~~ statement of common ground between NE and AHPL for ~~the~~ Material Change 2).

~~9.18.~~8.19. The SPA qualifying bird species for which LSE was not identified for AMEP alone were largely species that were not recorded as part of site-specific surveys or only records infrequently/in trivial numbers, and hence will not be affected at all by AMEP. In-combination ornithological effects were also concluded for the consented DCO and for the Material Change 2 not to occur because either (a) they were not reliant on the habitats lost (e.g. gull species recorded and others such as coot, heron and gadwall); or (b) there were only records of one or two birds; or they occurred in a such a small percentage of the Humber Estuary population as to be insignificant. That remains the case for the proposed Time Extension.

~~Transboundary Screening~~

~~9.19. It was concluded in the original application (in the Planning Inspectorate Transboundary Screening Matrix[20]) that transboundary issues required notification under Regulation 24 of the EIA Regulations, with Iceland identified as the country to be notified. That was unchanged for the proposed Material Change 2 and remains unchanged as a result of proposed Time Extension.~~

[20] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001351-120816_Able_Transboundary%20Screening%20Matrix.pdf~~

Conclusion

~~9.20.~~8.20. The previous assessment of LSE for the Project ~~in 2012~~ concluded LSE on the grounds set out in Table 3.3 of the HRA SoCG, and agreed at paragraph 3.6.7 (*ibid*), for the following species:

Qualifying Species:

- Avocet;
- Marsh harrier;
- Bar-tailed godwit;
- Black-tailed godwit;
- Dunlin;
- Redshank;
- Knot; and
- Shelduck.

Additional Assemblage Species:

- Curlew;
- Lapwing;
- Mallard
- Ringed plover;
- Shoveler; and
- Teal.

Supporting Habitat:

- Coastal lagoons
- Freshwater and coastal grazing marsh
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

~~9.21.~~8.21. With regard to the potential effects on the Humber SAC, the following features have been identified for which LSE cannot be ruled out, and therefore require Appropriate Assessment:

- Estuarine habitats;
- Intertidal mudflats;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*);
- Grey seal;
- Sea lamprey; and
- River lamprey.

~~9.22.~~8.22. The HRA carried out for the Material Change 2 reached the same conclusion and that LSE could not be ruled out for the same list of species and features.

~~9.23.~~8.23. The proposed Time Extension and minor changes to the baseline ornithological and ecological conditions since the Material Change 2 application do not make any difference to this conclusion.

~~9.24.~~8.24. Further information to inform the Appropriate Assessment will be provided as a separate report.

~~10.~~9. References

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APPENDIX 1: HUMBER ESTUARY SPA CITATION

EC Directive 79/409 on the Conservation of Wild Birds

Name: Humber Estuary

Unitary Authorities/Counties: City of Kingston-upon-Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire

Component SSSIs: The SPA encompasses all or parts of the following Sites of Special Scientific Interest (SSSIs): Humber Estuary SSSI, North Killingholme Haven Pits SSSI, Saltfleetby-Theddlethorpe Dunes SSSI, and The Lagoons SSSI.

Site description: The Humber Estuary is located on the east coast of England, and comprises extensive wetland and coastal habitats. The inner estuary supports extensive areas of reedbed, with areas of mature and developing saltmarsh backed by grazing marsh in the middle and outer estuary. On the north Lincolnshire coast, the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. Parts of the estuary are owned and managed by conservation organisations. The estuary supports important numbers of waterbirds (especially geese, ducks and waders) during the migration periods and in winter. In summer, it supports important breeding populations of bittern *Botaurus stellaris*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and little tern *Sterna albifrons*.

Size of SPA: The SPA covers an area of 37,630.24 ha.

Qualifying species:

The site qualifies under article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex I species	Count and season	Period	% of GB population
Avocet *Recurvirostra avosetta*	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern *Botaurus stellaris*	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier *Circus cyaneus*	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover *Pluvialis apricaria*	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit *Limosa lapponica*	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff *Philomachus pugnax*	128 individuals – passage	5 year peak mean 1996-2000	1.4%
Bittern *Botaurus stellaris*	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier *Circus aeruginosus*	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet *Recurvirostra avosetta*	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern *Sterna albifrons*	51 pairs – breeding	5 year mean 1998-2002	2.1%

The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	Count and season	Period	% of subspecies/ population
Shelduck *Tadorna tadorna*	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot *Calidris canutus*	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin *Calidris alpina*	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank *Tringa totanus*	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *brittanica*
Knot *Calidris canutus*	18,500 individuals – passage	5 year peak mean1996 – 2000	4.1% *islandica*
Dunlin *Calidris alpina*	20,269 individuals – passage	5 year peak mean1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank *Tringa totanus*	7,462 individuals – passage	5 year peak mean1996 – 2000	5.7% *brittanica*

Bird counts from: Wetland Bird Survey (WeBS) database and The Humber Estuary: A comprehensive review of its nature conservation interest (Allen et al. 2003).

Assemblage qualification:

The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 153,934 individual waterbirds (five year peak mean 1996/97 – 2000/01), including dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, pochard Aythya ferina, scaup Aythya marila, goldeneye Bucephala clangula, bittern *Botaurus stellaris*, oystercatcher *Haematopus ostralegus*, avocet *Recurvirostra avosetta*, ringed plover *Charadrius hiaticula*, golden plover *Pluvialis apricaria*, grey plover *P. squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, sanderling *C. alba*, dunlin *C. alpina*, ruff *Philomachus pugnax*, black-tailed godwit *Limosa limosa,* bar-tailed godwit *L. lapponica*, whimbrel *Numenius phaeopus*, curlew *N. arquata*, redshank *Tringa totanus*, greenshank *T. nebularia* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA is used by non-breeding merlin Falco columbarius, peregrine F. peregrinus and short-eared owl *Asio flammeus*, and breeding common tern *Sterna hirundo* and kingfisher *Alcedo atthis* (all species listed in Annex I to the EC Birds Directive) in numbers of less than European importance (less than 1% of the GB population).

Status of SPA:

Humber Flats, Marshes and Coast (Phase 1) SPA was classified on 28 July 1994.

The extended and renamed Humber Estuary SPA was classified on 31 August 2007.

APPENDIX 2: HUMBER ESTUARY RAMSAR SITE CITATION

Site: Humber Estuary
Coordinates: 053 32 59 N, 000 03 25 E Area: 37,988 ha

The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the estuary is exposed as mud or sand flats at low tide. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer.

Ramsar criterion 1
The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass *Spartina anglica* and annual glasswort *Salicornia* communities. Low to mid marsh communities are mostly represented by sea aster *Aster tripolium*, common saltmarsh grass *Puccinellia maritima* and sea purslane *Atriplex portulacoides* communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch Elytrigia atherica (*Elymus pycnanthus*) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed Phragmites australis fen and sea club rush *Bolboschoenus maritimus* swamp with the couch grass *Elytrigia repens (Elymus repens*) saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon.

Ramsar criterion 3
The Humber Estuary Ramsar site supports a breeding colony of grey seals *Halichoerus grypus* at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*.

Ramsar criterion 5
Assemblages of international importance:
153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001)
Ramsar criterion 6 – species/populations occurring at levels of international importance.

Common shelduck, *Tadorna tadorna*
Northwestern Europe (breeding) population
4,464 individuals, wintering, representing an average of 1.5% of the population (5 year peak mean 1996/7-2000/1)

Eurasian golden plover, *Pluvialis apricaria*
altifrons subspecies – NW Europe, W Continental Europe, NW Africa population 30,709 individuals, wintering, representing an average of 3.3% of the population (5 year peak mean 1996/7-2000/1)

Red knot, *Calidris canutus*
islandica subspecies
28,165 individuals, wintering, representing an average of 6.3% of the population (5 year peak mean 1996/7-2000/1)

Dunlin, *Calidris alpina*
alpina subspecies – Western Europe (non-breeding) population
22,222 individuals, wintering, representing an average of 1.7% of the population (5 year peak mean 1996/7-2000/1)

Black-tailed godwit, *Limosa limosa islandica* subspecies
1,113 individuals, wintering, representing an average of 3.2% of the population (5 year peak mean 1996/7-2000/1)

Bar-tailed godwit , *Limosa lapponica lapponica* subspecies
2,752 individuals, wintering, representing an average of 2.3% of the population (5 year peak mean 1996/7-2000/1)

Common redshank, *Tringa totanus brittanica* subspecies
4,632 individuals, wintering, representing an average of 3.6% of the population (5 year peak mean 1996/7-2000/1)

Ramsar criterion 8
The Humber Estuary acts as an important migration route for both river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* between coastal waters and their spawning areas.

APPENDIX 3 HUMBER ESTUARY SAC CITATION

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Humber Estuary

Unitary Authority/County: City of Kingston upon Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire

SAC status: Designated on 10 December 2009

Grid reference: TA345110

SAC EU code: UK0030170

Area (ha): 36657.15

Component SSSI: Humber Estuary

Site description:

The Humber is the second largest coastal plain **Estuary** in the UK, and the largest coastal plain estuary on the east coast of Britain. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them; these include a breeding bird assemblage, winter and passage waterfowl, river and sea lamprey, grey seals, vascular plantsand invertebrates.

The Humber is a muddy, macro-tidal estuary, fed by a number of rivers including the Rivers Ouse, Trent and Hull. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holdernesscoast. This is the northernmost of the English east coast estuaries whose structure and function is intimately linked with soft eroding shorelines. The extensive mud and sand flats support a range of benthic communities, which in turn are an important feeding resource for birds and fish. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers.

Habitats within the Humber Estuary include **Atlantic salt meadows** and a range of sand dunetypes in the outer estuary, together with **Sandbanks which are slightly covered by sea water all the time**, extensive intertidal mudflats, ***Salicornia* and other annuals colonising mud and sand**, and **Coastal lagoons**. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary. These are best-represented at the confluence of the Rivers Ouse and Trent at Blacktoft Sands.

Upstream from the Humber Bridge, the navigation channel undergoes major shifts from northto south banks, for reasons that have yet to be fully explained. This section of the estuary is also noteworthy for extensive mud and sand bars, which in places form semi-permanent islands. The sand dunes are features of the outer estuary on both the north and south banks particularly on Spurn peninsula and along the Lincolnshire coast south of Cleethorpes.

Examples of both **Fixed dunes with herbaceous vegetation (`grey dunes`)** and **Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes)** occur on both banksof the estuary and along the coast. Native sea buckthorn **Dunes with *Hippophae rhamnoides*** also occurs on both sides of the estuary.

Significant fish species include **river lamprey** *Lampetra fluviatilis* and **sea lamprey** *Petromyzon marinus* which breed in the River Derwent, a tributary of the River Ouse. **Greyseals** *Halichoerus grypus* come ashore in autumn to form breeding colonies on the sandy shores of the south bank at Donna Nook.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) asit hosts the following habitats listed in Annex I:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Coastal lagoons*
- Dunes with *Hippophae rhamnoides*
- Embryonic shifting dunes
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide

- Fixed dunes with herbaceous vegetation (`grey dunes`)*
- *Salicornia* and other annuals colonising mud and sand
- Sandbanks which are slightly covered by sea water all the time
- Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes')

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) asit hosts the following species listed in Annex II:

- Grey seal *Halichoerus grypus*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

Annex I priority habitats are denoted by an asterisk (*)

Appendix 4. Humber Estuary SPA and Ramsar site species and habitats and their exposure to risk of any effect from the AMEP proposed Time Extension[21]. Q = qualifying species (as per SPA citation and/or SPA Review), A = assemblage species (as listed in SPA Review and citation, jncc.defra.gov.uk).

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[22] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Avocet (breeding and wintering)	Q		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Bittern (breeding and wintering)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Hen harrier (wintering)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Golden plover (wintering)	Q	Q					Only seen in potential impact zone infrequently in low numbers, no LSE
Bar-tailed godwit (wintering)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Ruff (passage)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Marsh harrier (breeding)	Q		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.

[21] This Table relates only to the proposed Time Extension and therefore only to the AMEP site. There would be no change to the Cherry Cobb Sands compensation site (and no effect of the Time Extension on that site) so that has not been considered as part of the assessment summarised here.

[22] Potential impact zone was defined as the site plus a precautionary buffer of 300m buffer (to exceed the maximum likely disturbance to the most sensitive species, curlew, for which a 275m disturbance zone was agreed in the SoCG), though consideration was also given to effects over a wider area as appropriate (e.g wider effects on seals and fish).

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[22] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Little tern (breeding)	Q						Not present in potential impact zone, no LSE
Shelduck (wintering)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Knot (wintering and passage)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Dunlin (wintering and passage)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Black-tailed godwit (wintering and passage)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Redshank (wintering and passage)	Q	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Brent goose (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Wigeon (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Teal (non-breeding)	A		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Mallard (non-breeding)	A		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[22] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Shoveler (non-breeding)	A		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Pochard (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Scaup (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Goldeneye (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Oystercatcher (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Ringed Plover (non-breeding)	A	Q	✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Grey plover (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Lapwing (non-breeding)	A		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Sanderling (non-breeding)	A	Q					Only seen in potential impact zone infrequently in low numbers, no LSE
Whimbrel (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Curlew (non-breeding)	A		✓✓	✓✓	✓✓	✓✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[22] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Greenshank (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Turnstone (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Grey seal		Q		✓✓	✓✓	✓✓	
River lamprey		Q		✓✓	✓✓	✓✓	
Sea lamprey		Q		✓✓	✓✓	✓✓	
Natterjack toad		Q					No suitable habitat in potential impact zone, no LSE
Coastal lagoons				✓✓	✓✓	✓✓	
Freshwater and coastal grazing marsh				✓✓	✓✓	✓✓	
Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)				✓✓	✓✓	✓✓	
Intertidal sand and mudflats				✓✓	✓✓	✓✓	
Salicornia and other annuals				✓✓	✓✓	✓✓	

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[22] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
colonising mud and sand							
Saltmarsh (Atlantic salt meadows)				✓✓	✓✓	✓	
Water column				✓✓	✓✓	✓	
Other supporting habitats							No direct or indirect loss, so no LSE

Appendix 5. Summary of Like Significant Effects on the Humber Estuary SAC resulting from the consented scheme (including the Material Change) and the proposed ~~Tiem~~Time Extension[23].

Potential Effect	Significance of Effect on SAC Qualifying Interest Features (Original ES)	Material Change 2	Proposed time extension
Permanent direct loss of estuarine habitat (H1130)	**Likely Significant Effect** due to losses of habitat under the footprint of the new quay, effects on sea and river lamprey and the effects of capital and maintenance dredging and disposal. Appropriate Assessment (AA) required.	No change - LSE	No change - LSE
Permanent direct loss of intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)	**Likely Significant Effect** predominantly due to losses caused by the new quay. Effects of dredging and disposal as per estuarine habitat above. AA required.	No change - LSE	No change - LSE
Permanent direct loss of saltmarsh (H1330)	**Likely Significant Effect** due to loss of saltmarsh for breach on compensation site. AA required.	No change - LSE. Additional loss of saltmarsh will occur as result of colonisation of reclamation area	No change - LSE. Additional loss of saltmarsh will occur as result of colonisation of reclamation area
Indirect effects on estuarine habitat (H1130).	**Likely Significant Effect** with changes in the composition of the estuarine habitats present to the north and south of the quay. AA required.	No change - LSE	No change - LSE
	No Likely Significant Effect has been concluded about the effects on sub-tidal habitat for lamprey, the effects of the compensation site at CCS on the hydrodynamics of the estuary and the effects on water temperatures of the relocation of the power station outfall pipes for reasons listed below.	No change - no LSE	No change - no LSE
	No likely significant effects on sea or river lamprey due to the small indirect changes (see *Annex B*).	No change - no LSE	No change - no LSE
	Relocation of the outfalls to the front of the new quay will change the thermal plume, but there will be no significant changes to the temperatures of the receiving water (*EX9.7 – Assessment of the Relocation of the E.ON and Centrica Outfalls on Thermal Recirculation*), The relocation has yet to be agreed with E.ON and Centrica, however, the receiving water will be no warmer with AMEP even if the outfalls remain in their current location.	No change - no LSE	No change - no LSE

[23] *This Table relates only to the proposed Time Extension and therefore only to the AMEP site. There would be no change to the Cherry Cobb Sands compensation site (and no effect of the Material Change on that site) so that has not been considered as part of the assessment summarised here.*

Potential Effect	Significance of Effect on SAC Qualifying Interest Features (Original ES)	Material Change 2	Proposed time extension
Indirect effects on intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)	**Likely Significant Effect** predominantly due to changes in habitat to the north and south of the new quay and geomorphological changes due to rise in water levels. AA required.	No change - LSE	No change - LSE
	No Likely Significant Effect has been concluded about the effects of erosion at the breach location of the compensationsite at CCS and due to the discharge from the pumping station and increased wave heights due to the new quay. The reasons are set out below.	No change - no LSE	No change - no LSE
	Downstream of the breach at the compensation site, erosion and enlargement of the CCS Creek is predicted withincreases predominantly in the depth of the creek and also its width closer to the breach, although it will remain unchanged at the *"downstream"* location (Black & Veatch, 2012[1]).	No change - no LSE	No change - no LSE
	A channel will be initiated by dredging a short section of intertidal habitat seaward of the pumping station (see *Tables 12.2* and *12.3* of the SoCG for the ES), so there will be no significant erosion effects.	No change - no LSE	No change - no LSE
	Increased wave heights due to the new quay will be small and localised and any erosion resulting will be offset by accretion resulting from the sheltering effect of the quay as described in *Supplementary Information EX 8.7 Modelling ofFinal Quay Design*.	No change - no LSE	No change - no LSE
Indirect effects on saltmarsh (H1330)	**Likely Significant Effect** due to the transformation of existing habitat types into saltmarsh (see *Annex B*). AA required.	No change - LSE	No change - LSE
Disturbance to grey seal, sea and river lamprey (S1364 and S1099)	**Likely Significant Effect** as piling for the new quay construction will create underwater noise which could affect grey seal and migratory movements of sea and river lamprey. AA required.	No change - LSE	No change - LSE

1.2 - AMEP DRAFT CONSULTATION HRA; PART 2

(Tracked changes from submission in 2024)

Able Marine Energy Park: Article 7 Extension of Time

Habitats Regulations Assessment Report

Part 2: Information to Inform an Appropriate Assessment

DRAFT FOR CONSULTATION v4

Ecology Consulting Report to Able UK Ltd

~~*February 2024*~~

April 2025

1. Executive Summary

The requirement for this Assessment is set out under Article 6 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, (the 'Habitats Directive'). Article 6 requires that any plan or project which is not directly connected to, or necessary to the management of a Natura 2000/National Site Network site and which is likely to have a significant effect on the conservation objectives of the site, either individually or in combination with other plans and projects, should be subject to an appropriate assessment. Article 6(3) is fully transposed in English law by Requirement 63 of the Conservation of Habitats and Species Regulations 2017 (SI2017/1012).

Part 1 of the HRA report concluded that the Able Marine Energy Park (AMEP) project would have Likely Significant Effects (LSE) on eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, redshank and shelduck) and on six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal).

LSE was also recorded for seven features of the Humber Estuary SAC/Ramsar site (estuarine habitats, intertidal mudflats, *Salicornia* and other annuals colonising mud and sand, Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*), grey seal, sea lamprey and river lamprey).

This report, forming Part 2 of the HRA, provides the competent authority with the information required to assess and review the information and make its determination of effect for an Appropriate Assessment.

It is concluded that the Project Time Extension would continue to adversely affect the ecological integrity of the Humber Estuary SPA and Ramsar site, and the Humber Estuary SAC. Since the HRA to support the original ~~HRA~~DCO was carried out, the area of mudflat lost has reduced in size as it has converted to saltmarsh. The new quay alignment consented for the Material Change 2 (MC2) also slightly reduced the total area of habitat lost compared to the original scheme. Given that there would be no change to the proposed development from the Time Extension and that there have been no subsequent major changes to the ecological baseline assessed under MC2, the Time Extension would have the same effects as the Material Change 2. Where there are slight changes in habitats and bird numbers, the impact of these changes on the previously agreed compensation measures are reviewed in Part 5 of this document. The compensation proposals overall remain the same and ~~so~~ it is concluded that, after mitigation, the adverse effect on integrity would continue to be adequately compensated ~~and mitigated~~ by the measures already proposed.

2. Introduction and Background

2.1. This report forms part of the application for a Time Extension to the consented Able Marine Energy Park (referred to hereafter as the 'Project'). It addresses the nature conservation issues raised by the Project, specifically concerning the Conservation of Habitats and Species Regulations 2017, the 'Habitats Regulations'. It comprises the second part of the information to inform the Habitat Regulations Assessment (HRA) for the Project, and provides information required to inform an Appropriate Assessment of the likely significant effects previously identified (in the Part 1 LSE Test) on relevant sites of international nature conservation importance (i.e. the Humber Estuary SPA/Ramsar site/SAC).

2.2. Part 1 of the HRA report, the Likely Significant Effect report, concluded that the Project had the potential to affect the Humber Estuary SPA/Ramsar site/SAC but no others. It concluded Likely Significant Effects on eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, redshank, shelduck and redshank) and on six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal). LSE was also concluded for seven features of the Humber Estuary SAC; estuarine habitats, intertidal mudflats, *Salicornia* and other annuals colonising mud and sand, Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*), grey seal, sea lamprey and river lamprey.

2.3. As a result, it is necessary to undertake an Appropriate Assessment under the Habitats Regulations with regard to those Likely Significant Effects identified for these species. Sufficient information must be provided to allow the competent authority to assess and review the information and make its own determination of effect for an Appropriate Assessment. This report provides the required information. It reviews the Appropriate Assessments carried out for the original DCO application and for the Material Change 2 in light of the proposed Time Extension and any changes that have occurred in the baseline ecological conditions.

3. Legislative Framework

3.1. Under the Habitats Regulations, a development that is likely to significantly affect an SPA or SAC site requires Appropriate Assessment under Regulation 63 of those Regulations. As a matter of government policy, such a requirement also extends to Ramsar sites in England.

3.2. The first test under the Habitats Regulations is whether the development is likely to have a significant effect on a protected site, either alone or in combination with other plans or projects. This includes consideration of LSEs on any of the populations of importance for which the protected site has been designated. If it is, as determined by the competent authority, then the authority must make an appropriate assessment of the implications of the development for that site in view of the site's conservation objectives. In this context ecological integrity is defined in "Managing Natura 2000 Sites" (European Communities 2000) as:

"the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified"

~~3.3. In Part 1 of the HRA report it was concluded that the proposed Project could result in Likely Significant Effects on the Humber Estuary SPA/Ramsar avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, redshank, shelduck, knot, curlew, lapwing, mallard, ringed plover, shoveler and teal populations (together with their Supporting Habitat; coastal lagoons, freshwater and coastal grazing marsh, inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture), intertidal sand and mudflats, *Salicornia* and other annuals colonising mud and sand, Saltmarsh (Atlantic salt meadows) and water column).~~

~~3.4. There would also be LSE for the Humber Estuary SAC/Ramsar, for its (a) estuarine habitats, (b) intertidal mudflats, (c) sandbanks which are slightly covered by seawater all the time; (d) *Salicornia* and other annuals colonising mud and sand; (e) Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*); (f) grey seal, (g) sea lamprey and (h) river lamprey populations.~~

4. Scope of this assessment

4.1. The scope of this report is to provide the information required to allow the competent authority to assess and review the information and make its own determination of effect for an Appropriate Assessment.

4.2. The first part of the HRA report identified the following features of the Humber Estuary SPA/Ramsar/SAC populations for which LSE could not be ruled out, and therefore require Appropriate Assessment:

Qualifying Species:

- Avocet;
- Marsh harrier;
- Bar-tailed godwit;
- Black-tailed godwit;
- Dunlin;
- Redshank;
- Knot; and
- Shelduck.

Additional Assemblage Species:

- Curlew;
- Lapwing;
- Mallard
- Ringed plover;
- Shoveler; and
- Teal.

Supporting Habitat:

- Coastal lagoons;
- Freshwater and coastal grazing marsh;
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture);
- Intertidal sand and mudflats;
- *Salicornia* and other annuals colonising mud and sand;
- Saltmarsh (Atlantic salt meadows);
- Water column.

4.3. With regard to the potential effects on the Humber SAC, the following features have been identified for which LSE cannot be ruled out, and therefore require Appropriate Assessment:

- Estuarine habitats;
- Intertidal mudflats;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*);

- Grey seal;
- Sea lamprey; and
- River lamprey.

4.4. The likely significant effects identified above are the same habitats and species identified for the original consented scheme and agreed between the Applicant, Natural England and the MMO as recorded in a Statement of Common Ground (SoCG) in August 2012[1], and for the Material Change 2 consented in July 2022.

4.5. This second part of the HRA, therefore, focuses on these species and their supporting habitats. The specific likely significant effects on the SAC (as agreed in the SoCG) were as follows:

- The effects of permanent loss of estuarine habitat from the footprint of the development.
- The effects of capital and maintenance dredging on estuarine habitats and intertidal mudflats.
- The effects of disposal of dredged material on estuarine habitats and intertidal mudflats.
- The effects of the permanent direct loss of intertidal mudflat from Killingholme Marshes Foreshore (KMFS), due to the footprint of the development.
- The effects of the permanent loss of saltmarsh.
- The effects of indirect habitat changes on qualifying habitats (estuarine habitat, intertidal mudflat and saltmarsh).
- The effects of underwater noise from piling on the feeding behaviour of grey seals and the migratory movements of river lamprey.

4.6. The specific likely significant effects on the SPA (as agreed in the SoCG) were as follows:

- The effects of the permanent direct loss of estuarine and specifically intertidal mudflats from KMFS on waterfowl that it supports.
- functional loss ~~of 11.6 ha~~ of mudflat habitat as a result of disturbance.
- The effects on the use of North Killingholme Haven Pits (NKHP) as a roost if the feeding areas on the mudflats at Killingholme Marches Foreshore (KMFS) are lost.
- The disturbance effects on birds due to piling activities during construction of the new quay.
- The disturbance effects on birds using NKHP from construction activities other than piling, and operation of AMEP.
- The effects of loss of terrestrial habitat within the AMEP site at North Killingholme which is used by SPA birds (predominantly curlew).

4.7. As for the original DCO and the Material Change 2 assessment, the possibility of 'in combination' effects has been considered in relation to other proposed developments that could affect these SPA species. Consideration of present day in-combination effects is included within this report in relation to whether site integrity might adversely be affected by the Project in combination with any other developments in the region.

[1] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001606-SOCG009%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20Natural%20England%20and%20the%20Marine%20Management%20Organisation.pdf~~ 2012 SoCG

5. Consultation

5.1. Able Humber Port Ltd has consulted on this proposed 7 year time extension, including the production of an Environmental Review and a Consultation Draft HRA Report. The consultation material is available at: https://www.ableuk.com/sites/port-sites/humber-port/able-dco-extension/.

5.2. Natural England ~~did not respond~~submitted three written responses to the consultation~~, but North Lincolnshire Council confirmed that~~ as recorded below:

a) Letter dated 6 June 2024 (5 pages)

b) Letter dated 13 August 2024 (1 page)

c) Letter dated 1 October 2024 (9 pages)

5.3. The Department for Transport ('the ~~"local planning authority has no objections to raise with respect to~~ DfT') issued a decision on the ~~proposed time extension", and that "~~application on 28 October 2024. At paragraph 12 of their decision letter, the ~~LPA agrees with~~DfT set out a request for information in order to further consider the ~~conclusions of~~ application. In the ~~review in that the proposed extension to the implementation~~interim period ~~is unlikely to result~~, pending the Applicant's provision of this further information, the 10-year time limit specified in ~~new or materially different environmental impacts and that~~Article 7 of the DCO was extended for 1 year, although no new works may start in that period.

5.4. Specifically, paragraph 12 of the decision letter states:

12. To address the concerns raised by Natural England set out above, the Secretary of State requests the following information:

Updated ecological survey work

Update HRA to include a detailed in combination assessment

Provide a timeline in relation to the delivery of the overcompensation site at Cherry Cobb Sands

Provide a timeline in relation to the delivery of the benthic modelling for update of the CEMMP.

~~5.2.~~5.5. Following receipt of the decision, a meeting was held between NE and Able Humber Ports Ltd on 27 November 2024 to agree the scope of additional works necessary ~~mitigation is already secured and/or is in situ."~~to respond to the DfT. Two further update to the HRA were have been provided to NE since the decision letter. NE has provided further comments on theses updated drafts in letters dated 6 March 2025 and 8 April. The applicant has sought to address all NE comments on the HRA in this report (version 4).

6. Key Ornithological Interests: Baseline Conditions Update relating to SPA species

6.1. This section provides information on the baseline numbers, distribution and behaviour of the 14 bird species that have been taken forward for Appropriate Assessment, examining their use of the baseline survey area (defined to include all the potential impact zone of the development). The data are presented first for the Killingholme Marshes Foreshore and then for North Killingholme Haven Pits. All comparisons with the whole Humber Estuary SPA population use the most recent SPA BTO WeBS 5-year mean peak count, covering the period 2018/19 to 2022/23 (Woodward *et al.* 2024[2]).

Killingholme Marshes Foreshore

6.2. ~~Table 1 summarises the annual peak counts from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts**, showing the peak count each month over the most recently available five-year period (2017/18 –~~ Table 1 summarises the most recently available five-year mean peak counts from the Killingholme Marshes Foreshore (KMFS) sector, giving the peak for each winter, the mean annual peak over the last five years for which data are currently available, 2018/19 – 2022/23, and the % that this comprises of the mean annual peak of the whole Humber Estuary population of each species over the same five-year period. As an example, for teal the mean annual peak count for 2018/19 – 2022/23 was 389 individuals. The mean annual peak total Humber Estuary WeBS count over the same period was 5,710, giving a % of the SPA population at KMFS of 389/ 5,710= 6.8%.

~~6.2. 2021/22) for each of the species for which LSE could not be ruled out (other than marsh harrier, which is not covered by the WeBS scheme).~~

[2] Woodward, I.D., Calbrade, N.A., Birtles, A., Feather, G.A., Peck, K., Wotton, S.R., Shaw, J.M., Balmer, D.E. and Frost, T.M. 2024. Waterbirds in the UK 2022/23: The Wetland Bird Survey and Goose & Swan Monitoring Programme. BTO/RSPB/JNCC/NatureScot. Thetford.

Table 1. BTO WeBS Core High Tide Count Monthly Peak counts ~~2017-18 – 2021-22~~2018-19 – 2022-23, Killingholme Marshes Foreshore

Species	SPA species*	~~2017/18~~ 2018/19	2019/20 ~~2018/19~~	2020/21 ~~2019/20~~	2021/22 ~~2020/21~~	~~2021/22~~ 2022/23	Mean peak 18/19-22/23	% SPA mean peak 18/19-22/23
Shelduck	Q	~~110~~58	~~58~~93	~~93~~55	~~55~~27	~~27~~40	~~69~~55	~~1.10~~.6%
Shoveler~~Teal~~	~~A~~	~~376~~70	~~428~~93	~~192~~43	~~463~~31	~~432~~26	~~378~~53	16.7~~.2~~%
Mallard	A	~~41~~64	~~64~~98	~~98~~68	~~68~~114	~~114~~63	~~77~~81	6.96%
Teal~~Shoveler~~	A	~~784~~28	~~701~~92	~~934~~63	~~434~~32	~~314~~32	~~633~~89	~~21.4~~6.8%
Marsh Harrier	Not included in these surveys							
Avocet	Q	~~29~~60	~~60~~131	~~131~~32	~~32~~82	~~82~~129	~~67~~87	~~2~~3.6%
Ringed Plover	A	~~5~~2	~~2~~22	~~22~~94	~~9~~49	~~9~~53	~~26~~36	~~2.5~~3.1%
Lapwing	A	1930~~397~~	876~~1930~~	~~876~~1418	~~1418~~129 7	~~1297~~271	~~1184~~115 8	7.83%
Knot	Q	0	~~0~~12	~~12~~0	0	0	2.4	<0.~~0~~1%
Dunlin	Q	~~245~~349	~~349~~1000	~~1000~~380	~~380~~187	~~187~~115	~~432~~406	2.52%
Black-tailed Godwit	Q	1120~~165 0~~	2400~~112 0~~	2240~~240 0~~	1150~~224 0~~	~~1150~~780	~~1712~~153 8	~~30.3~~24.2%
Bar-tailed Godwit	Q	~~6~~0	0	0	0	0	~~1~~0	0.~~1~~0%
Curlew	A	~~97~~120	~~120~~34	~~34~~64	~~64~~115	~~115~~34	~~86~~73	3.42%
Redshank	Q	~~210~~86	~~86~~145	~~145~~92	~~92~~32	~~32~~74	~~113~~86	~~4.2~~3.3%

* Q = qualifying species, A = assemblage species.

6.3. Table 2 summarises the monthly pattern of occurrence from the British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts, showing the peak count each month over the most recently available five-year period.

Table 2. BTO WeBS Core Count Monthly Peak counts ~~2017-18 – 2021-22~~2018-19 – 2022-23, Killingholme Marshes Foreshore

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Shelduck	50	~~110~~40	93	~~31~~23	~~32~~31	~~2~~4	~~31~~10	~~18~~11	~~2~~41	14
Shoveler	~~78~~41	~~47~~43	~~58~~46	~~40~~8	~~10~~3	12	93	~~10~~18	70	91
Mallard	59	43	~~16~~20	18	22	58	73	~~43~~63	~~46~~48	98
Teal	~~428~~432	~~273~~133	150	~~63~~41	0	23	80	298	432	463
Marsh Harrier	Not included in these surveys									
Avocet	0	~~82~~129	131	54	36	42	1	48	~~2~~0	15
Lapwing	1930	876	~~22~~27	6	~~2~~4	32	6	48	317	1418
Ringed Plover	~~1~~0	~~1~~0	~~5~~4	0	94	9	22	2	0	0
Curlew	~~26~~34	115	~~56~~35	64	~~13~~5	48	~~53~~10	34	~~97~~83	120
Bar-tailed Godwit	~~1~~0	0	0	0	0	0	0	0	0	~~6~~0
Black-tailed Godwit	19	600	1150	~~580~~780	~~63~~105	2240	1660	1120	6	2400
Knot	0	0	0	0	0	0	0	12	0	0
Dunlin	~~245~~202	400	~~48~~22	0	90	18	680	380	349	1000

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Redshank	~~166~~49	~~154~~145	58	~~210~~92	0	~~5~~20	~~1~~2	86	~~124~~48	~~180~~64

6.4. The **BTO Low Tide Counts** from 2011-12 (the most recent available) are summarised in Table 3.

Table 3. BTO Low Tide Count totals for the Killingholme Marshes Foreshore sector (CH066), 2011-12.

Species	01/10/11	01/03/12	01/04/12	01/05/12	01/06/12	01/07/12	01/08/12	01/09/12	PEAK
Shelduck	0	12	2	1	2	0	0	0	12
Shoveler	0	0	0	0	0	0	0	0	0
Mallard	3	2	2	4	7	0	0	5	7
Teal	11	4	0	0	0	0	0	0	11
Avocet	0	2	5	0	0	0	0	0	5
Lapwing	0	0	0	0	0	0	0	0	0
Ringed Plover	0	0	0	0	0	0	0	0	0
Curlew	4	3	0	0	0	0	0	0	4
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0
Black-tailed Godwit	0	0	0	0	0	0	2000	650	2000
Knot	0	0	0	0	0	0	0	0	0
Dunlin	0	0	0	0	0	0	0	0	0
Redshank	0	0	0	0	1	0	0	0	1

~~6.5.~~ The results of the September 2017- May 2018 JBA surveys are summarised in Table 4.

Table 4. Monthly peak counts from Killingholme Marshes Foreshore, September 2017- May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Shelduck	5	168	102	105	64	74	96	41	20	168
Shoveler	0	0	4	0	0	0	0	0	0	4
Mallard	1	3	2	0	0	0	0	3	0	3
Teal	29	310	298	71	122	173	133	32	0	310
Marsh Harrier	0	0	0	0	0	0	0	0	0	0
Avocet	0	36	16	0	0	15	34	15	4	36
Lapwing	0	200	212	342	665	233	18	2	1	665
Ringed plover	33	18	0	0	0	5	11	39	28	39
Curlew	4	35	70	60	65	119	136	30	2	136
Bar-tailed godwit	0	0	5	0	0	0	0	0	0	5
Black-tailed godwit	362	267	24	0	6	2	1	0	538	538
Knot	0	0	0	0	0	0	0	0	0	0
Dunlin	18	376	503	156	501	12	80	26	42	503
Redshank	70	806	284	292	370	135	115	111	0	806

ABP DATA 2018-19 and 2019-20

~~6.6.~~6.5. Data were obtained from ABP from their monitoring surveys undertaken over several sites, including KMFS. The recent data from 2018-19 and 2019-20 for KMFS are summarised in Table 5, which gives the monthly peak counts over this survey period, and the annual peaks for each of the two years.

Table 5. ABP Survey Data for Killingholme Marshes Foreshore sector, October-March 2018-19 and 2019-20: monthly peak counts and annual peaks.

Species	Oct	Nov	Dec	Jan	Feb	Mar	Peak 2018-19	Peak 2019-20
Shelduck	31	44	56	48	51	76	76	56
Shoveler	0	0	0	0	0	0	0	0
Mallard	22	3	0	0	1	10	22	10
Teal	413	915	510	828	1064	888	1064	828
Marsh Harrier	0	0	0	0	0	0	0	0
Avocet	251	33	23	0	76	152	104	251
Lapwing	65	372	1642	1550	2374	6	2374	1254
Ringed plover	24	16	1	3	6	7	19	24
Curlew	49	62	96	68	63	63	68	96
Bar-tailed godwit	0	0	2	3	14	0	2	14
Black-tailed godwit	2183	22	220	162	372	271	2070	2183
Knot	0	0	0	0	0	0	0	0
Dunlin	455	512	659	680	381	136	680	512
Redshank	184	140	156	170	117	204	204	140

Able Data 2020-21

~~6.7.~~6.6. The data collected for Able UK by Nick Cutts during December 2020 – March 2021 from the Killingholme Marshes Foreshore are summarised in Table 6, where the total counts from each survey are presented.

Table 6. Count totals Killingholme Marshes Foreshore sector, December 2020- March 2021 (source: Nick Cutts). *Note: partial coverage of north end of sector only during Dec-Jan).*

Species	09/12/2020	23/12/2020	07/01/2021	21/01/2021	04/02/2021	18/02/2021	05/03/2021	PEAK
Shelduck	8	0	2	0	20	34	13	34
Shoveler	0	0	0	0	0	0	0	0
Mallard	2	2	14	4	13	4	8	14
Teal	1466	994	470	520	431	212	354	1466
Marsh Harrier	0	0	0	0	0	0	0	0
Avocet	0	0	0	0	0	0	205	205
Lapwing	980	950	310	1121	240	0	0	1121
Ringed Plover	0	2	0	0	0	0	0	2
Curlew	6	3	11	2	28	26	29	29
Bar-tailed Godwit	0	0	0	0	0	0	0	0
Black-tailed Godwit	0	0	0	0	170	0	0	170
Knot	0	0	0	0	0	0	0	0
Dunlin	75	35	40	0	22	232	10	232
Redshank	13	71	42	7	53	52	43	71

Able Data 2022-23

~~6.8.~~6.7. The results of the additional surveys undertaken during the 2022-23 winter for the Killingholme Marshes foreshore are summarised in Table 7. This area continued to support a range of important wintering waterbird populations, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit, curlew and redshank, in similar numbers to those recorded in other previous surveys.

Table 7. Monthly peak counts for the Able UK Ltd daytime counts of the Killingholme Marshes Foreshore sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	10	1	1	2	9	5	10
~~Wigeon~~Shoveler	~~10~~	0	0	0	0	0	~~10~~
Mallard	14	2	0	2	8	4	14
Teal	1666	1166	710	614	553	148	1666
~~Mallard~~	~~14~~	~~2~~	~~0~~	~~2~~	~~8~~	~~4~~	~~14~~
~~Shoveler~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
Marsh Harrier	0	1	0	0	0	0	1
Avocet	220	83	0	0	144	120	220
Lapwing	266	526	187	956	622	5	956
Ringed plover	0	0	0	0	0	0	0
~~Dunlin~~	~~80~~	~~205~~	~~56~~	~~147~~	~~17~~	~~11~~	~~205~~
Bar-tailed godwit	0	0	0	0	0	0	0
Black-tailed Godwit	3091	513	2	1	6	73	3091
Curlew	28	50	47	84	46	44	84
Knot	0	0	0	0	0	0	0
Dunlin	80	205	56	147	17	11	205
Redshank	115	147	67	50	73	37	147

~~6.9.~~6.8. Table 8 summarises the results of the night surveys that were undertaken of the Killingholme Marshes foreshore during the 2022-23 winter.

Table 8. Monthly peak counts for the Able UK Ltd night counts of the Killingholme Marshes Foreshore sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	0	0	0	2	2
Shoveler~~Wigeon~~	0	~~20~~	0	0	0	0	~~20~~
~~Teal~~	~~218~~	~~358~~	~~4~~	~~212~~	~~160~~	~~64~~	~~358~~
Mallard	0	2	2	0	0	0	2
Teal	218	358	4	212	160	64	358
Marsh Harrier	0	0	0	0	0	0	0
Avocet	0	2	0	0	0	1	2
Ringed Plover	0	0	0	0	1	0	1
Lapwing	14	38	0	35	2	3	38
~~Dunlin~~	~~10~~	~~346~~	~~100~~	~~8~~	~~33~~	~~55~~	~~346~~
Black-tailed Godwit	75	0	0	0	0	0	75
Bar-tailed Godwit	0	0	0	0	0	0	0
Curlew	11	47	6	1	17	13	47
Knot	0	0	0	0	0	0	0
Dunlin	10	346	100	8	33	55	346
Redshank	5	74	42	16	74	32	74

Able Data 2023-24

6.9. The data collected for Able UK by Cutts and Hemingway during June 2023 – May 2024 from the Killingholme Marshes Foreshore are summarised in Table 9, which gives the monthly peak count. As for the other recent surveys, higher peak numbers of teal, lapwing and avocet were recorded in this area than previously.

Table 9. Monthly peak counts of Killingholme Marshes Foreshore sector, June 2023 – May 2024 (Source: Cutts and Hemingway).

Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Shelduck	52	64	13	13	4	4	0	6	22	26	19	4	64
Shoveler	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	2	15	1	6	20	4	58	28	1	9	2	0	58
Teal	0	0	7	0	1230	1500	2810	1532	694	263	46	0	2810
Marsh Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0
Avocet	51	42	341	277	0	60	127	56	130	24	43	0	341
Lapwing	28	15	82	0	0	60	505	825	124	0	0	0	825
Ringed Plover	5	0	0	18	0	0	0	0	12	17	7	3	18
Curlew	14	31	108	58	28	102	163	104	108	19	48	16	163
Black-tailed Godwit	1	1621	2973	862	48	11	0	22	40	0	0	0	2973
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0	0	0	0	0
Knot	0	0	0	0	0	0	0	0	0	0	0	0	0
Dunlin	0	7	0	0	58	284	19	517	52	18	21	0	517
Redshank	2	212	47	35	24	15	33	98	73	50	9	0	212

Summary of Killingholme Marshes Foreshore Baseline

6.10. The data sources on waterbird numbers within the Killingholme Marshes Foreshore area that could be affected by the proposed development are summarised in Table ~~9~~10, which gives the peak count for each key species from each source~~.~~, and the % this represents of the Humber SPA for each period (taking the peak count over each period and the corresponding SPA population). Overall, there is broad agreement between the sources with regard to the important waterbird populations in this zone. ~~Symbols in the Table following the species name indicate where there have been notable changes in numbers from the original ES baseline.~~

6.11. The main changes since the original AMEP DCO application have been higher numbers of shoveler, teal, lapwing and avocet, which were noted in the Material Change 2 application. There have been no major (>10% increase in the proportion of the SPA supported) changes observed since then. The ~~recent~~ increased use of the site by these species since the original DCO application is likely to have been influenced by recent changes in the intertidal habitat caused by accretion and consequential saltmarsh colonisation of former mudflat at the site. This has enabled some species to feed longer through the tidal cycle and provides roosting habitat even through high tide states (at least during neap tides). Teal and avocet now use the site for feeding and roosting in higher numbers than previously recorded, and there has been increased use by lapwing, though predominantly for roosting. The ~~site~~count sector continues to be important for black-tailed godwits for both feeding and roosting, particularly in autumn/early winter, though also in spring, but the percentage of the SPA supported has fallen (from 66% for the original DCO

to 48% for the MC2 and 52% for the time extension). Teal and avocet have increased again since MC2, but lapwing has declined since MC2, but is still higher than reported in the original ES.

Table 910. Overall peak waterbirdSPA species counts for the Killingholme Marshes Foreshore. Green cells indicate an increase of more than 10%, red cells a decrease of more than 10%, in the % of the SPA population using Killingholme Marshes Foreshore.

Species	SPA spESTTTC	ES TTTCWeBS	% Humber ES WeBS	% Humber ESWeBS Core 15-19	WeBS Core 15-19Low 11-12	Other non-WeBS Low 11-12surveys 17-21	Other 17-21% Humber MC2	% Humber MC2 WeBS Core 18-22	WeBS Core 17-21Able 22-23	Able 22-23-24	% Humber TE
Shelduck Q	Q109	1099	92.4%	752.4%	75138	138168	1683.7%	3.7%55	6910	1064	1.10.7%
Shoveler	0	011	118.9%	8.9%53	530	04	424.7%	24.7%53	630	0	21.416.7%
Mallard A	A14	1413	130.7%	0.7%45	4510	1022	224.3%	4.3%81	7714	1458	6.96%
Teal A	A12	1213	130.5%	0.5%	06	14666	39.6%1466	3893.6%	16663 78	28101 666	31.549.2%
Marsh Harrier Q	Q0	-	0%	>1%	-	-1	>1%	>1%	-1	0	>1%
Avocet Q	Q0	0	0.0%	0.0%49	498	8251	25110.1%	10.1%87	67220	220341	8.514.3%
Lapwing A	A325	32515	151.8%	1.8%0	03	32374	237414.4%	14.4%1158	11849 56	956825	7.83%
Ringed plover A	A210	2100	17.0%	17.0%68	684	439	399.3%	9.3%36	260	018	2.53.1%
Curlew A	A158	15861	613.7%	3.7%66	66109	109136	1365.1%	5.1%73	8684	84163	3.47.1%
Bar-tailed godwit Q	Q123	1230	04.4%	4.4%1	135	3514	2.4%14	2.4%0	10	0	0.10%
Black-tailed godwit Q	2566Q	502 566	5066.0%	1524 6.0%	816 15 24	816218 3	218348.0%	48.0%1538	33131 712	29733 313	58.752.2%
Knot Q	Q0	01	10.0%	0.0%2	20	067	670.4%	0.4%2	20	0	0.0%
Dunlin Q	1029Q	871 029	5.7%87	3265 7%	32628 9	289680	6804.3%	4.3%406	43234 6	34651 7	2.57%
Redshank Q	Q540	540 83	8310.5%	10.5%116	11638	38806	80628.0%	28.0%86	11314 7	14721 2	5.58.2%

** Q = qualifying species, A = assemblage species.*

North Killingholme Haven Pits

6.12. Table 1011 summarises the annual peak counts from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts** for the North Killingholme Haven Pits, showing the peak count each month over the most recently available five-year period (2017/18 – 2021/222018/19 – 2022/23) for each of the species for which LSE could not be ruled out (other than marsh harrier, which is not covered by the WeBS scheme).

Table ~~10~~11. BTO WeBS Core High Tide Count Monthly Peak counts ~~2017-18 – 2021-22~~2018-19 – 2022-23, North Killingholme Haven Pits

Species	SPA species*	~~2017/18~~ 2018/19	2019/20 ~~2018/19~~	2020/21 ~~2019/20~~	2021/22 ~~2020/21~~	2022/23 ~~2021/22~~	Mean peak	% SPA
Shelduck	Q	~~13~~24	~~24~~10	~~10~~7	~~7~~16	~~16~~5	~~14~~12.4	0.~~2~~1%
~~Teal~~Shoveler	~~A~~	~~13~~35	~~16~~0	~~58~~8	~~61~~0	~~95~~0	~~73~~3	~~1.4~~0.8%
Mallard	A	~~8~~16	~~16~~23	~~23~~24	~~24~~12	~~12~~14	~~16.6~~17.8	1.~~5~~4%
Teal~~Shoveler~~	A	~~3~~416	~~5~~58	~~0~~61	~~8~~95	~~0~~72	~~9~~60.4	~~3.2~~1.1%
Marsh Harrier	Q	Not included in these surveys						
Avocet	Q	~~12~~45	~~45~~205	~~205~~286	~~286~~122	~~122~~237	~~134~~179	7.5~~.2~~%
Ringed Plover	A	0	0	~~0~~1	~~1~~0	~~0~~2	~~0.2~~1	0.~~0~~1%
Lapwing	A	~~128~~360	~~360~~246	~~246~~2580	~~2580~~548	~~548~~114	~~772~~770	~~5.1~~4.8%
~~Knot~~	~~Q~~	~~0~~	~~0~~	~~420~~	~~1050~~	~~22~~	~~298~~	~~1.1%~~
Curlew~~Dunlin~~	~~Q~~A	~~18~~07	~~45~~4	23~~2950~~	~~1290~~4	~~16~~52	~~92~~68	~~5~~0.3%
Bar-tailed Godwit	Q	0	0	0	~~0~~1	~~1~~0	0.2	<0.~~0~~1%
Black-tailed Godwit	Q	2770~~381~~0	5400~~277~~0	2950~~540~~0	3700~~295~~0	4700~~370~~0	~~3726~~3904	~~66.0~~61.5%
~~Curlew~~Knot	~~A~~Q	~~3~~0	~~7~~420	41050	~~23~~22	~~4~~6	~~8.2~~300	~~0~~1.3%
Dunlin	Q	45	2950	1290	165	49	900	4.8%
Redshank	Q	~~157~~251	~~251~~220	~~220~~320	~~320~~92	~~92~~185	~~208~~214	~~7.~~8.3%

* Q = qualifying species, A = assemblage species.

6.13. Table ~~11~~12 summarises the monthly pattern of occurrence from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts**, showing the peak count each month over the most recently available five-year period.

Table ~~11~~12. BTO WeBS Core Count Monthly Peak counts ~~2017-18 – 2021-22~~2018-19 – 2022-23, North Killingholme Haven Pits

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Shelduck	4	24	11	13	16	0	0	0	0	0
Shoveler	0	0	0	1	0	0	0	34	0	5
Mallard	16	23	8	3	5	0	0	18	2	7
Teal	133	95	67	18	0	1	6	32	86	61
~~Mallard~~Marsh Harrier	~~16~~Not included in these surveys		~~23~~	~~8~~	~~3~~	~~5~~	~~0~~	~~0~~	~~18~~	~~2~~ ~~7~~
~~Shoveler~~				~~0~~			~~0~~	~~0~~	~~1~~	~~0~~ ~~0~~ ~~0~~ ~~34~~ ~~0~~ ~~5~~
Avocet	0	0	122	38	40	54	205	286	33	5
Ringed Plover	0	0	0	0	0	1	2	1	0	0

Lapwing	48	34	7	0	0	41	128	425	2580	265
Curlew~~Dunlin~~	0	~~34~~	~~13~~	~~223~~	~~02~~	~~5803~~	~~12902~~	~~29504~~	~~724~~	~~07~~
~~Knot~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~570~~	~~1050~~	~~285~~	~~0~~	~~0~~
Bar-tailed Godwit	0	0	0	0	0	0	0	1	0	0
Black-tailed Godwit	0	0	3	3	144	3700	5400	4600	6	0
Knot~~Curlew~~	0	~~40~~	~~30~~	~~230~~	~~20~~	~~3570~~	~~21050~~	~~4285~~	~~40~~	~~70~~
Dunlin	0	3	1	2	0	580	1290	2950	72	0
Redshank	52	93	251	118	1	265	320	157	87	240

6.14. The **BTO Low Tide Counts** from 2011-12 (the most recent available) for NKHP are summarised in Table ~~12~~13. This shows generally lower peak count than WeBS core counts, which probably reflect the timing of the counts at low, rather than high, tide (the pits are more important as a high tide roost than as a low tide feeding area).

Table ~~12~~13. BTO Low Tide Count totals for the North Killingholme Haven Pits sector (CH017), 2011-12.

Species	01/10/11	01/03/12	01/04/12	01/05/12	01/06/12	01/07/12	01/08/12	01/09/12	PEAK
Shelduck	120	89	61	78	138	54	51	72	138
Shoveler	0	0	0	0	0	0	0	0	0
Mallard	0	8	6	4	10	0	10	5	10
Teal	0	6	0	0	0	0	0	0	6
Marsh Harrier	0	0	0	0	0	0	0	0	0
Avocet	0	8	0	0	0	0	0	0	8
Lapwing	0	0	0	0	0	0	0	3	3
Ringed Plover	0	2	0	4	0	0	0	0	4
Curlew	22	109	4	13	76	106	88	42	109
Bar-tailed Godwit	0	35	0	0	0	0	0	0	35
Black-tailed Godwit	530	219	0	0	288	816	1	21	816
Knot	0	0	0	0	0	0	0	0	0
Dunlin	289	0	3	0	0	0	0	71	289
Redshank	33	38	17	2	0	23	3	17	38

6.15. The results of the September 2017- May 2018 JBA surveys are summarised in Table ~~13~~14.

Table ~~13~~14. Monthly peak counts from North Killingholme Haven Pits, September 2017-May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Shelduck	0	3	0	0	3	0	6	5	8	8
Shoveler	0	0	0	0	0	0	1	4	0	4
Mallard	9	7	40	18	15	4	8	2	0	40
Teal	2	29	24	53	104	23	45	24	0	104
Marsh harrier	0	1	0	0	0	0	1	1	0	1
Avocet	3	23	44	0	0	0	33	8	2	44
Lapwing	100	180	269	202	38	5	11	0	0	269
Ringed plover	0	0	0	0	0	0	0	0	0	0
Curlew	2	4	4	2	0	0	1	0	0	4
Bar-tailed godwit	0	0	0	0	0	0	2	0	0	2
Black-tailed godwit	655	500	2	0	0	0	0	20	1	655

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Knot	0	0	0	0	0	0	0	0	0	0
Dunlin	20	450	32	24	0	0	0	0	0	450
Redshank	0	450	112	24	12	2	227	160	0	450

Able Data 2022-23

6.16. The results of the additional surveys undertaken during the 2022-23 winter for the North Killingholme Haven Pits are summarised in Table ~~14~~15. This area continued to support a range of important wintering waterbird populations, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit and redshank, in similar numbers to those recorded in previous surveys.

Table ~~14~~15. Monthly peak counts for the Able UK Ltd daytime counts of the North Killingholme Haven Pits sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	1	0	4	7	7
~~Wigeon~~Shoveler	0	0	~~0~~1	0	0	0	~~0~~1
Mallard	2	4	4	11	206	4	206
Teal	196	57	114	148	82	84	196
~~Mallard~~	~~2~~	~~4~~	~~4~~	~~11~~	~~206~~	~~4~~	~~206~~
~~Shoveler~~	~~0~~	~~0~~	~~1~~	~~0~~	~~0~~	~~0~~	~~1~~
Marsh Harrier	0	0	1	1	0	0	1
Avocet	175	110	0	0	4	47	175
Ringed Plover	0	1	0	0	0	0	1
Lapwing	49	340	26	4	8	18	340
~~Dunlin~~Curlew	~~9~~24	~~22~~5	~~1~~0	0	~~0~~1	~~0~~2	~~22~~24
Bar-tailed godwit	0	0	0	0	0	0	0
Black-tailed Godwit	3650	2648	2	0	0	28	3650
Knot~~Curlew~~	~~2~~40	~~5~~0	0	0	~~1~~0	~~2~~0	~~24~~0
Dunlin	9	22	1	0	0	0	22
Redshank	181	126	41	94	75	67	181

6.17. Table ~~15~~16 summarises the results of the night surveys that were undertaken of the North Killingholme Haven Pits during the 2022-23 winter.

Table ~~15~~16. Monthly peak counts for the Able UK Ltd night counts of the North Killingholme ~~Marshes Foreshore~~Haven Pits sector sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	0	0	0	2	2
~~Wigeon~~Shoveler	0	~~2~~0	0	0	0	0	~~2~~0
Mallard	0	2	2	0	0	0	2
Teal	218	358	4	212	160	64	358
~~Mallard~~Marsh Harrier	0	~~2~~0	~~2~~0	0	0	0	~~2~~0
Avocet	0	2	0	0	0	1	2
Ringed Plover	0	0	0	0	1	0	1
Lapwing	14	38	0	35	2	3	38
Curlew~~Dunlin~~	~~10~~11	~~346~~47	~~100~~6	~~8~~1	~~33~~17	~~55~~13	~~346~~47
Black-tailed Godwit	75	0	0	0	0	0	75
Bar-tailed Godwit~~Curlew~~	~~1~~0	~~4~~0	~~6~~0	~~1~~0	~~1~~0	~~1~~0	~~4~~0
Knot	0	0	0	0	0	0	0
Dunlin	10	346	100	8	33	55	346
Redshank	5	74	42	16	74	32	74

Able Data 2023-24

6.18. The data collected for Able UK by Cutts and Hemingway during June 2023 – May 2024 from the North Killingholme Haven Pits are summarised in Table 17, which gives the monthly peak counts.

Table 17. Monthly peak counts North Killingholme Haven Pits sector, June 2023 – May 2024 (Source: Cutts and Hemingway).

Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Shelduck	5	3	0	0	0	0	0	4	6	2	3	8	8
Mallard	10	2	2	12	18	0	1	2	0	1	2	7	18
Shoveler	0	0	0	0	9	0	0	0	0	0	0	0	9
Teal	0	0	1	17	768	20	0	0	4	38	0	0	768
Marsh Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0
Avocet	32	103	445	339	702	32	4	102	158	228	75	0	702
Ringed Plover	0	0	0	0	0	0	0	0	0	0	0	0	0
Lapwing	11	0	366	160	101	580	450	250	68	2	0	0	580
Curlew	0	4	62	14	21	0	19	0	12	1	23	2	62
Black-tailed Godwit	7	2432	5609	5575	470	55	1302	140	40	0	7	0	5609
Bar-tailed Godwit	7	0	2	0	0	0	0	0	0	0	0	0	7
Knot	0	0	5	0	0	0	0	0	0	0	0	0	5
Dunlin	0	0	0	14	36	107	22	0	0	0	0	0	107
Redshank	2	97	244	361	110	264	120	76	56	42	4	0	361

Summary of North Killingholme Haven Pits Baseline

~~6.18.~~6.19. The data sources on waterbird numbers within the North Killingholme Haven Pits that could be affected by the proposed development are summarised in Table ~~16~~18, which gives the peak count for each key species from each source~~.~~, and the % this represents of the Humber SPA for each period (taking the peak count over each period and the corresponding SPA population). Overall, there is broad agreement between the sources with regard to the important waterbird populations in this zone. Symbols in the Table following the species name indicate where there have been notable changes in numbers from the original DCO baseline. major (>10% increase in the proportion of the SPA population supported) changes observed since then. The increased use of the site by these species since the original DCO application

~~6.19.~~6.20. The main changes since the original AMEP DCO application generally reflect those for the Killingholme Marshes Foreshore. There have been higher numbers of mallard, teal, lapwing, avocet, knot, dunlin and ~~dunlin~~redshank but fewer shoveler than recorded in original surveys, which were noted in the Material Change 2 application. ~~No major changes have been observed since then, other than ongoing increases.~~ The site continues to be particularly important for roosting black-tailed godwits, particularly in autumn/early winter. Numbers were lower during the MC2 surveys, but higher again for the time extension.

Table ~~16~~18. Overall peak ~~waterbird~~SPA species counts for the North Killingholme Haven Pits. Green cells indicate an increase of more than 10%, red cells a decrease of more than 10%, in the % of the SPA population using North Killingholme Haven Pits.

Species	~~SPA sp~~ES TTC	ES ~~TTC~~ WeBS	~~% Humber ES WeBS~~	~~% Humber ES~~WeBS Core 15-19	WeBS ~~Core 15-19~~Low 11-12	~~WeBS Low 11-12~~JBA 17-18	~~JBA 17-18%~~ Humber MC2	~~% Humber MC2~~WeBS Core 18-22	~~WeBS Core 17-21~~Able 22-23	Able ~~22-~~23-24	% Humber TE
Shelduck Q	~~Q~~9	~~97~~	~~70~~.2%	~~0.2%~~9	~~9~~12	~~12~~8	~~8~~0.3%	~~0.3%~~12	~~14~~7	~~7~~8	0.21%
~~Teal~~ ↑	~~A~~	~~46~~	~~30~~	~~1.7%~~	~~0~~	~~11~~	~~104~~	~~2.8%~~	~~73~~	~~196~~	~~3.7%~~
Mallard ↑A	~~A~~34	~~34~~71	~~71~~3.4%	~~3.4%~~13	~~13~~7	~~7~~40	~~40~~3.8%	~~3.8%~~18	~~17~~206	~~206~~18	~~18.6~~16.7%
Shoveler ~~↓~~	61	~~61~~29	~~29~~49.5%	~~49.5%~~8	~~8~~0	~~0~~4	43.7%	3~~.7%~~	~~9~~1	~~1~~9	~~3.~~2.9%
Teal A	46	30	1.7%	0	11	104	2.8%	60	196	768	13.5%
Marsh ~~harrier~~Harrier Q	~~Q~~0	~~0~~-	0%	-	~~0~~-	~~0~~1	>1%	~~>1%~~-	~~0~~1	~~1~~0	>1%
Avocet ↑Q	~~Q~~16	~~16~~27	~~27~~5.3%	~~5.3%~~54	~~54~~5	~~54~~4	~~44~~2.2%	~~2.2%~~179	~~134~~175	~~175~~702	~~6.8~~29.4%
Lapwing ↑A	~~A~~5	~~5~~276	~~276~~1.6%	~~1.6%~~0	0	~~0~~269	~~269~~1.6%	~~1.6%~~770	~~772~~340	~~340~~580	~~5.1~~4.8%
Ringed plover	0	1	0.1%	1	0	0	0.1%	1	1	0	0.1%
Curlew A	~~A~~7	~~7~~12	~~12~~0.3%	~~0.3%~~4	4	4	40.2%	~~0.2%~~8	~~8~~24	~~24~~62	~~0.9~~2.7%
Bar-tailed godwit Q	~~Q~~1	~~10~~	<0.1%	0~~.0%~~	0	~~0~~2	~~20~~.1%	0~~.1%~~	0	~~0~~7	0.04%
Black-tailed godwit Q	3800 ~~Q~~	~~3338~~3 ~~800~~	97.8% ~~3338~~	~~3336~~9 ~~7.8%~~	~~2000~~3 ~~336~~	~~2000~~655	~~655~~73.4%	~~73.4%~~3904	~~3650~~3 ~~726~~	~~5609~~3 ~~650~~	~~66.0~~88.4%
Knot ↑Q	~~Q~~12	~~120~~	<0.1%	~~0.0%~~84	~~84~~0	0	0.4%	~~0.4%~~300	~~298~~0	~~0~~5	1.13%
Dunlin ↑Q	~~Q~~270	~~270~~380	~~380~~2.1%	~~2.1%~~663	~~663~~0	~~0~~450	~~450~~4.2%	~~4.2%~~900	~~926~~22	~~22~~107	~~5.3~~4.8%
Redshank Q	~~Q~~249	~~249~~215	~~215~~4.8%	~~4.8%~~230	~~230~~1	~~1~~450	~~450~~15.6%	~~15.6%~~214	~~208~~290	~~290~~361	~~10.9~~14.0%

** Q = qualifying species, A = assemblage species.*

Terrestrial Fields

~~6.20.~~6.21. As noted in the original DCO ES (paragraphs 11.5.90 *et seq.*), some of the Killingholme Fields (the terrestrial fields located between the CLdN Port (formerly C.Ro Port ~~(formerly~~and before that the Humber Sea Terminal) and Immingham Dock) are regularly used by waterbird species associated with the Humber Estuary. The fields were identified in the original DCO ES as providing functionally linked land for the SPA, particularly for feeding and roosting curlew (with a peak count of ~~106~~123, or 2.~~48~~% of the Humber Estuary population at that time). Redshank, black-tailed godwit, lapwing, redshank, whimbrel, and shelduck were also recorded during the original ES baseline surveys but in numbers below 1% of the Humber Estuary population.

~~6.21.~~6.22. A further survey in autumn 2016 (Cutts and Hemingway 2017[3]) found reduced curlew numbers present in the AMEP fields than previously (peak 15, equivalent to 0.6% of the Humber

[3] Cutts, N. & K. Hemingway. 2017. *Able Curlew Fields and North Killingholme Frontage Ornithological Survey Programme Autumn 2016.* Report to Able UK Ltd. Institute of Estuarine & Coastal Studies, University of Hull.

population), possibly because of their less favourable condition (with a longer sward developed as arable/improved grassland fields have reverted to neutral grassland). The same study reported a higher use (peak 110 curlew, 4.1% of the Humber population) on grassland on the adjacent operational Tank Farm (outside the AMEP site), over both high and low tide periods, so the species was simply preferring other nearby grassland at the time.

6.22. The area of terrestrial fields remaining within the AMEP site, is reducing as the DCO development is being implemented, as reported in the AMEP Monopile Factory ES (North Lincolnshire Council planning reference PA/2021/1525[4]). Overall, use of this part of the AMEP site by curlew is likely to continue to reduce, but has been mitigated for by the creation of alternative wetland habitat at the Halton Marshes Wet Grassland Mitigation Area (following consent from the Secretary of State to transfer the mitigation measures to this site from the site originally consented).

6.23. The results of the 2020-21 surveys of the Killingholme Fields by curlew is summarised in Table 1719, which gives the totals from each count from December 2020 through to May 2021. Given the seasonality of curlew occurrence in the general area from other surveys (e.g. WeBS for the Killingholme Marshes Foreshore – see Table 2), it is unlikely that any period of higher curlew counts would have been missed by these surveys. Use of the area by curlew is year-round, though with generally higher numbers recorded in spring (March-April).

Table 1719. Counts for the Killingholme Marshes fields, December 2020 - May 2021.

Species	09/12/20	23/12/20	07/01/21	21/01/21	04/02/21	18/02/21	05/03/21	22/03/21	06/04/21	19/04/21	03/05/21	17/05/21
Curlew	10	0	0	1	3	8	32	29	45	7	7	3

6.24. Table 1820 shows the results of the Killingholme Fields curlew counts made from October 2022 – March 2023. Peak numbers were similar to those recorded in 2020-21, but with those numbers sustained longer through most of the winter.

Table 1820. Counts for the Killingholme Marshes fields, October 2022 – March 2023.

Species	11/10/22	26/10/22	02/11/22	16/11/22	30/11/22	29/12/22	16/01/23	01/02/23	26/02/23	15/03/23	27/03/23
Curlew	12	34	46	38	2	24	21	47	12	30	41

6.25. Furthermore, curlew use of the KMFS has not increased numerically since the original DCO application (see Tables 9 and 16Table 10 above), though the area does hold a higher proportion of the Humber population (57% compared with 3.7% previously), as a result of a decline in the curlew population elsewhere in the estuary.

[4] PA/2021/1525 | North Lincolnshire Planning Portal (northlincs.gov.uk)

7. Key Ecological Interests: Baseline Conditions Update relating to SAC species and habitats

Estuarine Habitats

7.1. A range of mud, sands and gravels are present within the subtidal area of middle estuary, these with associated biological communities, and with biotopes describing these in Chapter 10 Table 10-~~2~~3 of the Material Change 2 Updated ES[5].

7.2. The area within which AMEP will directly impact tends to exhibit muddier sediments with muddy sands or sandy muds sometimes with small quantities (<1%) of gravel (slightly gravelly sandy mud or slightly gravelly muddy sand). Additional surrounding habitats that could be affected by the development include included muddy habitats including sandy muds or muddy sands (or slightly gravelly muddy sand/sandy muds) and two sandier sites (Allen, 2020: Material Change 2 Appendix UES10-4[6]).

7.3. The direct impact and surrounding areas were also characterised by low numbers of *Capitella* sp. but included modest numbers of species such *Corophium volutator* and *Streblospio shrubsolii*. However, many of the taxa present in these areas were recorded at relatively few sites. In terms of biomass the direct impact area was dominated by *Carcinus maenas* (1 site only), *Limecola balthica, Corophium volutator, Arenicolidae* sp. (*Arenicola marina*) and *Gammarus salinus* these species collectively accounting for over 90% of total biomass.

Intertidal mudflats

7.4. Allen (2006) describes the intertidal benthic community of the middle estuary south shore to be less diverse than in outer estuary, being dominated by *Corophium volutator, Streblospio shrubsolii, Hediste diversicolor* and the Spionid polychaete *Pygospio elegans*. Low abundances of *Macoma balthica* were also present with numbers increasing towards the outer estuary and in mid shore areas. These communities are typical for an estuarine habitat and primarily structured according to salinity, shore height and presumably sediment type. Whilst some communities are relatively impoverished these appear to be typical for such habitats and some variation in community structure is expected in a dynamic estuary.

7.5. The increase in intertidal elevation and colonisation by saltmarsh communities at the AMEP site has led to a loss of mudflat extent and influenced the distribution of several key species of invertebrate such as *Hediste diversicolor*. However, in the muddier areas, the 2015 and 2016 surveys (~~Materal~~Material Change 2 UES Appendices UES10-3 and UES10-4) recorded a broadly similar assemblage to that recorded in the baseline of 2010 for the original DCO ES.

7.6. The original DCO ES baseline commonly recorded *Tubificoides benedii*, Nematoda, the polychaete *Streblospio shrubsolii* and the amphipod crustacean *Corophium volutator* from the intertidal survey. The bivalve *Macoma* (*Limecola*) *balthica* was widespread and the polychaete *Hediste diversicolor* was present at most of the upper shore stations.

7.7. A broadly similar intertidal invertebrate assemblage was recorded in 2015 and 2016 at the AMEP site (~~Materal~~Material Change 2 Appendices UES10-3[7] and UES10-4), although with some

[5] MC2 UES Chapter 10
[6] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000162-TR030006-APP-6A-10-4.pdf~~MC2 UES App 10-4
[7] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000161-TR030006-APP-6A-10-3.pdf~~MC2 UES App 10-3

restrictions in the extent of the typical intertidal mudflat community correlating to saltmarsh community colonisation.

7.8. It is considered likely that the increase in elevation and saltmarsh colonisation seen in 2015 and 2016 has continued to the present day, with a substantial extent of the AMEP development intertidal frontage now featuring saltmarsh in the upper to mid shore. As such, it is likely that the extent and/or composition of the intertidal invertebrate community recorded in this area will have altered in response to the increase in elevation and associated saltmarsh development. Any changes in the baseline conditions will be determined from the pre-construction surveys agreed with Natural England that will be carried out to inform the compensation targets, as set out in the CEMMP.

7.9. The 2016 subtidal survey (Allen, 2020: Material Change 2 Appendix UES10-4) reported the subtidal bed to feature a very impoverished faunal community typical for the middle Humber and in line with findings from previous surveys (as described in the original DCO ES and in the ~~Materal~~Material Change 2 Updated ES supporting documentation Appendices UES10-3 and UES10-4), including species such as *Capitella* sp., *Arenicolidae* sp. (*Arenicola marina*), *Eurydice pulchra, Gammarus salinus*, *Corophium volutator*, *Nematoda* spp., *Polydora cornuta, Pygospio elegans, Streblospio shrubsolii* and *Tubificoides benedii*.

7.10. Allen (2016) concluded that the infaunal communities recorded during the 2015 subtidal survey around the potential dredge disposal areas were typical for dynamic mud, sand or mixed sediment subtidal sediments in the mid to outer Humber Estuary.

7.11. On this basis, it is concluded that there is the probability of natural variation in community composition over time, reflecting changes in estuarine dynamics, but given the community adaptation and continued active utilisation of the dredge deposit grounds, no significant change outwith these parameters is expected.

Saltmarsh: (1) Salicornia and other annuals colonising mud and sand, and (2) Atlantic sea meadows (Glauco-Puccinallietalia maritimae)

7.12. At the time of the original DCO baseline work, there was little or no evidence of substantial saltmarsh vegetation occurring across the central mudflat of the AMEP development, other than some fringing communities on the upper shore adjacent to the flood bank, upstream adjacent to North Killingholme.

7.13. However, the potential for accretion of the intertidal mudflat and associated increase in elevation and potential colonisation by saltmarsh was identified in the Examining Authorities Report[8] (2013).

7.14. A clear expansion in the extent of saltmarsh communities e.g. as surveyed in 2020 and 2021 (Material Change 2 Appendix UES10-1: Thomson Environmental Consultants, 2020. North Killingholme Marshes Saltmarsh Survey 2020[9]), has occurred on the intertidal frontage of the proposed AMEP development site since the baseline surveys for the original DCO application. This saltmarsh accretion has continued to date – this report (Table 21) includes data from October 2024 Google Earth aerial imagery to update the current baseline cover of saltmarsh and intertidal mudflat that would be affected by the proposed development. Further changes in the baseline conditions will be determined from the pre-construction surveys agreed with Natural England that will be carried out to inform the compensation targets, as set out in the CEMMP.

[8] ~~https://infrastructure.planninginspectorate.gov.uk/document/TR030001-002249~~
[9] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000163-TR030006-APP-6A-10-1A.pdf~~2020 Saltmarsh Survey

Grey Seal

7.15. Due to the low frequency of occurrence and high mobility of marine mammals in the low to middle estuary, dedicated surveys were not conducted for the original DCO application nor for the Material Change 2 or for this Time Extension. The occasional presence of grey seal in the vicinity of the AMEP development relates to the potential presence of prey items, and the populations of the species in the wider region e.g. Southern North Sea. The Humber Estuary SAC breeding grey seal colony at Donna Nook has shown a major increase since the original application, more than doubling in the last decade from around 2,000 individuals to recent counts of over 5,000 (Special Committee on Seals 2021[10]).

7.16. As set out in the Material Change 2 UES Chapter 10[11], there is the potential for any changes to the invertebrate and fish communities in the vicinity of the AMEP development to have an associated impact on grey seals through changes to prey composition and availability. However, the invertebrate and fish community composition remain the same as identified in the original ES and thus the nature of the effects will not change. No changes to the impacts on grey seals have been identified resulting from the material amendment to the proposed development.

7.17. The assessment of the effects of the material change on grey seals in the Material Change 2 UES Chapter 10 also acknowledges that the assessment guidance for marine mammals in relation to underwater noise and vibration has been supplemented by NOAA (2018[12]) JNCC (2024[13]) and DEFRA (2025[14]) but concludes that the proposed mitigation for grey seal would not need to be changed.

River Lamprey and Sea Lamprey

7.18. The direct comparison between the different fish baseline data is limited by the use of different sampling methods, with different selectivity, used in different habitats and with variable sampling effort (e.g. within and between seasons). Also, the natural variability in population dynamics (e.g. inter-annual fluctuations in recruitment) may affect the fish species occurrence and abundance in the catches over time.

7.19. Considering these factors, and in the context of the wider knowledge of fish assemblages and their distribution in the lower Humber Estuary, there were no significant changes in the baseline for fish at the AMEP site. There was no evidence of preferred use of these areas by migratory fish, confirming earlier observations. ~~Only a~~Intertidal and subtidal fish surveys were last undertaken in October/December 2013. A single river lamprey was recorded~~, during the November-December 2013 subtidal~~ from the otter ~~trawling~~trawl survey at this time (from the control area north of the AMEP site; see Material Change 2 ES Table 10-10~~), and~~). A previous fish survey in spring 2013, yielded no ~~sea~~ lamprey. A 2010 fish survey reported in the original ES also yielded a single river lamprey.

7.20. Further to this, the results of the most recently available Environment Agency TraC fish monitoring surveys for two sites nearest to AMEP (Seine netting/beam trawl surveys at

[10] http://www.smru.st-andrews.ac.uk/scos/scos-data/august-seal-counts/august-seal-counts-england/

[11] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000132-TR030006-APP-6-10.pdf~~MC2 UES Chapter 10

[12] National Oceanic and Atmospheric Administration, 2018. Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. NOAA Technical Memorandum NMFS-OPR-59, April 2018. National Oceanic and Atmospheric Administration National Marine Fisheries Service.

[13] https://jncc.gov.uk/our-work/marine-mammals-and-noise-mitigation/

[14] https://www.gov.uk/government/publications/reducing-marine-noise/reducing-marine-noise

Foulholme Sands and Otter Trawls at Burcom) are summarised in the table below for Lamprey. The surveys only yielded a single specimen of river lamprey.

Year	River Lamprey (No.)			Sea Lamprey (No.)		
	Burcom Otter Trawl	Foulholme Sands Seine Net	Foulholme Sands Beam Trawl	Burcom Otter Trawl	Foulholme Sands Seine Net	Foulholme Sands Beam Trawl
2012	-	No Survey	No Survey	-	No Survey	No Survey
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	-	No Survey	No Survey	-	No Survey	No Survey
2017	-	-	-	-	-	-
2018	1	No Survey	No Survey	-	No Survey	No Survey
2019	-	No Survey	No Survey	-	No Survey	No Survey

7.21. Any changes in the baseline conditions will be determined from the pre-construction surveys agreed with Natural England that will be carried out to inform the compensation targets, as set out in the CEMMP.

8. Mitigation

8.1. The mitigation measures identified as part of the extant DCO and Deemed Marine Licence (DML) remain suitable and fit for purpose without requirement for modification. These include:

- provisions under Schedule 8 of the DCO to ensure functional aspects of the Humber Estuary SAC are maintained, including constraints on aspects of works timing to avoid/reduce impacts from underwater noise and vibration from piling work, provision of a Marine Mammal Observer to ensure no impacts to marine mammals (including Grey Seals) present in the vicinity of the construction works, and reduce noise and lighting impacts to birds.

8.2. provisions to provide greenfield terrestrial foraging and roosting habitat for birds from the SPA assemblage (predominantly curlew), to replace that lost to AMEP and to reduce noise and lighting impacts to birdsFurther details on the agreed mitigation measures pertaining to the development are provided in the original Terrestrial Ecology and Nature Conservation ES chapter[15], and Chapter 8 of the Material Change 2 UES[16]. Measures will be secured through the approval of various plans and method statements as specified in Schedule 8 and 11 of the extant DCO.

8.3. These requirements have been reviewed in light of the proposed time extension and the updated baseline, and it has been concluded that they all would still be required for the material change, but that none would need any modification.

8.4. It is noted that a separate application for a non-material change to the DCO to move the location of Mitigation A to Halton Marshes was approved, though the outcome of the Appropriate Assessment is still the same.

8.5. All of these same measures will be implemented as part of the Time Extension and will ensure that there will be no adverse effect on site integrity relating to dredging.

8.6. The area of terrestrial fields remaining within the AMEP site, is reducing as the DCO development is being implemented, as reported in the AMEP Monopile Factory ES (North Lincolnshire Council planning reference PA/2021/1525[17]). Overall, use of this part of the AMEP site by curlew is likely to continue to reduce, but this impact has been mitigated by the creation of alternative wetland habitat at the Halton Marshes Wet Grassland (HMWG) Mitigation Area.

8.7. Monitoring has proven that the HMWG mitigation site is already hosting the target number of Curlew required to offset the impacts of the loss of Killingholme Marshes demonstrating that full mitigation is already established for the loss of these terrestrial fields.

[15] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000315-11%20-%20Ecology%20and%20Nature%20Conservation.pdf
[16] MC2 UES Chapter 8
[17] PA/2021/1525 | North Lincolnshire Planning Portal (northlincs.gov.uk)

~~8.~~9. Ecological Integrity Test

~~8.1.~~9.1. As there has been deemed to be a likely significant effect on the SPA/Ramsar site (as was concluded for the Project in Part 1 of the HRA report), then the competent authority will be required to decide whether the plan or project would adversely affect the integrity of the site, in the light of the relevant conservation objectives. From UK Government guidance[18], *"The integrity of the site will be adversely affected if a proposal could, for example:*

- *destroy, damage or significantly change all or part of a designated habitat*
- *significantly disturb the population of a designated species, for example, its breeding birds or hibernating bats*
- *harm the site's ecological connectivity with the wider landscape, for example, harm a woodland that helps to support the designated species from a nearby European site*
- *harm the site's ecological function, or its ability to survive damage, and reduce its ability to support a designated species*
- *change the site's physical environment, for example, by changing the chemical makeup of its soil, increasing the risk of pollution or changing the site's hydrology*
- *restrict access to resources outside the site that are important to a designated species, for example, food sources or breeding grounds*
- *prevent or disrupt restoration work, or the potential for future restoration, if it undermines the site's conservation objectives"*

~~8.2.~~9.2. The Conservation Objectives for the Humber Estuary SPA[19] are as follows:

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild 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.

~~8.3.~~9.3. The conservation objectives for the Humber Estuary SAC are as follows:

- 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 of qualifying species
  - The supporting processes on which qualifying natural habitats and habitats of qualifying species rely
  - The populations of qualifying species, and,

[18] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#test-the-integrity-of-the-site
[19] Source: Natural England web site: http://publications.naturalengland.org.uk/publication/5382184353398784

- The distribution of qualifying species within the site.

~~8.4.~~9.4. Site-specific objectives were also considered in the assessment for all LSE species/communities, as set out in Natural England's Supplementary Advice on Conservation Objectives for the Humber Estuary SPA[20] and for the Humber Estuary SAC[21].

[20] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006111&SiteName=humber&SiteNameDisplay=Humber+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=15

[21] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030170&SiteName=humber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=8,8

10. Compensation Targets

10.1. Given that AMEP will result in an adverse effect on the integrity of the Humber Estuary SPA/SAC/Ramsar site, part of the National Site Network, compensation measures will be required.

10.2. Compensation for the direct and indirect loss of 39 ha of intertidal mudflat, the direct and indirect loss of 6.6 ha of saltmarsh and the direct loss of 10.4 ha of estuary habitat (which comprises sub-tidal habitat). In addition, 2 ha of saltmarsh will convert mudflat once the breach of the flood defences is formed at Cherry Cobb Sands (see Table 19). This will be delivered at the Cherry Cobb Sands compensation site.

10.3. As there will be a time lag between the loss of the habitat on Killingholme Marshes foreshore and the creation of replacement functional habitat, additional compensation measures will reduce the impact of the time lag. Specifically, two grassland sites (at Halton Marshes and Cherry Cobb Sands) will be developed and managed to provide enhanced feeding and roosting areas for species impacted by the loss of feeding habitat on the Killingholme Marshes foreshore.

10.4. Details of how this compensation will be delivered, and its ongoing suitability, are set out in Part 5 of the HRA Report.

~~9.~~11. Assessment of Effects on SPA, Ramsar and SAC Species and Communities

Construction Phase

~~9.1.~~11.1. As set out in the original ES and the Material Change 2 Updated ES Aquatic Ecology and Terrestrial Ecology and Nature Conservation chapters (Chapters 10[22] and 11[23] of both documents), the main potential effects of the construction of the Development on SPA/Ramsar ornithological features are considered to be:

- Direct loss of intertidal habitat within the Humber Estuary SPA/Ramsar through construction of project infrastructure;
- Indirect Loss of intertidal habitat within the Humber Estuary SPA/Ramsar;
- Loss of fish habitat within the Humber Estuary SPA/Ramsar that could affect bird foraging;
- Loss of terrestrial habitat functionally linked to the Humber Estuary SPA/SAC;
- Disturbance to birds and fish (noise and visual);
- Underwater noise disturbance affecting fish;
- Dredging and other construction effects on water quality;
- Disposal of dredge spoil.
- Cumulative effects.

~~9.2.~~11.2. The main potential effects of the construction of the Development on SAC/Ramsar ecological features are considered to be:

- Direct loss of intertidal habitat within the Humber Estuary SAC/Ramsar through construction of project infrastructure;
- Indirect Loss of intertidal habitat within the Humber Estuary SAC/Ramsar;
- Loss of fish habitat within the Humber Estuary SAC/Ramsar;
- Disturbance to fish and marine mammals (noise and visual);
- Underwater noise disturbance affecting fish and marine mammals;
- Dredging and other construction effects on water quality;
- Disposal of dredge spoil.
- Cumulative effects.

~~9.3.~~11.3. Each of these is considered in relation to the Integrity Test, in conjunction with the specific pressures identified by Natural England in their Advice on Operations relating to 'Construction of Port and Harbour Structures'. The following are given by NE as medium-high risk category:

- ~~Above water~~Airborne noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement

[22] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000132-TR030006-APP-6-10.pdf
[23] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000133-TR030006-APP-6-11.pdf

- Changes in suspended solids (water clarity)
- Emergence regime changes, including tidal level change considerations
- Habitat structure changes - removal of substratum (extraction)
- Introduction of light
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Physical change (to another seabed type)
- Physical change (to another sediment type)
- Physical loss (to land or freshwater habitat)
- Removal of non-target species
- Smothering and siltation rate changes (Heavy)
- Smothering and siltation rate changes (Light)
- Underwater noise changes
- Vibration
- Visual disturbance
- Water flow (tidal current) changes, including sediment transport considerations
- Wave exposure changes.

~~9.4.~~11.4. Low risk pressures during construction included the following, though it should be noted that NE states for these that "*Unless there are evidence-based case or site-specific factors that increase the risk, or uncertainty on the level of pressure on a receptor, this pressure generally does not occur at a level of concern and should not require consideration as part of an assessment*." These have therefore been considered, but it was concluded that there are no factors at this site that would increase the risk above low, so they are not considered as possible risks to site integrity.

- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
- Collision below water with static or moving objects not naturally found in the marine environment
- Deoxygenation
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Nutrient enrichment
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)
- Transition elements & organo-metal (e.g. TBT) contamination.

Change in Construction Phase Effects from the proposed Time Extension

~~9.5.~~11.5. The proposed Time Extension would not result in any changes from the consented scheme affecting the Humber Estuary SPA, SAC and Ramsar site. The habitat loss resulting from the original DCO, the Material Change 2 and the Time Extension are summarised in Table ~~19~~21 and relate to changes in habitat loss from the updated scheme. There would be no difference in the

total direct habitat loss from the Time Extension compared with the consented Material Change 2 scheme (i.e. 43.6ha loss including estuaries feature, mudflats/sandflats and saltmarsh). There is, however, a reduction in mudflat loss (from 31.3ha under MC2 to 29.8ha under the TE) with a commensurate increase in saltmarsh loss (from 1.9ha under MC2 to 3.4ha under the TE), due to the predicted and ongoing conversion of mudflat on the Killingholme Marshes foreshore.

~~9.6.~~11.6. Table ~~19~~21 shows the immediate (short-term) impacts of the scheme. Medium-term (30-year timescale) and long-term (100 year timescale) are explained in Material Change 2 UES Appendix 11-2[24] but are deemed to be less significant due to the natural changes that would occur over decadal timescales to Killingholme Marshes foreshore without the scheme. In other words, its natural change from mudflat to saltmarsh and the impact of rising sea levels. The HRA is therefore based on the more critical short-term impacts.

Table ~~19~~21. Habitat loss from the consented (original DCO and Material Change 2) and the proposed Time Extension.

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE Dec '24 update)	Notes
Direct - reclamation to construct quay	1130	Estuaries	13.5	10.4	10.4	Within the reclamation site. The set back berth has reduced the area of subtidal loss
	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	31.5	31.3	~~31.3~~29.8	Within the reclamation site - supports a range of waterfowl. MC2 quay redesign led to slightly reduced loss.
	1330	Saltmarsh	0	1.9	~~1.9~~3.4	New loss of this community as has recently colonised this area.
Indirect functional loss through disturbance	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	11.6	7.7	7.~~7~~2	To the south of the reclamation site - potentially disturbed by operational activity on the quay following completion of construction (275m disturbance zone~~)~~). Area reduced over time as it transitions to saltmarsh
	1330	Saltmarsh	0	4.7	~~4.7~~5.2	New loss of this community as has recently colonised this area.

[24] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000174-TR030006-APP-6A-11-2.pdf

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE Dec '24 update)	Notes
Compensation Area Changes	1330	Saltmarsh	1.8	2.0	2.0	At Cherry Cobb Sands to form the channel across the foreshore from the existing flood defence to Cherry Cobb Sands Creek - this habitat would become mudflat offsetting the loss of Habitat type 1140. Area increased from 1.8 to 2ha in SoCG.

Note: further details of the change in habitat loss are given in Material Change 2 Appendix UES 11-2.

11.7. There would be ~~no~~only a minor change in the extent of the habitat loss resulting from the proposed time extension~~. Losses~~, as a result of further transition from mudflat to saltmarsh.

~~9.7.~~ The time extension would ~~be~~not result in any changes in the ~~same as those for the consented Material Change 2.~~

~~9.8.~~11.8. proposed activities. There would be no change in the extent of the noise disturbance resulting from the proposed time extension. No new operations are proposed as part of the Time Extension and consequently there would be no additional noise disturbance~~.~~, or any other source of disturbance.

~~9.9.~~11.9. There would be no change to the planned lighting regime for the proposed Time Extension. Lighting levels remain subject to approval under Schedule 11 of the extant DCO, Requirement 24 and require consultation with Natural England before being approved by the local planning authority.

~~9.10.~~11.10. The dredging proposals for the proposed Time Extension would remain the same as those consented for the Material Change 2.

~~9.11. Chapter 8 of the Material Change 2 UES[25] proposed (at 8.5.2) alternate and additional mitigation, which has been considered in terms of the implications on the Humber Estuary designated features. This includes:~~

- ~~Placement by barge of material dredged by CSD into sites HU081 and HU082 to spread impact during the placement period.~~
- ~~Consideration of placing greater quantity of material being placed into HU082 than HU081 to reduce potential for increased tidal currents around HU081.~~
- ~~Target placement of any glacial till dredged by BHD to HU082, so that changes caused by placement at HU081 occur for a shorter period.~~
- ~~Programme of bathymetric survey over HU081 and HU082 and in their vicinity during and after placement.~~
- ~~Use ongoing LiDAR monitoring as a source for surveillance of foreshore around Hawkins Point.~~
- ~~Current measurements pre- and post- construction of AMEP at the South Killingholme Oil Jetty to establish the significance of any changes to ebb tidal currents after construction of AMEP.~~

~~[25] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000130-TR030006-APP-6-8.pdf~~

~~9.12. All of these measures will be implemented as part of the Time Extension and will ensure that there will be no adverse effect on site integrity relating to dredging.~~

~~9.13.~~11.11. Though there have been some changes in bird numbers recorded in recent surveys, notably higher numbers of shoveler, teal, lapwing and avocet, this had not changed the conclusions reach in this shadow HRA. With regard to compensation targets for the Project, any changes necessary in light of changes in the baseline conditions will be determined from the pre-construction surveys that have been agreed with Natural England, as set out in the CEMMP. Chapter 10 of the Material Change 2 UES found no significant changes have been identified compared to those described in the DCO (2014) and the Examining Authority's Report (2013). That remains the case for the proposed Time Extension. No significant effects were identified other than those assessed in the original DCO ES, and it was concluded that the mitigation measures provided in Chapter 10 Aquatic Ecology of the original DCO ES are considered to remain valid, with no significant residual impacts to the aquatic ecology of the Humber Estuary expected following their discharge.

Operational Phase

~~9.14.~~11.12. The main potential effects of the operation of the Development on birds would be:

- Disturbance to birds (noise and visual, including lighting);
- Maintenance dredging, including boat disturbance;
- Lighting impacts; and
- Cumulative effects.

~~9.15.~~11.13. The only operational phase pressure identified by NE in the medium-high risk category is the introduction of light, so specific consideration of this has been made in this assessment.

~~9.16.~~11.14. Low risk pressures identified by NE relating to 'Operation of Ports and Harbours' comprise the following, though as for the low risk construction phase pressures, there are not any factors at this site that would increase the risk above low, so they are not considered as possible risks to site integrity.

- Above water noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement
- Changes in suspended solids (water clarity)
- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
- Collision below water with static or moving objects not naturally found in the marine environment
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Smothering and siltation rate changes (Light)
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)

- Transition elements & organo-metal (e.g. TBT) contamination
- Underwater noise changes
- Visual disturbance

Change in Operational Phase Effects from the proposed Time Extension

~~9.17.~~11.15. The proposed Time Extension will not change the operational phase effects of the Development. The recent colonisation of the mudflat by saltmarsh has resulted in changes to the indirect functional loss of habitat through disturbance that will occur during the operational phase, with a reduced loss of mudflat and increased loss of saltmarsh compared with the original DCO.

~~9.18.~~11.16. There would be no change in the extent of the operational noise disturbance resulting from the proposed time extension. Operational noise levels are much less than construction noise levels and are not critical to the impact assessment. No new operations are proposed as part of the ~~Tme~~Time Extension and consequently there would be no additional noise disturbance. There would no change either to the consented Material Change 2 lighting regime. Lighting levels are subject to approval under Schedule 11 of the extant DCO, Requirement 24 and require consultation with Natural England before being approved by the local planning authority.

~~9.19.~~11.17. There will be indirect functional habitat loss through disturbance during the operational phase of the development, likely displacing internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds. As a result, **adverse effect on integrity** has been concluded for this functional loss.

~~9.20.~~11.18. The Project (including the proposed Time Extension) would not, subject to the mitigation secured by the DCO, have any other operational phase effects on any SPA or SAC species/community, so would, following the implementation of the agreed mitigation measures, result in **no adverse effect on integrity**, with regard to any other operational phase impacts.

Assessment Update: Humber Estuary SAC and Ramsar site

~~9.21.~~11.19. The shadow Appropriate Assessment for the Humber Estuary SAC is summarised in Table ~~20~~22, comparing the outcome of the DCO and Material Change 2 Appropriate Assessments with the assessment for the proposed Time Extension.

~~9.22.~~11.20. **Adverse effect on integrity** was concluded for loss of sub-tidal estuarine habitat, loss of intertidal mudflat and loss of saltmarsh.

~~9.23.~~11.21. **No adverse effect on integrity** was found for disturbance to grey seals and river and sea lampreys.

Assessment Update: Humber Estuary SPA and Ramsar site

~~9.24.~~11.22. The shadow Appropriate Assessment for the Humber Estuary SPA is summarised in Table ~~21~~23, comparing the outcome of the DCO and Material Change 2 Appropriate Assessments with the assessment for the updated Project incorporating the proposed time extension.

~~9.25.~~11.23. **Adverse effect on integrity** was concluded for all eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, redshank and shelduck) and for the six wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal) for which LSE was identified, though direct loss of estuarine habitat (including intertidal mud,

saltmarsh and sub-tidal), and through indirect functional loss as a result of disturbance. It could also not be ruled out that the continued use of NKHP as a roost site by waders from KMFS, particularly black-tailed godwit, could be affected once mudflats at KMFS were lost.

~~9.26.~~11.24. **No adverse effect on integrity** was found for (1) loss of terrestrial habitat (due to the provision of replacement foraging and roosting habitat in Halton Marshes Wet Grassland Mitigation Area), for (2) disturbance within NKHP (as a result of the protection from disturbance as set out in the extant DCO at Schedule 11 Requirement 42), for (3) lighting effects on NKHP (through implementation of the agreed lighting mitigation), and (4) from piling (based on the adoption of agreed measures for managing piling activities, are set out in Schedule 8 paragraphs 37-43 of the extant DCO).

Table ~~20~~22. Shadow Appropriate Assessment for the Humber Estuary SAC/Ramsar: ES/SoCG and update in light of the proposed Extension of Time

Issue	Assessment (ES, SoCG)	Impact of Material Change 2 and Updated Baseline	Assessment update (after material change 2)	Impact of Time Extension and further Updated Baseline
Effects on estuarine habitat (H1130)	Permanent direct losses of 45 ha (31.5 ha of intertidal mudflat and 13.5 ha of sub-tidal habitat) and medium and longer term changes to habitat arising from the quay presence (see *ES Annex B*). The effects result in an adverse effect due to a reduction in the extent and distribution of habitat for which no mitigation is possible. The effects of capital and maintenance dredging and disposal on sub-tidal habitat and benthic communities - no adverse effect on integrity . The effects on the wider estuary have been assessed (Deltares, 2012). EA has indicated that an allowanceshould be made for the change of 5 ha of intertidal habitat to sub-tidal. AHPL's has therefore, taken a precautionary approach and accepted this view and included 10 ha of intertidal mudflat in the habitat provided as compensation taking account of the 2:1 ratio for compensatory mudflat (see *ES Table 5.1* and *Annex B*). Migratory movements of lamprey will not be affected by the presence of the new quay as described in *Annex 10.2* of the ES	Quay re-design has reduced direct loss of estuarine habitat. Additionally, habitat change resulting primarily from effects of the Humber International Terminal (HIT) since the original ES (accretion of saltmarsh) has meant that the habitats affected will include more saltmarsh and less intertidal mudflat	Permanent direct loss amended to 43.6 ha (31.3 ha of intertidal mudflat and 10.4 ha of sub-tidal habitat, plus an additional loss of 1.9ha of colonising saltmarsh), but no change to conclusions reached, i.e. adverse effect on integrity. No adverse effect on integrity from capital and maintenance dredging – no material change in vessel movements.	~~No change from consented Material Change 2. Adverse effect on integrity from habitat loss.~~ Permanent direct loss amended to 43.6 ha (29.8 ha of intertidal mudflat and 10.4 ha of sub-tidal habitat, plus an additional loss of 3.4 ha of colonising saltmarsh), but no change to conclusions reached, i.e. adverse effect on integrity. . No adverse effect on integrity from capital and maintenance dredging (no change from Material Change 2).
Effects on intertidal mudflat and mudflat with pioneer	Adverse effect concluded because of permanent direct loss for the new quay (31.5 ha), and in the longer term the indirect effects of the quay will result in the transformation of	Quay re-design has reduced direct loss of intertidal habitat. Additionally, some of the loss that	Permanent loss of intertidal mudflat reduced to 31.3ha, but conclusions unchanged, i.e. adverse effect on integrity.	~~No change from consented Material Change 2. Adverse~~Permanent loss of intertidal mudflat reduced to 29.8

Issue	Assessment (ES, SoCG)	Impact of Material Change 2 and Updated Baseline	Assessment update (after material change 2)	Impact of Time Extension and further Updated Baseline
saltmarsh (H1140/1310)	intertidal mudflat to saltmarsh (*ES Annex B*). These effects result in a reduction in the extent and distribution of intertidal mudflat, for which no mitigation is possible. The effects on intertidal mudflat as part of the effects on the wider estuary are as described above.	was intertidal mudflat previously has now been colonised by saltmarsh, so intertidal mudflat loss is reduced further.		ha, but conclusions unchanged, i.e. adverse effect on integrity.
Effects on saltmarsh (H1330)	Adverse effect concluded as a reduction in the extent of saltmarsh (2 ha) occurs for which no mitigation is possible.	Loss of saltmarsh increased as a result of recent colonisation of the direct habitat loss area for the quay.	Additional direct loss of 1.9ha of saltmarsh (as result of colonisation of mudflat), but no change to conclusion, i.e. adverse effect on integrity.	~~No~~Additional direct loss of 3.4 ha of saltmarsh (as result of colonisation of mudflat), but no change ~~from consented Material Change 2. Adverse~~to conclusion, i.e. adverse effect on integrity.
Disturbance to grey seals and river and sea lampreys (S1364, S1095 and S1099)	No adverse effect concluded with the implementation of the mitigation measures listed in *ES Section 4.4*.	Change to quay design.	No change to previous conclusion of no adverse effect on integrity~~.~~ with the implementation of the mitigation measures listed in *ES Section 4.4*..	No change from consented Material Change 2. No adverse effect on integrity with the implementation of the mitigation measures listed in *ES Section 4.4*.

Table ~~21~~23. Shadow Appropriate Assessment for the Humber Estuary SPA/Ramsar: ES/SoCG and update in light of the proposed Extension of Time

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
Effects on estuarine habitat (H1130)	Adverse effect concluded on internationally important populations of regularly occurring *Annex I* species,migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds. No mitigation is possible	Quay re-design has reduced direct loss of estuarine habitat. Additionally, habitat change resulting primarily from effects of the Humber International Terminal (HIT) since the original ES	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
		(accretion of saltmarsh) has meant that the habitats affected will include more saltmarsh and less intertidal mudflat		
Effects on intertidal mudflat and ~~mudflar~~mudflat with pioneer saltmarsh (H1140/1310)	Adverse effect concluded on internationally important populations of regularly occurring *Annex I* species, migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds. No mitigation is possible	Quay re-design has reduced direct loss of intertidal habitat. Additionally, some of the take area that was intertidal previously has now been colonised by saltmarsh, so intertidal loss reduced further.	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
	Cannot confirm the continued use of NKHP as a roost site by waders from KMFS, particularly black-tailed godwit, once mudflats at KMFS lost. The effect cannot be mitigated. Therefore, as scientific doubt remains as to the absence of adverse effects, the competent authority cannot be certain that the scheme will not adversely affect the integrity of the European site.	No change - no construction proposed any closer to the NKHP than DCO	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
Loss of terrestrial habitat	No adverse effect due to the provision of replacement foraging and roosting habitat in Mitigation Area A.	No change. Halton Marshes Wet Grassland Mitigation Area has been implemented as a substitute for Mitigation Area A	No change in conclusion - no adverse effect on integrity.	No change from consented Material Change 2. No adverse effect on integrity
Disturbance effects on birds	Indirect functional habitat loss through disturbance to internationally important populations of regularly occurring *Annex I* species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds. No mitigation is possible.	Some of the mudflat that was intertidal previously has now been colonised by saltmarsh, so intertidal loss reduced.	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
	No adverse effect on birds within NKHP based on a commitment to limit noise at site boundary.	No change.	No change in conclusion - no adverse effect on integrity (based on a commitment to limit noise at site boundary)	No change from consented Material Change 2. No adverse effect on integrity (based on a commitment to limit noise at site boundary).
	No adverse effects on birds using Mitigation Area A based on commitments to noise limits and to distance limits and storage heights within the operational buffer.	No change. Halton Marshes Wet Grassland Mitigation Area has been implemented as a substitute for Mitigation Area A	No change in conclusion - no adverse effect on integrity (based on commitments to noise limits and to distance limits and storage heights within the operational buffer)	No change from consented Material Change 2. No adverse effect on integrity (based on commitments to noise limits and to distance limits and storage heights within the operational buffer)
	No adverse effects on birds at NKHP from lighting within the AMEP site as described in *Supplementary Information EX19.1 - Lighting Lux Plans.*	No change.	No change in conclusion - no adverse effect on integrity with lighting as described in *Supplementary Information EX19.1 - Lighting Lux Plans*	No change from consented Material Change 2. No adverse effect on integrity with lighting as described in *Supplementary Information EX19.1 - Lighting Lux Plans*
	No adverse effects from piling based on adoption of measures agreed in the piling methods statement, which are set out in Schedule 8 of the DCO	No change.	No change in conclusion - no adverse effect on integrity based on adoption of measures agreed in the piling methods statement, which are set out in Schedule 8 of the DCO	No change from consented Material Change 2. No adverse effect on integrity based on adoption of measures agreed in the piling methods statement, which are set out in Schedule 8 of the DCO

10. Mitigation for the Project Alone

10.1.1.1. The mitigation measures identified as part of the extant DCO remain suitable and fit for purpose without requirement for modification. These include:

- provisions under Schedule 8 of the DCO to ensure functional aspects of the Humber Estuary SAC are maintained, including constraints on aspects of works timing to avoid/reduce impacts from underwater noise and vibration from piling work, provision of a Marine Mammal Observer to ensure no impacts to marine mammals (including Grey Seals) present in the vicinity of the construction works, and reduce noise and lighting impacts to birds.
- provisions to provide greenfield terrestrial foraging and roosting habitat for birds from the SPA assemblage (predominantly curlew), to replace that lost to AMEP and to reduce noise and lighting impacts to birds.

10.2.1.1. Further details on the agreed mitigation measures pertaining to the development are provided in the original Terrestrial Ecology and Nature Conservation ES chapter[26] and the original DCO (Appendix UES1-1). Measures will be secured through the approval of various plans and method statements as specified in Schedule 8 and 11 of the extant DCO.

10.3.1.1. These requirements have been reviewed in light of the proposed time extension and the updated baseline, and it has been concluded that they all would still be required for the material change, but that none would need any modification.

10.4. It is noted that a separate application for a non-material change to the DCO to move the location of Mitigation A to Halton Marshes has been approved, though the outcome of the Appropriate Assessment is still the same.

[26] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000315-11%20-%20Ecology%20and%20Nature%20Conservation.pdf

~~11.~~12. In-combination Assessment

12.1. The projects considered in-combination in ~~the~~this Time Extension application are as follows ~~(those considered~~:

~~11.1.~~ **Considered in the** ~~original application were as set out in the~~**MC2 HRA** ~~information Report at~~ (Section ~~4.12 (see footnote 1), and those for the Material Change 2 in Section 5.1~~3.3 of ~~that~~the SoS's HRA~~):~~[27])

- Able Logistics Park – PA/2015/1264 – North Lincolnshire Council (implemented but not completed);
- North Killingholme ~~Generating Station (DCO Application) -~~Power Project (NKPP)- Development of a thermal generating station (not implemented);
- Hornsea Offshore Wind Farm (Zone 4) Project 2 ~~(~~– DCO ~~Application)~~application;
- Yorkshire Energy Park (17/01673/STOUTE) – East Riding of Yorkshire Council~~)~~);
- Outstrays to Skeffling Managed Realignment Site;
- South Humber Gateway Mitigation Areas (including Cress Marsh, Novartis and the former Huntsman Tioxide site~~).~~);

~~▪ The Immingham Open Cycle Gas Turbine Order 2020 (DCO) – Construction of a new Open Cycle Gas Turbine Power Station.~~

New Projects Submitted/Approved since MC2

- Erection of a monopile manufacturing facility – PA/2021/1525 (consented~~).~~);
- AHP ~~Ltd~~ Enabling Works South – PA/2023/502 – North Lincolnshire Council~~.~~ (consented);
- VPI Power – post-combustion carbon capture plant – PA/2023/421 (submitted, decision pending);
- ABP Westgate Immingham – PA/2022/1223~~.~~ (submitted, decision pending);

~~11.2. Consideration has also been given to the possible inter-related effects of construction and operation on the Project site at the same time (as parts may become operational at the same time as construction continues in other parts). However, the greater magnitude effects of the construction phase would mean that the operational phase impacts would not materially increase those, even if they were occurring simultaneously within the site.~~

- Immingham Eastern Ro-Ro Terminal (IERRT, DCO, consented); and
- Immingham Green Energy Terminal (IGET, DCO, consented).

12.2. Given that the impacts of the Project on the features of the Humber Estuary SPA/SAC/Ramsar site are assessed to be the same as at the time of the MC2 application, then it is relevant to consider the conclusion of the MC2 HRA.

12.3. In the HRA ~~prepared by~~for MC2, it is recorded that:

~~11.3.~~ *'Having considered the list of plans and projects and paragraph 2.3 of the RIES which states that NE was satisfied all relevant schemes had been assessed,* ***the Secretary of State*** ~~for Material Change 2, it is recorded that:~~*is content that all plans and projects with the potential to*

[27] MC2 HRA Report

have significant in combination effects with the Development in terms of the HRA have been identified', (Section 3,3), and

'AEoI from the Proposed Changes in-combination with other plans or projects In combination effects only occur if there are residual effects of a project because impacts of the project have not been fully mitigated (or compensated) which could then cause a significant impact when taken together with another project that has not fully mitigated its impacts. As with the AMEP DCO, all impacts from the project alone are either fully mitigated or compensated for. The Secretary of State notes that in response to the RIES, NE [REP6-007] confirmed that it was satisfied that in combination effects have been satisfactorily addressed', (Section 5.3).

12.4. ~~The compensation and~~Taking into account the additional, more recent, projects listed above, the conclusion of the MC2 HRA remains valid, specifically with respect to:

- **Impacts on Curlew at Killingholme Fields - these are fully mitigated by the creation of Mitigation Area A.**

  In short, and by inspection, there are no new projects since the MC2 HRA that are sufficiently proximate to Halton Marshes to have any in-combination effects to birds using the mitigation site. This conclusion therefore remains valid.

- **Impacts on birds using North Killingholme Haven Pit – these are fully mitigated by Conditions attached to the AMEP DCO and the NKPP DCO.**

  At the time of the original HRA there were no other projects proximate enough to NKHP to add to the effects generated from the AMEP scheme (Paragraph 6.7.4 of the Applicant's HRA Report[28]). However, subsequent to AMEP being consented the North Killingholme Power Project (NKPP) was consented. This project includes activities that could also potentially disturb NKHP.

  Relevantly therefore, the NKPP HRA[29] records the following:

  '*NE advised that potential disturbance to North Killingholme Haven Pits from the Project should be considered in combination with potential disturbance from AMEP. However following the further mitigation applied where necessary, NE then agree that there are no longer any significant in-combination effects'*, (paragraph 8.2).

  This particular extract both records that only AMEP needed to be considered in combination with NKPP in relation to disturbance at NKHP and that with NKPP mitigation secured, there was no significant in-combination effect with AMEP. No other projects have come forward since NKPP was consented that are sufficiently proximate to NKHP to add to the disturbance effects of NKPP and AMEP, so the extant NE advice remains valid.

- **Impacts on marine habitats and species - these are fully mitigated by Conditions attached to the AMEP DCO Deemed Marine Licence**

  Dredging and dredge disposal operations create sediment plumes that cause increased concentrations of suspended sediment within the Humber waterbody. These sediment plumes could have consequential impacts on habitats and species that are features of the SPA/SAC. Notably however, the estuary already has high levels of suspended sediment and the original 2014 HRA reported:

  *'11. The Secretary of State agrees with the Panel that the **AMEP** development **will not have adverse effects on the qualifying features** of the European sites (including the SPA and Ramsar site) **directly from capital dredging**. He agrees also that the potential for*

[28] 2011 HRA Report
[29] NKPP-Habitats Regulations Assessment.pdf

*adverse **in-combination or cumulative effects** over the long-term from maintenance dredging and the disposal of materials **from capital and maintenance dredging can be avoided** by compliance with the monitoring regime under the Marine EMMP. This will be secured by condition 15 of the proposed Deemed Marine Licence in Schedule 8 to the Order ("the DML") and requirement 17 in Schedule 11 to the Order'*, (Paragraph 11, emphasis added)

In 2021, Appendix UES8-1[30], '*Sediment Plume Dispersion from Dredging'* submitted as part of the MC2 application reported the effects from dredging as follows:

*'Except for the dredging location itself, all of the predicted increases in suspended sediment concentration caused by the dredging activity are **small compared with the natural variation in suspended sediment concentrations** which has been measured to be up to 3,300 mg/l on spring tides'*, (Executive Summary, penultimate bullet point, emphasis added).

The MC2 HRA[31] confirmed that:

*'On the basis that the Proposed Changes **have not resulted in any materially different effects** to the AMEP DCO, the Secretary of State agrees with the ExB and sees no reason to either amend the existing mitigation or secure any further additional mitigation. The Secretary of State agrees with the ExB's conclusions'*, (Section 5.4, final paragraph, emphasis added).

IGET and IERRT both include dredging operations.

In relation to IERRT, the HRA found no significant effect of that project in combination with any other projects. This conclusion obviously includes the in-combination effects of dredging.

In relation to IGET, the shadow HRA repeatedly refers to elevated suspended sediment concentrations due to capital and maintenance dredging as being '*localised and temporary'*, and '*of a magnitude that can occur naturally'*. The Applicant's own assessment detailed in Appendix UES8-1 (noted above), fully concurs with this assessment. The localised and temporary nature of the impacts of elevated suspended sediment concentrations, and the fact that such concentrations lie within or very close to natural levels, plainly militates against adverse in-combination effects. The HRA concluded:

'94.The Secretary of State agrees with the conclusion drawn in Table C within Appendix C of the Recommendation Report that concluded no AEoI, alone or in combination with any other plans or projects for any of the European sites discussed, where no IPs disputed this conclusion during the Examination.

*95.The Secretary of State has also had regard to those issue which were disputed during the Examination, and has had regard to the additional representations from the Applicant and the relevant IPs. **She is content to conclude no AEoI on these impact pathways on all designated sites identified, alone or in combination with other plans or projects**.'*

In summary, there are no significant effects that arise from dredging activity at AMEP in combination with dredging activities elsewhere in the estuary because the activities will be separated by distance and because, remote form the dredger itself, the effects will be within the natural range.

[30] TR030006-000151-TR030006-APP-6A-8-1.pdf
[31] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000531-TR030006%20-%20HRA%20Report.pdf

- **Impacts on intertidal and subtidal losses and the consequential effects on bird that use the intertidal areas for feeding.**

  AMEP alone results in a significant loss of SAC/SPA habitat from the NKM foreshore. This is recorded in the original 2014 HRA as follows:

  'The Secretary of State agrees with the Panel that the AMEP development is likely to have a significant adverse effect on the Humber Estuary SPA and Ramsar site, having regard to the core purpose of their designations, namely the protection of habitats of importance for migratory birds. He notes that construction of the new quay will lead to a reduction in the extent and distribution of estuarine and inter-tidal habitat, including the loss of food supply from 31.5 hectares of inter-tidal mudflat; and that an additional 11.6 hectares of mudflats is likely to have reduced functionality as a result of disturbance', (paragraph 12).

  In addition to these impacts, the original HRA (paragraph 6) noted that 13.5 hectares of subtidal (estuarine) habitat would be lost. This loss was reduced to 10.4 ha, pursuant to MC2.

  These impacts, both the habitat loss and the consequential displacement of over-wintering birds, cannot be mitigated and compensatory measures were therefore agreed with Natural England for these particular adverse impacts of AMEP alone. The compensation measures do not prevent the AEoI. Compensation measures are intended to offset the residual negative effects of AMEP so that the overall ecological coherence of the National Site Network is maintained. There is no requirement for an in-combination assessment of these impacts as it is agreed that AEoI arises from the project alone and will inevitably persist as it cannot be mitigated. Compensation to address this impact alone has been agreed.

  The original 2014 HRA reviews various risks that might arise from permitting the development and adopting the compensation measures but concludes that the risks are acceptable, refer to the extract below:

  '49. The Secretary of State notes and agrees with Natural England's advice that there is a residual risk that the applicant's compensatory measures might not work. He is however satisfied that the risk has been adequately mitigated', (paragraph 49).

NOTE ON IGET AND IERRT PROJECTS

12.5. Consideration has been given, as to whether the HRAs for two marine developments that have been consented since MC2, namely IGET and IERRT, properly considered in-combination effects with AMEP. Specifically, NE's letter dated 1 October 2024 asserted the following:

'The Applicant has stated that these projects (IERRT and IGET) "are supported by an HRA which found no in-combination effects with AMEP*". We do not consider that this justification is sufficient in this case, because the in-combination assessments for these two projects* ***did not take into account*** *the currently proposed time extension application for the AMEP DCO',* (page 3, emphasis added).

12.6. The Applicant finds no evidence for the assertion that the IERRT and IGET assessments ignored the AMEP development in their respective HRAs.

12.7. In the case of IERRT, this was consented by the Secretary of State for Transport on 4 October 2024. The Applicant has reviewed both the IERRT HRA and ABP's own shadow HRA document[32]. Relevantly, in ABP's shadow HRA, AMEP is specifically identified in Figure 5 as a development

[32] IERRT Shadow HRA

that is '*relevant to the in-combination assessment'*, and AMEP is specifically mentioned on 34 occasions; for brevity, a typical extract is reproduced below:

12.8. *'The AMEP project will result in a direct loss of intertidal habitat (mudflat and saltmarsh) as a result of the reclamation of the proposed quay (33 ha). Compensation for this loss will be provided at the Cherry Cobb Sands compensation site. Direct loss of intertidal as a result of the proposed IERRT development will be de minimis (i.e., negligible and ecologically inconsequential) and therefore, with the provision of the compensatory habitat required for AMEP project, there is no additional cumulative effect from the IERRT project that could compromise any of the conservation objectives, and it is concluded that there is no potential for AEOI on qualifying interest features',* (Table 37).

12.9. It is clear from this extract (and, in fact, from the other 33 references to AMEP within the document) that ABP's shadow HRA does, in fact, contemplate the construction and operation of the AMEP scheme in full at some point in the future without any consideration of a limiting time frame.

In the SoS's HRA[33] dated 4 October 2024, AMEP is mentioned twice in relation to the in-combination assessment of IERRT with other projects. The HRA states:

'The other pressures NE referred to were considered in the in combination assessment of .. (ABP's) *HRA Report, the Applicant* (ABP) *stressed, and concluded the effects were either insignificant or have already been (or would be) compensated for (in the case of AMEP…)',* (paragraph 5.115).

12.10. It is therefore evident that the IERRT HRA had regard to the future development of AMEP in full, including the compensation proposals. The Applicant therefore disagrees with NE that the IERRT HRA in combination assessment has not considered the future development of AMEP. AMEP has been considered and it has been concluded that IERRT has no significant adverse effect on the Humber Estuary SPA/SAC/RAMSAR site in-combination with the effects of AMEP. It invariably follows that the converse is true; AMEP has no adverse effect on the integrity of the protected sites in-combination with IERRT either.

12.11. In relation to IGET, this scheme was consented by the Secretary of State for Transport on 6 February 2025. Table 35 of the IGET shadow HRA[34] identified AMEP as a project that was relevant to the in-combination assessment. AMEP is referenced on 36 occasions with the shadow HRA but no significant in-combination effects were concluded. On 18 December 2024, Natural England wrote to the Transport Infrastructure Planning Unit confirming that:

'Natural England's previous concerns about potential ***cumulative and in-combination*** *impacts for this project have been sufficiently addressed in the further information provided* ***within the updated shadow Habitats Regulations Assessment*** *(HRA) and associated documents*

Natural England agree *with the Applicant's conclusions of* ***no adverse effects*** *on integrity of the Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites,* ***both alone and in-combination****',* (emphasis added)[35].

12.12. Plainly, as NE agrees that IGET has no adverse effects on the integrity Humber Estuary SPA/SAC/Ramsar sites in combination with other projects, then it follows that AMEP has no adverse effect on the integrity of the protected sites in-combination with IGET either.

SUMMARY

~~11.4.~~12.13. The mitigation proposals that have been agreed with Natural England for the Project continue to fully avoid any residual effects, therefore in-combination effects with other projects

[33] IERRT HRA
[34] IGET Shadow HRA
[35] NE Letter to TIPU 181224

can be discounted. It is not possible to mitigate for the effects of habitat loss as a result of the project alone. Compensation is provided for these impacts to address the losses and consequential impacts caused by the Project alone.

~~12.~~13. Summary and Conclusion

~~12.1.~~13.1. This report has provided baseline data and analysis to inform the assessment process should the Competent Authority determine that an Appropriate Assessment is required (as was concluded in the Likely Significant Effects report).

~~12.2.~~13.2. The SPA and SAC Conservation Objectives (as set out in Section 6 above) against which this assessment needs to be made seek to maintain the habitats of the qualifying species in favourable condition.

~~12.3.~~13.3. The predicted effects of the Project Time Extension on the relevant SPA and SAC qualifying habitat and assemblage species in the context of the Habitats Regulations have been assessed above. These have been assessed against the SPA and SAC Conservation Objectives, to determine whether there would be any adverse effect of the development on the ecological integrity of the Humber Estuary SPA/SAC/Ramsar site.

~~12.4.~~13.4. The same conclusion was reached for the Time Extension as for the original DCO application and the Material Change 2, i.e. that the AMEP ~~Poject~~Project would have an **adverse effect on the ecological integrity of the SPA and of the SAC**, through direct loss of habitat and through indirect functional loss as a result of disturbance. The residual effects of the DCO Time Extension alone, taking account of the mitigation, will have an adverse effect on the integrity of the Humber Estuary SAC, SPA and Ramsar site due to the reduction in the extent and distribution of qualifying interest habitats (estuarine habitats, intertidal mudflat and saltmarsh), and a deterioration in the quality of these habitats for qualifying bird species. In addition, there will be significant disturbance to these bird species, and their populations and distribution will be affected.

~~12.5.~~13.5. In summarising the likely effects on the qualifying populations/communities for the SPA/SAC/Ramsar site, the assessment process illustrated in the flow diagram in the Planning Inspectorate's Advice Note 10 (reproduced in Figure 1 of Part 1 of the HRA report) is undertaken as follows:

- *"Is the project likely to have significant effect on the site?"*
  - For eight qualifying species, and six assemblage species of the Humber Estuary SPA/Ramsar, and for six features of the Humber Estuary SAC/Ramsar, this cannot, under the definition of likely significant effect under the Habitats Regulations, be ruled out, so the next stage is:
- *"Assess the implications of the effects of the proposal for the site's conservation objectives"*
- *"Will the project affect integrity of the site?"*
  - Yes. Qualifying and assemblage species have been identified as being significantly affected by the Project. In terms of the relevant tests under the Habitat Regulations, it has been concluded that the proposed development would threaten the ecological integrity of the Humber Estuary SPA/SAC/Ramsar site.

~~12.6.~~13.6. The DCO Time Extension impacts that could have an adverse effect on integrity of the Humber Estuary SAC/Ramsar (and hence requiring compensation) are the same as those for the original DCO scheme and the Material Change 2, and are as follows:

- Permanent direct loss of 43.6 ha estuarine habitats (~~31.3~~29.8 ha of intertidal mudflat and 10.4 ha of sub-tidal habitat, plus an additional loss of ~~1.9ha~~3.4 ha of colonising saltmarsh).

~~12.7.~~13.7. The DCO Time Extension impacts that could have an adverse effect on integrity of the Humber Estuary SPA/Ramsar (and hence requiring compensation) are also the same as those for the original DCO scheme and the Material Change 2, and are as follows:

- Adverse effect on internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds.
- The continued use of NKHP as a roost site by waders from KMFS cannot be confirmed, particularly black-tailed godwit, once the mudflats at KMFS are lost.
- Indirect functional habitat loss through disturbance to internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds.

~~12.8.~~13.8. A compensation scheme was agreed for the original DCO, as set out in the AMEP Compensation Environmental Management and Monitoring Plan (agreed in January 2016). That scheme was agreed to be appropriate for the Material Change 2. The magnitude of the impacts of the consented Material Change 2 scheme was slightly reduced on the original DCO scheme after, but the compensation scheme remained unchanged. As the proposed Time Extension would have the same impacts as the Material Change 2, that compensation scheme can be expected to still provide the appropriate quantum of compensation. Further details of the losses and compensation ratios for the habitat that will be lost are reviewed in the ~~Material Change 2~~update of Technical Appendix UES11-2. Further update to the CEMMP will be made in light of the results of the pre-construction surveys that have been agreed with Natural England.

1.3 - AMEP DRAFT CONSULTATION HRA, MARCH 2025, PARTS 3 & 4

(No changes)

ABLE MARINE ENERGY PARK (ARTICLE 7 EXTENSION OF TIME)

Habitats Regulations Assessment – Alternative Solutions and IROPI

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Basis of Report

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Table of Contents

Tables in Text

Figures in Text

1.0 Introduction

Background

1.1 This report has been produced by SLR Consulting Ltd as part of an application by Able Humber Ports Limited (APHL) for consent from the Secretary of State to extend a time limit in the Able Marine Energy Park (AMEP) Development Consent Order 2014 (S.I. 2014/2935) under article 7 of the Order.

1.2 Article 6(4) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ('the directive') provides a derogation under article 6(4) which allows projects that may have an "*adverse effect on the integrity of a European site*" to be approved provided three tests are met:

- there are no feasible alternative solutions to the plan or project which are less damaging;
- there are "imperative reasons of overriding public interest" (IROPI) for the plan or project to proceed; and
- compensatory measures are secured to ensure that the overall coherence of the network of European sites is maintained.

1.3 The directive is primarily transposed into domestic legislation through the Conservation of Habitats and Species Regulations 2017. In accordance with Regulation 64, if the competent authority is satisfied that, there being no feasible alternative solutions, the project must be carried out for imperative reasons of overriding public interest (which may be of a social or economic nature), it may agree to the project notwithstanding a negative assessment of the implications for the European site.

1.4 It should be noted that the 2017 Regulations were subsequently updated through the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Within the 2019 amendments to the Regulations, the Natura 2000 Network was renamed as the 'National Site Network'; this revised naming has been utilised throughout this document.

Development Consent Order

1.5 The DCO for the Able Marine Energy Park (AMEP) was made on 13th January 2014, laid before Parliament on 10th February 2014 and subsequently came into force on 29th October 2014 (Statutory Instrument 2014 No. 2935). It was amended by a non-material change on 13 May 2021 and a material change on 16 July 2022 (see further below). A copy of the DCO is provided within Technical Appendix ER1-1 of the Environmental Review.

1.6 The DCO permits, *inter alia*, the development of a new quay and associated development at Killingholme in North Lincolnshire, on the south bank of the Humber Estuary. Briefly, the development on the south bank comprises a quay, reclaimed estuarine habitat and the provision of onshore facilities for the manufacture, assembly and storage of components relating to the offshore renewable energy sector. The DCO further permits other associated development including environmental habitat, namely the Cherry Cobb Sands compensation site, on the north bank of the Humber in the East Riding of Yorkshire authoritative area.

1.7 The authorised development is described in Schedule 1 of the DCO 'Authorised Development', whilst Part 2, Article 7 of the DCO limits the time period during which works can be carried out.

1.8 The DCO submission was accompanied by an Environmental Statement (ES). During the examination of the proposals, additional environmental information was submitted by the Applicant and was incorporated into the original ES for the Project. The documents forming the project ES are listed at Schedule 11, paragraph 1 of the AMEP DCO, and this complete set of documents is referred to as 'the original ES'.

Purpose of Report

1.9 In view of the passage of time between the corresponding information prepared for the original DCO application and the application for an extended time limit, this report provides updated information on feasible alternative solutions (Section 2.0) and the Imperative Reasons of Overriding Public Interest (IROPI) (Section 3.0) which originally supported the Habitats Regulations Assessment (HRA).

2.0 Alternative Solutions

Introduction

2.1 This part of the updated report demonstrates the continued absence of any feasible alternative solutions to meet the needs that define the project objectives.

Changes in Legislation, Guidance and Policy

2.2 Guidance on the application of the three tests under article 6(4) in England and UK offshore waters is provided in "*Habitats Regulation Assessments: protecting a European Site*" (DEFRA, updated December 2023). The purpose of the alternative solutions test is to confirm that there are no other feasible ways to deliver the overall objectives of the project which will be less damaging to the integrity of the European site affected (in this case The Humber Special Area of Conservation (SAC) and Special Protection Area (SPA)/Ramsar Site).

2.3 In respect of considering whether a derogation should be allowed, the DEFRA guidance confirms that the proposer (Applicant) should provide the competent authority (in this case the Secretary of State for Transport) with information about alternatives. The competent authority should use its judgement to determine what is reasonable in respect of alternative solutions, which might include different location; scale; size; methods; or timing, alongside the 'do nothing' option (also referred to as 'zero-option').

2.4 With respect to assessing whether alternatives meet the objectives of the project, the DEFRA guidance confirms that an alternative solution would be acceptable if it:

- *"achieves the same overall objective as the original proposal;*
- *is financially, legally and technically feasible; and*
- *is less damaging to the European site and does not have an adverse effect on the integrity of this or any other European site."*

2.5 Taking into account the above, the purpose of this section of the report is to present to the competent authority the categories of feasible alternative solution considered for the AMEP project and thereby demonstrate that there is no feasible alternative solution that satisfies the project objectives.

Updated Objectives of the Project

2.6 The Project will address three key objectives of UK Energy Policy, viz.

- decarbonise the means of electricity production in a sector that has a key role on the UK trajectory to Net Zero by 2050;
- provide secure energy supplies for the UK; and
- improve UK competitiveness by creating jobs and growth in a sector in where the UK has the highest deployment in Europe.

2.7 In particular the Project will:

- provide facilities for the manufacture of large-scale offshore energy components;
- contribute to 'rebalancing' the UK economy by enabling the development of a significant manufacturing cluster - such a cluster will have a beneficial impact on the competitiveness of the UK offshore wind industry; and
- provide a significant contribution to the regeneration of the Humber Estuary sub-region, an economically deprived area of the UK.

2.8 The need for new manufacturing facilities and for construction ports in the UK to enable growth of the offshore wind energy sector arises from a number of international, national and regional imperatives, viz.

2.9 World production of energy needs to be decarbonised in order to avoid the potential adverse impacts of climate change. The UK Climate Change Strategy (2021-2024) reflects that "*climate change is a global challenge, requiring global solutions - profound, comprehensive and urgent international cooperation is required to deliver a net zero global economy".* Accordingly, International Treaties and national legislation compel the UK Government to make an urgent transition to a low carbon economy.

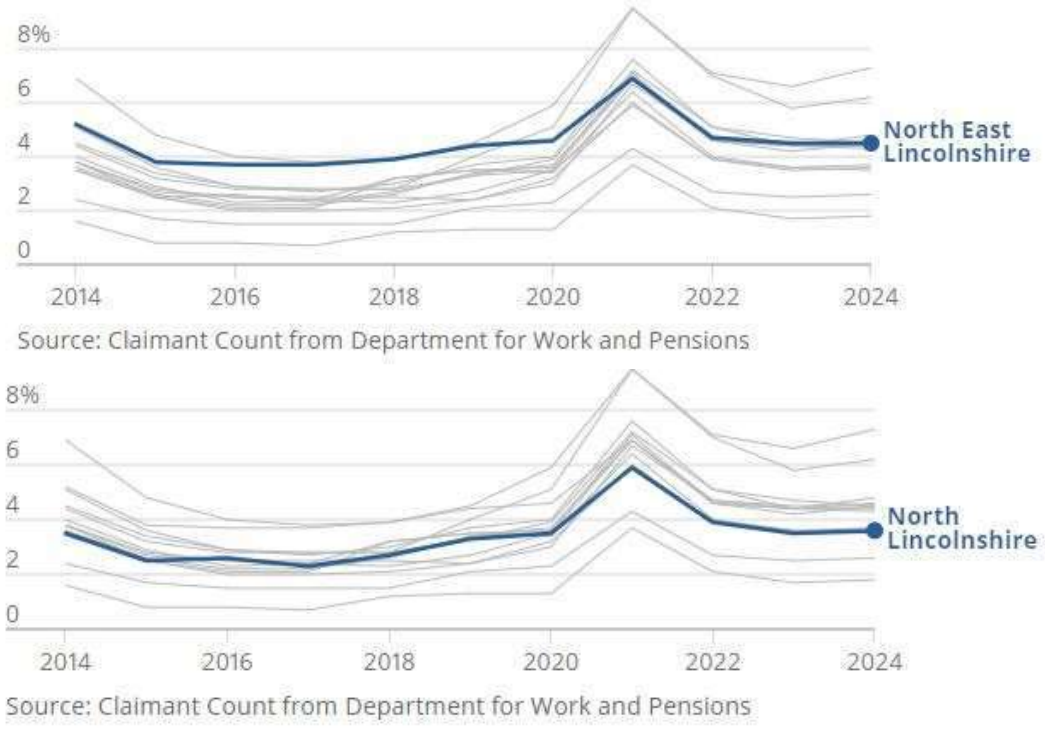
2.10 The UK must ensure security of its energy supplies whilst managing its own transition from fossil fuels to renewable forms of energy over the next few decades. This need has been emphasised since the invasion of Ukraine in February 2022. The HM Government Energy Security Plan (March 2023) states that "*energy security necessarily entails the smooth transition to abundant, low-carbon energy. If we do not decarbonise, we will be less energy secure*". In this context, a secure energy supply is characterised by: a diverse energy mix of different sources and fuels; limited reliance on imported supplies; reliable and well managed infrastructure and stable prices. Offshore renewable energy is part of such a diverse mix of energy generation. The transition is to be market-led.

2.11 The UK must develop large capacity offshore wind turbines to make the delivery of sufficient offshore wind turbine capacity feasible and to reduce the environmental impacts associated with manufacturing, deployment and maintenance. Minimising the environmental impacts of road transportation, such turbines will need to be manufactured at portside locations.

2.12 The UK needs to increase its manufacturing base and, where practicable to do so, target investment in areas of relative deprivation to reduce social imbalance between regions. The transition from a fossil fuel economy to a low carbon one offers substantial new employment opportunities in the manufacturing sector and the potential for significant socio-economic benefit to the UK.

2.13 The Humber sub-region is an area of relative deprivation and is in need of substantial investment. North East Lincolnshire is currently suffering higher levels of unemployment than North Lincolnshire and Yorkshire and the Humber. Trends in claimant counts for both authority areas from 2014 to 2024 compared to the other authorities within Yorkshire and Humber are illustrated in Figure 2-1 below.

Figure 2-1: Claimant Count trends for North East Lincolnshire and North Lincolnshire 2014 - 2024[1]



The Need to Decarbonise Energy Production

2.14 The earth's climate has been changing constantly over millions of years. Indeed, it is only ten thousand years since the majority of the UK land mass was covered by a series of thick ice sheets. In the current era we can understand the climate and the factors that influence it.

2.15 The climate is mainly influenced by the amount of energy coming from the sun, but also by factors such as the amount of greenhouse gases and aerosol propellant in the atmosphere. Recent human activity is changing the composition of the atmosphere and its properties. Since pre-industrial times (around 1750), carbon dioxide concentrations have increased by just over a third from 280 parts per million (ppm) to 420 ppm today, predominantly as a result of burning fossil fuels, deforestation and changes in land use. The concentration of other greenhouse gases such as methane and nitrous oxide are also rising.

2.16 There is compelling scientific evidence that the rising levels of greenhouse gases will have a warming effect on the earth's climate through increasing the amount of infrared radiation (heat energy) trapped in the atmosphere, "the greenhouse effect". In total the warming effect due to all greenhouse gases[2] emitted by human activities was equivalent to around

[1] https://www.ons.gov.uk/visualisations/labourmarketlocal/E06000012/ & https://www.ons.gov.uk/visualisations/labourmarketlocal/E06000013/

[2] Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_20), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6), as defined in the Kyoto Protocol

472 ppm of carbon dioxide in 2021. This concentration represented an increase of about 50 ppm over the preceding 10 years and was about 192 ppm more than in pre-industrial times[3].

2.17 The impact of climate change is to potentially threaten the basic elements of life for people around the world – access to water, food, health and use of land and the environment generally. One of the ways in which this would occur would be through rises in sea levels, inundating coastal areas around the world. Accordingly, the UK Government is a signatory to international commitments on climate change and national legislation has been developed that provides a statutory framework for the reduction of greenhouse gas emissions over the next few decades.

2.18 The Kyoto Protocol was developed to limit the growth of greenhouse gas emissions. Under the protocol, industrialised countries and those in transition to a market/industrialised economy agreed to limit or reduce their emissions of greenhouses gases. It came into force on 16 February 2005 and commits signatories, including the United Kingdom, to reduce or limit their greenhouse gas emissions to a specified target value relative to their 1990 emissions in the period 2008-2012.

2.19 The UK government has achieved its target reduction for emissions. Since the Kyoto Protocol, however, it has become evident that more significant action is required to limit climate change. Accordingly, legislation has been introduced by the UK Government, to impose legal obligations that compel a transformation to a lower carbon economy.

2.20 The Climate Change Act 2008 is the basis for the UK's approach to tackling and responding to climate change. It requires that emissions of carbon dioxide and other greenhouse gases are reduced and that climate change risks are adapted to. The Act also establishes the framework to deliver on these requirements. The Act supports the UK's commitment to urgent international action to tackle climate change. Through the Act, the UK Government has set a target to significantly reduce UK greenhouse gas emissions by 2050 and a path to get there.

2.21 The Act also established the Committee on Climate Change (CCC) to ensure that emissions targets are evidence-based and independently assessed. The Act commits the UK Government by law to reducing greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050. The 100% target was based on advice from the CCC's 2019 report, '*Net Zero – The UK's contribution to stopping global warming*.'

The Need for Security of the UK Energy Supply

2.22 Whilst the development of renewable energy has been mainly driven by concerns over climate change, an additional important issue is the role of renewables in contributing to security of UK energy supplies. This is being driven by global shortages of oil supplies and increased oil demand from the developing economies (particularly China), depletion of national offshore gas reserves (particularly in the UK) and actions by the world's largest gas supplier – Russia.

2.23 In accordance with Section 172 of the Energy Act 2004 (as amended by Section 80 of the Energy Act 2011), the government and Ofgem is required, in every calendar year, to:

[3] https://www.eea.europa.eu/en/analysis/indicators/atmospheric-greenhouse-gas-concentrations

> "*publish a report dealing, as regards both the short term and the long term, with the availability of electricity and gas for meeting the reasonable demands of consumers in Great Britain".*

2.24 The most recent of such reports, '*Statutory Security of Supply Report'*, (DECC, 2023), records that at the end of 2023, the UK had sufficient electricity capacity to meet the forecast winter's demand, with a margin of 4.4GW (about 7.4%) between supply and demand. This represented an increase on the 3.7GW (6.3%) that was expected at the end of 2022.

2.25 The Overarching National Policy Statement for Energy, EN-1 (November 2023), states that to ensure that there is sufficient electricity to meet demand, new electricity infrastructure will have to be built to replace output from retiring plants and to ensure we can meet increased demand. Even with major improvements in overall energy efficiency, and increased flexibility in the energy system, demand for electricity is likely to increase significantly over the coming years and could more than double by 2050 as large parts of transport, heating and industry decarbonise by switching from fossil fuels to low carbon electricity, with an illustrative range of 465-515TWh in 2035 and 610-800TWh in 2050.

The Need for Large Capacity Offshore Turbines

2.26 The importance of offshore wind and need for large capacity offshore turbines is reiterated in the UK Government *Offshore Wind Net Zero Investment Roadmap* (March 2023), noting that offshore wind is an established and proven part of the UK energy mix and is set to become even more important in the future. The Roadmap highlights the need for *"Large-scale, deepwater ports for the fabrication, assembly, storage and deployment of floating offshore wind turbines."*

2.27 This need is also reflected in the Overarching National Policy Statement for Energy, EN-1 which states that as part of delivering a secure, reliable, affordable, net zero consistent system in 2050, the UK government announced in the British Energy Security Strategy[4] an ambition to deliver up to 50 gigawatts (GW) of offshore wind by 2030, including up to 5GW of floating wind.

The Need to Rebalance the UK Economy

2.28 The concept of a "rebalanced" economy has become central to the debate on how the UK can generate sustainable growth. One major imbalance is considered to be the level of manufacturing in the UK compared to other industrialised countries. In the UK, manufacturing and associated employment has declined rapidly in recent decades, with the proportion of manufacturing workforce jobs in Yorkshire and the Humber reducing from 17.9% in 1996 to 10% in 2024; this compares to a corresponding UK fall from 15.2% to 7%[5] Recent trends in UK manufacturing output are shown below[6].

[4] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[5] https://www.nomisweb.co.uk/reports/lmp/gor/2013265923/subreports/gor_wfjsa_time_series/report.aspx?

[6] https://commonslibrary.parliament.uk/research-briefings/sn05206/

Figure 2-2: Trends in UK manufacturing output

2.29 The State of the European Wind Energy Supply Chain (Rystad Energy, 2023) suggests that "*noteworthy European countries in the current wind supply chain include Germany, Spain and Denmark, all of which have significant activity linked to producing the main components of wind turbines – blades, nacelles, and towers. In recent years, France has also emerged as one of the key countries, with new blade and nacelle manufacturing plants. For offshore wind foundations, key producers include the Netherlands, Germany, and Denmark. Unsurprisingly, these countries are also among the leaders in terms of installed capacity for offshore wind in Europe. Most of these facilities are in port cities, facilitating sea transport.*"

2.30 A result is that 80 percent to 90 percent of the historic capital value in UK offshore wind farm projects has been based on imported goods and services and the economic benefits to the UK have been very limited (Garrad Hassan, 2010).

2.31 The aforementioned aspirations for increase in the contribution of the UK offshore wind sector to achieving Net Zero requires urgent and significant investment in new manufacturing facilities and port infrastructure in the UK. This investment must be market led, and for the UK to benefit significantly from private sector investment in new manufacturing facilities, it must provide suitable development sites, including deep water port installations.

The Need to Regenerate The Humber Sub-Region

2.32 The English Indices of Deprivation 2019 (MHCLG[7]) provide local authority district summaries. For the Index of Multiple Deprivation, which represents a combination of different individual deprivation indices, North Lincolnshire was ranked 79th, whilst North East Lincolnshire was ranked 51st out of 151 authorities (where 1 is the most deprived and 151 the least deprived). For the corresponding employment index, North East Lincolnshire was ranked 35th and North Lincolnshire 54th.

[7] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

2.33 Accordingly, there is a manifest need to address deprivation in the Humber sub-region by promoting investment in that area. The development of AMEP will have a significant positive impact on these criteria at the local level but will also benefit the Humber sub-region as a whole.

2.34 Much of the AMEP site now forms part Humber Freeport which, with effect from 19th November 2021, has been designated and recognised in law as one of a number of geographical areas where businesses can benefit from tax reliefs to bring investment, trade and jobs to regenerate regions across the country that need it most.

2.35 Based on 2011 values (noting they have not been updated to 2024 values), the following economic effects are estimated:

- The employment impact at the site will be 4,100 FTE jobs. The net additional local impact is 3,740 FTE jobs taking into account deadweight, leakage, displacement, and indirect and induced multiplier effects.
- The UK-wide cumulative net additional impact is 10,600 FTE jobs. These jobs will generate significant net additional GVA in the local economy – estimated at £210 million, and in the national economy – estimated at £602.5 million.

2.36 As indicated above, these estimates are considered conservative and the GVA impact will potentially be higher due to higher GVA per job in the offshore wind energy sector.

2.37 The AMEP labour market impact is potentially significant, especially in the immediate vicinity of the development. It is expected that the workforce will have to come from a wider area, both North and North East Lincolnshire and from within the wider region of Yorkshire and the Humber. Based on the impact assessment of AMEP, it is evident that economic impacts can be expected to be highly positive:

- diversification of the manufacturing sector into new offshore wind technologies providing higher job security compared to traditional industries in decline;
- new jobs (4,100 direct jobs excluding installation related jobs) created directly at the site absorbing some of the potentially available pool of workers (unemployed and potentially economically active). These new jobs will attract highly skilled workers from other areas as well, thereby creating a critical mass of offshore wind professionals in the local area;
- AMEP will enable the development of an offshore wind manufacturing cluster in the Humber region as it will be cheaper and more efficient to co-locate businesses in the supply chain. A manufacturing cluster will help to develop offshore wind (and other marine renewables) technologies further;
- new offshore wind jobs will require highly qualified workers and AMEP represents opportunity to raise the skill level of local labour to ensure increased local participation;
- the supply chain for AMEP offshore wind manufacturers will be developing in the Yorkshire and the Humber region and beyond with signs of this process appearing recently with foundation manufacturers setting up facilities in Scunthorpe and Teesside;
- AMEP will also support 200 FTE jobs at a number of suppliers of goods, services, and works locally (i.e. within NL and NEL) and further 920 FTE jobs through spending of its and suppliers' employees in the local economy; and

- Wider impacts will include attraction of inward investment, growth of R&D in offshore wind in Yorkshire and the Humber, upskilling of the workforce, and others.

Project Description

2.38 The development of a Marine Energy Park is directly related to the global environmental project to decarbonise world energy production. The need to decarbonise world energy production, and its overriding benefit to the global environment, is beyond any reasonable scientific doubt. The project is described in *Chapter 4* of the original Environmental Statement, Volume 1 and this application has not amended this description.

Works having an Adverse Effect on Integrity

Works outside the National Site Network

2.39 Works outside the National Site Network comprise the manufacturing areas and the impacts of that development of National Site Network features are mitigated within the development site and at Halton Marshes Wet Grassland which has already been constructed.

Works within the National Site Network

2.40 Works within the National Site Network comprise a new solid quay structure and the environmental impact of those works cannot be mitigated. It is therefore necessary to consider whether any alternative solutions to those works exist that would avoid an adverse effect on integrity of the National Site Network.

Methodology for the Assessment of Alternatives

2.41 The assessment of alternative solutions is undertaken in four stages.

Stage 1 - Zero Option

2.42 An assessment of the feasibility of constructing the development without the quay, or not constructing the development at all.

Stage 2 – Is There an Alternative Site that would result in less damage to the National Site Network?

Stage 2A

2.43 Subject to the development being needed and needing a quay, an assessment of whether the development could be constructed on an alternative site that is not part of the National Site Network.

Stage 2B

2.44 Subject to there being no alternative site outside the National Site Network, an assessment of whether the development could be constructed on another National Site Network site and have less overall environmental impact.

Stage 2C

2.45 Subject to there being no alternative site for the whole development anywhere, an assessment of whether the development could feasibly be constructed as a series of smaller developments and have less overall environmental impact.

Stage 3 – Is There an Alternative Design that would be less damaging to the National Site Network?

Stage 3A

2.46 Subject to there being no feasible alternative site or sites for the development, an assessment of whether the environmental impact could be reduced by adopting a different scale of development.

Stage 3B

2.47 Subject to there being no feasible alternative site or sites for the development, an assessment of whether the environmental impact could be reduced by adopting a different design for the quay.

Stage 4 – Can the Facility be Operated in any way that would reduce the negative impact on the National Site Network Site?

2.48 Subject to there being no feasible alternative design or scale of development, an assessment of alternative means of operating the facility to reduce its environmental impact.

The Assessment of Alternatives

Updated Stage 1 - The Zero-Option

Definition

2.49 The zero option can comprise either:

- constructing manufacturing facilities for offshore wind turbines without a quay, or
- not building offshore wind manufacturing facilities at all.

Offshore Turbine Manufacturing Facilities without a Quay

2.50 If the development excluded the quay, then all of the products manufactured on the site would need to be transportable by road or rail to a nearby port. This would mean that products could be no larger than those manufactured for onshore installation.

2.51 The Crown Estate *Offshore Wind Report 2022* reflected that "*the average turbine size for projects commissioned in 2022 was 9MW, an increase of almost five times the size of the first commercial offshore turbines installed twenty years ago".* Indicative increases in the scale of offshore turbine components are summarised in **Table 2-1** below[8]:

[8] Data from: https://www.ft.com/content/565c21bf-25a0-4fc6-9f47-c7483671d43a

Table 2-1: Increases in the Scale of Offshore Wind Turbine Components

Year	Typical rotor diameter (m)	Typical hub height (m)	Typical installed output (MW)
1991	35	35	0.5
2001	76	64	2.0
2010	93	68	2.3
2015	154	102	6.0
2017	164	113	8.0
2024	252	146	16.0

2.52 By virtue of the length of blades and tower sections, modern offshore turbines are not transportable by road or rail. Consequently, all new manufacturing facilities for offshore wind turbines must have direct access to a quay and existing onshore facilities cannot be used that rely on road or rail transport.

2.53 In summary, manufacturing facilities for next generation offshore wind turbines need a quay and the development cannot proceed without it.

No Offshore Wind Turbine Manufacturing Facilities

2.54 In April 2024 RenewableUK, the Offshore Wind Industry Council, The Crown Estate and Crown Estate Scotland published a detailed Industrial Growth Plan (IGP), setting out how to triple offshore wind manufacturing capacity over the next ten years, firmly establishing the UK as a leader in a surging global market.

2.55 The IGP reports that the UK has the second largest global pipeline of offshore wind projects at all stages of development at nearly 100GW - more than six times our current capacity; it emphasises however that supply chain constraints in many of the key components needed in offshore wind farms are already starting to be felt in the global market. The IGP identifies strategic new factories and manufacturing capabilities which the UK should build up to protect against supply chain risks and boost economic growth.

2.56 The manufacture of offshore wind blades and turbine towers is one of five key technology areas that the IGP identifies for the UK to prioritise investment to secure value for UK industry.

2.57 To fulfil the objectives for generation of energy from offshore wind by 2030 set out within the Overarching National Policy Statement for Energy, it is evident that many new offshore wind turbine manufacturing facilities are required.

2.58 In summary, manufacturing facilities for next generation offshore wind turbines need to be built.

Summary – Zero Option

2.59 The development of large turbines specifically for the offshore wind sector is firmly rooted in UK policy and there is a defined need to increase manufacturing capacity for offshore wind turbine components to support the national policy objectives for Net Zero.

2.60 Next generation offshore wind turbine manufacturing facilities must have direct access to a quay as they are too heavy to transport by road or rail. A quay is therefore an essential requirement for new offshore turbine manufacturing facilities.

2.61 The zero option is therefore discounted.

Updated Stage 2: Alternative Sites

Possible Alternative Sites

The Geographical Limits - The Continent

2.62 Alternative sites outside of the UK are not considered because such sites would not meet the long term economic and social needs of the UK or stated Government policy. This is emphasised in the Government support for offshore wind set out in the *Offshore Wind Net Zero Roadmap*, which focuses on the employment, skills and economic benefits that the industry can bring at a domestic level.

2.63 Furthermore, alternative sites outside of the UK would not deliver the project objectives outlined above of contributing to the security of UK energy supplies, and the growth and rebalancing of the UK economy through regeneration and the development of manufacturing industry.

The Geographical Limits - The UK

2.64 To be commercially viable as a manufacturing cluster with an on-site construction port, the alternative sites are realistically limited to the south and east coast of Britain where the Round 3, 4 and 6 zones are concentrated and where there is ready access to other nations' economic zones.

Site Specification

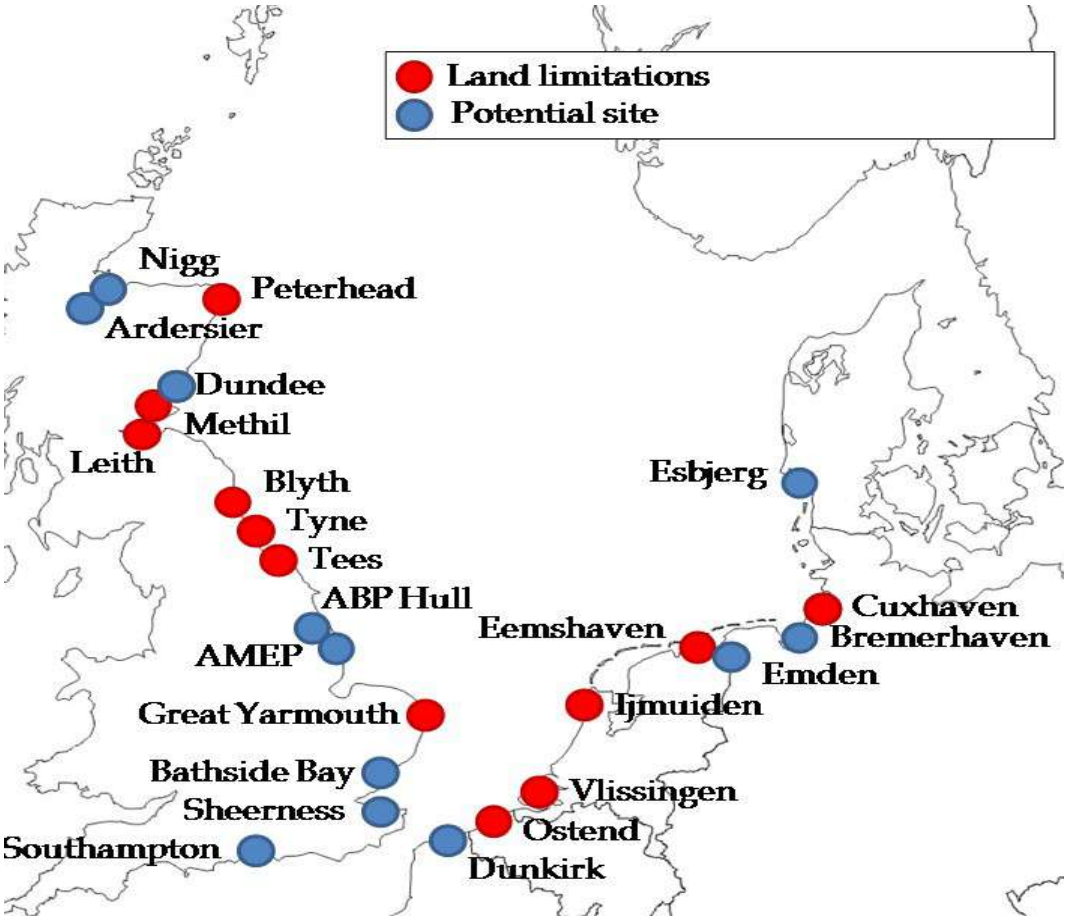
2.65 The specific site requirements are set out in Chapter 6 of the original ES and are summarised below:

- proximity to the major Round 6 development zones, which include Hornsea Project 4 and East Anglia Two, Phase 1 (noted that this referred to Round 3 in the ES);
- a substantial single parcel of flat land with access to deep water;
- good road and rail access;
- appropriate land use allocation.

Port Sites on the South and East Coast of Britain

2.66 The previous iteration of the alternative sites assessment referenced *UK Offshore Wind Ports Prospectus* (DECC, 2009), which provided details of 26 potential ports, 15 of them on the southern and eastern shoreline of the UK, that could be developed to serve the offshore wind industry in some capacity. These ports are Nigg, Peterhead, Dundee, Methil, Leith, Blyth, Tyneside, Able Middlesbrough, Hartlepool, Able Seaton, ABP Hull, Able Humber, Great Yarmouth, Isle of Grain, Sheerness and Southampton. Their locations are illustrated in **Figure 2-3.**

Figure 2-3: Potential Alternative Port Locations[9]



2.67 Of the ports identified, eight have clear size limitations in terms of their development as a manufacturing and construction port cluster; these are summarised in **Table 2.2** below and have been screened out of any further assessment.

Table 2-2: Port Locations with Insufficient Land

Port	Restriction	Details
Peterhead	Land/Quay	The port has developed a 1.6 ha site for renewables with a further 3.2 ha offsite. A new 170 m berth has been developed to support offshore renewables operations.
Methil	Land/Quay	The port's Energy Park is 54 ha of which 7.5 ha are currently available. The site has two quays with a total length of 345 m.
Leith	Land	The port owner has commenced construction of a bespoke riverside berth as part of its development of a 175 ha renewable energy hub on adjacent land
Blyth	Land/Quay	100 ha of land are available with more than 1.5 km of quay but this is divided into parcels with areas already utilised by existing customers including the Energy Central Learning Hub, test facilities of the Offshore Renewable Energy Catapult, the Northumberland Energy Park and EDF's Blyth Offshore Demonstrator Wind Farm.

[9] Source: BVG Associates

Port	Restriction	Details
Tyne	Land	The Renewable Energy Park is located on the north bank of river and has 60 ha of available land with 800 m of quayside. This is split into a number of discontinuous sites. The Tyne Renewables Quay is being marketed as available, with 11.7 hectares and adjacent deep water berth
Tees	Land	The Seaton and Middlesbrough sites on the north and south banks of the river and offer a total of 72 ha and 550 m and 350 m respectively. Outside the river mouth, Hartlepool offers 23 ha with 900 m of quayside. The sites provide support to the surrounding Tees Valley energy hub and could be developed for discrete manufacturing facilities but not a construction port/manufacturing cluster.
Great Yarmouth	Land	The port has 12 ha of development land with up to 1,000 m of quay as well as the opportunity to develop further land beyond the new outer harbour. The port was identified in 2023 by Vattenfall as the preferred location for the operations and maintenance base for the Norfolk Offshore Wind Zone.

2.68 The remaining alternatives– Nigg, Ardersier, Dundee, ABP Hull, Bathside Bay, Sheerness and Southampton - are considered in greater detail below. Information has been sourced from company documents and websites as well as publications by public and industry bodies.

Description of UK Port Sites with a Significant Land Parcel

Nigg

2.69 The Nigg Site is approximately 526 kilometres from Hornsea Project 4 and 729 kilometres from the East Anglia Two. A development masterplan for the Port of Nigg was developed in 2013 by The Highlands and Islands Enterprise and the Highlands Council. Layout of the port area from the development masterplan is provided as **Figure 2-4** below**.**

2.70 Subsequent development at the port has included:

- completion of improvements to the existing South Quay in 2015, which has been re-faced with a new steel piled wall and the area dredged to a depth of 12.7 metres below chart datum;
- the completion of the Easy Quay project in June 2022, providing 225 metre length, 50 metre width, and 12 metres water depth at the lowest astronomical tide, to service multiple large scale energy sector projects simultaneously.

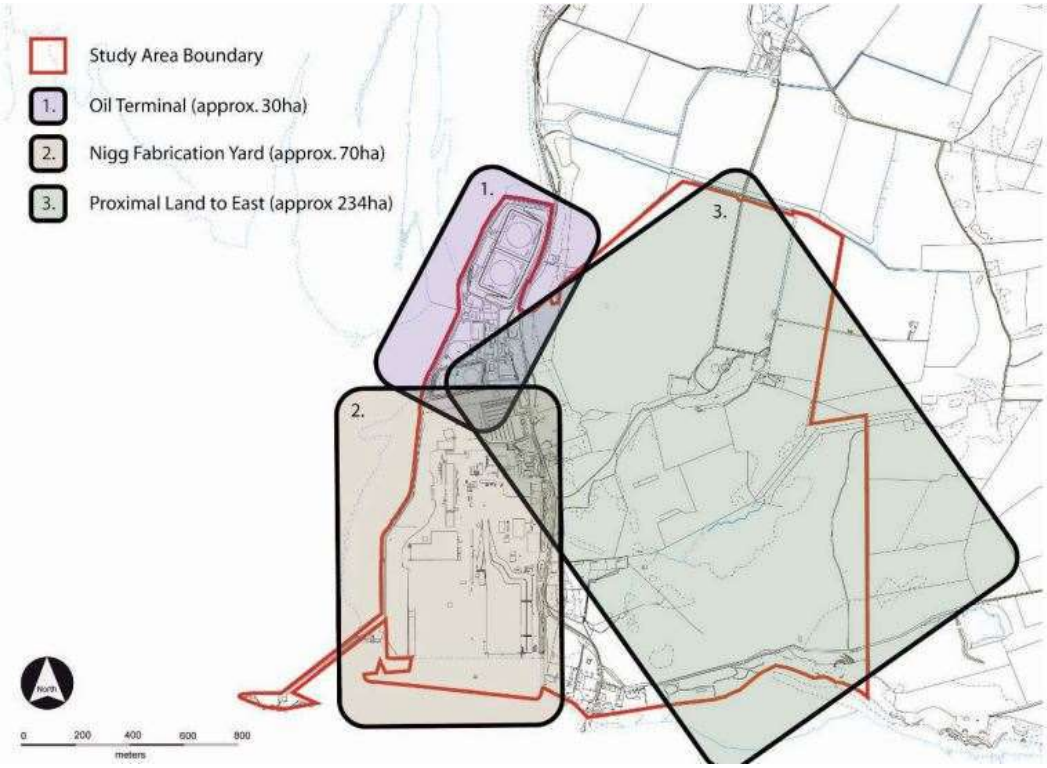
2.71 The 70-ha fabrication yard has the benefit of an existing 306 m long dry dock and has been used for the manufacture of offshore wind turbines. A heavy-duty quay partly runs along one side and is capable of supporting a distributed load of 90 T/m^2.

2.72 The proximal land to the east lies on steeply rising ground and only a small area near the coast is actually flat and suitable for offshore component manufacturing. The coastal boundary also lies within the Cromarty Firth SPA/SSSI/Ramsar site.

2.73 Its geographic remoteness from the majority of the Round 6 zones is a significant barrier to the use of this site as a manufacturing cluster or project port for the forthcoming development areas. Topographic constraints also mean that Nigg cannot be considered a feasible site for a MEP. It is nevertheless in a very favourable position to serve as a construction port for the Moray Firth zone and could clearly support a significant foundation

fabrication yard. Its dry dock also provides a real opportunity for the manufacture of gravity-based foundation structures.

Figure 2-4: Nigg Site Layout[10]



Ardersier

2.74 The Ardersier yard is located in north east Scotland on the south shore of the Moray Firth, approximately 12 kilometres south of Nigg. It lies adjacent to the Moray Firth SAC, Inner Moray Firth SPA and Ramsar sites and Whiteness Head SSSI. The site is approximately 522 kilometres from Hornsea Project 4 and 717 kilometres from East Anglia Two. An aerial view of Ardersier is shown at **Figure 2-5.**

2.75 Ardersier was originally reclaimed for the construction of oil and gas platforms in the early 1970s, but such activity ceased in the early 1990s. Previous development proposals for the site by the Whiteness Property Company, had outline planning permission for nearly 2,000 houses already and ambitions for up to 4,000 units. Investment had been made to remediate the land in preparation for housing.

2.76 It is understood that the site is now being developed by Haventus to support the large-scale deployment of offshore wind to provide a 180-ha site with berth dredged to 12.4 metres below chart datum; 659 metre quay wall and 420 metre main quay. Scheduled full operation is 2025.

2.77 The HE-HIS Strategic Environmental Assessment concluded that there was potential for development to have significant adverse environmental effects on the designated sites. In summary the assessment stated that:

[10] Source: HE-HEIS, 2013

"'It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

- *effects of construction noise and vessel movement on bottlenose dolphins*
- *effects of construction on birds using habitat within the SPA*
- *effects of dredging on coastal erosion/deposition patterns and the potential for this to affect the SPA and SAC interests."*

2.78 In common with the nearby Nigg site, Ardersier's geographical remoteness is its key weakness as an alternative site.

Figure 2-5: Aerial view of Ardersier

Dundee

2.79 The port is approximately 388 kilometres from Hornsea Project 4 and approximately 587 kilometres from East Anglia Two. The port has 1,600 metres of quay with six working berths, but this is not continuous; it is already utilised by existing customers and is partially lock bound.

2.80 Whilst the port has invested £10 million to support opportunities for decommissioning and the offshore wind industry, including provision of 300 metres of new quayside with a minimum water depth of 9 metres at lowest astronomical tide, substantial development of the port for the offshore wind sector is envisaged to require reclamation and consequential habitat loss within the Firth of Tay and Eden Estuary SAC.

2.81 The landholding is considered too dispersed to provide a base for an integrated manufacturing and construction port facility.

ABP Hull

2.82 The port of Hull is owned by ABP and is 10 kilometres upriver from the AMEP development site. The port is approximately 95 kilometres from Hornsea Project 4 and approximately 279 kilometres from East Anglia Two. An aerial view of Hull is shown in **Figure 2-6.**

Figure 2-6: Aerial View of Hull

2.83 Consent was granted in 2006 for the development of a 12-ha riverside berth with 600 metres of quayside adjacent to Alexandra Dock on the western end of the port. The consent provided for the development of a container terminal and is likely to require a new authorisation to cover a different use.

2.84 Development of the site was subject to an Appropriate Assessment (Department for Transport, 2005) which agreed with English Nature (as so named at the time) that the development would have an adverse effect on the integrity of the Humber Estuary designated site because it would, 'result *in the loss of about four hectares of inter-tidal mudflats used by waders and other water birds, while demolition of West Wharf Pier would result in a loss of roosting habitat'.*

2.85 Consent was granted on the basis that no alternatives existed and that the development was required for imperative reasons of overriding public interest (IROPI). The decision letter noted that:

> *'(t)he Secretary of State accepts the Applicant's case that the port forms part of the national infrastructure and is a valuable component in the national and regional logistics chain. The port plays a vital role in the national feeder container market and in the continental short sea shipping market. The potential of Hull and of the Humber Region to provide a major link between Ireland, the UK and continental Europe is recognised in Regional Planning Guidance note 12. The Secretary of State observes moreover that Hull and the Humber ports form one of the key areas in the three northern Regional Development Agencies' Northern Way initiative for the regeneration of the North of England.*

2.86 Despite the IROPI case being accepted, the consent has never been implemented and ABP has since marketed the facility to the offshore wind industry and has also proposed infilling half of Alexandra Dock to offer more development land. Further quayside would also be available within the King George Dock, although this would be beam restricted by locks. A 200 ha satellite site is available close to Hull Docks but is separated from it. If it were to be developed as a manufacturing site additional quays would need to be developed. The land has a narrow frontage onto the estuary.

2.87 In January 2011, Siemens Gamesa identified Hull as its preferred location for the construction of a new offshore wind turbine factory. This provides further evidence the importance of the Humber as a manufacturing and port hub for the offshore wind sector and

in particular in relation to the proximity to the Hornsea Projects 1-4. The resultant collaboration between ABP and Siemens Gamesa has been a catalyst for the Green Port Hull vision and the capacity of the Siemens facility is to double in size; accordingly, this is not an alternative site to AMEP but an asset that can function alongside AMEP within the Humber cluster.

Bathside Bay

2.88 Bathside Bay lies within the Stour and Orwell Estuaries SPA and Ramsar site. It also lies within the Stour Estuary SSSI. Bathside Bay is located on the south bank of the river Stour in Essex next to the existing port of Harwich and is approximately 220 kilometres from Hornsea Project 4 and approximately 62 kilometres from East Anglia Two. An aerial view of Bathside Bay is shown in **Figure 2-7**.

Figure 2-7: Aerial View of Bathside Bay

2.89 Bathside Bay was given planning permission in 2006 for a container terminal. The consent was limited to ten years but the recession affected the growth of the container market and demand did not justify its construction. Hutchison Ports (UK) Ltd (HPUK) had previously sought to extend the consent. If constructed, the project would have seen up to 113 ha of port land reclaimed.

2.90 The consented development would have resulted in the direct loss of 69 ha of intertidal feeding habitat within the SPA. As a consequence the development was assessed to have an adverse effect on the integrity of the designated site and a 138 ha managed realignment site was secured to compensate for the damage to the coherence of the National Site Network. The development was consented on the basis that there were IROPI for a container terminal to be developed at the site and that no alternatives existed.

2.91 The Bathside Bay site was previously presented as part of Freeport East (**Figure 2-8**), which consisted of a 122-ha site green energy hub intended to support large-scale manufacturing and marshalling of offshore wind turbines and components to serve the UK and overseas offshore wind market. The port was also home to the RWE's O&M base for the Galloper windfarm. In common with the previous proposals for a container terminal, the port would provide a quay length of 1,400m and water depth of 15m.

2.92 The site now benefits from a planning permission (ref. 23/01594/FUL[11]) which granted consent for the *"Temporary use of Bathside Bay container terminal permitted under planning permission 10/00202/FUL dated 14 February 2013 as varied by permission 21/01810/VOC dated March 2022 (BBCT Permission) for wind turbine storage, staging, marshalling and assembly including the import and export, handling and deployment of concrete substructures, moorings, anchors and array cables and other related offshore green energy paraphernalia followed by decommissioning to enable continuation of container terminal use under the BBCT Permission".*

Figure 2-8: Illustrative image of Freeport East Harwich

2.93 In conclusion of the above, whilst the scale of Freeport East is substantial (albeit smaller scale than AMEP) and in excess of 100 ha could feasibly be located on this site, such development would result in the loss of more National Site Network land than the AMEP site, whilst providing less land for manufacturing.

Sheerness

2.94 The Port of Sheerness is located on the bank of the Medway near its confluence with the Thames. An aerial view is shown in **Figure 2-9**. The port is approximately 123 km from the East Anglia Two zone and 300 km from the Hornsea Project 4 zone. Sheerness is not located within in a European designated site although the Thames Estuary and Marshes SPA and the Medway Estuary and Marshes SPA are both in close proximity.

[11] https://idox.tendringdc.gov.uk/online-applications/files/870C2B5FE896908BCBBB9E50765973D0/pdf/23_01594_FUL-PLANNING_STATEMENT_-_REC_D_08.11.23-1930594.pdf

Figure 2-9: Aerial View of Sheerness

1. Ridham Dock
2. Neats Court
3. Queenborough
4. Sheerness
5. Isle of Grain
6. Kingsnorth (off picture)

2.95 The Port has had significant recent investment including a new Fresh Fruit Terminal, which included a new 160-metre berth and a 30,000 m^2 fully temperature-controlled storage and distribution complex. The port also serves the pulp needs of Kent's busy papermills, and large volumes of pulp are transhipped coast-wise from Sheerness to Scotland for papermaking. The port also handles vehicle exports and imports and the Lappel Bank, an area reclaimed by Medway Ports over the past 20 years, provides 76 hectares of dedicated secure vehicle storage.

2.96 In terms of quayside, the jetty and pier arrangement are not suitable for use by the offshore wind industry and the quay could only be made suitable by land reclamation works.

2.97 In addition to the existing port estate, there are a number of additional sites that are all within 10 kilometres of the port by road or barge. These include Ridham Docks (6 ha, 200m quay, 6.2m draft), Queenborough (12 ha) and Neats Court (36 ha). On the north bank of the Medway, there is a 46-ha site at Kingsnorth and up to 150 ha on the National Grid's Isle of Grain site. Both sites are currently undeveloped and would require the construction of port facilities, with substantial dredging envisaged to create suitable deep-water berths due to adjacent areas of foreshore exposed at low tide.

2.98 While the port is able to offer parcels of land almost immediately, these are currently too small. The additional sites in the surrounding area could help meet the total land requirement but the benefits of clustering would potentially be diminished by the need to load units onto barges to be moved between sites.

2.99 The location of the Sheerness site also means that while it is well located to serve the East Anglia Two zone and the southern North Sea, it is not as favourably located for the Hornsea Project 4 zone. In conclusion of the above, an 80-ha site or thereabouts could feasibly be located at Sheerness but such development would:

- permanently displace a significant quantum of existing international trade activity and associated existing local employment;
- need development of the existing quays including land reclamation and potentially dredging; a likely significant effect on nearby SPA's cannot be excluded; and
- provide a less optimal geographic location than AMEP and thereby give rise to a greater overall carbon footprint from vessels travelling to the two main Round 6 offshore development zones.

Southampton

2.100 The port of Southampton is shown in **Figure 2-10** is approximately 360 km from East Anglia Two, and approximately 565 km from the Hornsea Project 4 zone.

Figure 2-10: Aerial View of Southampton (Dibden Bay)

2.101 It is owned and operated by ABP and is located on the UK's south coast. It is a mixed-use port, handling a range of traffic including cars, containers and cruise liners. The main port is heavily utilised with limited spare land available but it does have a 323 ha site called Dibden Bay available on the western bank of the River Test. Dibden Bay lies within the Solent Maritime SAC, and the Solent and Southampton Water SPA and Ramsar sites. All of these habitats fall within the Hythe to Calshot SSSI.

2.102 The Dibden Bay site was the subject of a £600 million proposal submitted by ABP in 2000 for a deep water container terminal with a 1,850 m quay and 202 ha of port facilities. However the application faced strong local opposition and was rejected on environmental grounds in 2004 following a public inquiry. According to the Inspectors Report (The Planning Inspectorate, 2003):

> *'(t)he construction of the proposed quay, and the dredging of the deep-water berthing pocket and approach channel, would entail the destruction of some 76ha of inter-tidal mudflat on the Dibden foreshore, together with 52ha of shallow sub-tidal habitat. This harm is unavoidable if the project proceeds. It cannot be mitigated,'* (paragraph 7.94).

2.103 The site is currently undeveloped with no quay and any proposal would require planning permission or development consent to proceed.

2.104 While the Dibden Bay site would meet the requirements for a Marine Energy Park, its location on the south coast means it is too far from the main North Sea sites to be viable as

major turbine manufacturing and construction cluster. Development would also result in significant environmental impact to a designated site.

2.105 In conclusion of the above, a large MEP could feasibly be located on this site, but such development would:

- preclude its potential development as a container terminal in the future;
- result in the loss of significantly more National Site Network land than the AMEP site whilst providing only a small additional area of land for manufacturing; and
- provide a far less optimal geographic location than AMEP and thereby give rise to a much greater overall carbon footprint from vessels travelling to the three main offshore development zones.

Summary of Alternative Sites

2.106 A summary of salient features relating to alternative sites is detailed in **Table 2-3.** There is no alternative site that is of an equivalent scale to AMEP except for Southampton and development of that site would result in the loss of significantly more of the National Site Network than would AMEP. Whilst a combination of other smaller cluster sites could provide an equivalent distributed facility, the sites in Scotland, Nigg and Ardersier, are remote from the main Round 6 development zones and this would result in a significantly greater operational carbon footprint for the facility than AMEP.

2.107 An assessment of the relative carbon footprint associated with a cluster site compared to a UK distributed site, and a continental distributed site is reproduced in **Annex 6.2** to the original ES**.**

Conclusions

Stage 2A

2.108 From the above assessment, there are no sites outside of the National Site Network capable of supporting a marine energy park that would achieve AMEP's objectives.

Stage 2B

2.109 From the above assessment, only Southampton (Dibden Bay) has a land parcel of sufficient scale to support AMEP. However, development of Southampton would have a greater impact on the National Site Network than development of the AMEP site (as evidenced by the previous refusal of the ABP container port application), provide no socio-economic benefit to the Humber Assisted Area, and its operation would generate a greater carbon footprint than AMEP for support to the Round 6 zones.

Stage 2C

2.110 From the above assessment, only the Port of Hull, the Port of Sheerness and Bathside Bay (Freeport East Harwich) are likely to be viable. Of these three, the development of Bathside Bay would have a greater scale of impact on the National Site Network than development of the AMEP site. The remaining two are existing ports and their development would displace existing or proposed international trade capacity.

2.111 The Port of Hull has existing turbine manufacture for Siemens Gamesa, which is expanding, and as such is not an alternative to AMEP; it is needed as well. The provision of a facility at Hull would not remove the urgent need for windfarm manufacturing that drives the requirement for a facility of the scale of AMEP.

2.112 The Port of Sheerness has been identified by Vestas for turbine manufacturing, and as such is not an alternative to AMEP; it is needed as well. Manufacturing at the Port of Sheerness would however displace existing international trade activity that will erode the buffer capacity of the UK's existing port infrastructure.

Overall Stage 2 Conclusion

2.113 The updated assessment undertaken concludes that there is no reasonable alternative site to AMEP that would have a less damaging effect on the National Site Network and can meet the project objectives. Other, smaller potential development sites will be needed as well and are therefore not alternatives.

Table 2-3: Summary of Alternative Sites

	Nigg	Ardersier	Southampton	Sheerness	Bathside Bay	ABP Hull	Able Humber
Area Available (ha)	70 (234 ha proximal land is on sloping ground)	109 (28 ha additional land available)	323	50 (+ potential for an additional 85 ha)	113	82	330
Potential Quay Length (m), and Draught	420m @ 12m (existing)	1,000m @ 12m (new quay req'd)	1,850m @ 16m (new quay req'd)	800m @ 9m (new quay req'd)	1,400m @ 15m (new quay req'd)	600m @ 11m (new quay req'd)	1200m @ 11m (new quay req'd)
SPA/SAC Site	Cromarty Firth SPA/Ramsar	Moray Firth SAC, Inner Moray Firth SPA/Ramsar	Solent Maritime SAC, Southampton Water SPA/Ramsar	Proximal to Thames Estuary and Marshes SPA, Medway Estuary and Marshes SPA	Stour and Orwell Estuary SPA/Ramsar	Humber Estuary SPA/SAC/Ramsar	Humber Estuary SPA/SAC/Ramsar
Area of National Site Network likely to be adversely affected	Unquantified indirect effects	Unquantified indirect effects	Up to 128 ha	Unquantified indirect effects	69 ha	4 ha	55 ha
Proximity to Round 6 Wind Farm zones (km/NM):							
Hornsea Project 4	526km / 284nm	514km / 277nm	565km / 305nm	300km / 162nm	220km / 118nm	95km / 51nm	93km / 50nm
East Anglia Two	729km / 393nm	717km / 387nm	360km / 194mn	123km / 66nm	62km / 33 nm	279km / 151nm	277km / 149nm
Existing Planning Consents	No, existing use is for offshore fabrication	Yes, site has been remediated for housing	No, application for container terminal refused in 2004	No, operational port activity would be displaced	Yes, for container terminal that would be displaced.	Yes, for container terminal that would be displaced.	Yes, on terrestrial areas for 116 ha of port related storage

Updated Stage 3A: Alternative Scale of Development

Reducing the Scale of Development

2.114 AMEP comprises the development of 223 ha of land for manufacturing of components that need direct access to a quay. It has been demonstrated in Chapter 5 of the original ES that there is a significant need for land to be developed for this use in the UK; this continuing need has been confirmed within this updated report.

2.115 AMEP is not of a sufficient scale in itself to meet the overall need – other developments are required as well. Reducing the scale of the development would merely transfer the need for that quantum of development omitted to be located elsewhere. However, the number of potential alternative sites is limited; other sites are needed as well and others are also located within, or adjacent to, the National Site Network themselves. Accordingly, the alternative of reducing the scale of the development is discounted as it inconsistent with the imperative need to urgently provide significant facilities for the manufacture of marine energy products.

Stage 3A Conclusion

2.116 Owing to the scale of expansion and investment required in support of the UK offshore wind sector; the limited number of reasonable alternative sites and the likely displacement effects of reduced scale at AMEP requiring increased scale elsewhere, it is concluded that there are no reasonable alternative reduced scale of development.

Updated Stage 3B: Alternative Designs

2.117 Offshore energy component parts are of a significant size and weight. **Table 2.1** shows how the scale of turbine components has increased as generating capacity of individual units grows.

2.118 The movement of such oversized and heavy components require heavy duty craneage – in excess of 1,000 tonne rated capacity – and self-propelled mobile transporters. Such plant imparts heavy concentrated loads on the ground or any supporting structure over which it travels. The components themselves require commensurately large laydown areas and areas for pre-assembly into the fewest possible parts for shipping and installation offshore.

2.119 Because of the size and weight of the sub-components of the OWT, pre-assembly takes place at the quayside where goods are stored in preparation for loading. The land immediately behind the quay is therefore a large storage and assembly – an area of 15 ha is currently required by the offshore sector behind each installation quay.

2.120 A modern construction port is illustrated in **Figure 2-11**.

Figure 2-11: Able Seaton Port in Use for Dogger Bank A, B and C[12]

2.121 Alternative designs for a pier and jetty arrangement of quays and for a suspended quay are considered in Annex 4.4 of the original ES. They were discounted as being not fit for the purposes of the offshore energy sector.

Stage 3B Conclusion

2.122 By virtue of the specific spatial requirements associated with the manufacture, storage and transportation of offshore wind turbine components, there is no reasonable alternative design that will be fit for use by the offshore energy sector.

Updated Stage 4: Alternative Operation of the Facility

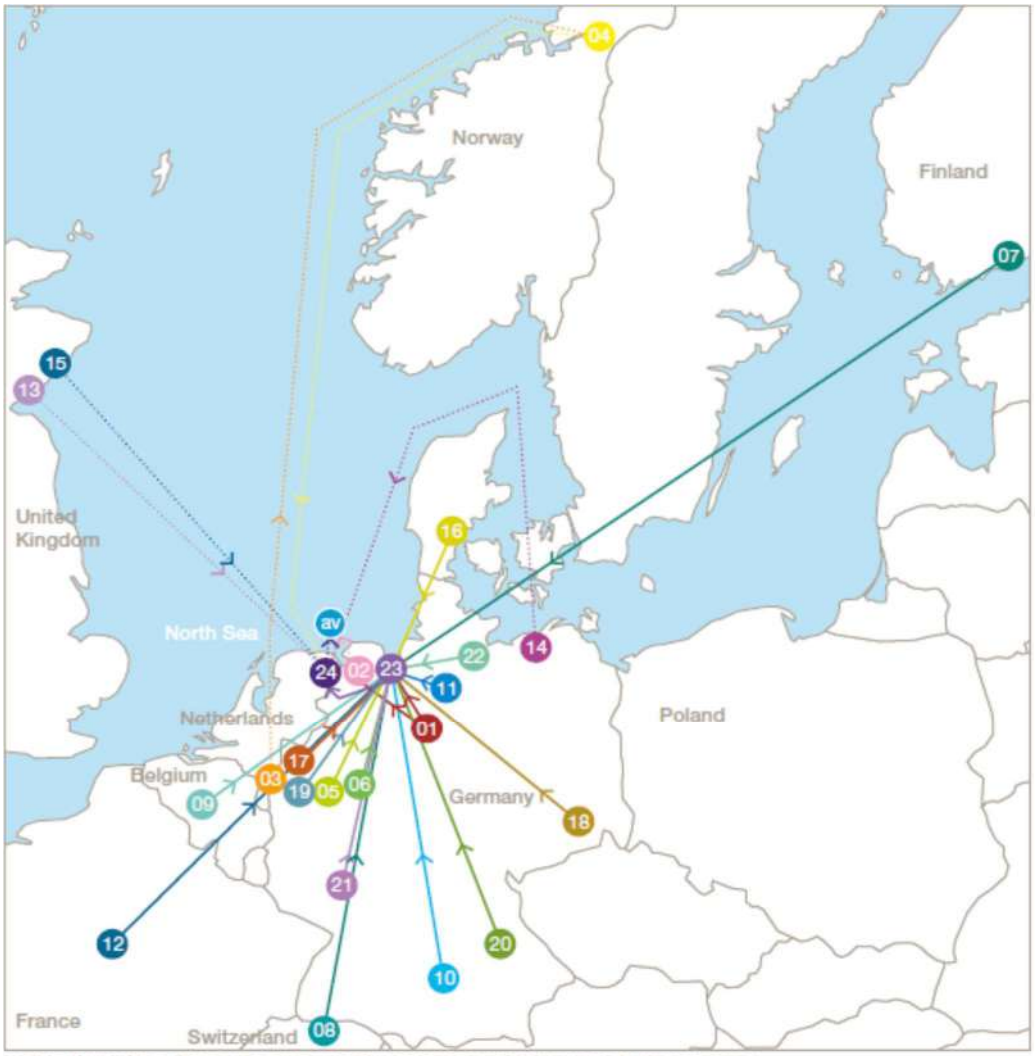
Introduction

2.123 The focus of this section of the reasonable alternatives assessment is whether there is a reasonable alternative to the way that AMEP would be operated as a combined manufacturing facility and construction port.

2.124 The onshore manufacturing sector is widely distributed, an example of which is shown in **Figure 2-12**, and this has historically led to significant logistical challenges in transporting sub-components to the construction ports for preassembly before shipping to the wind farm site itself.

[12] https://www.ableuk.com/able-seaton-port

Figure 2-12: Distributed Supply Chain for the Alpha Ventus Wind Farm[13]



Logistics of a wind farm: The map shows various production locations and delivery routes for the components.

2.125 Issues associated with the nature and scale of the offshore wind industry supply chain were a focus of the Ostend North Sea Summit in April 2023 in relation to the European challenge of being able to increase from production of 7 GW a year of offshore wind to over 20GW a year by the second half of this decade. An industry declaration following the Ostend Summit on behalf of more than 100 companies associated with the European offshore wind sector outlined the urgent need to strengthen Europe's wind energy manufacturing capacities, citing bottlenecks in the manufacturing of foundations, cables, substations and in the availability of installation, service and other offshore wind vessels.

Environmental Benefits of Combined Manufacturing Facilities and Construction Ports

2.126 At a combined site, manufactured products can be transferred to a goods handling zone with quays that are specifically designed for use by installation vessels. This avoids transhipment of finished components to other ports and provides an environmental benefit by cutting CO_2 emissions from shipping that would otherwise arise from "double handling" the manufactured products. The environmental benefit, in terms of reduced CO_2 emissions, of the operation of a significant combined facility is set out in Annex 6.2 of the original ES.

[13] Source: www.alpha-ventus.de

Economic Benefits of Combined Manufacturing Facilities and Construction Ports

2.127 If the current approach to manufacturing and assembly continues, then the potential economic benefits of scale will be diminished. The delivery of offshore windfarms is far less likely to undergo a step change in scale and as a result the UK is far less likely to meet the renewable energy targets set out in the 2023 Energy White Paper and Net Zero Strategy. The challenge of sourcing and then coordinating the delivery of many different components to a remote construction quay is an unnecessary cost.

Health and Safety Considerations

General

2.128 In considering alternative methods of operation, it is necessary to consider the impact on the health and safety of persons who will be working on the site and on offshore windfarm installation generally. The guiding principle is that risks to the workforce should be '*as low as reasonably practicable',* or ALARP. For a risk to be ALARP it must be possible to demonstrate that the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained. It is often a judgment of the balance of risk and societal benefit.

The Management of Health and Safety at Work Regulations 1999

2.129 This Directive introduced measures to encourage improvements in the safety and health of people at work. Article 6 of the Directive places general obligations on employers as follows:

> *'1. Within the context of his responsibilities, the employer shall take the measures necessary for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organization and means.*
>
> *The employer shall be alert to the need to adjust these measures to take account of changing circumstances and aim to improve existing situations.*
>
> *2. The employer shall implement the measures referred to in the first subparagraph of paragraph 1 on the basis of the following general principles of prevention:*
>
> *(a) avoiding risks;*
>
> *(b) evaluating the risks which cannot be avoided:*
>
> *(c) combating the risks at source;*
>
> *(d) adapting the work to the individual, especially as regards the design of work places, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health.*
>
> *(e)adapting to technical progress;*
>
> *(f) replacing the dangerous by the non-dangerous or the less dangerous;*
>
> *(g) developing a coherent overall prevention policy which covers technology, organization of work, working conditions, social relationships and the influence of factors related to the working environment;*
>
> *(h) giving collective protective measures priority over individual protective measures;*
>
> *(i)giving appropriate instructions to the workers.'*

2.130 The Directive is transposed into UK law by the Management of Health and Safety at Work Regulations 1999; which in themselves have not been amended since Brexit. Accordingly, in considering alternative means of operation, even at this stage, it is necessary to consider whether risks are being introduced that can be avoided.

Alternative 1: No Pre-Assembly on site

2.131 The development could potentially operate as a manufacturing facility with an import/export quay only. All products manufactured at the site would be exported to a separate construction port. There, they would be stored in preparation for the installation campaign. There are however significant adverse safety considerations with this approach.

Logistical Challenge

2.132 In *Alternative 1* a number of shipping movements are required in order to transfer the goods produced by the manufacturers to a separate construction port. The construction port needs to be equipped with duplicate cranage and the same heavy transporters as the manufacturing site. Once the installation commences the products will need to be taken back to the quay for assembly and loading back onto a vessel. Developers are therefore duplicating plant and resources.

The Safety Case

2.133 In *Alternative 1* a number of heavy lifting operations are undertaken that can be avoided compared to pre-assembly being undertaken at the manufacturing port. Whilst good planning and adherence to good practice, can mitigate the risk of an accident occurring during a crane lift, human error, inevitably, remains. Unfortunately where an incident does occur during a heavy lift, the consequences can be severe. Accidents are only one health implication of crane-lifts however; in this particular alternative any overall assessment would also need to consider the health impacts caused by producing, using and maintaining all of the duplicated plant. Furthermore, fuel production and use leads to emissions, which in turn has health impacts.

2.134 The occupational hazards associated with offshore wind farms have been considered in a major risk study reported by the Health and Safety Executive. This concluded that the principal safety hazards arise from:

> *'Construction and major repair: operation of jack-up construction barges and associated lifting operations during tower and nacelle erection. These health and safety issues may be more challenging in the future, as the new generation of wind turbines become significantly larger and taller.*
>
> *Operation (maintenance and minor repair operations): primary issues are access and egress (frequent personnel transfers between boats/construction vessels/towers), working at height, and emergency response. It is anticipated that each offshore wind turbine could require up to six maintenance or repair visits per year'*, (HSE, 2006, emphasis added).

2.135 The 2023 Incident Data Report produced by G+ Global Offshore Wind Health and Safety Organisation reported recorded a total of 1,679 incidents within the global offshore wind sector worldwide in 2023, up from the 867 recorded in 2022. This represented a 94% increase. In the UK, there were 502 recorded incidents in 2023, up from 348 in 2022. The report highlighted three areas which saw a substantial increase in reported safety incidents: onshore and offshore substations, service operation vessels, and onshore turbine assembly. Incidents associated with from onshore turbine assembly activities rose by 75%, with 56 recorded in 2023.

2.136 It is clear from the above that in accordance with ALARP principles, lifting operations should be kept to an absolute minimum. Using a separate construction port should be avoided where it is reasonably practicable to do so and accordingly, the development should incorporate construction quays for any wind farms within reasonable sailing time.

2.137 *Alternative 1* is discounted as it introduces demonstrable and unnecessary risks for those people working on the construction and installation of marine energy projects; it prolongs the construction programme, increases costs and increases the environmental impact of the operations being undertaken.

Alternative 2: Maximum Pre-Assembly on Site

2.138 This is the alternative proposed and provides an optimal environmental and economic solution and reduces risks to as low as reasonably practical by substantially reducing trans-shipment of goods to a construction port.

Summary and Conclusion

The Project

2.139 The proposed development incorporates a quay that adversely affects protected features within the Humber Estuary SAC. It is also likely to have an adverse effect on features of the Humber Estuary SPA and Ramsar site.

The Project Objectives

2.140 The project will contribute towards the achievement of three key objectives of UK Energy Policy, viz.

- decarbonise the means of electricity production;
- provide secure energy supplies for the UK;
- improve UK competitiveness by creating jobs and growth in a sector in which the UK is a global leader.

2.141 In particular the project will:

- provide facilities for the manufacture of large-scale offshore energy components;
- contribute to 'rebalancing' the UK economy by enabling the development of a significant manufacturing cluster - such a cluster will have a beneficial impact on the competitiveness of the UK and wider European offshore wind industry; and
- regenerate the Humber Estuary sub-region, an economically deprived area of the UK.

The Habitats Regulations

2.142 In accordance with the Conservation of Habitats and Species Regulations 2017, where an appropriate assessment concludes that the project will give rise to significant adverse effects on a European Site and that these cannot be fully mitigated, then the project may only be consented where: there is a need; there are no reasonable '*alternative solutions'*, *'the plan or project must be carried out for imperative reasons of overriding public interest*' and acceptable compensatory land is secured. This report has considered whether there is any alternative solution to the need that would have a lesser effect on the National Site Network.

The Alternative Solutions

General

2.143 Any alternative solution must meet the project objectives noted above.

Do Nothing or Zero Option

2.144 The growth of the marine renewable energy sector and specifically the offshore wind sector is rooted in UK energy policy.

2.145 Next generation offshore wind turbine manufacturing facilities must have direct access to a quay as they are too heavy and large to transport by road or rail. A quay is therefore an essential requirement for new offshore turbine manufacturing facilities.

2.146 The zero option, which is that there are no new quays for use by the offshore renewable energy sector, can be discounted.

Alternative Sites

2.147 A number of port sites have been identified, which could be developed to serve the offshore wind industry in some capacity. Of the 16 potential locations, eight have been shown to have clear size limitations in terms of their development as a manufacturing and construction port cluster. The remaining alternatives to AMEP are Nigg, Ardersier, Dundee, ABP Hull, Bathside Bay, Southampton and Sheerness.

2.148 There is no alternative site that is of an equivalent scale to AMEP except for Southampton and development of that Dibden Bay site would result in the destruction of significantly more of the National Site Network than would the development of AMEP. This location has also previously had major port development refused based on impact to the National Site Network.

2.149 Whilst a combination of other smaller cluster sites could provide an equivalent distributed facility this would result in a significantly greater operational carbon footprint for the facility than AMEP. An assessment of the relative carbon footprint associated with a cluster site compared to a UK distributed site, and a continental distributed site is reproduced in Annex 6.2 of the original ES.

Alternative Scale of Development

2.150 AMEP is not of a sufficient scale in itself to meet the overall need – other developments are required as well. Reducing the scale of the development would merely transfer the need for that quantum of development omitted to be located elsewhere. However, the number of potential alternative sites is limited; other sites are needed as well and others are also located within, or adjacent to, the National Site Network themselves.

Alternative Designs for the Development

2.151 The offshore renewable energy sector requires facilities that allow manoeuvring of very large and very heavy components. These components need direct access from their place of manufacture to an export quay. Pre-assembly of several large components close to the quay is also required, necessitating laydown areas and areas for heavy lift cranage. The result is that the quay needs to be fully reclaimed to provide a design that is fit for purpose. There is no feasible alternative design.

Alternative Means of Operation

2.152 Providing a bespoke facility that enables manufactured products to be shipped directly to their place of installation minimises the carbon footprint of the operational facility, provide economic benefits, and minimise risks from heavy lifting operations.

3.0 IROPI

Introduction

3.1 This section of the report seeks to provide an update on the Imperative Reasons of Overriding Public Interest (IROPI) following the submission of an Article 7 for an extension of time for completion of the works at Able Marine Energy Park.

3.2 This update has concentrated on updating the IROPI to ensure that any changes in legislation, guidance, policy, needs, economic considerations or justification of the project are consistent at the time of writing. However, it should be duly recognised that a significant proportion of the original IROPI remains valid and is repeated herein.

Changes in Legislation, Guidance and Policy

Legislation

3.3 The Conservation of Habitats and Species Regulations 2017 were adopted subsequent to the completion of the original IROPI and subsequently amended through The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

3.4 Notwithstanding, the pertinent Regulations still identify within Paragraph 64 (1) that *"If the competent authority is satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), it may agree to the plan or project notwithstanding a negative assessment of the implications for the European site or the European offshore marine site (as the case may be)."*

3.5 Paragraph 68 subsequently identifies that: *"Where in accordance with regulation 64 —*

(a) a plan or project is agreed to, notwithstanding a negative assessment of the implications for a European site or a European offshore marine site, or

(b) a decision, or a consent, permission or other authorisation, is affirmed on review, notwithstanding such an assessment,

the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 [National Site Network] *is protected."* (SLR Amend)

3.6 This report seeks to provide a comprehensive update to the original IROPI case to ensure that the imperative reasons of overriding public interest that relate to the project are still relevant and appropriate.

Guidance

3.7 'Managing Natura 2000 Sites: The Provision of Article 6 of the 'Habitats Directive 92/43/EEC' (EC, 2000) has been superseded by the use of the following government guidance documents:

- Appropriate Assessment – published July 2019[14]; and
- Habitats Regulations Assessments: Protecting a European Site – published February 2021 and last updated December 2023[15].

3.8 The Appropriate Assessment guidance identifies at Paragraph 001 that *"Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project* ***can only proceed if there are imperative reasons of over-riding public interest*** *and if the necessary compensatory measures can be secured"* (emphasis added).

3.9 Within the Habitats Regulations Assessments: Protecting a European Site guidance, outlines in Section 3 (Derogations: allow exceptions) that *"In certain circumstances, you can allow a proposal that's failed the integrity test to go ahead. This is known as a derogation.*

You should tell the proposer as soon as possible if you'll consider a derogation on a proposal that's failed the integrity test. It must pass all 3 legal tests for a derogation to be granted.

Derogations: 3 legal tests

To decide if the proposal qualifies for a derogation, you must apply the 3 legal tests in the following order:

1. *There are no feasible alternative solutions that would be less damaging or avoid damage to the site.*
2. ***The proposal needs to be carried out for imperative reasons of overriding public interest.***
3. *The necessary compensatory measures can be secured.*

You should make sure that you record all your findings, including a failed test" (emphasis added).

3.10 The guidance continues by providing further information on the undertaking of Test 2 which relates to IROPI, stating:

"If there are no feasible alternative solutions, you must next be able to show that there are imperative reasons of overriding public interest why the proposal must go ahead. These must justify the proposal, despite the damage it will or could cause to the European site.

You must decide if the proposal is:

- *imperative - it's essential that it proceeds for public interest reasons*
- *in the public interest - it has benefits for the public, not just benefits for private interests*
- *overriding - the public interest outweighs the harm, or risk of harm, to the integrity of the European site that's predicted by the appropriate assessment*

National strategic plans, policy statements and major projects are more likely to have a high level of public interest and be able to show they are imperative and overriding. Plans or projects that only provide short-term or very localised benefits are less likely to be able to show imperative reasons of overriding public interest."

[14] https://www.gov.uk/guidance/appropriate-assessment

[15] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

3.11 In considering the overriding public interest, the guidance identifies that this would normally consider the following:

- human health;
- public safety; and
- important environmental benefits.

3.12 However, where other reasons of overriding public interest are wished to be considered (i.e. social or economic benefits), these must be at the discretion/opinion of the relevant national government in England or Wales.

3.13 Only where a proposal meets the requirements of Test 1 (alternatives) and 2 (IROPI) should the competent authority consider the requirements of Test 3: secure compensatory measures.

Summary of The Basic Case

3.14 Fundamentally, the project will deliver socio-economic benefits to the UK generally and the Humber Estuary sub-region in particular by enabling the growth of the emerging renewable energy sector. It will also have beneficial consequences of primary importance for the environment by enabling the UK's continued transition to low carbon energy production. Within the Government's Policy Paper 'Powering Up Britain: Net Zero Growth Plan' (April 2023)[16].

3.15 Energy is essential for society to function but fossil fuel methods of energy production are damaging to the environment and rely on non-indigenous fuel sources that are not secure in the long term. To function sustainably, and to be economically competitive, government policy is for the UK economy to meet a net zero target by 2050; which extends to energy production within the UK. This strategy is outlined within a range of governmental white papers, strategies, plans and policies, including:

- Energy White Paper: Powering our Net Zero Future (December 2020)[17]
- Climate Change Strategy 2021-2024 (September 2021)[18]
- Net Zero Strategy: Build Back Greener (October 2021)[19]
- British Energy Security Strategy (April 2022)[20]
- Environmental Improvement Plan 2023 (February 2023)[21]

[16] https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain-net-zero-growth-plan#:~:text=In%20the%20Net%20Zero%20Strategy%2C%20government%20committed%20to%20have%20a,underpin%20our%20net%20zero%20ambitions.

[17] https://assets.publishing.service.gov.uk/media/5fdc61e2d3bf7f3a3bdc8cbf/201216_BEIS_EWP_Command_Paper_Accessible.pdf

[18] https://assets.publishing.service.gov.uk/media/6148b3ffe90e070438c9463d/UKEF_Climate_Change_Strategy_2021.pdf

[19] https://assets.publishing.service.gov.uk/media/6194dfa4d3bf7f0555071b1b/net-zero-strategy-beis.pdf

[20] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[21] https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64fffa/environmental-improvement-plan-2023.pdf

- Powering Up Britain: Energy Security and Net Zero (March 2023)[22]
- Offshore Wind Net Zero Investment Roadmap (March 2023)[23]
- Powering Up Britain: Net Zero Growth Plan (April 2023)[24]
- Energy Act (October 2023)[25]
- Overarching National Policy Statement for Energy (EN-1) (November 2023)[26]
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (January 2024)[27]

3.16 The above sets out how the need for a secure, reliable, cost-effective, decarbonised power sector is critical for a modern industrial economy. In the Net Zero Strategy, government committed to have a fully low-carbon power sector by 2035, subject to security of supply, to underpin net zero ambitions. Significant emphasis is placed on the role of offshore wind within all of the above.

3.17 This project will address key objectives of the strategies and policies identified above by:

- Assisting in the decarbonisation of electricity production within the UK. This is a beneficial consequence of the project that is of primary importance to the environment;
- Assisting in providing secure energy supplies for the UK; this is imperative for economic development and growth; and
- Improving competitiveness within the UK by creating jobs and growth in a sector in which the UK is becoming a leader in renewable energy use and supply. This will have subsequent effects on socio-economic receptors through investment and economic growth.

3.18 Whilst none of the above objectives lie entirely within the interest of single companies or individuals, the project will:

- provide facilities for the manufacture of large scale offshore renewable energy components;
- contribute to ‘rebalancing’ the UK economy by enabling the development of a significant manufacturing cluster - such a cluster will have a beneficial impact on the competitiveness of the offshore wind industry; and
- contribute to the regeneration of the Humber Estuary sub-region, an economically deprived area of the UK.

[22] https://assets.publishing.service.gov.uk/media/642468ff2fa8480013ec0f39/powering-up-britain-joint-overview.pdf

[23] https://www.gov.uk/government/publications/offshore-wind-net-zero-investment-roadmap

[24] https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain-net-zero-growth-plan#:~:text=In%20the%20Net%20Zero%20Strategy%2C%20government%20committed%20to%20have%20a,underpin%20our%20net%20zero%20ambitions.

[25] https://www.legislation.gov.uk/ukpga/2023/52/enacted

[26] https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf

[27] https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf

Updated Description of Imperative Public Interests

The Environmental Imperative to Decarbonise Energy Production

3.19 The project will assist in enabling the transition to low carbon means of energy production.

3.20 There is compelling scientific evidence that rising levels of greenhouse gases in the atmosphere will have a warming effect on the earth's climate through increasing the amount of infrared radiation (heat energy) trapped in the atmosphere, 'the greenhouse effect'. In total the warming effect due to all greenhouse gases[28] emitted by human activities is now equivalent to around 426 ppm of carbon dioxide (July 2024[29]) and is rising at between 2.3 – 2.8 ppm per year[30]. Current levels of greenhouse gases are higher now than at any time in at least the past 650 000 years.

3.21 The potential environmental impacts of climate change are reported in the Stern Review (HM Treasury, 2006); Figure 2 from the Executive Summary is reproduced in Figure 3-1 below. Potential effects include: rising sea levels that threaten major cities; irreversible damage to ecosystems; major declines in crop yields and water shortages. These potential impacts are beyond any reasonable scientific doubt.

3.22 The UK government fully accepts the imperative need to reduce greenhouse gas emissions through the policies, guidance and legislation outlined above, as well as the Climate Change Act 2008 and the Climate Change Strategy 2021-2024[31] which identifies that: *"2010-2019 was the hottest decade on record, driving dangerous weather patterns and affecting societies and ecosystems around the world. To keep the goal of limiting global mean temperature rise to 1.5 degrees within reach, global greenhouse gas emissions must be halved by 2030."* In 2019 the UK became the first major economy to pass into law a domestic requirement for net zero greenhouse gas emissions by 2050.

3.23 The Net Zero Strategy: Build Back Greener identifies that *"We need to act urgently and reduce emissions globally to limit further global warming. The landmark 2015 Paris Agreement agreed to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit it to 1.5°C.*

3.24 Within the above policies, guidance and legislation, the UK government clearly recognises the central role of electricity in the low carbon economy and in moving toward net zero greenhouse gas emissions by 2050. The need for renewable energy sources, including offshore wind, is key to delivering these targets; as such, manufacturing capacity for offshore wind turbines must also increase substantially and should be sustainably delivered in coastal / port locations.

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[28] Carbon dioxide (C02), Methane (CH4), Nitrous oxide (N20), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF6), as defined in the Kyoto Protocol

[29] https://climate.nasa.gov/vital-signs/carbon-dioxide/?intent=121#:~:text=It%27s%20important%20to%20understand%20that%20%E2%80%9Cparts%20per%20million%E2%80%9D,%28about%205%20to%207%20miles%29%20above%20the%20ground.

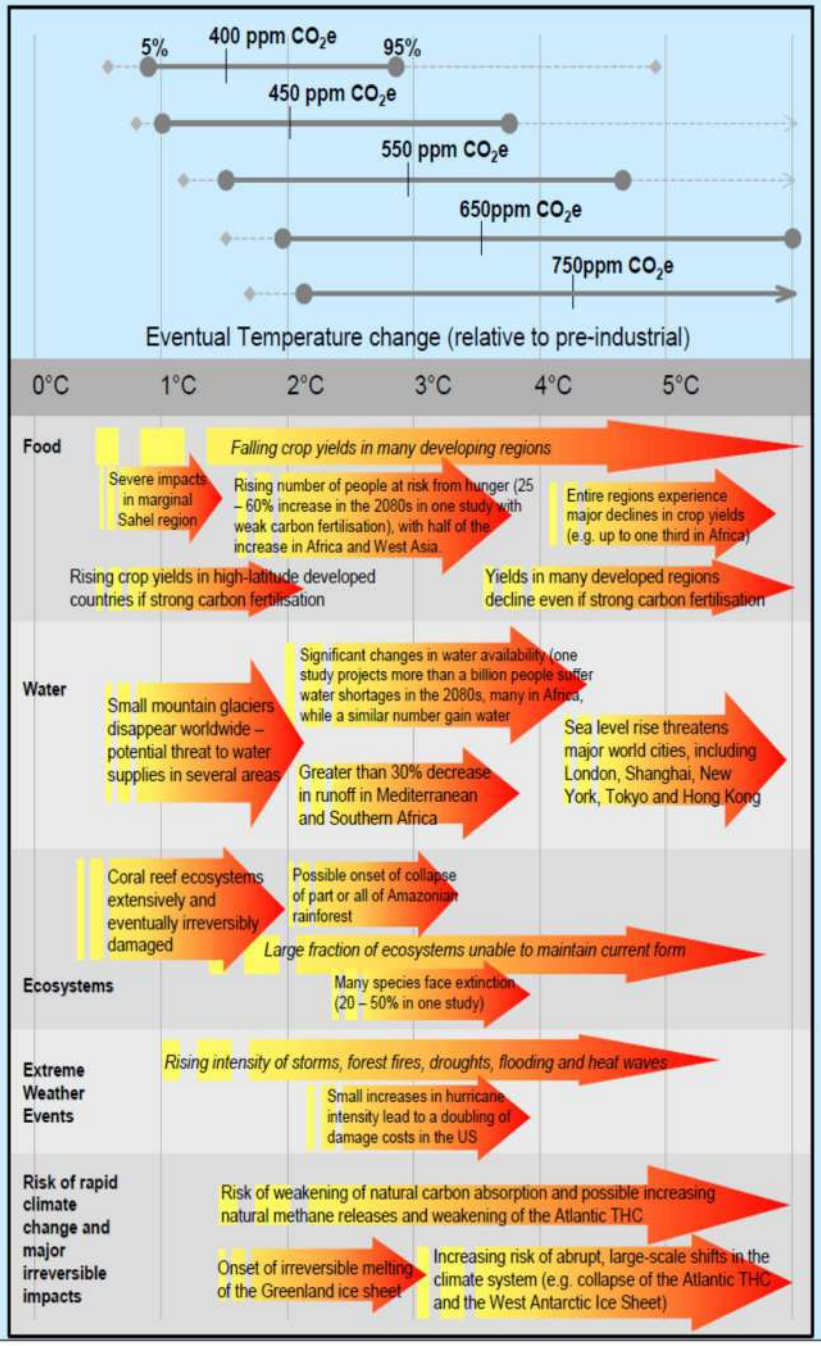
[30] https://research.noaa.gov/2024/04/05/no-sign-of-greenhouse-gases-increases-slowing-in-2023/

[31] https://assets.publishing.service.gov.uk/media/6148b3ffe90e070438c9463d/UKEF_Climate_Change_Strategy_2021.pdf

Figure 3-1: Extract from 'STERN REVIEW: The Economics of Climate Change'

Figure 2 Stabilisation levels and probability ranges for temperature increases

The figure below illustrates the types of impacts that could be experienced as the world comes into equilibrium with more greenhouse gases. The top panel shows the range of temperatures projected at stabilisation levels between 400ppm and 750ppm CO_2e at equilibrium. The solid horizontal lines indicate the 5 - 95% range based on climate sensitivity estimates from the IPCC 2001[2] and a recent Hadley Centre ensemble study[3]. The vertical line indicates the mean of the 50th percentile point. The dashed lines show the 5 - 95% range based on eleven recent studies[4]. The bottom panel illustrates the range of impacts expected at different levels of warming. The relationship between global average temperature changes and regional climate changes is very uncertain, especially with regard to changes in precipitation (see Box 4.2). This figure shows potential changes based on current scientific literature.



The Imperative Need to Secure Indigenous Energy Supplies

3.25 Energy is the lifeblood of society. Securing energy supplies from indigenous sources is imperative for long term economic stability within the UK.

3.26 The Powering Up Britain (March 2023) document outlines that *"After decades of reliance on imported fossil fuels, the new department's mission is to replace them with cheaper, cleaner, domestic sources of energy. We will be powered by renewables including wind and solar, hydrogen, power with carbon capture, usage and storage (CCUS) and new nuclear plants - while recognising the vital role that UK oil and gas will play in the transition. This will make us much more energy independent, to protect us from volatile international energy markets, while underpinning our clean energy transition, so the UK becomes a net zero economy by 2050. It will also help us make sure the UK has among the cheapest wholesale electricity prices in Europe by 2035"*.

3.27 Powering Up Britain continues by outlining the need for an Energy Security Plan given the current geopolitical landscape, outlining that: *"Putin's invasion exposed mainland Europe's over-dependence on Russian gas, with implications for affordability and security. The UK cannot ever afford to be at the mercy of a malign actor like this. The British Energy Security Strategy was clear that the long-term solution is to address our underlying vulnerability to international fossil fuel prices by reducing our dependence on imported oil and gas. Our vision is to power the UK through affordable, home-grown, clean energy:*

- *ensuring Britain has among the cheapest wholesale electricity prices in Europe by 2035;*
- *moving towards energy independence through a potential doubling of Britain's electricity generation capacity by the late 2030s;*
- *maximising the vital production of UK oil and gas as the North Sea basin declines; and*
- *capturing global early mover advantages and capitalising on the decarbonisation needs of the more than 90% of the global economy that are now signed up to net zero targets.*

3.28 The document continues by detailing there is in need for the UK to be more energy independent in the future, becoming more energy secure by:

- reducing energy demand and increasing the overall share of domestic energy production by building on the ambitions set out in the Net Zero Strategy and British Energy Security Strategy;
- ensuring that where the UK still needs to import energy, including through interconnectors, that those imports are built on strong relationships with trusted partners and allies and diversified sources of supply, which will also provide access to long term export markets to support the growth of clean energy industries; and
- building in resilience and mitigations to ensure that if there are disruptions to imports, consumers still have a reliable supply of energy.

3.29 With regard to building in resilience and mitigations, the Net Zero Strategy: Build Back Greener identifies that *"as we produce more of our own electricity – from wind farms in the North Sea and state-of-the-art British nuclear reactors – families will be much better protected from energy price spikes caused by volatile international fossil fuel markets. At the*

same time, by getting ahead of the curve in driving down the costs of the latest clean technology, more consumers will enjoy more efficient cars and heating systems sooner. Furthermore, by accelerating the deployment of cheap renewable power, and rolling out further energy efficiency measures, government decarbonisation policies mean that the average consumer energy bill in 2024 will likely be cheaper than it would otherwise have been."

3.30 Within the Net Zero Strategy: Build Back Greener, the following key policies have been identified for energy production within the UK:

- *"By 2035 the UK will be powered entirely by clean electricity, subject to security of supply.*
- *Secure a final investment decision on a large-scale nuclear plant by the end of this Parliament, and launch a new £120 million Future Nuclear Enabling Fund, retaining options for future nuclear technologies, including Small Modular Reactors, with a number of potential sites including Wylfa in North Wales.*
- *40GW of offshore wind by 2030, with more onshore, solar, and other renewables – with a new approach to onshore and offshore electricity networks to incorporate new low carbon generation and demand in the most efficient manner that takes account of the needs of local communities like those in East Anglia.*
- *Moving towards 1GW of floating offshore wind by 2030 to put us at the forefront of this new technology that can utilise our North and Celtic Seas – backed by £380 million overall funding for our world-leading offshore wind sector.*
- *Deployment of new flexibility measures including storage to help smooth out future price spikes."*

3.31 The imperative need to secure indigenous energy supplies is further emphasised within the British Energy Security Strategy (April 2022) which identifies that *"… as the global economy reopened in the aftermath of the pandemic, the sudden surge in demand for everything from new cars to foreign holidays drove a massive spike in demand for oil and gas, dramatically increasing the price of these essential fuels.*

This has been compounded by Russia's abhorrent and illegal invasion of Ukraine. As we are part of a global market, the price we pay for gas is set internationally. And President Putin has used this against us by restricting the supply of Russian gas to the European market, further pushing up prices. The vital sanctions imposed by the UK and its allies to support the Ukrainian people will also inevitably have an adverse effect on all economies.

As a result of all these factors, European gas prices soared by more than 200% last year and coal prices increased by more than 100%. This record rise in global energy prices has led to an unavoidable increase in the cost of living in the UK, as we use gas both to generate electricity, and to heat the majority of our 28 million homes."

3.32 The British Energy Security Strategy continues by detailing that *"Accelerating the transition away from oil and gas then depends critically on how quickly we can roll out new renewables. The government's 'Ten point plan for a green industrial revolution', together with the 'Net zero strategy' and this Energy Strategy, is driving an unprecedented £100 billion of private sector investment by 2030 into new British industries including offshore wind and supporting around 480,000 clean jobs by the end of the decade."*

3.33 The Energy Security Strategy emphasises that the growing proportion of the UK's electricity coming from renewables reduces the country's exposure to volatile fossil fuel markets and that without the renewables on the grid today, and the green levies that support them, energy bills would be higher than they are now.

3.34 As such, there is a critical need to build a British energy system that is much more self-sufficient. Nevertheless, the UK government is still acutely aware that there is a need to work with international partners to maintain a stable energy market and prices to protect UK consumers and reduce the use of fossil fuels globally and pivot toward clean, affordable energy.

3.35 The governments 10 point plan is outlined within Table 3-1 below.

Table 3-1: Government's 10 Point Plan (British Energy Security Strategy - April 2022)

Point	Delivery Highlights
Advancing offshore wind	– Over £1.6 billion invested, securing 3,600 jobs – 11GW already generated, and another 12GW in the pipeline – Up to £320 million in government support for fixed bottom and floating wind ports and infrastructure – Additional government support for other low-cost renewables technologies
Driving the growth of low carbon hydrogen	– £7.5 million awarded to ITMs Gigastack Project, an early mover in the market, with potential to support up to 2,000 jobs over time – Preparing to allocate up to £100 million of revenue support to initial electrolytic projects – Launching £240 million to Net Zero Hydrogen Fund later in April – Developed indicative Heads of Terms for hydrogen business model contract
Delivering new and advanced nuclear power	– Committed to provide up to £1.7 billion of direct government funding to enable one nuclear project to FID this Parliament – Investing £100 million into Sizewell C to help develop this project – Investing £210 million to develop Small Modular Reactors with Rolls Royce – Announced a £120 million Future Nuclear Enabling Fund to progress new nuclear
Accelerating the shift to zero emission vehicles	– £4 billion of investment has flowed into the UK zero emission vehicle sector – Building 2 new gigafactories, in Sunderland and Blyth – 30,425 public charge-points in the UK with 100 new rapid chargers added to the UK network every month during 2021
Green public transport, cycling and walking	– 1,678 zero emission buses funded – Launched Active Travel England, increasing cycling by 75%
Jet zero and green ships	– Consulted on introduction of a UK Sustainable Aviation Fuel (SAF) mandate, requiring jet fuel suppliers to blend an increasing proportion of SAF into aviation fuel from 2025 – Allocated £23 million as part of the Clean Maritime Demonstration Competition
Greener buildings	– Cut VAT for insulation and heat pumps – 46% of homes in England at EPC C or above, up from 9% in 2008, and 2,300 social housing homes in the process of being improved – Over 60,000 heat pumps installeations estimated by industry, now offering households grants of £5,000 towards an air source heat pump so they are cost competitive compared to a gas boiler

Investing in CCUS	– Committed £1 billion in public investment to decarbonise our industrial clusters – Announced the first 2 clusters in Teeside, the Humber and Merseyside – Launched phase 2 of the Industrial Energy Transformation Fund, allocating £60 million to decarbonisation technologies, with a further £100 million delivered in May and October this year
Protecting our natural environment	– Additional £124 million provided at Spending Review 2021 to the Nature for Climate Fund to support tree planting and peat restoration, going beyond 2019 manifesto commitment of £640 million – 13,290 hectares of trees planted across the UK in 2020 to 2021 – Launched 3 new Community Forests in Cumbria, Devon and the North-East – £5.2 billion invested in a 6 year programme of flood defences
Green finance and innovation	– £615 million allocated from the Net Zero Innovation Portfolio – Set the JET world record, with 59 megajoules of heat energy in a single fusion 'shot' that lasted 5 seconds

3.36 Therefore, irrespective of the significant adverse environmental impacts of climate change, there is a need for the UK to develop new, indigenous sources of energy in order to secure energy supplies into the future. The Energy Security Strategy, along with the more recent policy and legislation, continues by outlining how offshore wind will form a key component of the renewable energy to be delivered within the UK; including an ambition to deliver up to 50GW by 2030. Accordingly manufacturing capacity of offshore wind turbines must increase significantly.

The Need to Develop Large Scale Wind Turbines

3.37 The importance of offshore wind and need for large capacity offshore turbines is reiterated in the UK Government *Offshore Wind Net Zero Investment Roadmap* (March 2023), noting that offshore wind is an established and proven part of the UK energy mix and is set to become even more important in the future. The Roadmap highlights the need for *"Large-scale, deepwater ports for the fabrication, assembly, storage and deployment of floating offshore wind turbines".*

3.38 Furthermore, at the time of publication (March 2023), there was an estimated 78GW of offshore wind capacity in the UK pipeline; with around 60% being fixed bottom and 40% being floating. The Roadmap also identifies that there is a clear investment opportunity for the delivery of portside infrastructure to support the manufacturing, installation, operation and maintenance of fixed foundation offshore windfarms.

3.39 This need is also reflected in the Overarching National Policy Statement for Energy, EN-1 which states as part of delivering a secure, reliable, affordable, net zero consistent system in 2050, UK government announced in the British Energy Security Strategy[32] an ambition to deliver up to 50 gigawatts (GW) of offshore wind by 2030, including up to 5GW of floating wind.

3.40 The National Policy Statement for Renewable Energy Infrastructure (EN-3) (January 2024) includes a section on Offshore Wind (Section 2.8) which outlines that *"the Government expects that offshore wind (including floating wind) will play a significant role in meeting*

[32] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

demand and decarbonising the energy system. The ambition is to deploy up to 50GW of offshore wind capacity (including up to 5GW floating wind) by 2030, with an expectation that there will be a need for substantially more installed offshore capacity beyond this to achieve net zero carbon emissions by 2050".

3.41 The remainder of National Policy Statement for Renewable Energy Infrastructure (EN-3) deals with the environmental considerations that should be made by the Secretary of State when determining renewable energy schemes within the UK.

The Imperative Need to Rebalance the UK Economy

3.42 The concept of a "rebalanced" economy has become central to the debate on how the UK can emerge from recession and generate sustainable growth. One major imbalance is considered to be the level of manufacturing in the UK compared to other industrialised countries. In the UK, manufacturing and associated employment has declined rapidly in recent decades, with the proportion of manufacturing workforce jobs in Yorkshire and the Humber reducing from 17.9% in 1996 to 10% in 2024; this compares to a corresponding UK fall from 15.2% to 7%[33] Recent trends in UK manufacturing output are shown below[34].

3.43 The European Wind Energy Supply Chain (Rystad Energy, 2023) suggests that "*noteworthy European countries in the current wind supply chain include Germany, Spain and Denmark, all of which have significant activity linked to producing the main components of wind turbines – blades, nacelles, and towers. In recent years, France has also emerged as one of the key countries, with new blade and nacelle manufacturing plants. For offshore wind foundations, key producers include the Netherlands, Germany, and Denmark. Unsurprisingly, these countries are also among the leaders in terms of installed capacity for offshore wind in Europe. Most of these facilities are in port cities, facilitating sea transport."*

[33] https://www.nomisweb.co.uk/reports/lmp/gor/2013265923/subreports/gor_wfjsa_time_series/report.aspx?

[34] https://commonslibrary.parliament.uk/research-briefings/sn05206/

3.44 A result is that 80 percent to 90 percent of the historic capital value in UK offshore wind farm projects has been based on imported goods and services and the economic benefits to the UK have been very limited (Garrad Hassan, 2010).

3.45 The aforementioned aspirations for an increase in the contribution of the UK offshore wind sector to achieving Net Zero requires urgent and significant investment in new manufacturing facilities and port infrastructure. This investment must be market led, and for the UK to benefit significantly from private sector investment in new manufacturing facilities, it must provide suitable development sites, including deep water port installations.

3.46 The UK Government has provided grants to manufacturing facilities through the Offshore Wind Manufacturing Investment Scheme with an expectation for these new facilities to boost supply chain capacity for the offshore wind industry. In this regard, the project will enable significant investment in manufacturing in the growing marine energy sector in the UK.

3.47 In The Advanced Manufacturing Plan (December 2023)[35], the government outlined a prioritisation of investing in the long-term future of manufacturing within the UK, whilst acknowledging a need to cooperate internationally in building supply chain resilience and needing to seek to reduce costs and remove barriers to competitiveness. With regard to offshore wind, the Plan identifies that *"Through the new £960 million Green Industries Growth Accelerator ('the Accelerator'), we are supporting the development of green manufacturing industries, namely carbon capture, utilisation and storage (CCUS), hydrogen, electricity networks and offshore wind."*.

3.48 In summary, the offshore manufacturing sector has enormous potential to support economic recovery by creating financial and strategic value. It can help realise value from the country's distinctive science and technology base and provide employment opportunities for people with a wide range of abilities and skills. The continued growth in manufacturing, especially within the Green Industries, is essential to the UK economy.

The Need to Regenerate the Humber Sub-Region

3.49 A specific imbalance in the UK economy is that between the economic output of different parts of the UK. The past three decades have seen a widening of regional differences in economic growth and job creation in the UK. London and the South East have experienced robust growth, benefiting from the concentration of business and financial services in those areas, whilst the north of England, Northern Ireland and Wales have all lagged behind. This creates economic and social issues that consecutive governments have attempted to rectify. In the short term, regional disparities are likely to become accentuated as heavy public spending cuts hit all regions of the UK in the next few years. The Humber sub-region is an area of particular deprivation and regeneration of this area is essential. This is considered further below.

[35] https://www.gov.uk/government/publications/advanced-manufacturing-plan/advanced-manufacturing-plan-html-version#:~:text=As%20part%20of%20our%20Advanced,removing%20barriers%20to%20boost%20competitiveness.

Updated Certainty of Imperative Needs

The Imperative Need to Decarbonise Energy Production

3.50 The earth's climate has been changing constantly over millions of years. Indeed, it is only ten thousand years since the majority of the UK land mass was covered by a series of thick ice sheets. In the current era we can understand the climate and the factors that influence it.

3.51 The climate is mainly influenced by the amount of energy coming from the sun, but also by factors such as the amount of greenhouse gases and aerosol propellant in the atmosphere. Recent human activity is changing the composition of the atmosphere and its properties. Since pre-industrial times (around 1750), carbon dioxide concentrations have increased by just over a third from 280 parts per million (ppm) to 420 ppm today, predominantly as a result of burning fossil fuels, deforestation and changes in land use. The concentration of other greenhouse gases such as methane and nitrous oxide are also rising.

3.52 There is compelling scientific evidence that the rising levels of greenhouse gases will have a warming effect on the earth's climate through increasing the amount of infrared radiation (heat energy) trapped in the atmosphere, "the greenhouse effect". In total the warming effect due to all greenhouse gases[36] emitted by human activities was equivalent to around 472 ppm of carbon dioxide in 2021. This concentration represented an increase of about 50 ppm over the preceding 10 years and was about 192 ppm more than in pre-industrial times[37].

3.53 The impact of climate change is to potentially threaten the basic elements of life for people around the world – access to water, food, health and use of land and the environment generally. One of the ways in which this would occur would be through rises in sea levels, inundating coastal areas around the world. Accordingly, the UK Government is a signatory to International commitments on climate change and national legislation has been developed that provides a statutory framework for the reduction of greenhouse gas emissions over the next few decades.

3.54 The Kyoto Protocol was developed to limit the growth of greenhouse gas emissions. Under the protocol, industrialised countries and those in transition to a market/industrialised economy agreed to limit or reduce their emissions of greenhouses gases. It came into force on 16 February 2005 and commits signatories, including the United Kingdom, to reduce or limit their greenhouse gas emissions to a specified target value relative to their 1990 emissions in the period 2008-2012.

3.55 The UK government has achieved its target reduction for emissions. Since the Kyoto Protocol, however, it has become evident that more significant action is required to limit climate change. Accordingly, legislation has been introduced in the European Parliament, and by the UK Government, to impose legal obligations that compel a transformation to a lower carbon economy.

[36] Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_20), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6), as defined in the Kyoto Protocol

[37] https://www.eea.europa.eu/en/analysis/indicators/atmospheric-greenhouse-gas-concentrations

3.56 The Climate Change Act 2008 is the basis for the UK's approach to tackling and responding to climate change. It requires that emissions of carbon dioxide and other greenhouse gases are reduced and that climate change risks are adapted to. The Act also establishes the framework to deliver on these requirements. The Act supports the UK's commitment to urgent international action to tackle climate change. Through the Act, the UK Government has set a target to significantly reduce UK greenhouse gas emissions by 2050 and a path to get there.

3.57 The Act also established the Committee on Climate Change (CCC) to ensure that emissions targets are evidence-based and independently assessed. The Act commits the UK Government by law to reducing greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050. The 100% target was based on advice from the CCC's 2019 report, '*Net Zero – The UK's contribution to stopping global warming*.'

The Need for Security of the UK Energy Supply

3.58 Whilst the development of renewable energy has been mainly driven by concerns over climate change, an additional important issue is the role of renewables in contributing to security of UK energy supplies. This is being driven by global shortages of oil supplies and increased oil demand from the developing economies (particularly China), depletion of national offshore gas reserves (particularly in the UK) and actions by the world's largest gas supplier – Russia.

3.59 In accordance with Section 172 of the Energy Act 2004 (as amended by Section 80 of the Energy Act 2011) , The government and Ofgem is required, in every calendar year, to:

> "*publish a report dealing, as regards both the short term and the long term, with the availability of electricity and gas for meeting the reasonable demands of consumers in Great Britain".*

3.60 The most recent of such reports, '*Statutory Security of Supply Report'* (December 2023)[38], records that at the end of 2023, the UK had sufficient electricity capacity to meet the forecast winter's demand, with a margin of 4.4GW (about 7.4%) between supply and demand. This represented an increase on the 3.7GW (6.3%) that was expected at the end of 2022.

3.61 The Overarching National Policy Statement for Energy, EN-1 (November 2023), states that to ensure that there is sufficient electricity to meet demand, new electricity infrastructure will have to be built to replace output from retiring plants and to ensure we can meet increased demand. Even with major improvements in overall energy efficiency, and increased flexibility in the energy system, demand for electricity is likely to increase significantly over the coming years and could more than double by 2050 as large parts of transport, heating and industry decarbonise by switching from fossil fuels to low carbon electricity, with an illustrative range of 465-515TWh in 2035 and 610-800TWh in 2050.

The Need for Large Scale Wind Turbines

3.62 Energy costs need to be maintained as low as reasonably practicable. Turbine scaling increases energy capture while reducing general project infrastructure costs and landscape impacts, which ultimately reduce the cost of wind energy. The need for further / scaling-up

[38] https://assets.publishing.service.gov.uk/media/6574ae1a33b7f2000db72144/statutory-security-supply-report-2023.pdf

of offshore wind turbines is recognised in the range of UK government strategies, plans and policies outlined above, and is certain.

3.63 The importance of offshore wind and need for large capacity offshore turbines is reiterated in the UK Government *Offshore Wind Net Zero Investment Roadmap* (March 2023), noting that offshore wind is an established and proven part of the UK energy mix and is set to become even more important in the future. The Roadmap highlights there is a clear investment opportunity for the delivery of portside infrastructure to support the manufacturing, installation, operation and maintenance of fixed foundation offshore windfarms.

3.64 This need is also reflected in the Overarching National Policy Statement for Energy, EN-1 which states as part of delivering a secure, reliable, affordable, net zero consistent system in 2050, UK government announced in the British Energy Security Strategy[39] an ambition to deliver up to 50 gigawatts (GW) of offshore wind by 2030, including up to 5GW of floating wind.

The Need for Growth in UK Manufacturing

3.65 The need for a healthy manufacturing sector is recognised within a range of UK government documents.

3.66 As outlined above. Within the Advanced Manufacturing Plan (December 2023)[40] the government outlined a prioritisation of investing in the long-term future of manufacturing within the UK, whilst acknowledging a need to cooperate internationally in building supply chain resilience and needing to seek to reduce costs and remove barriers to competitiveness. With regard to offshore wind, the Plan identifies that *"Through the new £960 million Green Industries Growth Accelerator ('the Accelerator'), we are supporting the development of green manufacturing industries, namely carbon capture, utilisation and storage (CCUS), hydrogen, electricity networks and offshore wind. We are establishing a H2 taskforce to assess the manufacturing opportunities provided by hydrogen technologies as a dual multipower option".*

3.67 In summary, the offshore manufacturing sector has enormous potential to support economic recovery by creating financial and strategic value. It can help realise value from the country's distinctive science and technology base and provide employment opportunities for people with a wide range of abilities and skills. The continued growth in manufacturing, especially within the Green Industries, is essential to the UK economy.

The Regeneration of the Humber Sub-Region

Employment

3.68 The Humber sub-region (consisting of North Lincolnshire, North East Lincolnshire, Kingston Upon Hull and East Riding of Yorkshire Local Authority Areas) is an area of relative deprivation. Whilst it has received significant investment over the previous decade, further

[39] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[40] https://www.gov.uk/government/publications/advanced-manufacturing-plan/advanced-manufacturing-plan-html-version#:~:text=As%20part%20of%20our%20Advanced,removing%20barriers%20to%20boost%20competitiveness.

continued public and private investment is needed to improve the overarching indices in this locality.

3.69 As shown within Tables 3-2 and Figure 3-2 below, whilst the levels of unemployment are below the national average (for 3 of the 4 authority areas), the levels of employment have stagnated over the previous 10 years and are below the UK average. This data is taken from the ONS Census 2021.

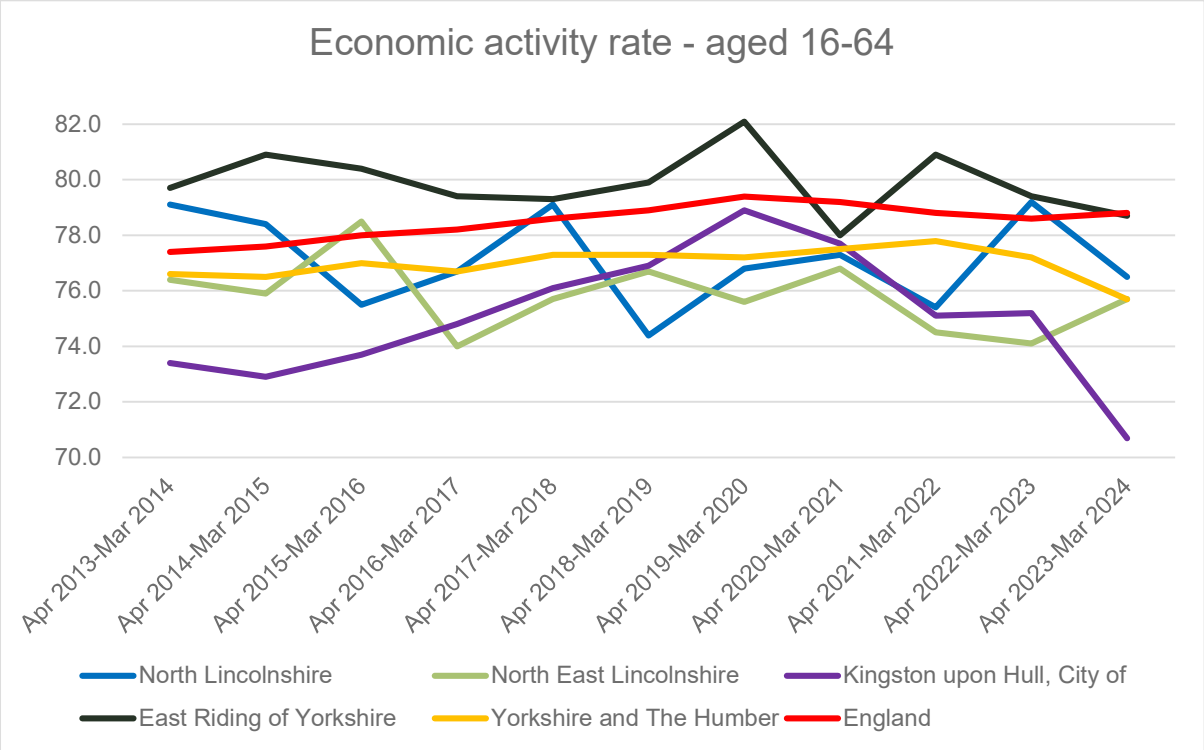
3.70 In addition to this employment data, Table 3-3 provides an indication of the average gross weekly pay at local authority level, which is again below the UK average. Finally, Table 3-4 provides a breakdown of major employment groups within these local authority areas. As can be noted, there are significant levels of employment within the manufacturing, retail (inc. vehicle repair), education, and human health and social work sectors. These are all above the UK averages for these sectors.

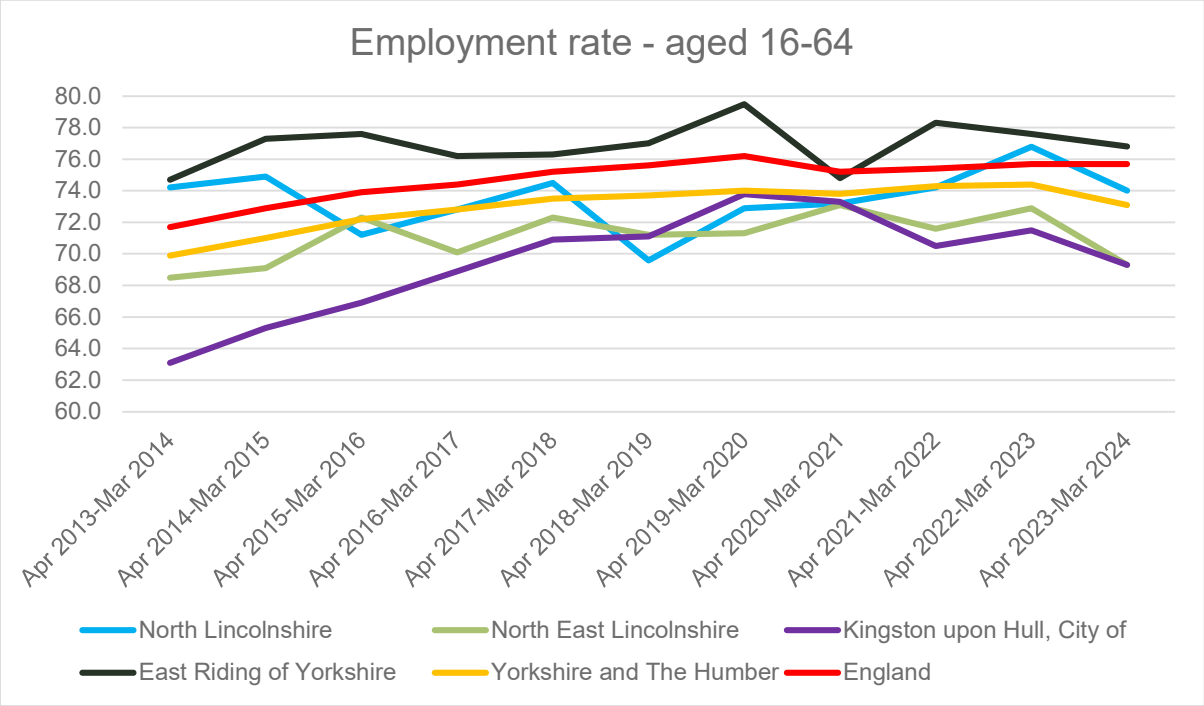
Table 3-2: Economic Activity Status (population 16+)[41]

Economic activity status	North Lincolnshire (District) %	North East Lincolnshire (District) %	Kingston upon Hull, City of (District) %	East Riding of Yorkshire (District) %	Yorkshire and The Humber (County) %	England (National) %
Economically active	55.9	55.4	57.4	54.9	56.2	58.6
Economically active: In employment	53.3	52.6	53.3	52.9	53.5	55.7
Economically inactive	42.3	42.7	40.1	43.5	41.4	39.1
Economically active: Unemployed	2.6	2.8	4.1	2.0	2.7	2.9
*excludes full time students						

[41] NOMIS (2021) Economic Activity Rates. Available at: https://www.nomisweb.co.uk/query/construct/components/stdListComponent.asp?menuopt=12&subcomp=100.

Figure 3-2: Employment Change Graphs[42]





[42] NOMIS (2024) Annual Population Survey. Available at: https://www.nomisweb.co.uk/query/construct/components/stdListComponent.asp?menuopt=12&subcomp=100.

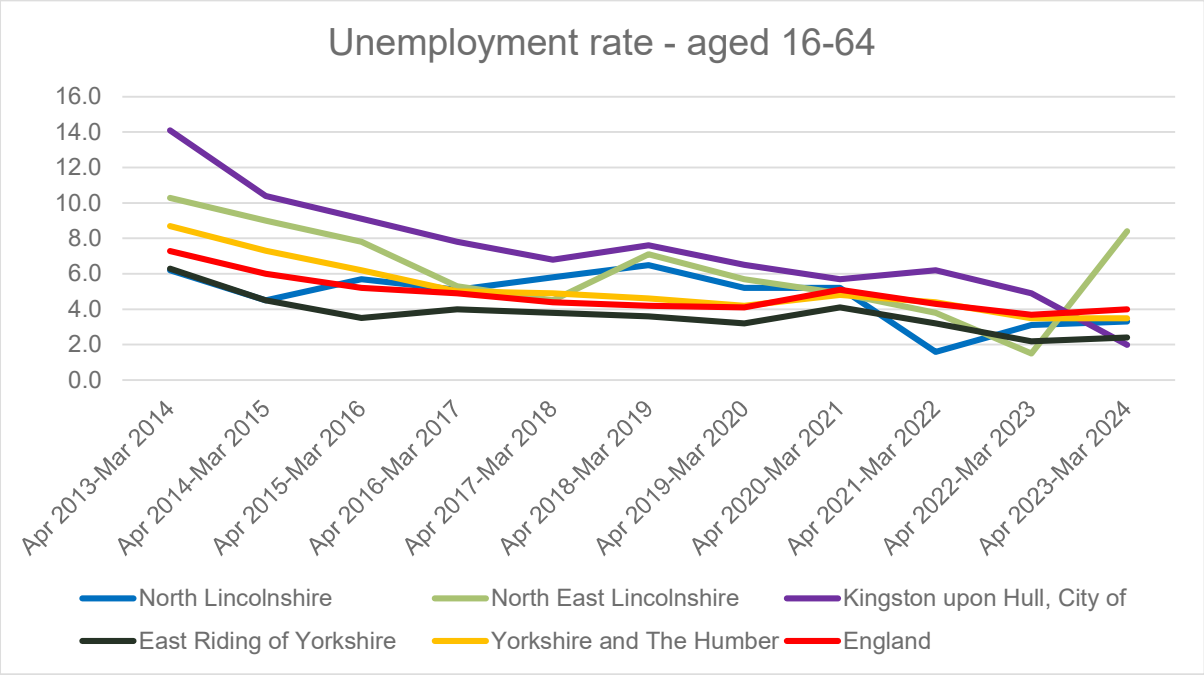


Table 3-3: Weekly Pay[43]

	North Lincolnshire (District) £	North East Lincolnshire (District) £	Kingston upon Hull, City of (District) £	East Riding of Yorkshire (District) £	Yorkshire and The Humber (County) £	England (National) £
Mean gross weekly earnings	754.9	751.9	622.3	752.2	731.6	812.4

Table 3-4: SOC Major Employment Groups[44]

	North Lincolnshire (District) %	North East Lincolnshire (District) %	Kingston upon Hull, City of (District) %	East Riding of Yorkshire (District) %	Yorkshire and The Humber (County) %	England (National) %
Agriculture, Forestry and fishing	1.7	0.5	0.5	3.0	1.0	0.8
Mining and quarrying	0.4	0.7	0.2	0.3	0.2	0.2
Manufacturing	17.4	13.9	15.2	9.9	9.4	7.3
Electricity, gas, steam and air conditioning supply	0.8	1.1	0.7	0.9	0.6	0.6

[43] NOMIS (2023) Earnings and hours worked. Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/placeofresidencebylocalauthorityashetable8.

[44] NOMIS (2021) Jobs by industry. Available at: https://www.nomisweb.co.uk/query/construct/components/stdListComponent.asp?menuopt=12&subcomp=100

	North Lincolnshire (District) %	North East Lincolnshire (District) %	Kingston upon Hull, City of (District) %	East Riding of Yorkshire (District) %	Yorkshire and The Humber (County) %	England (National) %
Water supply; Sewerage, Waste management and Remediation activities	0.8	0.6	0.7	0.7	0.8	0.7
Construction	8.3	8.4	9.2	9.5	8.6	8.7
Wholesale and retail trade; repair of motor vehicles and motorcycles	17.2	18.2	18.6	15.4	16.7	15.0
Transport and storage	6.7	8.0	5.0	4.4	5.2	5.0
Accommodation and food service activities	4.4	5.0	5.2	4.7	4.9	4.9
Information and communication	1.6	1.3	2.1	2.4	3.1	4.7
Financial and insurance activities	1.1	0.9	0.9	1.5	3.0	3.8
Real estate activities	1.0	1.0	0.9	1.1	1.2	1.6
Professional, scientific and technical activities	3.2	3.6	3.0	5.1	5.2	6.7
Administrative and support service activities	4.5	5.3	5.7	4.4	4.9	5.3
Public administration and defence; compulsory social security	5.1	4.1	5.0	7.2	5.9	5.8
Education	8.0	8.3	8.2	10.3	10.0	9.9
Human health and social work activities	14.3	15.3	15.4	14.7	15.3	14.6
Other	3.5	3.6	3.6	4.2	4.1	4.6

Area Status

3.71 The site lies within an area formally designated as the ‘Humber Assisted Area’ which was recognised by the European Commission as one that requires investment to raise employment levels and its manufacturing base. However, following Brexit, this status was formally removed in 2020.

3.72 Notwithstanding, the Humber region was identified for approximately £185 million worth of government funding for a range of projects[45], including investment in Humber Freeport (£15m), Towns Fund projects (£66m) and other major infrastructure work such as East Coast Cluster which is focusing on hydrogen and carbon capture projects, as well as improvements to the strategic road and rail networks.

3.73 There are plans for a Humber Economic Plan to be collectively developed by Combined Authorities within the region with an accompanying investment strategy.

English Indices of Deprivation

3.74 Indices of Multiple Deprivation[46] are published by government and are derived from a combination of income, employment, education, health, skills and training, barriers to housing and services, and crime to create an overall score of deprivation. They therefore provide a useful summary of many of the issues noted above. Below is the overall deprivation ranks for the authority regions assessed England for 2019 (where 1 is the most deprived and 317 is least deprived):

- North Lincolnshire ranked 120 out of 317 local authorities;
- North East Lincolnshire ranked 66 out of 317 local authorities;
- Kingston upon Hull, City of ranked 9 out of 317 local authorities; and
- East Riding of Yorkshire ranked 217 out of 317 local authorities.

3.75 The full deprivation domains are provided in Table 3-5 below

Table 3-5: Deprivation Domains

Economic activity status	North Lincolnshire (District) %	North East Lincolnshire (District) %	Kingston upon Hull, City of (District) %	East Riding of Yorkshire (District) %
Overall rank	120	66		
Income	108	53	11	212
Employment	80	49	20	184
Education	76	41	4	198
Health	96	78	23	200
Crime	118	59	7	233
Barriers to Housing and Services	280	296	159	212
Living Environment	201	92	31	182

[45] https://www.northernpowerhousepartnership.co.uk/devolution-in-action-shared-goals-in-the-humber/#:~:text=The%20area%20has%20seen%20significant,in%20the%20last%2018%20months.

[46] UK Government (2019) English indices of deprivation 2019. Available at: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019.

3.76 On the basis of the above, the need for action to address deprivation in the Humber sub-region is certain.

Updated Immediacy of the Needs

The Imperative to Decarbonise Energy Production

3.77 The need to address the overriding environmental impacts of climate change is urgent. The Stern Review, Executive Summary, states that "*The effects of our actions now on future changes in the climate have long lead times. What we do now can have only a limited effect on the climate over the next 40 or 50 years. On the other hand what we do in the next 10 or 20 years can have a profound effect on the climate in the second half of this century and in the next" and "the evidence gathered by the Review leads to a simple conclusion: the benefits of strong, early action considerably outweigh the costs*".

3.78 This is reiterated throughout the white papers, strategies, plans and policies identified above. Indeed, it is usefully summarised within the Powering our Net Zero Future (December 2020) which emphatically states that *"We need to act urgently. The future impacts of climate change depend upon how much we can hold down the rising global temperature. To minimise the risk of dangerous climate change, the landmark Paris Agreement of 2015 aims to halt global warming at well below 2°C, while pursuing efforts to limit it to 1.5°C, increasing measures to adapt to climate change, and aligning financial systems to these goals".* As such, the need for action on climate change is immediate.

Security of Energy Supply

3.79 The transition to low carbon means of energy production has commenced but needs to escalate rapidly. Offshore wind is now a substantially proven technology but investor confidence is imperative and the provision of sites that enable significant commercial development is an immediate need. Failure to provide such sites will constrain offshore development.

3.80 The immediacy of the imperative need to secure indigenous energy supplies is emphasised within the British Energy Security Strategy (April 2022) which identifies that *"… as the global economy reopened in the aftermath of the pandemic, the sudden surge in demand for everything from new cars to foreign holidays drove a massive spike in demand for oil and gas, dramatically increasing the price of these essential fuels.*

This has been compounded by Russia's abhorrent and illegal invasion of Ukraine. As we are part of a global market, the price we pay for gas is set internationally. And President Putin has used this against us by restricting the supply of Russian gas to the European market, further pushing up prices. The vital sanctions imposed by the UK and its allies to support the Ukrainian people will also inevitably have an adverse effect on all economies.

As a result of all these factors, European gas prices soared by more than 200% last year and coal prices increased by more than 100%. This record rise in global energy prices has led to an unavoidable increase in the cost of living in the UK, as we use gas both to generate electricity, and to heat the majority of our 28 million homes."

3.81 The British Energy Security Strategy continues by detailing that *"Accelerating the transition away from oil and gas then depends critically on how quickly we can roll out new renewables. The government's 'Ten point plan for a green industrial revolution', together with the 'Net zero strategy' and this Energy Strategy, is driving an unprecedented £100 billion of private sector investment by 2030 into new British industries including offshore wind and supporting around 480,000 clean jobs by the end of the decade."*

3.82 The transition to secure energy supplies cannot be delayed.

Need for Large Scale Offshore Wind Turbines

3.83 The importance of offshore wind and need for large capacity offshore turbines is reiterated in the UK Government *Offshore Wind Net Zero Investment Roadmap* (March 2023), noting that offshore wind is an established and proven part of the UK energy mix and is set to become even more important in the future. The Roadmap highlights there is a clear investment opportunity for the delivery of portside infrastructure to support the manufacturing, installation, operation and maintenance of fixed foundation offshore windfarms.

3.84 This need is also reflected in the Overarching National Policy Statement for Energy, EN-1 which states as part of delivering a secure, reliable, affordable, net zero consistent system in 2050, UK government announced in the British Energy Security Strategy[47] an ambition to deliver up to 50 gigawatts (GW) of offshore wind by 2030, including up to 5GW of floating wind.

3.85 The need for large scale wind turbines to be manufactured, especially within the right geographic location, is immediate.

The Need to Rebalance the UK Economy

3.86 The UK is emerging from the economic shock of the Covid pandemic as well as more recent shocks associated with energy supplies due to the conflict in Ukraine and an embargo on the importation of natural gas from Russia. Nevertheless, the UK has a clear opportunity to ensure growth and rebalance the UK economy through green energy manufacturing and low carbon technologies.

3.87 It is imperative that the UK promotes, in the immediate term, the development of manufacturing sites that serve emerging low carbon technology sectors to ensure growth in the green energy market. Manufacturers in the marine energy market need to have facilities constructed and operational in the immediate future to ensure the UK governments targets for both 2030 and 2050 are achievable and met; as such, the development site should be delivered in the immediate future to assist in achieving this.

Regeneration of the Humber Sub-Region

3.88 Whilst the Indices of Deprivation for the sub-region have improved since 2010 (albeit not directly comparable), in 2019 North East Lincolnshire was still ranked 66th out of 317 authority areas, whilst Hull is higher at 9th. Both of these authority areas are within

[47] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

commuting distance from the site, and would directly benefit from the proposals being brought forward.

3.89 The need for investment to improve socio-economic indicators in the City of Hull and Humberside region is demonstrably immediate.

Updated Duration of Public Need

The Need to Decarbonise the Means of Energy Production

3.90 The need to avoid the overriding environmental impacts of climate change is permanent. The Stern Review, Executive Summary, states that "*The effects of our actions now on future changes in the climate have long lead times. What we do now can have only a limited effect on the climate over the next 40 or 50 years. On the other hand what we do in the next 10 or 20 years can have a profound effect on the climate in the second half of this century and in the next".*

Security of Energy Supply

3.91 The need for secure energy supplies will always exist but there is a pressing need to provide these in the immediate future.

The Need for Growth in UK Manufacturing

3.92 Economic growth is key to the UK economy with the government, with growth in the green economy becoming the emphasis over the past decade. In this respect, the following key documents have been published:

- Build Back Better – our plan for growth (Marth 2021);
- The Growth Plan (September 2022);
- Energy White Paper: Powering our Net Zero Future (December 2020)
- Net Zero Strategy: Build Back Greener (October 2021)
- Offshore Wind Net Zero Investment Roadmap (March 2023)[48]
- Powering Up Britain: Net Zero Growth Plan (April 2023)[49]

3.93 Economic growth, especially within the green economy, is a long-term objective and is an imperative for the UK.

Manufacturing of Large Scale Wind Turbines

3.94 It is imperative that the UK promotes, in the immediate term, the development of manufacturing sites that serve emerging low carbon technology sectors to ensure growth in the green energy market. Manufacturers in the marine energy market need to have facilities constructed and operational in the immediate future to ensure the UK governments targets

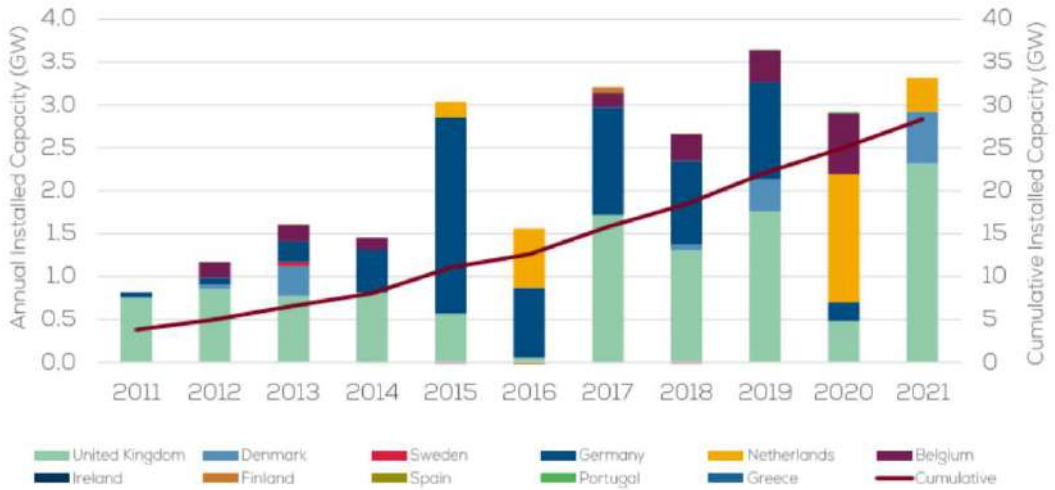
[48] https://www.gov.uk/government/publications/offshore-wind-net-zero-investment-roadmap

[49] https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain-net-zero-growth-plan#:~:text=In%20the%20Net%20Zero%20Strategy%2C%20government%20committed%20to%20have%20a,underpin%20our%20net%20zero%20ambitions.

for both 2030 and 2050 are achievable and met; as such, the development site should be delivered in the immediate future to assist in achieving this.

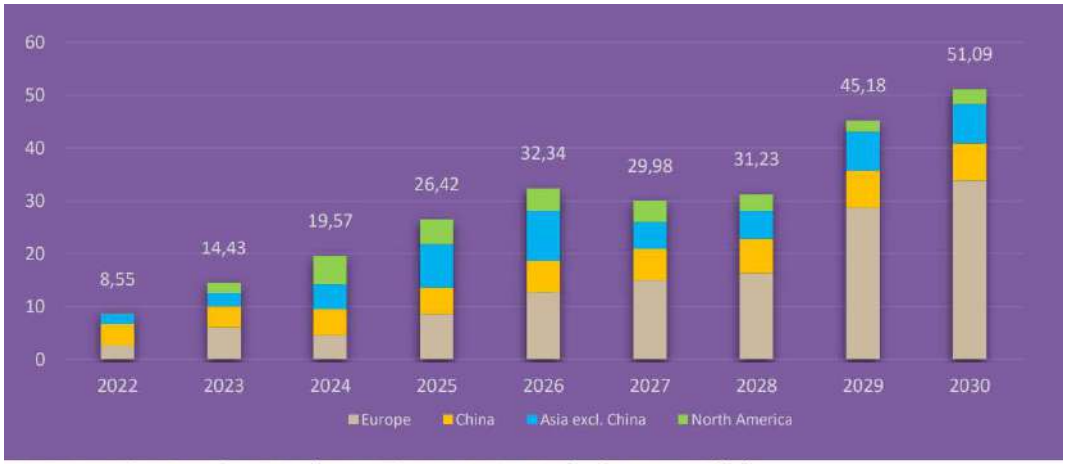
3.95 Figure 3-3 shows the levels of offshore wind installations from the period 2010 to 2021, with the UK indicated as one of the main installers over the past decade.

Figure 3-3: Cumulative and Annual Offshore Wind Installations 2010-2021[50]



3.96 Europe, including the UK, is going to account for almost 50% of the global offshore wind capacity by 2030. As illustrated by Figure 3-4 below, the offshore wind capacity installed each year between 2022 and 2026 will raise significantly on an annual basis, with a further significant rise in commissioned volume anticipated in 2029 and 2030.

Figure 3-4: World New Installations to 2030[51]



Source: H-BLIX based on information from WindEurope, GWEC 2021 [D1], GWEC 2022 [D2].

[50] https://windeurope.org/policy/topics/offshore-wind-energy/

[51] https://windeurope.org/wp-content/uploads/files/policy/topics/offshore/Offshore-wind-vessel-avaiability-until-2030-report-june-2022.pdf

3.97 The UK has a clear long-term need for wind energy generation. Since offshore wind is more efficient than onshore, due to higher wind speeds across flat ocean surfaces and the ability to use much larger turbines, offshore can be the dominant wind sector in the future.

3.98 Taking into account the need for re-powering of obsolete turbines at the end of their service life (currently assumed to be 25 years), a long term need for the UK to produce up to an additional 5 GW of offshore turbines per year is a sound assumption; especially given the recent Institute for Public Policy Research report which identifies that the UK is falling behind its manufacturing targets for offshore wind to achieve the 2030 targets[52]. The UK could sustain a much higher level of manufacturing if it became a location of choice for offshore wind manufacturing and thus a net exporter of components.

3.99 In conclusion of the above the public need for AMEP is both immediate and long term.

Regeneration of the Humber Sub-Region

3.100 The regeneration of the Humber sub-region is a long term objective and will require major investment over many decades. The proposed project will make a significant contribution to this objective by creating ca 4,100 direct FTE jobs on the site related to manufacturing of offshore wind turbines and 5,000 direct FTE jobs in the Yorkshire and Humber region and elsewhere in the UK (excluding installation works). Further details are contained within the Environmental Statement.

Summary and Conclusion

The Balance of Interests

3.101 Where the balance of public interests weighs in favour of interests other than the strict protection of the National Site Network site, a decision maker may consent a project, even where the possibility of that project having an adverse effect on the integrity of a particular site cannot be excluded. This is normally only the case where the public interest is long term and where the interests are clearly in accordance with the fundamental policies of the State and for the benefit of society as a whole.

The Competing Imperative Reasons of Overriding Public Interest

3.102 The adverse effects on the National Site Network site are set out in the HRA.

3.103 As the project does not threaten a priority habitat or species Article 6(4) of the Habitats Directive explicitly permits the following categories of IROPI to be considered:

- human health;
- public safety;
- socio-economic;
- beneficial consequences of primary importance for the environment, or,

[52] https://www.ippr.org/media-office/revealed-billions-at-stake-and-net-zero-goals-threatened-as-uk-falls-behind-in-the-race-for-wind-manufacturing

- other imperative reasons that are subject to the opinion of the national government.

3.104 Fundamentally, the project will deliver socio-economic benefits to the UK generally and the Humber Estuary sub-region in particular by enabling the growth of the emerging renewable energy sector. It will also have beneficial consequences of primary importance for the environment by enabling Europe's necessary transition to low carbon energy production.

Beneficial Consequences of Primary Importance to the Environment

3.105 There is compelling scientific evidence that rising levels of greenhouse gases in the atmosphere will have a warming effect on the earth's climate through increasing the amount of infrared radiation (heat energy) trapped in the atmosphere, 'the greenhouse effect'. Potential effects include: rising sea levels which threaten major cities; irreversible damage to ecosystems; major declines in crop yields and water shortages. These potential impacts are beyond any reasonable scientific doubt.

3.106 The project would enable the development of a harbour facility that is designed to support the manufacture, export and installation of renewable energy components for the marine environment. This sector is essential to the delivery of the UK's renewable energy targets that aims to make energy production in Europe carbon neutral by 2050.

3.107 The need for transition to a low carbon economy is certain and is necessary in the immediate term. The project will assist in enabling this transition.

The Beneficial Effect of Large Scale OWT Components

3.108 Energy costs need to be maintained as low as reasonably practicable. Turbine scaling increases energy capture while reducing general project infrastructure costs (as well as landscape impacts) that ultimately reduce the cost of wind energy. The need for larger turbines is recognised in the UK government's Offshore Wind Net Zero Investment Roadmap.

3.109 The scale of development in the next decade and beyond represents a step change in offshore development to date. The UK government has established significant targets for offshore wind within the range of Net Zero documents identified above.

3.110 The project will provide facilities suitable for the manufacture and assembly of these large-scale offshore wind turbines.

The Need for Security of Energy Supplies

3.111 The Powering Up Britain (March 2023) document outlines that *"After decades of reliance on imported fossil fuels, the new department's mission is to replace them with cheaper, cleaner, domestic sources of energy. We will be powered by renewables including wind and solar, hydrogen, power with carbon capture, usage and storage (CCUS) and new nuclear plants - while recognising the vital role that UK oil and gas will play in the transition. This will make us much more energy independent, to protect us from volatile international energy markets, while underpinning our clean energy transition, so the UK becomes a net zero economy by 2050. It will also help us make sure the UK has among the cheapest wholesale electricity prices in Europe by 2035"*.

3.112 Powering Up Britain continues by outlining the need for an Energy Security Plan given the current geopolitical landscape, outlining that: *"Putin's invasion exposed mainland Europe's over-dependence on Russian gas, with implications for affordability and security. The UK cannot ever afford to be at the mercy of a malign actor like this. The British Energy Security Strategy was clear that the long-term solution is to address our underlying vulnerability to international fossil fuel prices by reducing our dependence on imported oil and gas. Our vision is to power the UK through affordable, home-grown, clean energy:*

- *ensuring Britain has among the cheapest wholesale electricity prices in Europe by 2035;*
- *moving towards energy independence through a potential doubling of Britain's electricity generation capacity by the late 2030s;*
- *maximising the vital production of UK oil and gas as the North Sea basin declines; and*
- *capturing global early mover advantages and capitalising on the decarbonisation needs of the more than 90% of the global economy that are now signed up to net zero targets.*

3.113 The document continues by detailing there is in need for the UK to be more energy independent in the future, becoming more energy secure by:

- reducing energy demand and increasing the overall share of domestic energy production by building on the ambitions set out in the Net Zero Strategy and British Energy Security Strategy;
- ensuring that where the UK still needs to import energy, including through interconnectors, that those imports are built on strong relationships with trusted partners and allies and diversified sources of supply, which will also provide access to long term export markets to support the growth of clean energy industries; and
- building in resilience and mitigations to ensure that if there are disruptions to imports, consumers still have a reliable supply of energy.

3.114 The Energy Security Strategy emphasises that the growing proportion of the UK's electricity coming from renewables reduces the country's exposure to volatile fossil fuel markets and that without the renewables on the grid today, and the green levies that support them, energy bills would be higher than they are now.

3.115 As such, there is a critical need to build a British energy system that is much more self-sufficient. Nevertheless, the UK government is still acutely aware that there is a need to work with international partners to maintain a stable energy market and prices to protect UK consumers and reduce the use of fossil fuels globally and pivot toward clean, affordable energy.

3.116 Irrespective of the significant adverse environmental impacts of climate change, the UK needs to develop new, indigenous sources of energy, in order to secure energy supplies into the future. Current UK policy is that offshore wind energy must make a substantial contribution to the security of supply. The project will enable this objective to be realised

The Socio-Economic Benefit to the UK Economy

3.117 The UK is emerging from the economic shock of the Covid pandemic as well as more recent shocks associated with energy supplies due to the conflict in Ukraine and an embargo on the importation of natural gas from Russia. Nevertheless, the UK has a clear opportunity to ensure growth and rebalance the UK economy through green energy manufacturing and low carbon technologies.

3.118 The offshore manufacturing sector has enormous potential to support economic recovery by creating financial and strategic value. It can help realise value from the country's distinctive science and technology base and provide employment opportunities for people with a wide range of abilities and skills. The continued growth in manufacturing, especially within the Green Industries, is essential to the UK economy

3.119 Economic growth is a long-term objective and is an imperative for the UK. The UK must promote, in the immediate term, the development of manufacturing sites that serve emerging low carbon technology sectors. The project will provide a significant number of manufacturing jobs and has the potential to generate many more because of its cluster potential.

The Socio-Economic Benefit to the Humber Sub-Region

3.120 The English Indices of Deprivation 2019 (MHCLG[53]) provide local authority district summaries. For the Index of Multiple Deprivation, which represents a combination of different individual deprivation indices, North East Lincolnshire was ranked 51st out of 151 authorities (where 1 is the most deprived and 151 the least deprived); North Lincolnshire was ranked 79th. For the corresponding employment index, North East Lincolnshire was ranked 35th and North Lincolnshire 54th.

3.121 Accordingly, there is a manifest need to address deprivation in the Humber sub-region by promoting investment in that area. The development of AMEP will have a significant positive impact on these criteria at the local level but will also benefit the Humber sub-region as a whole.

3.122 Much of the AMEP site now forms part Humber Freeport which, with effect from 19th November 2021, has been designated and recognised in law as one of a number of geographical areas where businesses can benefit from tax reliefs to bring investment, trade and jobs to regenerate regions across the country that need it most.

3.123 Based on 2011 values (noting they have not been updated to 2024 values), the following economic effects are estimated:

- The employment impact at the site will be 4,100 FTE jobs. The net additional local impact is 3,740 FTE jobs taking into account deadweight, leakage, displacement, and indirect and induced multiplier effects.

[53] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

- The UK-wide cumulative net additional impact is 10,600 FTE jobs. These jobs will generate significant net additional GVA in the local economy – estimated at £210 million, and in the national economy – estimated at £602.5 million.

3.124 As indicated above, these estimates are considered conservative and the GVA impact will potentially be higher due to higher GVA per job in the offshore wind energy sector.

3.125 The AMEP labour market impact is potentially significant, especially in the immediate vicinity of the development. It is expected that the workforce will have to come from a wider area, both North and North East Lincolnshire and from within the wider region of Yorkshire and the Humber. Based on the impact assessment of AMEP, it is evident that economic impacts can be expected to be highly positive:

- diversification of the manufacturing sector into new offshore wind technologies providing higher job security compared to traditional industries in decline;
- new jobs (4,100 direct jobs excluding installation related jobs) created directly at the site absorbing some of the potentially available pool of workers (unemployed and potentially economically active). These new jobs will attract highly skilled workers from other areas as well, thereby creating a critical mass of offshore wind professionals in the local area;
- AMEP will enable the development of an offshore wind manufacturing cluster in the Humber region as it will be cheaper and more efficient to co-locate businesses in the supply chain. A manufacturing cluster will help to develop offshore wind (and other marine renewables) technologies further;
- new offshore wind jobs will require highly qualified workers and AMEP represents opportunity to raise the skill level of local labour to ensure increased local participation;
- the supply chain for AMEP offshore wind manufacturers will be developing in the Yorkshire and the Humber region and beyond with signs of this process appearing recently with foundation manufacturers setting up facilities in Scunthorpe and Teesside;
- AMEP will also support 200 FTE jobs at a number of suppliers of goods, services, and works locally (i.e. within NL and NEL) and further 920 FTE jobs through spending of its and suppliers' employees in the local economy; and
- Wider impacts will include attraction of inward investment, growth of R&D in offshore wind in Yorkshire and the Humber, upskilling of the workforce, and others.

The Significance of the Competing Interests

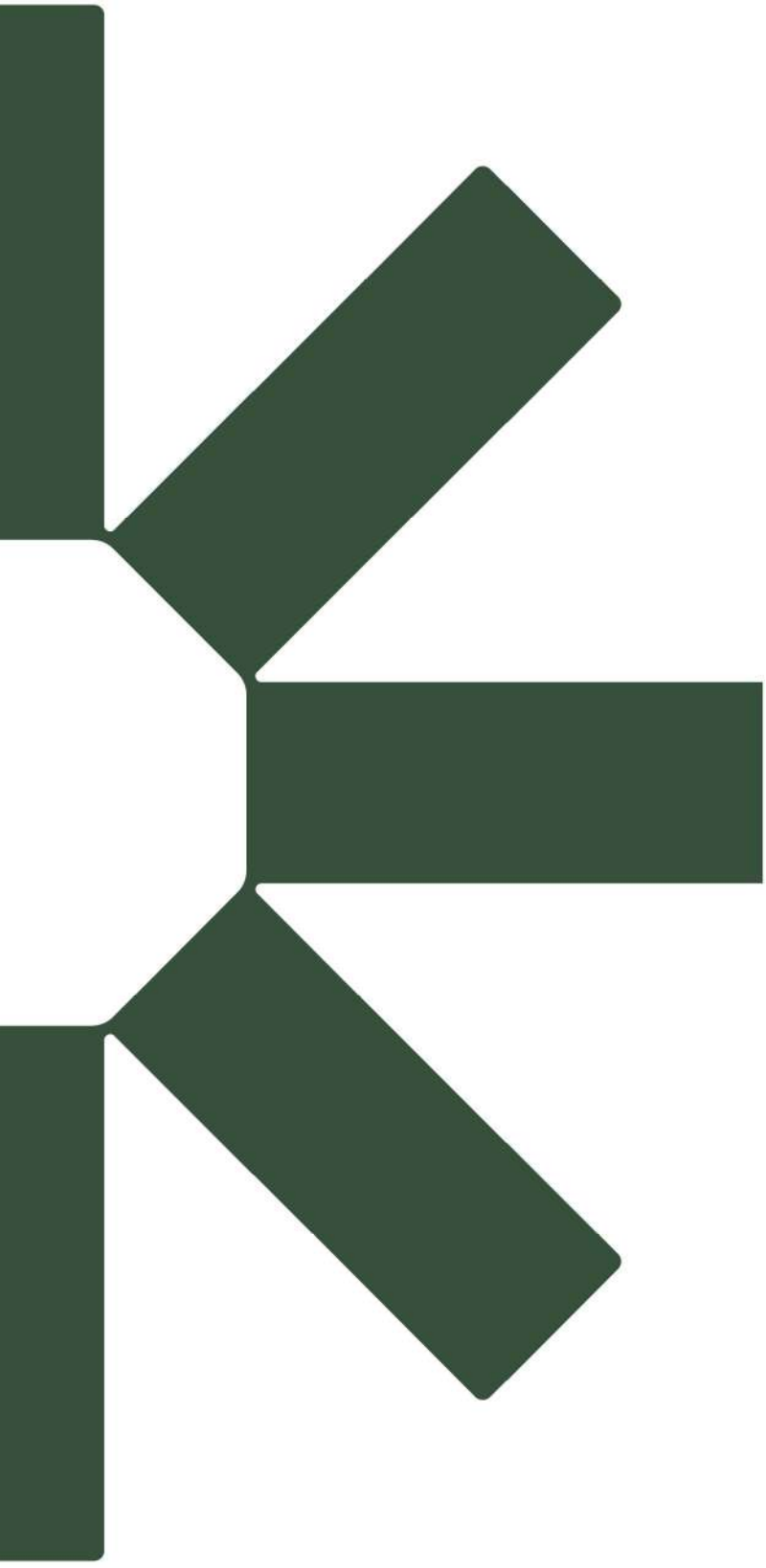
3.126 There is a compelling case that there is an overriding public interest to:

- Decarbonise the means of energy production;
- Secure energy supplies from indigenous sources;
- Manufacture large scale offshore generators;
- Grow manufacturing in the UK; and
- Regenerate the Humber sub-region

3.127 These overriding public interests are contended to duly outweigh the loss of 45 hectares of a National Site Network site.

3.128 The project addresses these objectives by providing a new quay with direct access to a significant land parcel that is to be developed to support the manufacture of components for the offshore renewable energy sector. This is a sector that must grow to enable the delivery of European Energy policy. The sector has specific locational requirements that are realised with the least possible environmental harm.

3.129 The imperative overriding needs detailed above are both certain and immediate and the project will make a significant contribution towards them over a long period of time.



Making Sustainability Happen

1.4 - AMEP DRAFT CONSULTATION HRA; PART 5

(Tracked changes from submission in 2024)

THE ABLE MARINE PARK DEVELOPMENT CONSENT ORDER 2014 (S12014/2935)

APPLICATION FOR A 7 YEAR EXTENSION TO THE 10 YEAR TIME LIMIT ON COMMENCING CONSTRUCTION (ARTICLE 7)

HRA Part 5 ~~COMENSATION~~COMPENSATION MEASURES

~~**September 2024**~~

April 2025

1 HRA PART 5 COMPENSATION MEASURES

~~1.1 INTRODUCTION~~

~~1.1.1 The findings of Part 2 of the HRA Report Draft for Consultation (HRA) were that AMEP will result in an adverse effect on the integrity of the Humber Estuary SPA/SAC/Ramsar site, part of the National Site Network. Where an adverse effect is concluded, and it has been shown that there are no alternative solutions (HRA Part 3) and also that IROPI has been demonstrated (HRA Part 4), the decision maker can only approve the application once it is satisfied that suitable compensation measures have been secured.~~

~~1.1.2 This Part describes the compensation measures and signposts the reader to more supporting documents submitted with previous related applications which provide more detailed descriptions. In short, the compensation measures remain substantially as described in paragraph 21 of the original HRA Report that formed Annex 1 of the original decision letter, (the original HRA) (PLANNING ACT 2008 (planninginspectorate.gov.uk)).~~

~~1.2 COMPENSATION SITE~~

~~*Intertidal Habitats*~~

~~1.2.1 The updated appropriate assessment submitted with the application showed that it will be necessary to compensate for the direct and indirect loss of 39 ha of intertidal mudflat, the direct and indirect loss of 6.6 ha of saltmarsh and the direct loss of 10.4 ha of estuary habitat (which comprises sub-tidal habitat). In addition 2 ha of saltmarsh will convert mudflat once the breach of the flood defences is formed at Cherry Cobb Sands (see HRA Table 19). The ratio of compensation for habitat losses that has been previously agreed with Natural England is explained in Section 4 of UES 11-2, submitted with the Material Change 2 application[1].~~

~~1.2.2 The intertidal and subtidal compensation is to be provided at Cherry Cobb Sands on the opposite bank of the Humber Estuary, refer to Figure 1.1. The site comprise four 'fields' with hydraulic structures to manage water levels (a regulated tidal exchange site or RTE) that will provide sustainable mudflat and an area of managed realignment (MR) that is directly connected to the estuary. The MR site will mostly develop as saltmarsh due to the limited number of tidal inundations. These proposals are further described within document EX28.3:Part3 of the original Environmental Statement[2].~~

1.1 -THE ORIGINAL COMPENSATION PROPOSALS

1.1.1 At the time of the original application, the following areas and types of habitat were agreed to be directly or indirectly impacted by the AMEP development (Statement

[1] ~~TR030006-000174-TR030006-APP-6A-11-2.pdf (planninginspectorate.gov.uk)~~

[2] ~~https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001740-121012_TR030001_Leslie%20Hutchings%20of%20Able%20Humber%20Ports%20Limited.zip~~

of Common Ground on Shadow Habitats Regulations Assessment, Table 3.1, 24 August 2012[3] (2012 SoCG)):

31.5ha of mudflat lost on the Noth Killingholme foreshore due to reclamation of the estuary to form the quay;

13.5ha of sub-tidal (estuarine) habitat at North Killingholme lost due to reclamation of the estuary for the quay;

11.6ha of mudflat impacted by disturbance from AMEP causing a loss of its functionality as a feeding resource for SPA species;

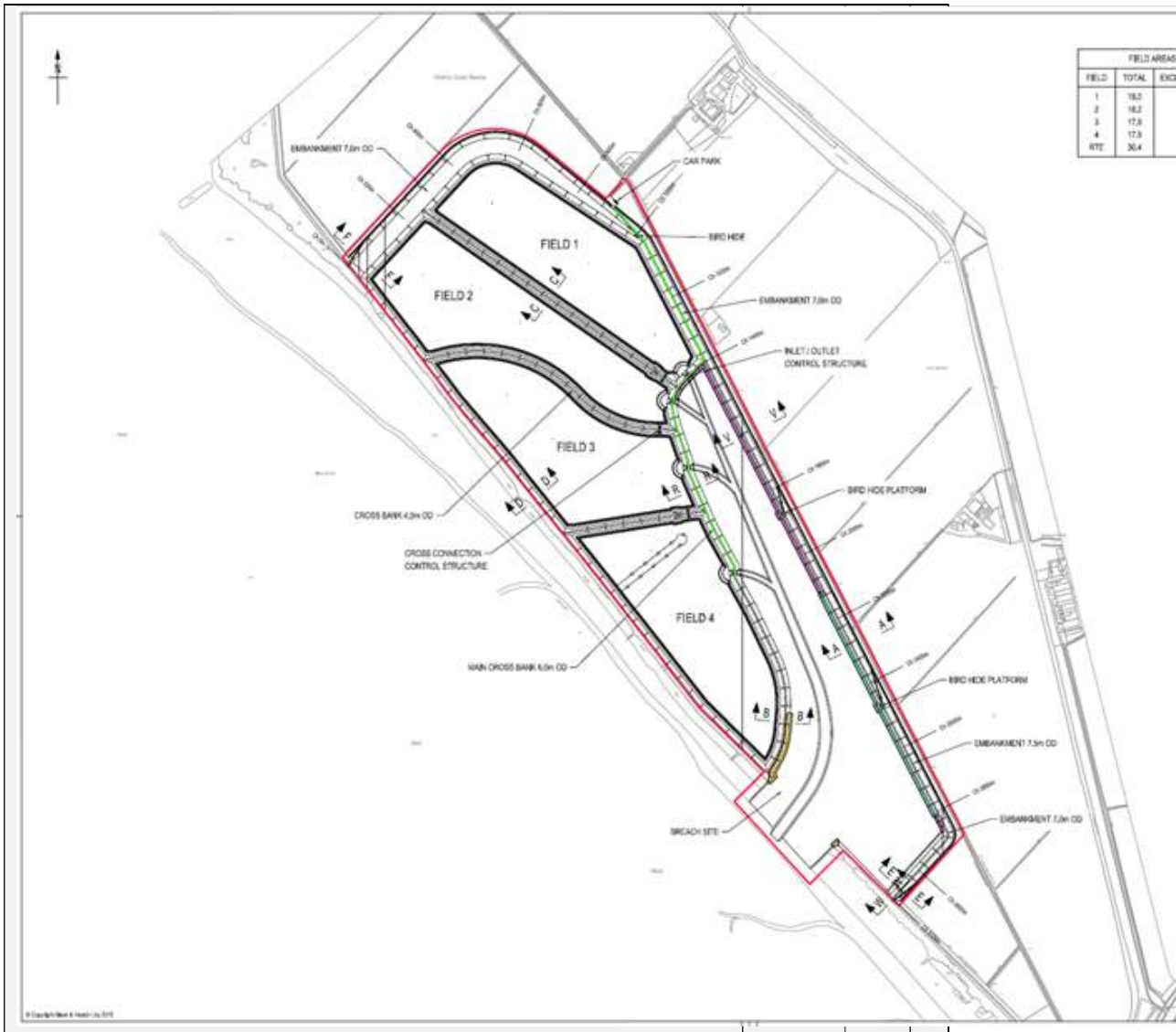
2ha of saltmarsh at Cherry Cobb Sands converted to mudflat due to the creation of a channel into the compensation site.

1.1.2 Also at the time of the original application thirteen species of birds that were roosting and/or feeding on the North Killingholme Marshes (NKM) foreshore or North Killingholme Haven Pits (NKHP) were agreed to be significantly adversely affected by the AMEP development. The number of these species is summarised in Table 1 below (abstracted from the Applicant's shadow Habitats Regulations Assessment, Table 5.1, December 2011[4] (the 2011 sHRA)).

(1) [3] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR030001-001606-SOCG009%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20Natural%20England%20and%20the%20Marine%20Management%20Organisation.pdf

(2) [4] https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR030001-000572-16%20-%20Habitat%20Regulations%20Assessment%20Report%20(15).pdf

~~*Figure 1.1 AMEP Compensation Site- Cherry Cobb Sands RTE and MR Site*~~



Species			
Avocet	493	4	0.8
Black-tailed godwit (BTG)	3 887	2566	66.0
Bar-tailed godwit	(5 926)	123	2.1
Curlew	4 440	158	3.6
Dunlin	21 518	1029	4.8
Lapwing	18 756	325	1.7
Mallard	2 096	14 (WeBS)	0.7
Marsh Harrier	10	1 at NKHP	10
Redshank	5 445	540	9.9
Ringed Plover	(2 168)	210	9.7
Shelduck	5 314	109	2.0
Shoveler	145	11 (WeBS)	7.6

Teal	2 685	13	0.4

* **TTTC unless noted otherwise**
Humber Population – Population taken from mean of peak data from 5 Year WeBS core count data between 2004/05 – 08/09 for Sector 38950 the Humber Estuary. () indicates mean calculated from an incomplete 5 year data set.
Peak count – The highest species count recorded within Killingholme Marshes either from WeBS data or IECS surveys.
WeBS – Mean of Peak Count derived from WeBS 5 Year Core Count Data from 04/05-08/09 for Sector 38406 Killingholme Marshes (TA178187).
TTTC – Waterbird Surveys undertaken at Killingholme Marshes by Institute of Estuarine Coastal Studies (IECS) between April 2010 and April 2011

Table 1: Bird Species Using Killingholme Marshes Foreshore and adversely affected by AMEP

1.1.3 Although species counts for Avocet, Mallard and Teal were less than 1% on the NKM foreshore, they were present at NKHP in more significant numbers and were consequently included in the list of species likely to be impacted through disturbance. The Marsh Harrier is included in the list of species impacted by AMEP because one pair bred at North Killingholme Haven Pits in 2011.

1.1.4 No likely significant effect was determined on all other bird assemblage species for one of the following reasons (2012 SoCG, paragraph 3.6.2):

- Species not recorded to be present in the 2010/11 TTTC count programme;
- Species not reliant on habitats at North Killingholme Marshes;
- Species present in numbers ≥ 1% but whose ecology makes them resilient to impacts;
- Only individual or pairs of the species present, or where the percentage of the Humber population was insignificant.

1.1.5 It was agreed with Natural England (NE) that the impacts on the NKM foreshore habitat and species using it, could not be mitigated, so a compensation scheme was proposed by the Applicant. The overriding objective of the compensation measures was, and remains, to ensure that *'the overall coherence of Natura 2000* (now the National Site Network) *is protected'* (Habitats Directive, Article 6.4). The original Examining Authority (the Panel) consulted widely on how this phrase should be interpreted in the context of the AMEP development and, in their report, concluded the following:

10.108 The Panel concludes that, on the basis of the evidence and the submissions before it, the overall coherence of Natura 2000 would be protected in this case if –

(a) that is understood to mean the replacement of the critical ecological function that would be lost with this section of the North Killingholme Marshes, in particular the foreshore;

(b) in practice, the compensation package is capable of meeting the requirement to replace the ecological function performed by North Killingholme Marshes for BTG (Black-tailed godwit) *during the autumn moult.*

10.109 In this case while the marshes have a general role as a feeding ground for wading birds, including seven species (shelduck, lapwing, ringed plover, dunlin, bar-tailed godwit, redshank and curlew) that are part of the SPA non-breeding waterbird assemblage, they have a much more significant, specific and particular function in providing a nutritional resource for BTG in very large numbers during what the experts agree is the critical period of the autumn moult.

10.110 Responding to Second Round Question 2, NE advises that all these species are likely to be catered for if the needs of the BTG population, the species

present in the most significant numbers and with specific requirements are met ….

10.111 The Panel is consequently satisfied that the compensation site should thus be designed with the specific objective of being able to meet the feeding needs of BTG during the autumn passage.

1.1.6 The original HRA (at Annex 1 of the Decision Letter[5]) echoed the Panel's conclusions stating:

'20. The Secretary of State (SoS) *accordingly agrees with the Panel's conclusion that protecting the overall coherence of Natura 2000 in the context of the AMEP development means replacing the critical ecological function that would be lost from the North Killingholme Marshes* (NKM)*, in particular the foreshore, and the ecological function performed by the North Killingholme Marshes for BTG during the autumn moult. He agrees with the Panel that this would be protected if the compensation site were designed with the specific objective of meeting the feeding needs of BTG during the autumn passage'*

1.1.7 The compensation measures that were ultimately approved by the SoS to ensure the coherence of the Natura 2000 Network are described in paragraph 21 *et seq* of the original HRA, as reproduced below:

'21….. At the end of the examination the compensation proposals comprised:

(a) a Managed Realignment (MR) *and Regulated Tidal Exchange ("RTE") scheme providing some 101.5 hectares of inter-tidal area at Cherry Cobb Sands on the north bank of the Humber Estuary directly opposite the AMEP site; this would provide replacement, managed mudflat habitat that is sustainable in the long· term and would provide a feeding area for wading birds to replace the ecological function that would be lost as a result of the AMEP development;*

(b) a 38.5 hectare compensatory habitat at Cherry Cobb .Sands adjoining the RTE; this would comprise approximately 26 hectares of wet grassland, open water and two islands of approximately 0.4 hectares as roosting areas for BTG, plus a further roost in a water-filled scrape; this was outside the red line boundary of the Order application and was the subject of a separate application for planning permission to the East Riding of Yorkshire Council ("ERYC") which was approved on 16 May 2013; and

(c) a 38.8 hectare site in the applicant's ownership at East Halton Marshes on the south bank of the Humber Estuary which the applicant said during the examination could be converted to wet grassland if the Secretary of State considered it necessary to compensate for any time lag between loss of existing habitat and establishment of compensatory habitat; this would not require planning permission to be developed.

22. In relation to (a), the RTE area comprises four 18 hectare cells with sluices to allow seawater to enter each cell directly and to provide a means to transfer seawater between cells. Ponded areas and reduced functionality due to bed levelling mean that there would normally be 60 hectares of managed mudflats available as a foraging area for BTG and other SPA birds, dropping to 45 hectares during neap tides. ….

(3) [5] https://infrastructure.planninginspectorate.gov.uk/document/TR030001-002225

23. The RTE scheme and associated wet grassland site at Cherry Cobb Sands are designed to have a comparable relationship to that between North Killingholme Haven Pits and the North Killingholme Marshes foreshore. They are included in the Compensation EMMP dated March 2013 which was agreed by the applicant and Natural England after the close of the examination.

24. The applicant envisages that while the Managed Realignment and RTE scheme would be provided on a permanent basis, the other two compensatory schemes would be provided for as long as required, that is, until the habitat created by the RTE scheme is fully functional. Natural England, however, considers that the wet grassland site at Cherry Cobb Sands will be required in perpetuity as it will mimic the roost site at North Killingholme Haven Pits in terms of closeness to the North Killingholme Marshes foreshore and will provide a further food source for the BTG and other SPA birds (10.154). The Secretary of State agrees with the Panel that this is an essential part of the project (PR 10.156). As regards the permanency of wet grassland site, he notes that Natural England said in its letter of 1 May 2013 that this matter would be determined by the applicant following consultation with the Steering Group to be established under the agreed Compensation EMMP and in accordance with the achievement of the compensation targets specified in that EMMP. He considers that this is an acceptable approach to the issue of permanency.

25. The Panel recommended that the East Halton Marshes scheme should be included as a compensatory measure to provide as much available feeding ground as possible, given the disagreement between the applicant, Natural England and the RSPB during the examination about how much food-stock was required to replace the existing resource at North Killingholme Marshes (PR 10.158-164). Although the East Halton Marshes scheme was not included in the Compensation EMMP dated March 2013, the Secretary of State notes from the applicant's further information submitted on 15 October 2013 that it has now agreed to provide its land at East Halton Marshes for compensation. The applicant has also proposed improvements to its design proposals for the site to benefit BTG and other estuary birds such as surface water features and islands in scrapes to serve as secure roosts in winter. The applicant has agreed that delivery of these proposals could be secured by an amendment to the Compensation EMMP, which will have to be finally approved by Natural England under requirement 17(1) of Schedule 11 to the Order.'

1.1.8 The MR/RTE scheme is illustrated in Figure 1 below.

1.1.9 In summary, the MR/RTE scheme provides for the loss or disturbance of SAC habitat in the following proportions.

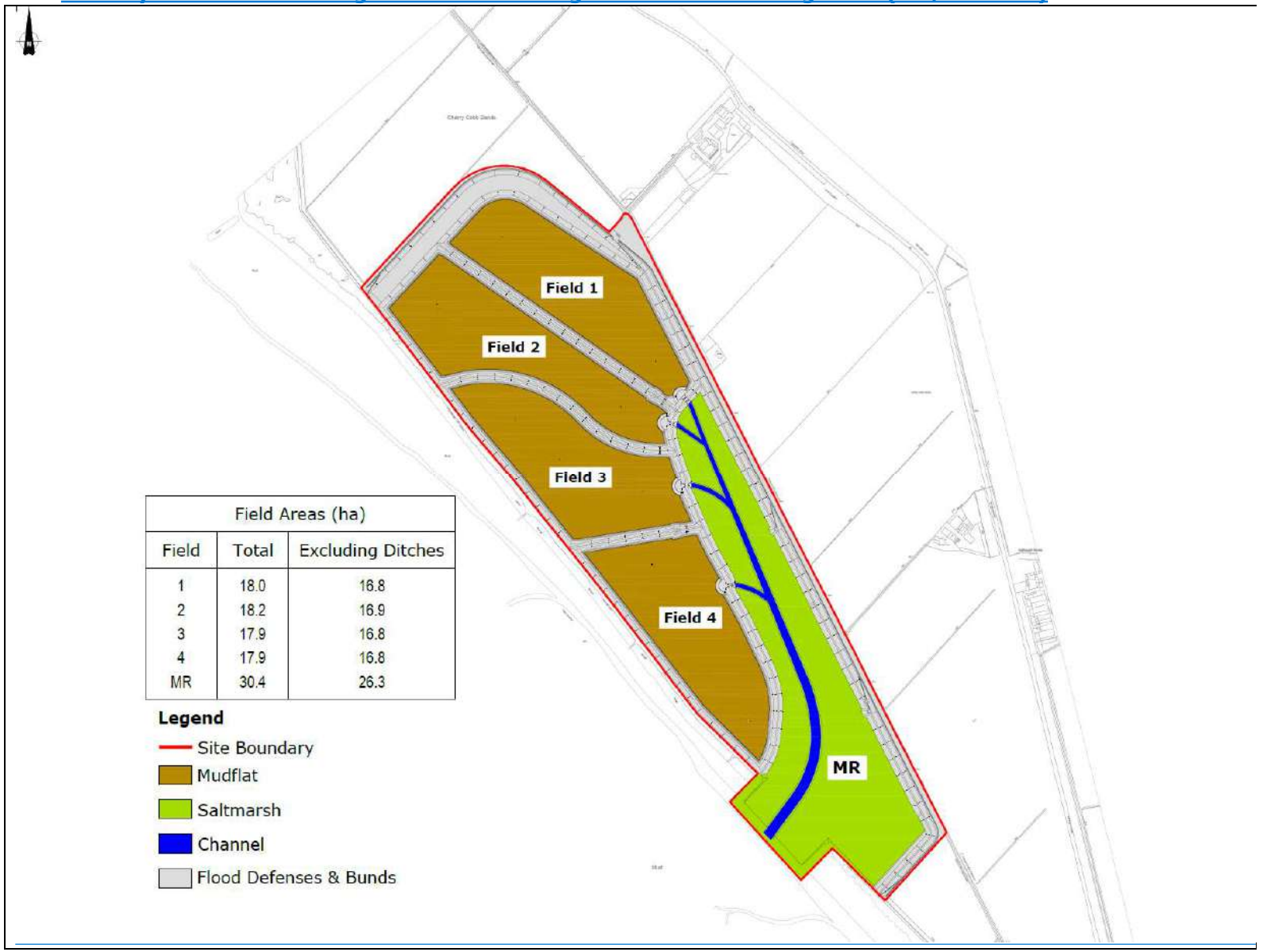
Habitat Type	**Habitat Loss Agreed with NE in 2012[1] (ha)**	**Compensation Provision**
Sub-tidal (Estuarine) Habitat (1130)	13.5	26.5 ha of estuarine habitat will be created within the managed realignment part of the compensation site.
Mudflat (1140)	43.1 (31.5+11.6)	72 ha of mudflat will be created and maintained within the RTE part of the compensation site
Saltmarsh (1330)	2	Over time, saltmarsh will develop over most of the 26.5ha of the managed

		realignment part of the compensation site.

Table 2: Habitat Compensation Proposal

Figure 1

~~There~~**: Cherry Cobb Sands Managed Retreat and Regulated Tidal Exchange Site (MR/RTE Site)**



1.1.10 It is also a requirement that the MR/RTE habitat will be monitored and managed in accordance with an approved Compensation Environmental Management and Monitoring Plan (CEMMP), and this will continue until the site achieves full functionality (AMEP DCO Schedule 11, paragraph 19(1)). Plainly, once the site achieves the same functionality as NKM foreshore in terms of a food and roosting resource for SPA species, then it will be capable of supporting the same number of birds as the area lost. In the interim period two terrestrial sites (one at Cherry Cobb Sands and another at East Halton marshes) were agreed to be developed, managed and monitored to provide further replacement feeding and roosting habitat for SPA species.

1.1.11 The original HRA concluded:

'49. The Secretary of State notes and agrees with Natural England's advice that there is a residual risk that the applicant's compensatory measures might not work. He is however satisfied that the risk has been adequately mitigated for the reasons given above. Taking into account all relevant information now before him, the Secretary of State agrees with the Panel's conclusion at PR 10.237 that the first and second tests specified in the European Commission's guidance for ensuring the coherence of Natura 2000 (set out at paragraph 26 above) are met. ***He considers further that there is adequate assurance that, subject to implementation of the EMMPs, the compensatory measures will provide functions comparable to those for which the European sites at North Killingholme were selected****'*, (emphasis added).

1.1.12 Subsequent to the decision, the following EMMPs have been agreed with NE pursuant to Schedule 11 paragraph 19 of the DCO:

- Compensation EMMP – approved by NE 15 January 2016;
- Marine EMMP – latest approval by MMO 15 May 2021;
- Terrestrial EMMP – latest approval by NE 20 March 2024.

1.1.13 The approved EMMPs include for pre-construction surveys of the NKM foreshore to ensure that monitoring and management targets for the compensation measures are set using contemporaneous data.

1.1.14 At the time of the original application it was recognised that the habitat on the North Killingholme foreshore was in transition due to accretion of sediment. The accretion was causing the intertidal levels to rise which in turn created the conditions for the conversion of mudflat to saltmarsh. Thus, it was predicted with a high level of certainty, that a proportion of the mudflat that was providing a feeding resource for SPA species in 2012 would gradually convert to saltmarsh. This change was not expected to have any detrimental impact on the compensation measures because the ratio of (compensation habitat : habitat loss) provides a sufficient buffer to accommodate the predicted changes (refer to UES 11-2[1], Section 4).

1.1.15 Importantly also, the precise number of birds present on the foreshore was not, *per se*, a factor in determining the area of habitat to be replicated. This is axiomatic, because if the habitat is replicated then the bird carrying capacity of the habitat will also be replicated. Pre-construction surveys

(4) [1] MC2 version of UES 11-2

undertaken immediately before the habitat is lost will inform the habitat, benthos and faunal targets for the compensation measures which the Applicant will the use to compare to monitoring data to be collected once the compensation measures are constructed.

1.2 REVIEW OF COMPENSATION MEASURE FOR MATERIAL CHANGE 2

1.2.1 On 25 June 2021, the Applicant sought a Material Change (MC) to the approved scheme. The MC comprised the following:

a) a realignment of the proposed quay (within its existing limits of deviation) to remove a berth pocket at the southern end and introduce a setback at the northern end;

(b) changes to the construction methodology to allow a piled relieving slab at the rear of the quay to be at the surface as an alternative to being buried or to be omitted altogether;

(c) the use of anchor piles as an alternative to flap anchors;

(d) consequential changes to dredging; and,

(e) unrelated to the quay changes, the realignment of a footpath diversion to the north west of the site to go round the end of a railway track instead of crossing it.

1.2.2 The application was accompanied by an updated sHRA document[1] (the 2022 sHRA), which recorded the impacts of the amended scheme on protected SAC habitats and SPA/Ramsar species . In relation to habitats, the sHRA presented an updated assessment of habitat losses alongside the original assessment (2022 sHRA:Part 2:Table 11). For ease of reference this information is reproduced in Table 3 below.

			AREA Lost		
Loss	**Habitat Type**	**Description**	**2012 SoCG**	**2022 sHRA**	**Notes**
Direct - reclamation to construct quay	1130	Estuaries	13.5	10.4	Within the reclamation site. The set back berth has reduced the area of subtidal loss
	1140/ 1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	31.5	31.3	Accretion has increased the area of intertidal habitat and resulted in saltmarsh development
	1330	Saltmarsh	0	1.9	
Indirect functional loss through disturbance	1140/ 1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	11.6	7.7	To the south of the reclamation site - potentially disturbed by operational activity on the quay following completion of construction (275m disturbance zone)
	1330	Saltmarsh	0	4.7	New loss of this community as has recently colonised this area.

(5) [1] AMEP Quay Change UES HRA Report

			AREA Lost		
Loss	**Habitat Type**	**Description**	**2012 SoCG**	**2022 sHRA**	**Notes**
Compensation Area Changes	1330	Saltmarsh	2.0	2.0	At Cherry Cobb Sands to form the channel across the foreshore from the existing flood defence to Cherry Cobb Sands Creek - this habitat would become mudflat offsetting the loss of Habitat type 1140.

Table 3: Reproduced from 2022 sHRA, Part 2, Table 11.

1.2.3 The 2022 sHRA also updated the assessment of bird species adversely affected by the loss of habitat using 2015 to 2019 WeBS data and three sets of TTTCs undertaken in 2017/18, 2018/19 and 2019/20. The re-assessment concluded an adverse effect,

'for all eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, redshank and shelduck) and for the six wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal) for which LSE was identified, though direct loss of estuarine habitat (including intertidal mud, saltmarsh and sub-tidal), and through indirect functional loss as a result of disturbance', (2022 sHRA, Part 2 paragraph 8.27).

1.2.4 Relevantly, the significant species from the bird assemblage in 2012 remained the same except for the addition of Knot. This species was recorded using the NKHP in higher numbers from 2019/20, with the most recent five-year mean annual peak of 300 representing 1.3% of the Humber SPA population over the same period. Much lower numbers were recorded using the NKM foreshore sector (peak 67 in the November 2017 JBA survey).

1.2.5 The revised numbers of birds adversely affected by the loss of, or disturbance to, SAC habitat are listed in Table 4 below (extracted from the 2022 sHRA Part 2 Table 1).

Species	Peak Count 2012*	Updated Peak Count (Year)**	Updated %
Avocet	4	251 (2019/20)	10.1 (+9.3)
Black-tailed godwit (BTG)	2566	2183 (2019/20)	48.0 (-18.0)
Bar- tailed godwit	123	14 (2019/20)	2.4 (+0.3)
Curlew	158	136 (2017/18)	5.1 (+1.5)
Dunlin	1029	680 (2018/19)	4.3 (-0.5)
Knot	4	67 (2017/18)	0.4 (+0.4)
Lapwing	325	2 374 (2018/19)	14.4 (+12.7)
Mallard	71	22 (2018/19)	4.3 (+0.9)
Marsh Harrier	1	0	N/A
Redshank	540	806 (2017/18)	28 (+18.1)
Ringed Plover	210	39 (2017/18)	9.3 (-0.4)
Shelduck	109	168 (2017/18)	3.7 (+1.7)
Shoveler	11	53 (2015/19)	24.7 (+17.1)
Teal	46	1466 (2021)	39.6 (+38)

* Extracted from Table 5.1, of the 2011 sHRA
** Extracted from Table 1 of the 2022 sHRA: Part2
Red Text indicates WeBS mean Peak count for the period

Notes on percentages:
1. The 2012 % is explained in the Footnote to Table 1 of this document.
2. The updated % peak no. is the maximum count recorded at NKM since 2012 as a percentage of the WeBS mean annual peak Humber population for the species over the 5 year period 2015/16 to 2019/20.
3. Red Shading indicates a % that has reduced by >10%.
4. Green Shading indicates a % that has increased by >10%.

Table 4: Comparison of Bird No.'s on NKM Foreshore (2012 v 2022)

1.2.6 Peak numbers will vary for natural reasons, unrelated to the Humber Estuary, from year to year and changes of less than 10% either way are not considered noteworthy. The potentially significant changes since 2012 were therefore for Teal, Redshank, Lapwing, Shoveler and Black-tailed godwit. The increase in Teal is most likely attributable to the increased area of saltmarsh on the NKM foreshore which the species graze. The increase in Lapwing is most likely attributable to natural variation given the bird is widely distributed within the Humber and will use the intertidal areas opportunistically for roosting and loafing. The increase in Redshank is related to a single count in October 2017 that is an outlier in comparison to all other data for the species. The increased peak number of Shoveler recorded in

2015/19 WeBS counts was impersistent. Notably, the species wasn't recorded in any of the later TTTC counts conducted on the NKM foreshore in 2018/19 or 2019/20. The lower peak number of BTG present on the foreshore still represented a very significant proportion of the Humber population. BTG remained the species most impacted by the Project.

1.2.7 It is worth repeating that the precise number of birds present on the foreshore is not, per se, a factor in determining the area of habitat to be replicated. If the habitat is replicated, then the bird carrying capacity of the habitat will also be replicated. Pre-construction surveys undertaken immediately before the habitat is lost will inform the habitat, benthos and faunal targets for the compensation measures which the Applicant will compare to monitoring data to be collected once the compensation measures are constructed.

1.2.8 Natural England agreed with the Applicant's updated assessment noting in a Statement of Common Ground (2022 SoCG1) that:

'*3.9* ***NE is satisfied that the compensatory habitat at Cherry Cobb Sands will remain adequate****. The parties agree that accurate tables relating to Habitat Losses are included in updated Environment Statement (UES) Appendix UES11-2 (APP-137). NE notes that the immediate habitat losses have been included in the Part 2 of the shadow Habitats Regulations Assessment (sHRA), Table 11. NE is satisfied that UES11-2 has been updated with information on medium and long term changes as detailed in the original sHRA, and that the rationale for focussing on short-term impacts has been explained in the updated HRA. The Applicant has also clarified how figures for habitat change have been calculated, including for functional loss',* (emphasis added).

1.2.9 On 18 July 2022, the Secretary of State (SoS) for Transport approved a Material Change (MC) to the AMEP development Consent Order. The SoS undertook a new HRA[2] of the scheme (the 2022 HRA) which updated the Impacts of the Project and concluded with respect to the compensatory measures that:

'*the ExB notes that the compensation scheme has not been altered, despite a slight reduction in the extent of effects. The ExB is therefore content that, as stated in the Applicant's Overall Summary of Case [REP6-002], there would be a slightly greater ratio of compensatory habitat being provided to that being lost, when compared to the AMEP DCO. The ExB has concluded that the Proposed Changes would not materially change the outcomes of the original assessment, and most importantly, would not result in additional adverse effects. The ExB therefore considers that the derogations case for the AMEP DCO can be relied upon for the Proposed Changes.*

Having given due consideration to the information presented to him, the Secretary of State agrees with the position of the Applicant / the advice of NE / other key stakeholders / the recommendations of the ExB. The Secretary of State concludes that sufficient legal and technical arrangements are in place to secure that the ***compensation package as proposed is***

(6) [1]MC2 SoCG with NE

(7) [2] MC2 HRA

appropriate *and guaranteed to be implemented under the AMEP DCO, and that secure and binding plans are in place to deliver and manage the measures on an ongoing basis',* (emphasis added).

1.3 REVIEW OF THE COMPENSATION PROPOSALS FOR THE 7-YEAR EXTENSION

SAC Habitats

1.3.1 Part 2 of this sHRA (the 2025 sHRA) further updates the impacts of AMEP on SAC habitats and SPA/Ramsar species. The updated assessment of habitats impacted by AMEP is summarised in Table 5 below, alongside the previous assessments.

Loss	Habitat Type	Description	Area (2012 SoCG)	Area (2022 sHRA)	Area (2024 sHRA)	Notes
Direct - reclamation to construct quay	1130	Estuaries	13.5	10.4	10.4	No change since MC2
	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	31.5	31.3	29.8	Conversion of 1.5ha of mudflat to saltmarsh between 2022 and 2024.
	1330	Saltmarsh	0	1.9	3.4	
Indirect functional loss through disturbance	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	11.6	7.7	7.2	Conversion of 0.5ha of mudflat to saltmarsh between 2022 and 2024.
	1330	Saltmarsh	0	4.7	5.2	
Compensation Area Changes	1330	Saltmarsh	2.0	2.0	2.0	At Cherry Cobb Sands to form the channel across the foreshore from the existing flood defence to Cherry Cobb Sands Creek - this habitat would become mudflat offsetting the loss of Habitat type 1140. Area increased from 1.8 to 2ha in SoCG.

Table 5: Data from 2025 sHRA:Part 2: Table 21

1.3.2 There are minor changes to the composition of the habitat impacted since 2022 which are attributable to the ongoing accretion of the foreshore. The changes make no material difference to the compensation measures already agreed. In broad terms less mudflat and more saltmarsh will be lost or disturbed. No reduction in mudflat is proposed in the MR/RTE compensation site, so by inspection the mudflat provision remains adequate. With respect to saltmarsh, the MR part of the compensation site will still develop far more saltmarsh (up to 26ha) than is being lost at North Killingholme and Cherry Cobb Sands combined (10.6ha). Given the agreed compensation ratio for

this habitat is 1:1 (UES11-2[1], Section 4), then the compensation provision remain adequate for saltmarsh as well

1.3.3 Part 2 of the 2025 sHRA provides more up to date bird survey data. For ease of reference the key peak counts are reproduced in Table 6 below alongside the original 2012 baseline.

Species	**Peak Count 2012***	**Updated Peak Count (Year)****	**Updated %**
Avocet	4	341 (2023/24)	14.3 (+9.8)
Black-tailed godwit (BTG)	2566	3313 (2022/23)	52.2 (-13.8)
Bar- tailed godwit	123	14 (2019/20)	2.4 (+0.3)
Curlew	158	163 (2023/24)	7.1 (+3.5)
Dunlin	1029	680 (2018/19)	4.3 (-0.5)
Knot	4	67 (2017/18)	0.4 (+0.4)
Lapwing	325	2 374 (2018/19)	14.4 (+12.7)
Mallard	71	81 (2018/22)	6.6 (+3.2)
Marsh Harrier	1	0	N/A
Redshank	540	806 (2017/18)	28 (+18.1)
Ringed Plover	210	39 (2017/18)	9.3 (-0.4)
Shelduck	109	168 (2017/18)	3.7 (+1.7)
Shoveler	11	53 (2018/22)	24.7 (+17.1)
Teal	46	2810 (2023/24)	49.2 (+47.6)

* Extracted from Table 5.1, of the 2011 sHRA
** Extracted from Part 2:Table 1 of the 2025 sHRA
Red text indicates the WeBS mean peak for the 5 year period indicted

Notes on percentages:
1. The 2012 % is explained in the Footnote to Table 1 of this document.
2. The updated % peak no. is the maximum count recorded at NKM since 2012 as a percentage of the WeBS mean annual peak Humber population for the species over the 5 year period 2018/19 to 2022/23.
3. Red Shading indicates a % that has reduced by >10%.
4. Green Shading indicates a % that has increased by >10%.

Table 6: Comparison of Bird No.'s on NKM Foreshore (2012 v 2024)

(8) [1]

1.3.4 Comparison between Table 4 and Table 6 shows that the changes from the original 2012 baseline is similar to the changes reported in the MC2 application and the assemblage has remained similar to the assemblage present in 2012 and 2022.

1.3.5 It is reiterated. that as the objective of the compensation measures is to replicate the habitat lost and disturbed, then the bird carrying capacity of the compensation site will be adequate to support whatever birds are present on North Killingholme Marshes at the time it is lost or subject to disturbance. Accordingly, the compensation measures remain adequate.

1.4 FUNCTIONALITY OF THE MR/RTE SITE FOR SPA SPECIES

1.2.3 1.4.1 There is no change to the functionality of the agreed compensation measures. In short, there is likely to be a reduction in the levels of disturbance at the existing intertidal mudflats at Cherry Cobb Sands in the immediate vicinity of the compensation site due to the permanent re-alignment of the coastal footpath adjacent to the compensation site. The path will be re-aligned landward of the new flood defence, and level with the base of the embankment wall. This will remove a source of disturbance to birds. Bird hides will be created along the new embankment to facilitate views across the mudflats whilst avoiding disturbance to birds. Had the footpath been diverted across the top of the new flood defence, the disturbance effect of walkers would have reduced the functional value of the new habitat to the SPA assemblage ~~and a greater amount of productive farmland would have been lost~~.

1.2.4 1.4.2 Any regrading work on the compensation site will be undertaken prior to the breach being created in the existing flood defence wall. Hence any construction work will be undertaken behind the existing flood defence embankments. This will provide screening for birds on the foreshore, shielding them from possible visual disturbance from the construction workforce and from construction noise~~, and no piling will be required~~.

1.2.5 1.4.3 It is possible ~~therefore~~ that the existing mudflats at Cherry Cobb Sands adjacent to the compensation site may be able to accommodate more bird-days with this reduction in disturbance. This would provide an additional area in which birds displaced from Killingholme Marshes foreshore, and particularly those which are more restricted to intertidal mudflats could forage in the short term whilst the compensation site matures.

1.2.6 1.4.4 The creation of the compensation site will displace wetland birds which currently use these fields predominantly at high tide. There are a number of reasons why the creation of the compensation site and the displacement of the birds from the existing arable fields are not predicted to result in an adverse effect on the European site. These are listed below.

- The compensation site will comprise new intertidal habitat, its creation will simply move the field /estuary interface inland a field. Hence arable fields would still be available adjacent to the estuary. In addition, arable fields similar to those lost will be readily accessible over a wide area in this location.

- The fields which would be available for the birds are of a similar type and size to those which would be lost~~,~~ and are subject to similar land management. Hence it is considered likely that the food resource and availability will be similar. There is also no indication of any wide scale change in land use / management in this area which might restrict the opportunities for birds to find suitable fields.

- Whilst the immediate fields are closer to areas of habitation, the buildings are largely screened by shelterbelts, and hence it not envisaged that there will be significant additional risk of disturbance from people around these properties. The footpath which currently runs along the edge of the estuary will be diverted between the new embankment and Cherry Cobb

Sands Road. The influence of Cherry Cobb Sands Road is not considered to be any greater than at present.

- The extent of shooting and use of bird scarers in this area is uncertain, however, it is considered unlikely that the magnitude of such risks will be any greater on the fields available in the future compared with the ones they currently use.

~~*Additional Compensatory Measures*~~

~~1.3~~1.5 ADDITIONAL COMPENSATORY MEASURES

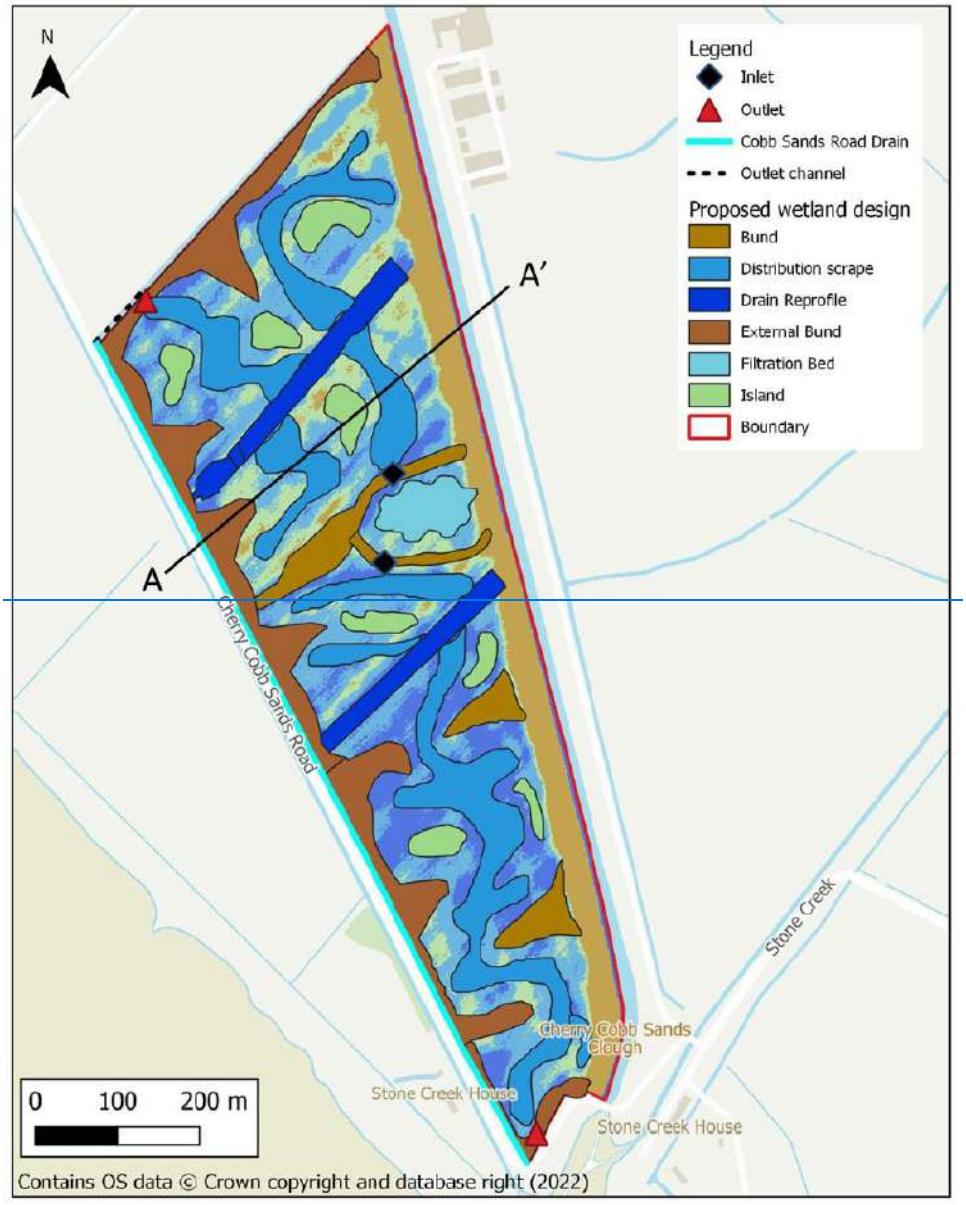
~~1.3.1~~1.5.1 As there will be a time lag between the loss of the habitat on Killingholme Marshes foreshore and the creation of replacement functional habitat, additional compensation measures are ~~proposed~~included to reduce the impact of the time lag. Specifically, two grassland sites will be developed and managed to provide enhanced feeding and roosting areas for species impacted by the loss of feeding habitat on the ~~Killingholme Marshes~~NKM foreshore.

Cherry Cobb Sands ~~Wet Grassland~~***Lagoons***

~~1.3.2~~1.5.2 An area of 38.5 ha of existing agricultural land adjacent to the compensation site will be converted ~~to wet grassland.~~brackish lagoons. The Applicant originally obtained planning permission in 2013 from East Riding of Yorkshire Council (ERYC) (planning reference DC/12/04154/STPLF/STRAT) ~~—~~for a wet grassland scheme. However, following consultation with Natural England and RSPB, an amended scheme was submitted to ERYC for planning approval in April 2023 (planning reference 23/01384/STP). ~~Despite the passage of time ERYC has not determined the application to date but there appears to be no overriding barrier to ERYC determining the application~~Planning consent was granted on 1 November 2024. A schematic plan of the proposal is shown in Figure 2 below.

~~1.3.3 A schematic plan of the proposal is shown in Figure 1.2 below. Further details of the design are provided in the Design Report submitted to ERYC as part of the application (JBA Consulting Report Template 2015 (eastriding.gov.uk)).~~

Figure 1.2 AMEP Additional Compensation Site – Cherry Cobb Sands Wet Grassland



1.3.4 Black-tailed godwit is the species most adversely affected by the loss of estuarine habitat due to AMEP, and hence the compensation requirements have focused particularly on this species. Evidence of black-tailed godwits feeding on grassland fields comes from a variety of sources including:

- at Clonakilty Bay in County Cork, the birds spend part of their time inland foraging on grassland fields from November onwards, supplementing the food obtained from the estuary mudflats (Hutchinson & O'Halloran, 1994[11];

(1) [11] Hutchinson C D & O'Halloran J (1994) The Ecology of Black-tailed Godwits at an Irish South Coast Estuary. *Irish Birds* 5: 165-172

- ~~the Irish Callows, where supplementary feeding was recorded on grassland fields (pers comm J Gill, 2011); and~~

- ~~at Poole harbour where terrestrial fields were considered of vital importance for shorebirds such as black tailed godwit (Durell et al, 2006).~~

~~1.3.5~~ ~~The fields are located in an area which is readily accessible by birds from the estuary. Whilst information about shooting in this area is uncertain, it is considered unlikely that the magnitude of such risks will be any greater than at present.~~

Halton Marshes Wet Grassland

~~1.3.6~~1.5.3 In 2017, planning permission was obtained from North Lincolnshire for the creation of ecological habitat, mainly comprising wet grassland, on East Halton Marshes. The site was developed in 2018/19 (see Figure 3 below) and has been managed and ~~maintained~~monitored in accordance with ~~a plan~~the Terrestrial EMMP approved by Natural England ~~(see Section 1.5 below).~~pursuant to Schedule 11 paragraph 19(3) of the AMEP DCO. Monthly monitoring of over-wintering birds shows the site as a whole is already achieving its target numbers of curlew and supporting significant numbers of other SPA species. ~~The~~

Figure ~~1.~~2 AMEP Additional Compensation Site - Cherry Cobb Sands Wet Grassland

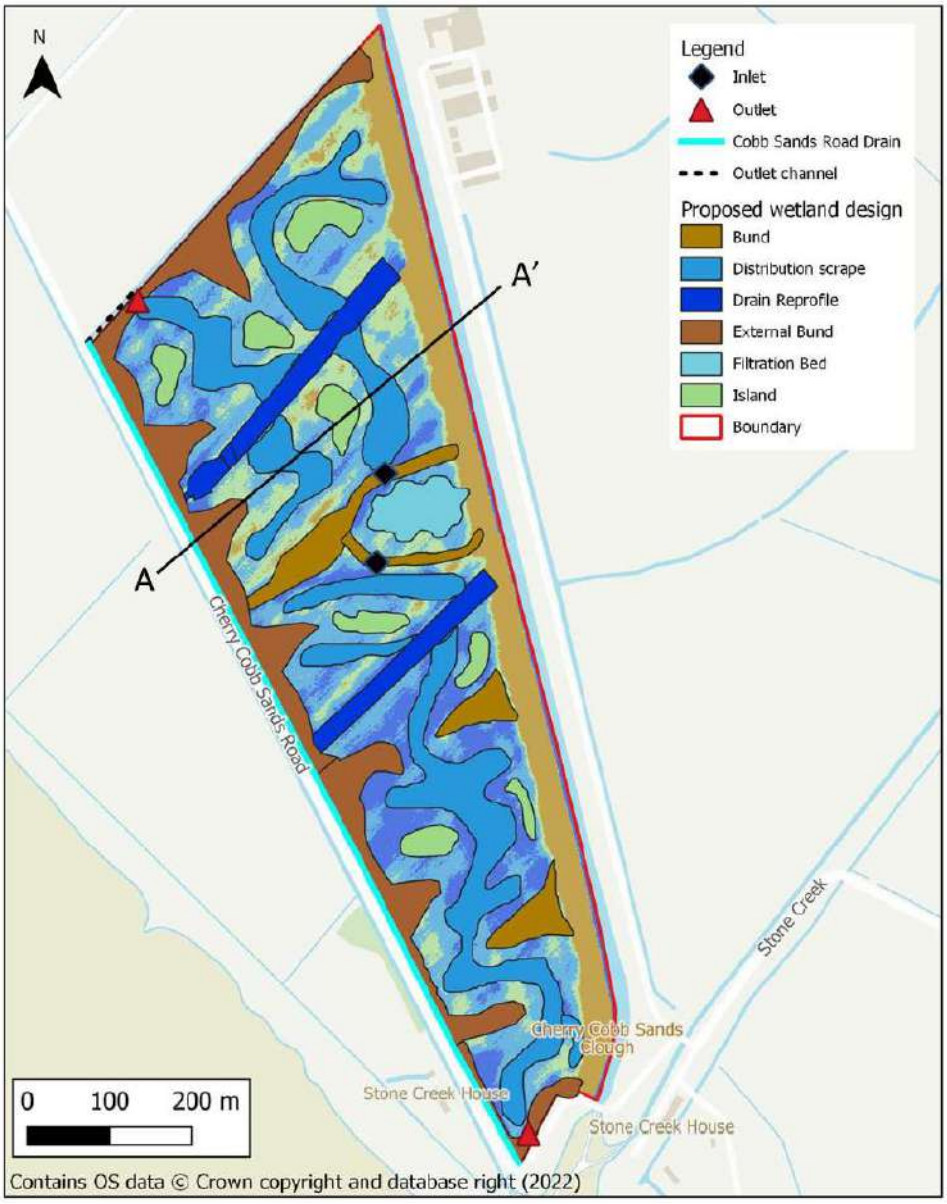
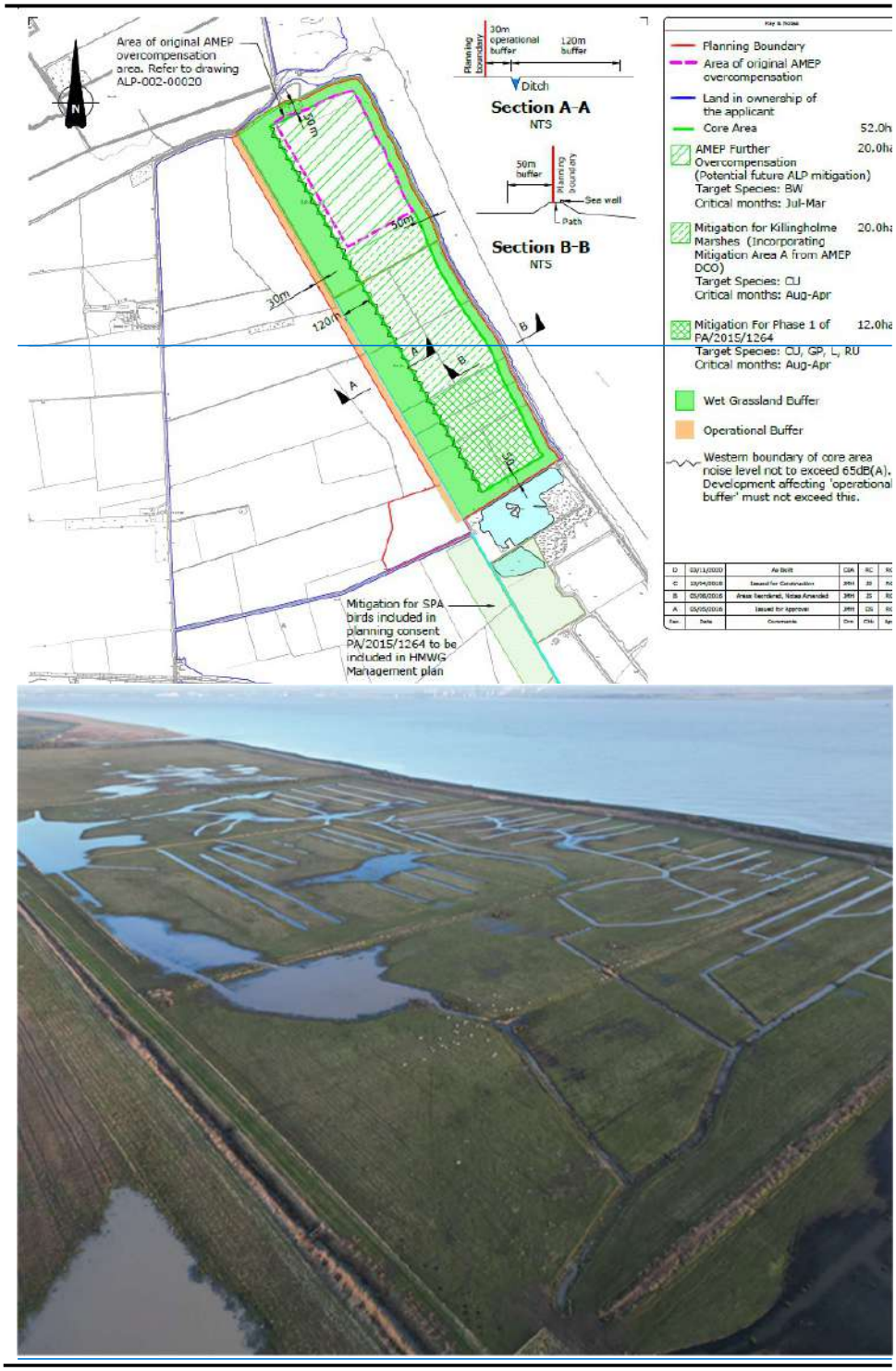


Figure 3 AMEP Additional Compensation Site - Cherry Cobb Sands Wet Grassland



~~1.4 TIME LAG~~

1.6 TIME LAG

1.4.1 1.6.1 The risk that there will be time lag between the loss of functional habitat and the creation of new habitat was fully considered in the original HRA which stated the following:

'39. The Secretary of State considers that in relation to the time lag between the commencement of the AMEP development and the compensation site becoming fully functional, the applicant has taken reasonable steps to limit the time delay and has agreed in recognition of the delay to provide additional compensation at East Halton Marshes - albeit that this may not be of significant value for the birds displaced by the development. He notes also that further reduction of the risk would be possible by starting work on the Cherry Cobb Sands Wet Grassland Site earlier. The Secretary of State has considered the representations of the RSPB on this matter, but continues to agree with the Panel's opinion that EU and Defra guidance on compensatory measures "allow for a possible time lag, although obviously they will not encourage if'(PR 10.187). He is satisfied that in this instance there is sufficient assurance that the applicant's compensatory measures will in time become fully functioning replacement for the habitat that will be lost, and that all the necessary arrangements are in place to ensure that the measures will proceed and be maintained as agreed.'

1.5 ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS (EMMPS)

1.5.1 1.7.1 Schedule 11 paragraphs 19(1) to 19(3) require three EMMPs to be approved: a Compensation EMMP and a Terrestrial EMMP to be approved by Natural England, and a Marine EMMP to be approved by the Marine Management Organisation. A version of each EMMP has been approved since the DCO came into force. The Compensation EMMP which addresses all the proposals at Cherry Cobb Sands will need to be amended once the new proposals for wet grassland are approved by ERYChas been drafted and issued to NE for approval.

1.6 CONCLUSIONS

1.8 CONCLUSIONS

1.6.1 1.8.1 The AMEP proposals include for compensatory habitat in the form of intertidal habitat (c.100 ha adjacent to Cherry Cobb Sands),) and wetsupporting lagoons and grassland on inland fields (38.5 ha at Cherry Cobb Sands and 38ha at East Halton Marsh). The wet grasslandsupplementary measures will provide supplementary foraging habitat in the short term, whilst the intertidal habitat is developing. –The time over which the grassland issupplementary measures are required as compensation will be subject to the findings of bird monitoring, and discussions of these findings with NE and the wider Environmental Steering Group.

1.6.2 1.8.2 Additional benefits will be provided through the realignment of the existing coastal footpath inland of the new Compensation Site, behind the embankment. –This will result in a reduction in the risk of disturbance to

birds on the existing intertidal mudflats at Cherry Cobb Sands~~,~~ and may therefore facilitate its use by a greater number of waterfowl species.

~~1.6.3~~ The locations and areas of these compensation measures have been previously accepted by NE as suitable compensation for the effects of the AMEP development.

1.8.3

ATTACHMENT 2 - UPDATE TO APPENDIX UES11-2

(New document)

ABLE MARINE ENERGY PARK DCO EXTENSION

CHANGE IN HABITAT LOSSES WITHIN THE DESIGNATED SITE

2025 UPDATE TO APPENDIX UES11-2

March 2025
Revision: 02
Able UK Ltd

APPROVAL & REVISION REGISTER

	NAME	SIGNATURE	DATE
Originator:	R Cram	RMC	
Checked by:	S Percival	SP	
Approved by:	R. Cram	RMC	

REVISION	COMMENTS	DATE
01	Draft for Review	18-12-24
02	Table of losses updated	25-3-25

CONTENTS

APPENDICES

ANNEX 1 – *Saltmarsh Extent Survey, North Killingholme Marshes'*, Thomson Ecology, March 2021

ANNEX 2 – Drawing: AME – 06077F Habitat Impacts

1 PURPOSE OF DOCUMENT

1.1.1 This document updates Appendix UES 11-2 of the Updated Environmental Statement submitted as part of the application for a Material Change to the Able Marine Energy Park DCO. The original document is available here: Microsoft Word - 1.0.13 Updated version of UES 11-2 Cover Sheet

2 INTRODUCTION

2.1.1 The Humber Estuary is a designated Special Protection Area (SPA), Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI) and Ramsar site. Development of the Able Marine Energy Park (AMEP) includes the reclamation of a significant area of intertidal mudflat, saltmarsh and subtidal habitat within these designated sites. Compensation for the loss of habitat was assessed at the time of the original DCO application in 2011, and compensatory habitat is provided for within the AMEP DCO. Acceptance of the compensation provision is set out in the original Habitats Regulations Assessment (HRA) by the Secretary of State for Transport[1] in 2014. The HRA was subsequently updated in July 2022[2] as part of the process for determining Material Change 2 (MC2) of the DCO. The overall extent of subtidal habitat loss reduced slightly with Material Change 2 due to a change in the quay layout which reduced the loss of subtidal habitat.

2.1.2 The Humber Estuary is a dynamic environment, and at the time of the DCO application, it was plain that the Killingholme Marshes foreshore was accreting and that this would result in some mudflat habitat 'naturally' converting to saltmarsh over time. This was specifically mentioned by the Examining Authority in the '*Panel's Findings and Recommendations to the Secretary of State*'[3], (21 February 2013, 'the Panel's Report'). In brief, the Panel stated that:

> *'The Panel's assessment of the implications of the proposed NSIP on the Humber Estuary SPA is taken against the following factual background –*
> *..*
> *7. That conditions favourable to the formation of extensive areas of very gently sloping inter-tidal mudflat at the North Killingholme Marshes have been reinforced by the creation of the Immingham Outer Harbour* [this should read Humber International Terminal] *but that the general pattern is that accreting shorelines will develop into salt marsh as has happened observably at Cherry Cobb Sands and in some locations on the Killingholme shore adjacent to the floodwall',* (paragraph 10.79).

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002225-SoS%20Decision%20letter%20with%20annexes.pdf
[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000531-TR030006%20-%20HRA%20Report.pdf
[3] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002249-The%20Able%20Marine%20Energy%20Park%20Order%20201X%20Panel's%20Findings%20and%20Recommendations%20with%20Appendices.zip

2.1.3 This process meant that by the time of MC2 , slightly more saltmarsh was lost due to AMEP with an equivalent reduction in mudflat loss, when compared to 2012. Nevertheless, it was agreed with NE that the compensation scheme remained fit for purpose in the context of MC2.

2.1.4 The extent and composition of saltmarsh within the AMEP reclamation area, is detailed in a saltmarsh survey undertaken in June 2020 by Thomson Ecology. This was submitted as part of the Material Change 2 application and can be accessed in three parts here:

TR030006-000163-TR030006-APP-6A-10-1A.pdf

TR030006-000164-TR030006-APP-6A-10-1B.pdf

TR030006-000159-TR030006-APP-6A-10-1C.pdf

2.1.5 A supplemental survey of saltmarsh extent to the south of the reclamation, (covering the 275m disturbance buffer) was undertaken in March 2021, also by Thomson Ecology. This is included in Annex 1.

2.1.6 The conversion of the Killingholme foreshore from mudflat to saltmarsh is continuing, refer to Figure 1 below.

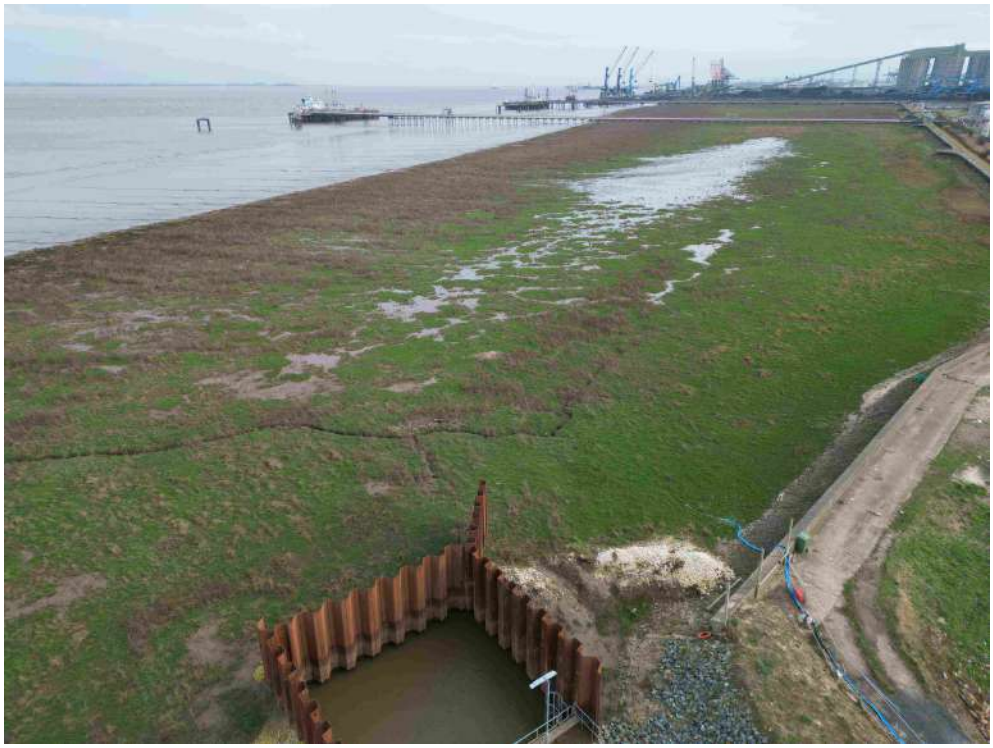


Figure 1: Conversion of former Mudflat to Saltmarsh between HIT and AMEP, Feb 2024.

2.1.7 To update the 2020 assessment of saltmarsh extent on the North Killingholme foreshore, aerial photography has been used. The changes are illustrated in Drawing AME—6077 F, included in Annex 2.

2.1.8 Aerial imagery provides the requisite level of accuracy given the fact that the process of change is fully understood. Taking this new data into account a revised assessment of the immediate habitat losses consequential to the construction of the quay and associated development, including the changes proposed to the quay, is tabulated below.

DESCRIPTION OF WORKS	HABITAT TYPE	AREA (ha)	DESCRIPTION OF HABITAT	ASSOCIATED DOCUMENTS
Reclamation Area (Intertidal)  **Intertidal Area October2024**	1140/ 1310 1330	**29.8** **3.4**	**Direct loss**, through reclamation, of mudflats and sandflats not covered by seawater at low tide. Mudflat with Pioneer Saltmarsh Atlantic Salt Meadow (Saltmarsh)	Drawing AME-06077F, *Habitat Impacts*, Annex 2.
Reclamation Area (Subtidal)	1130	**10.4**	**Direct loss**, through reclamation, of Estuary habitat	Drawing AME-06077F, *Habitat Impacts*, Annex 2.
Functional Loss due to Operational Disturbance	1140/ 1310 1330	7.2 5.2	**Indirect loss**, through disturbance, of mudflats and sandflats not covered by seawater at low tide Mudflat with Pioneer Saltmarsh Saltmarsh	Drawing AME-06077F, *Habitat Impacts,* Annex 2
Flood Defence Breach Area	1330	**2.0**	**Saltmarsh converted to mudflat** due to construction of a channel	Drawing AME-06077F, *Habitat Impacts*, Annex 2.

3 SUMMARY

3.1.1 The immediate effects of habitat loss are summarised below for the scheme consented in 2014, the modified scheme consented in 2022 and the scheme at the present time given ongoing habitat changes.

Habitat Type	Habitat Loss Agreed with NE in 2012[1] (ha)	Habitat Loss 2021 (ha) UES11-2	Habitat Loss 2024 (ha) (Annex 2)
1130	13.5	10.4	10.4
1140/1310[2]	43.1	39	37
1330	2	8.6	10.6

[1]Original HRA, paragraph 6
[2] All Treated as mudflat for the purposes of compensation provision.

4 COMPENSATION

4.1.1 At the time of the original application the applicant proposed to create a 101.5ha managed realignment site at Cherry Cobb Sands, and the details were described in the contemporaneous SoCG[4] between AHPL, NE and MMO as:

'Provision of new estuarine habitat at a ratio of 1:1 through a managed realignment / Regulated Tidal Exchange (RTE) scheme at CCS. Sub-tidal loss (part of the estuary feature) will be replaced with estuarine habitat', and

'Provision of new intertidal mudflat based on an overcompensation target ratio of 2:1 (based on permanent direct loss and permanent functional loss for birds). The current design proposals demonstrate that the site could provide an initial area of c86 ha of which c66 ha remains after 5 years and c57 ha after 10 years (which >1:1) … Options for increasing the area of mudflat and for maintaining more of it in the longer term are the subject of ongoing discussions', (SoCG, Table 5.1).

4.1.2 At the time, the outline design of the compensation site was being actively developed and Natural England did not agree particular proposals within the SoCG, but did confirm the following:

It will be necessary to provide a compensatory ratio of at least 2:1 for the loss of intertidal mudflat, and a ratio of 1:1 for the loss of estuary (subtidal) habitat. (SoCG, paragraph 5.1.2).

4.1.3 Following extensive design development of the compensation scheme during the DCO Hearings, the Applicant proposed to create a more engineered proposal comprising four 18ha fields with water levels managed by significant

[4] TR030001-001606-SOCG009 TR030001 Able Humber Ports Ltd Statement of Common Ground with Natural England and the Marine Management Organisation.pdf

hydraulic structures together with a smaller managed realignment site of around 30ha that would develop as estuarine habitat.

4.1.4 Following the Secretary of State's '*minded to approve'* letter to the Applicant dated 28 August 2013, Natural England advised the Applicant in correspondence dated 11 October 2013[5] that:

'Able UK has confirmed that the RTE will create c60ha of long-term sustainable mudflat, which will be reduced to c45ha as part of the operational management of the RTE when during neap tide cycles one of the 15ha cells will be impounded. This amounts to a compensation ratio of 1.5:1 (on occasions 1:1) as compared to the 2:1 ratio that was initially proposed by Able UK and agreed by Natural England. Natural England subsequently advised that a ratio of 1:1 is acceptable provided the RTE/MR meets its quality objectives and targets', (underline added).

4.1.5 In the subsequent HRA completed by the Secretary of State prior to issuing his consent for the development to proceed, it is recorded (at paragraph 6) that there would be a direct loss of 31.5ha of inter-tidal mudflat, an additional loss of 11.6ha of functional mudflat habitat, a direct loss of 13.5ha of estuarine habitat (all from Killingholme Marshes foreshore) and a permanent loss of 2ha of saltmarsh from Cherry Cobb Sands due to the breach of the sea wall for the compensation site. The appropriate assessment then recorded Natural England's confirmation that a '*ratio of 1:1* (habitat loss: compensatory habitat) *is acceptable provided that the RTE and Managed Realignment site meets its quality objectives and targets',* (paragraph 38(b)).

4.1.6 A detailed General Arrangement drawing of the compensation scheme is included in Annex 5 of the original document (see paragraph 1.1.1), and this confirms the provision of 72 ha of RTE fields (providing a maximum of 66.7ha of functional habitat, but 50.4ha when one field is impounded), and 30.4ha of estuarine/saltmarsh habitat . Relevantly therefore, and pursuant to the above, the existing compensation proposals remain adequate with the ratio of habitat compensation for mudflat being generally 50.4:37 (or 1.36:1), and the compensation ratio for estuarine and saltmarsh habitat being 30.4:21 (1.44:1). Plainly both ratios exceed the minimum threshold of 1:1.

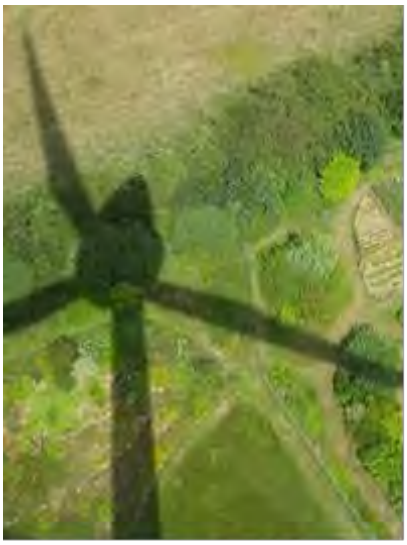
5 COMPENSATION ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN (CEMMP)

5.1.1 Since the AMEP DCO came into force the applicant has agreed the CEMMP for the site with Natural England. Due to changes agreed with Natural England for ecological habitat at the Cherry Cobb Sands terrestrial habitat site, the CEMMP has been revised. An updated CEMMP has been issued to Natural England, but is not yet approved.

[5] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002128-Natural%20England%20%20-%20Submitted%20for%20the%20DfT%20deadline%20of%2015%20November%202013%20.pdf

ANNEX 1

'*Saltmarsh Extent Survey, North Killingholme Marshes'*, Thomson Ecology, March 2021



Saltmarsh Extent Survey
North Killingholme Marshes

For

Able UK

Project No.: NABL114/006

March 2021

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Project Number	Report No.
NABL114/006	001

Revision No.	Date of Issue	Author	Reviewer/Approver
001	30/03/2021	D. Irvine	D. Chamberlain

Contents

1. Introduction

1.1 Background

1.1.1 The Able Marine Energy Park (AMEP) development site is located near Immingham on the southern bank of the Humber Estuary, east of North Killingholme. The AMEP site is situated in an area known as Killingholme Marshes and will partly impact the Humber Estuary Special Protection Area (SPA) / Ramsar site and Special Area of Conservation (SAC).

1.1.2 Consequently, a Marine Environmental Management and Monitoring Plan (MEMMP) for the development was produced that outlines a series of compensation and mitigation measures and monitoring plans. Objective M3 of the MEMMP is to record changes in extent and composition of saltmarsh in the vicinity of the AMEP site.

1.1.3 Previous National Vegetation Classification (NVC) surveys conducted in August 2020 did not cover the entire area of salt marsh specified by the latest version of the MEMMP. As a result, Thomson were contracted to conduct a further survey adjacent to the previous survey site.

1.2 The Brief and Objectives

1.2.1 To determine saltmarsh and mudflat extent within the site boundary shown in Figure 1.

1.2.2 As this survey was to be carried out outside of the optimal period for NVC surveys (May-August), the extent of the saltmarsh was to be mapped but plant species identification was not required.

1.3 Surveyors

1.3.1 The survey was conducted by biologist Dale Irvine MMbiol.

2. Methodology

2.1.1 A walkover survey was conducted on the 16th of March 2021 between 10:00 and 14:00. Low tide was 1.3m at 14:14. The boundary of saltmarsh extent was mapped using ARC Collector on a Toughpad and photographs taken of the site.

3. Results

3.1.1 The survey site was located on the South bank of the Humber estuary, the shore ran roughly Northwest to Southeast (Figure 1). A low seawall ran along the entire length of the site at the top of the shore.

3.1.2 The shore was comprised of a band of saltmarsh starting at the boundary of the seawall and extending around 150m down the shore. The upper shore was covered in dense saltmarsh, represented by green in Figure 2. Below the marsh was an area of bare mudflat represented as brown in Figure 2.

3.1.3 The vegetation was notably less dense in the center of the marsh for around two thirds of the survey area as can be seen in photographs 1-3 in Figure 3. This region was classified as 'scattered plants saltmarsh coastland' and is represented by purple in Figure 2.

3.1.4 A jetty/fuel line ran perpendicular to the shore around 130m from the South-eastern boundary of the survey area, the shore underneath the jetty was completely barren mudflat along the entire length of the jetty. At the boundary of the mudflat and saltmarsh either side of the jetty the vegetation was less dense.

3.1.5 The rest of the shore Southeast of the jetty was evenly covered in dense saltmarsh vegetation represented as green in Figure 2 and can be seen in photograph 4 of Figure 3.

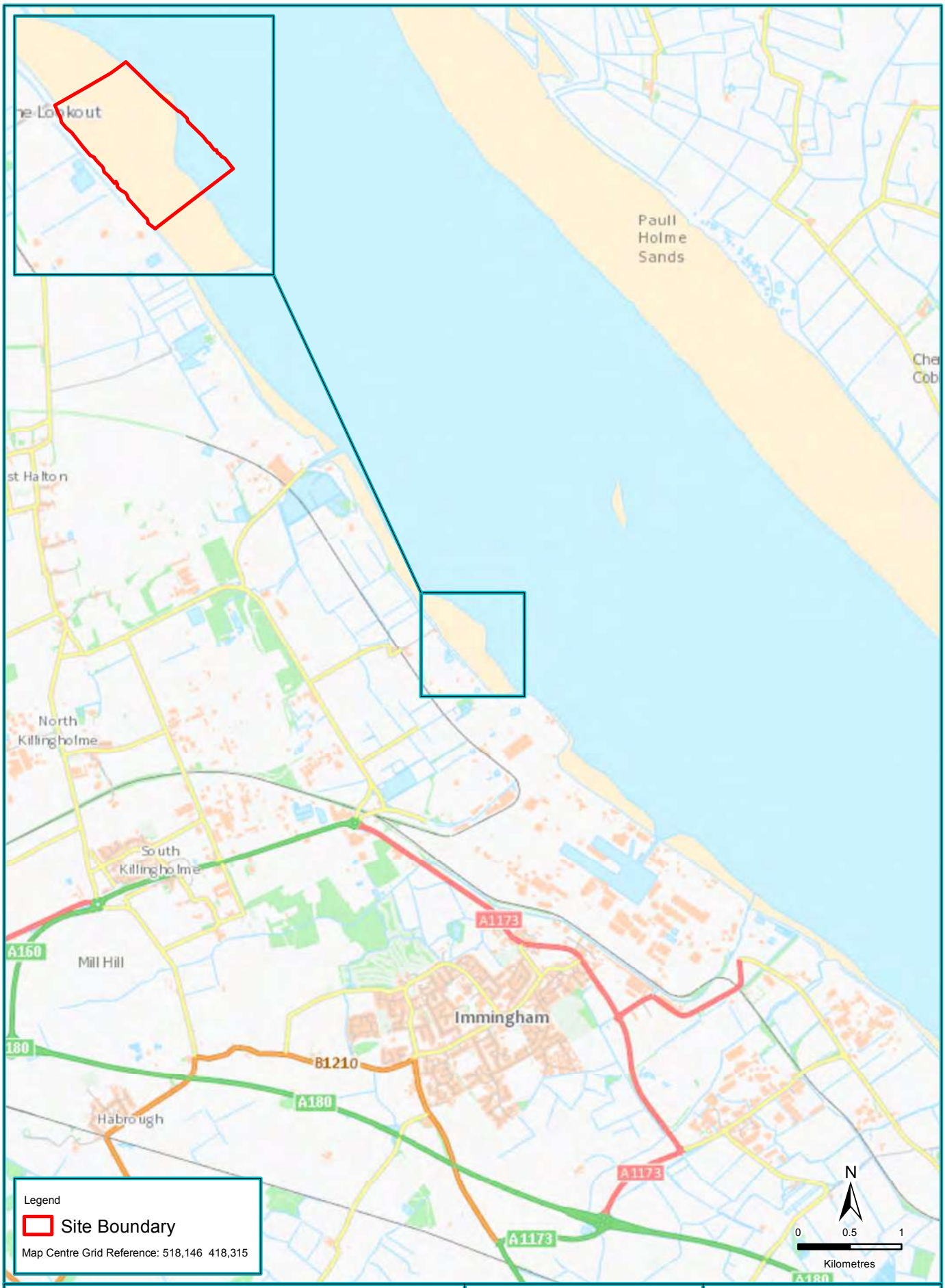

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Figure Number: 1		Scale at A4: 1:50,000	
Figure Title: Site Location		Drawn: LF	Checked: EA
		Date: 23/03/2021	Date: 23/03/2021

Thomson environmental consultants
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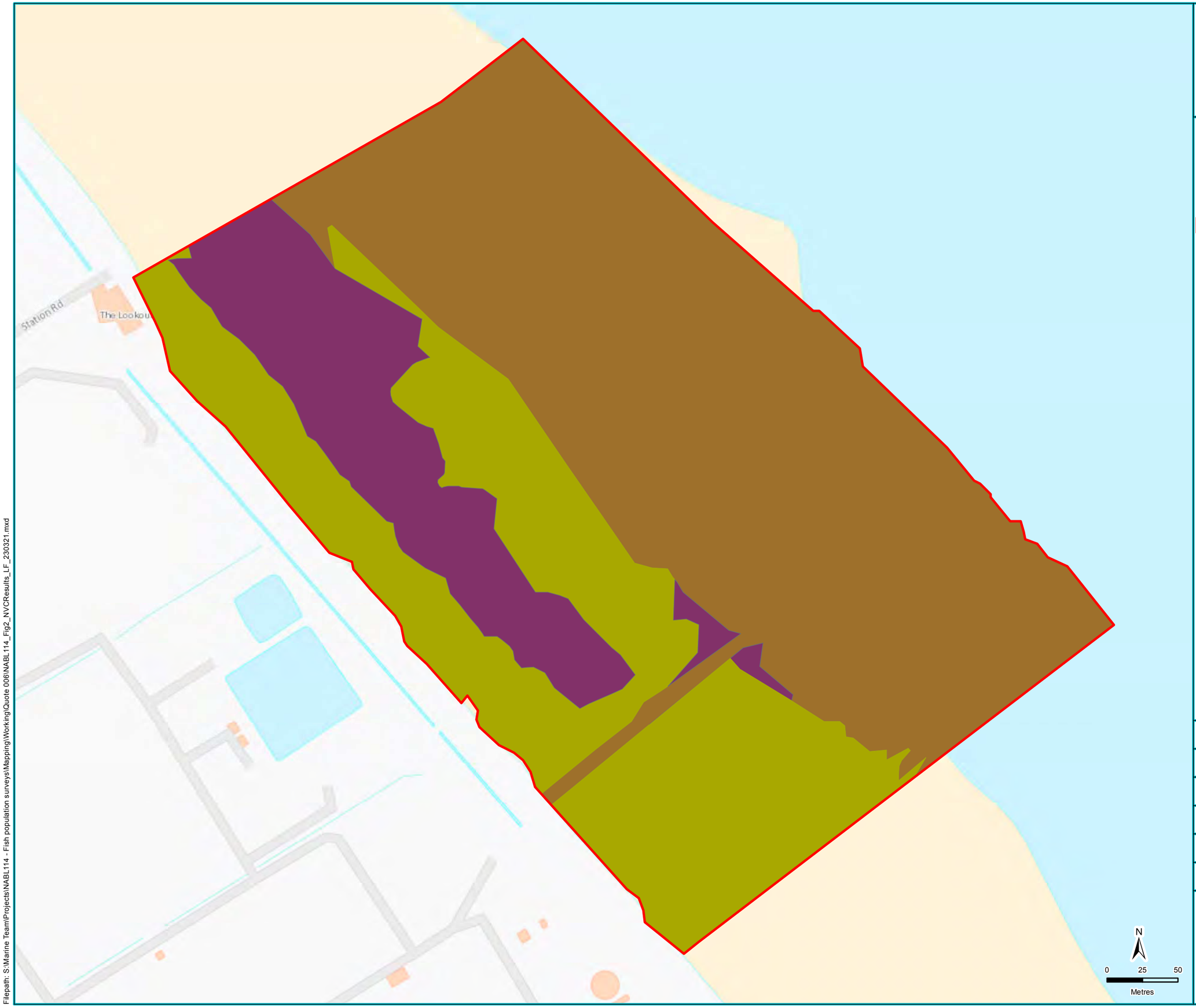

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Legend

- Dense/Continuous Saltmarsh
- Mud Flat
- Scattered Plants Saltmarsh Coastland
- Site Boundary

Map Centre Grid Reference: 518,132 418,310

Drawing Ref	NABL114/31888/1
Scale at A3	1:2,500
Drawn: LF	Checked: EA
Date: 23/03/2021	Date: 23/03/2021
Client	Able UK
Figure Number	2
Figure Title	Survey Results

Filepath: S:\Marine Team\Projects\NABL114 - Fish population surveys\Mapping\Working\Quote 006\NABL114_Fig2_NVCResults_LF_230321.mxd

Photograph 1:

Saltmarsh viewed from the seawall in North-west region of the site looking South-east. Dense Saltmarsh visible in the upper shore and lower shore, with a large region of patchy saltmarsh in the mid shore

Photograph 2:

Saltmarsh viewed from the low-shore in North-west region of the site looking South-east. Patchy saltmarsh visible in the mid shore, dense saltmarsh in the low shore with mud-flat visible at the bottom of the shore

Photograph 3:

Saltmarsh viewed from the low-shore in North-west region of the site looking South-west. Patchy salt-marsh visible in the low shore and dense saltmarsh in the upper shore

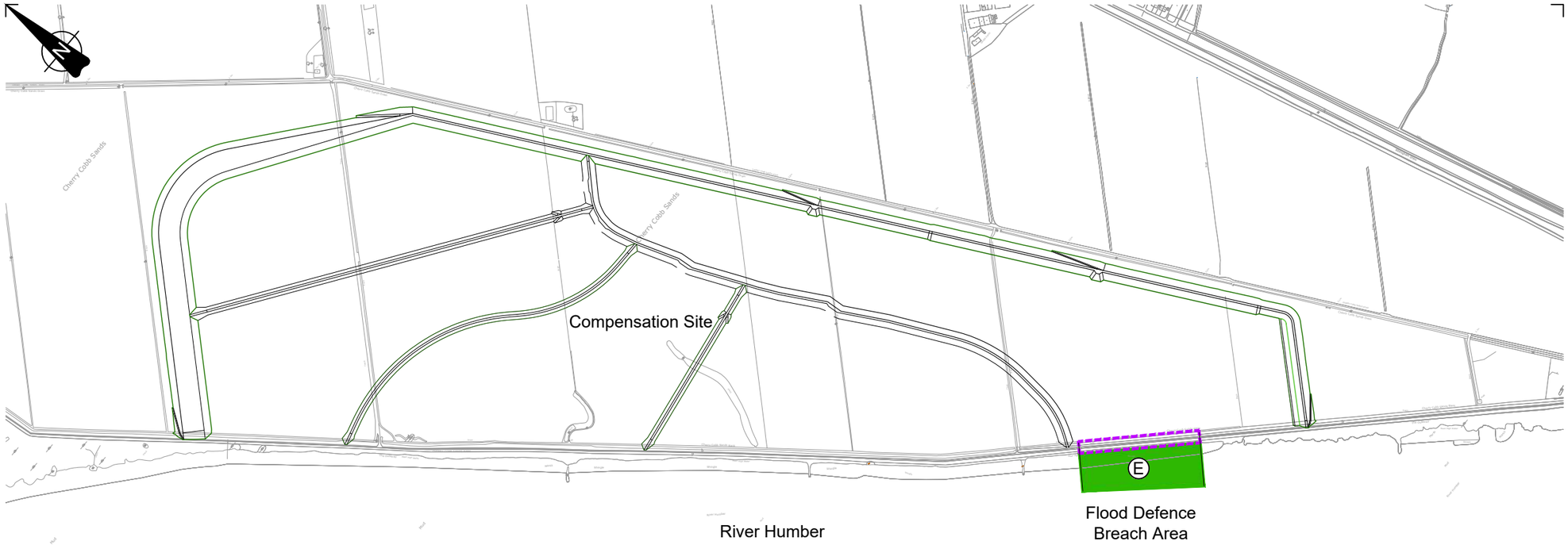
Photograph 4:

Saltmarsh viewed from the seawall south of the jetty. Only dense saltmarsh visible.

Client: Able UK		Drawing Ref: NABL114/006	Thomson environmental consultants
Figure Number: Figure 3.		Drawn: DI / Checked: DC	
Figure Title: Photographs of the Site		Date: 30/03/2021	www.thomsonec.com enquiries@thomsonec.com

ANNEX 2

Drawing: AME – 06077F Habitat Impacts



Break Line

North Bank
Scale 1:10,000

Break Line

Key & Notes

Mudflat / Scattered Saltmarsh (Rev E)

Mudflat	-	261,217m²
SM6 (small stands)	-	43,308m²
Scattered Saltmarsh	-	8,701m²
Total		**313,226m²**
Net Mudflat loss (21-24)		-15,310m²

Saltmarsh (Rev E)

Dense Saltmarsh	-	5,010m²
SM6	-	12,158m²
SM12	-	1,098m²
SM8	-	289m²
SM21	-	88m²
SM4	-	73m²
Total		**19,571m²**
Saltmarsh Gained (21-24)		+15,310m²

B Subtidal Habitat Loss (H1130) - 10.4ha

C **Limit of Operational Disturbance**

Mudflat (H1140)	-	5.5ha
Dense Saltmarsh (H1330)	-	4.7ha
Scattered Saltmarsh (H1310)	-	2.2ha
Total		**12.4ha**
Mudflat Loss (21-24)		-0.5ha
Saltmarsh Gain (21-24)		+0.5ha

Flood Defense

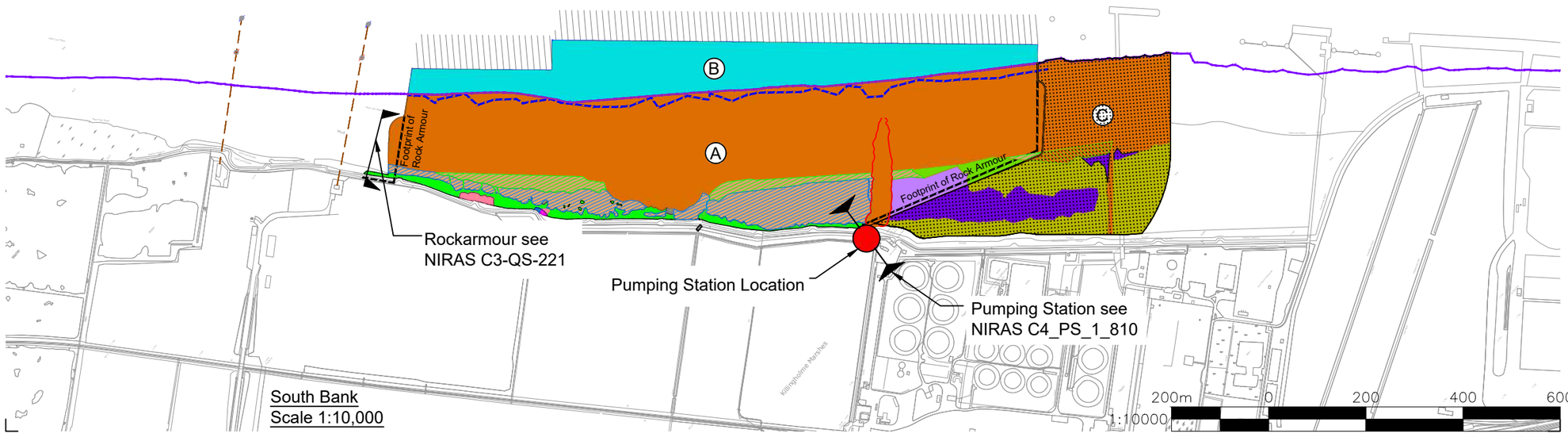
E Breach Area (H1330) - 2ha

Mean Low Water Spring 2020

Mean Low Water Spring 2011

Limit of Operational Boundary

River Humber



South Bank
Scale 1:10,000

Rev.	Date	Comments	Drn	Chk	App
F	10/12/2024	Mudline Amended To October 2024	RH	RC	RC
E	14/12/2021	Key Notes Amended	DJA	RC	RC
D	12/04/2021	Direct Mudflat Loss Amended	DJA	RC	RC
C	01/04/2021	North Bank Compensation Site Amended South Bank Quay Amended	DJA	RC	RC
B	17/05/2012	North Bank Added	RK	JD	RC
A	13/04/2012	Preliminary Issue	JH	RC	RC

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Project: ABLE Marine Energy Park

Client: ABLE UK Ltd

Drawing Title: Habitat Impacts

PRELIMINARY

Scale:	Drawn By	Checked By	Approved By
As Shown @A3	J Harris	R Cram	R Cram
Date:	13/04/2012	13/04/2012	13/04/2012

Drawing No: AME - 06077 Revision: F

ATTACHMENT 3 - DRAFT CEMMP

(Tracked Changes shown from Revision C as previously agreed with Natural England)

COMPENSATION ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

~~**DECEMBER 2015**~~

DECEMBER 2024

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Approved by:	R. Cram	RCram	16-10-2015

REVISION	COMMENTS	DATE
A	Revised Layout	14-09-2015
B	Amended following NE consultation comments	17-12-2015
C	NE Approval following revisions – Final Document Issue	16-01-2016
D	Information Update & Brackish Lagoon Provision	11-12-2024

CONTENTS

1 INTRODUCTION

1.1 GENERAL

1.1.1 The development of the Able Marine Energy Park (AMEP) east of North Killingholme on the Lincolnshire Coast will partly affect the Humber Estuary Special Area of Conservation (SAC) and the Special Protection Area (SPA) / Ramsar site. Measures to both compensate and mitigate for the effects of AMEP on these European sites have been identified, and will be implemented as part of any future development.

1.1.2 The AMEP DCO application included an Environmental Statement (ES, 'the original ES'). Documents forming part of the original ES are accessible here: Documents | Able Marine Energy Park

~~1.1.2~~1.1.3 This document is ~~a~~the Compensation Environmental Management and Monitoring Plan (CEMMP) for the compensation sites ~~and it.~~ It has been ~~drawn up taking account of guidance on management planning produced by the Conservation Management System (CMS) Consortium (www.cmsconsortium.org).~~ prepared pursuant to the requirements of the AMEP DCO 2014, Schedule 11 Requirement 19(1). It describes the compensation measures that are required and lists specific objectives which are fundamental to their delivery. Further it includes targets and management actions which support the objectives and the monitoring which will be undertaken to confirm progress towards the objectives, and ultimately confirming that they have been achieved. Limits of acceptable change are defined and any necessary remedial actions which will be undertaken should the monitoring show that these limits have not been met.

~~1.2 PROCESS OF FINALISING OUTSTANDING TARGETS~~

1.1.4 Revision C was approved by Natural England on 15 January 2016. This version updates the ecological baseline and fully those section that relate to the terrestrial compensation site. The update reflects the recent East Riding of Yorkshire planning permission 23/01384/STPLF that permits the creation of brackish habitat. This replaces the previous permission for fresh water habitat.

1.2 PROCESS OF FINALISING OUTSTANDING TARGETS

1.2.1 The compensation proposals for AMEP are complex, and the objectives and targets / management options included in this version of the CEMMP have been subject to extensive discussions with stakeholders.

1.2.2 The CEMMP is a live working document which will be in place for as long as it is deemed necessary to achieve the agreed objectives set out in it. Updates to it will be overseen by the Steering Group (see Paragraph 1.~~6~~4), whose role is explained below and includes undertaking a complete review of the EMMP every five years.

~~1.3 PRINCIPLE FOR REVIEW OF BENTHIC SPA BIRD PREY TARGETS~~

~~1.3.1 The benthic target protocol set out in this CEMMP is based on the current understanding of the benthic communities at North Killingholme Marshes~~

~~(NKM) foreshore. It is understood that the targets can only be finalised once the baseline benthic surveys at NKM and Cherry Cobb Sands (CCS) have been completed. This will occur prior to the start of any work on AMEP that involve the loss of mudflats at the NKM foreshore, or disturbance to SPA birds that use it. The following considerations will need to be taken into account when reviewing the targets:~~

1.2.3 It should be noted that as part of the evolution of the compensation measures, in discussion with Natural England (NE), a component of the terrestrial habitat provisions have altered and developed, with a shift in provision at Cherry Cobb Sands from predominantly a terrestrial wet grassland habitat (previously referred to as CCSWG) to one of a brackish lagoon mosaic with fringing terrestrial habitats (Cherry Cobb Sands Brackish Lagoons (CCSBL)).

1.2.4 The overall aim of the CCSBL scheme is to create a habitat mosaic with a system of shallow brackish lagoons and marginal habitats which will provide suitable feeding and roosting resource for black-tailed godwits, as compensatory habitat for the birds displaced by the AMEP Quay. It will also provide suitable habitat for other wetland birds for which the Humber Estuary is designated a Special Protection Area (SPA) and Ramsar site.

1.3 PINCIPLE FOR REVIEW OF BENTHIC SPA BIRD PREY TARGETS

1.3.1 The compensation site needs to function like the mudflats on ~~NKM~~North Killingholme Marshes (NKM) foreshore for black-tailed godwits and other waterfowl, and must support the benthic prey that the birds require. ~~The review of the evidence will assess the presence of patches of high prey density and appropriate size classes associated with the numbers of foraging black tailed godwits it has to support. The findings of the annual benthic monitoring will be set in context within the agreed target range, taking account of natural changes at the control site(s).~~The Marine Environmental Management and Monitoring Plan (MEMMP) provides details of benthic sampling to be undertaken on the North Killingholme Marshes Foreshore in order to characterise the benthic communities that currently provide the prey for foraging birds (MEMMP Appendix 3, Section 6). Two benthic bird food surveys have been undertaken on NKM foreshore in the autumn period, both in accordance with the MEMMP survey protocol. Surveys of the Cherry Cobb Sands foreshore were also undertaken at the same time. Survey dates were:

~~The ability of univariate~~3/4/5th September 2013 for NKM, and ~~multivariate analysis techniques along with biotope mapping~~11/12th September 2013 for CCS

16th September–2nd October 2015

Sample cores were taken to ~~adequately characterise~~a depth of 15cm in 2013 and 30cm in 2015. The deeper cores in 2015 followed a request from Natural England to modify the ~~necessary functional aspects~~original sampling strategy set out in the original 2013 Marine EMMP which formed part of ~~Killingholme so they can be replicated within~~ a Legal Agreement between Able Humber Ports Limited (AHPL) and NE.

Two other benthos characterisation surveys were carried out the spring of 2013 and 2016, on the following dates:

26/27th May 2013 for NKM, and 29th May/10th June 2013 for CCS

19th June, 3rd and 27th July 2016 for NKM, and 4/5th June 2016 for CCS.

Cores were taken to a depth of 15cm in both spring surveys.

1.3.2 Originally it was intended to use this survey data to establish benthic targets for the compensation ~~area will need to be considered; not just peak areas of prey density but also~~site but in 2020 Natural England advised the following:

'After detailed discussion amongst our ornithology and marine invertebrate specialists, we have come to the conclusion that the marine invertebrate surveys provided are too limited and now too out of date to be the only source of data used for target setting in this highly dynamic area. Therefore, we are of the opinion that, alone, these surveys will not be adequate to generate robust targets. Going forward we think that there are two options:

- *1. Undertake additional benthic invertebrate surveys to provide both additional, and more up to date, data. These should be carried out between late June to July, prior to the black-tailed godwits arrival in the area and follow the described methodologies, taking into account Natural England's previous recommendations, to; i) use a deeper core (30cm rather than 15cm to ensure larger worms that can bury deeper within sediments are not missed), and; ii) to record the number and biomass of ~~specific key~~benthic prey species~~, only a~~ within size classes (otherwise it is not possible to determine the proportion ~~of which will represent those individuals within a suitable size range to be consumed~~that are too small to be taken by ~~specific~~foraging birds~~.~~).*

- ~~The benthic targets will be set taking account of the energetic requirements of the black tailed godwits. These will be defined through a combined assessment of the baseline benthic surveys of the mudflats on the NKM foreshore and the identified feeding locations of the birds.~~

- ~~One of the key concerns is to avoid a situation where benthic targets are met in a single year, but with additional years' survey effort are shown to be consistently at the bottom end of the target range. This could provide sub optimal habitat for supporting the peak numbers of black-tailed godwits, which are currently using the NKM foreshore in internationally important numbers. The regular review process will focus on benthic distribution, density, size classes and feeding requirements of black-tailed godwits, along with the numbers of birds using the site (see Annex 3 – Target Setting Protocol). This will identify sub optimal performance early, and allow remedial management actions to be undertaken. Targets will be reviewed and the effectiveness of management actions monitored.~~

2. We recognise that due to the time constraints of the project that this might not be desirable, and therefore we strongly recommend a complimentary modelling approach, irrespective of whether new benthic surveys are commissioned. Whilst the invertebrate data are limited and out of date, we do have more accurate bird count data. It is possible to calculate the energetic requirements of the birds due to be displaced from the development site and, consequently, how much food they eat. This information can then be used to develop benthic prey targets for the compensation site. This would be a desk-based exercise using bird counts from the development site, instead of requiring additional benthic survey data.

This type of modelling approach is highly specialised. We have had a preliminary discussion with Professor Richard Stillman at Bournemouth University, the UK's leading academic expert in this field, who has agreed the work is feasible. He could oversee a small contract with a post-doctoral student in order to minimise costs.', (e-mail NE to ABLE 20/11/2020).

1.3.3 Accordingly, the Brief for a modelling study is to be agreed between Natural England, AHPL and Bournemouth University and the conclusions shall then be used to set the benthic targets for the compensation site.

~~1.3.2~~1.3.4 As the CEMMP is a live document it allows ~~the current~~ targets to be re-evaluated and adjusted as and when necessary~~, including once the baseline benthic surveys have been completed.~~. The Steering Group will oversee the ~~review of the baseline benthic survey findings, and the revision~~setting of the benthic targets~~ based on the review findings~~. The Group may also agree to draw on additional external expertise if required. The cost implications to ~~Able Humber Ports Limited (~~AHPL~~)~~ of any changes, or additional support, will be subject to reasonable agreement between AHPL and the Steering Group.

~~The Benthic SPA Bird Prey Targets will be set out in a separate document once the baseline benthic surveys at NKM and Cherry Cobb Sands (CCS) have been completed and the results analysed. This document will be made available in early 2016.~~

1.3.5 Since the CEMMP was first approved by NE in 2016, further biological data have been collected for the NKM and CCS sites, including Through The Tide Count (TTTC) bird surveys from June 2023 to May 2024. Summarised information from this programme has been used to update the baseline data in this version of the CEMMP.

1.4 THE STEERING GROUP

1.4.1 AHPL will have overall responsibility for the implementation and delivery of the CEMMP. However, the involvement of other stakeholders is essential for the effective working of the CEMMP, and hence AHPL will establish a Steering Group whose members and terms of reference are set out in a '*Deed in Relation to the Able Marine Energy Park*', between Able Humber Ports Limited and Natural England.

1.4.2 An agenda will be drawn up in advance of each Steering Group meeting by AHPL and minutes will be produced after the meeting by AHPL for agreement.

1.4.3 Unless otherwise stated, the default duration for the ecological survey work (e.g. saltmarsh intertidal and subtidal benthos and fish communities described within this document) is 10 years. Continuance of any of these components beyond that period will be determined through discussion on findings etc. by the Steering Group. It is expected that some components of the compensation and the mitigation will require on-going management to ensure that the objectives continue to be met.

2 ENVIRONMENTAL BASELINE AND IDENTIFIED IMPACTS

~~2.1 INTERTIDAL HABITATS~~

2.1 BASELINE NORTH KILLINGHOLME MARSH (NKM)

2.1.1 The original (2012) environmental baseline ~~is~~conditions are described in the original ES document EX28.3 Part 2 in terms of historical trends, mud type, benthic community and bird populations. This identified that the ~~shore~~foreshore was eroding but has entered a phase of accretion since 2000 after the construction of the Humber International Terminal. As a result~~, over the last 10 years~~ of this, the intertidal area that lies between the Mean High Water Neaps (MHWN) and Mean High Water Springs (MHWS) elevations ~~has increased from 3.27 ha to 18.95 ha, an increase of 15.68 ha. The~~is increasing.

~~2.1.1~~2.1.2 The foreshore sediments are composed of a high proportion of fine silts giving soft and sloppy mud. The upper shore is subject to colonisation by *Spartina anglica* (Common Cord-grass) dominated saltmarsh. ~~Table 1 summarises the benthic population (details of the methodology are given in Annex 10.1 of the Environmental Statement (ES).~~Aspects of the intertidal environment at NKM were presented in the Updated Environmental Statement (UES) (2021), for the consideration of Material Change 2 to the AMEP DCO. Documents supporting the Material Change 2 application (including the UES) can be found here: Documents | Able Marine Energy Park Material Change 2 ~~Biomass is wet (blotted) weight in grams. Further data is provided in the Marine Environmental Management and Monitoring Plan (MEMMP).~~

2.1.3 Table 1 below summarises the benthic population in 2010 at the time of the original Application (details of the methodology are given in Annex 10.1 of the original ES). Biomass is wet (blotted) weight in grams. ~~Further invertebrate sampling work will be undertaken in~~ Further data is provided in the MEMMP.

2.1.4 Table 2 updates the information provided in Table 1 based on benthic sample collection on the NKM site (upper, mid and low shore samples) taken in the autumn of 2015 (Allen, 2017) and the spring of 2016 (Allen 2020) (Appendices UES10-3 & UES10-4 of the UES).

2.1.5 However, it is important to emphasise that the biomass calculation methodologies vary between the original baseline (Table 1), which used a wet weight tissue blotted approach, and ash free dry weight technique in the 2015 and 2016 surveys (Table 2). As such, the biomass values between the 2010 baseline and the 2015/16 information are not directly comparable.

2.1.6 Furthermore, it should be noted that following request from Natural England, the autumn 2015 cores were collected to a depth of 30cm, compared to the more standard 15cm depth of the cores from the original 2010 baseline and the spring 2016 data.

~~2.1.2 Autumn 2015 and Spring 2016 to provide a new preconstruction baseline and identify targets for the compensation site.~~

Table 1: Intertidal Abundance and Biomass of Principal Species (NKM CEMMP Original Baseline, 2010)

Abundance (15cm cores)								
Upper Shore			Mid Shore			Lower Shore		
species	(12 x 0.01m² samples)	per m²	species	(12 x 0.01m² samples)	per m²	species	(12 x 0.01m² samples)	per m²
Tubificoides benedii	268	2233	*Tubificoides benedii*	271	2258	*Streblospio ~~shubsoliishrubsolii~~*	91	758
Hediste diversicolor	114	950	*Corophium volutator*	202	1683	*Corophium volutator*	88	733
Corophium volutator	109	908	Nematoda	93	775	Nematoda	21	175
Streblospio ~~shubsoliishrubsolii~~	50	417	*Streblospio ~~shubsoliishrubsolii~~*	50	417	*Tubificoides swirencoides*	16	133
Nematoda	49	408	*Macoma balthica*	47	392	*Tubificoides benedii*	15	125
Biomass (g, Wet Wight Tissue Blotted)								
Upper Shore			Mid Shore			Lower Shore		
species	(12 x 0.01m² samples)	per m²	species	(12 x 0.01m² samples)	per m²	species	(12 x 0.01m² samples)	per m²
Hediste diversicolor	2.86	23.83	*Macoma balthica*	1.55	12.92	*Macoma balthica*	0.21	1.75
Corophium volutator	0.42	3.50	*Corophium volutator*	0.45	3.75	*Corophium volutator*	0.13	1.08
Macoma balthica	0.27	2.25	*Tubificoides benedii*	0.2	1.67	*Hediste diversicolor*	0.07	0.58
~~Tubificoides~~Tubificoides benedii	0.17	1.42	*Hydrobia ulvae*	0.02	0.17	*Mysella bidentata*	0.06	0.50
Streblospio ~~shubsoliishrubsolii~~	0.01	0.08	*Streblospio ~~shubsoliishrubsolii~~*	0.01	0.08	*Streblospio ~~shubsoliishrubsolii~~*	0.03	0.25
Total biomass per m² (g, wet weight)		**31.08**			**18.58**			**4.17**

~~*Note: once target abundance has been agreed from benthic survey work, abundance and biomass will be combined to provide suitable prey sizes/quality targets for the compensation site.*~~

~~***Impacts***~~

~~2.1.3 Details of agreed impacts are provided in the Statement of Common Ground (SoCG) on the Shadow Habitat Regulations Assessment (sHRA). Habitat losses are detailed in Annex B and the amount of compensatory habitat that will be delivered is summarised in Table 2.~~

~~**Table 2: Compensatory Habitat to be delivered (ha)**~~

Table 2: Intertidal Abundance and Biomass of Principal Species (NKM, autumn 2015, spring 2016 (Allen 2017 & 2020))

Abundance 2015 (30cm cores)			~~Habitat Type~~					
Upper Shore			~~Saltmarsh~~Mid Shore			~~Intertidal Mudflat~~Lower Shore	~~Sub-tidal (Estuary)~~	~~Total~~
Species	(51 x 0.01m² samples)	per m²	Species	(52 x 0.01m² samples)	per m²	Species	(51 x 0.01m² samples)	per m²
Corophium volutator	2769	5429	*Corophium volutator*	6036	11608	*Corophium volutator*	3396	6659
Tubificoides benedii	464	910	*Tubificoides benedii*	2329	4479	*Enchytraeidae spp.*	1571	3080
Streblospio shrubsolii	215	422	Nematoda	914	1758	*Tubificoides benedii*	514	1008
Nematoda	124	243	*Limecola balthica*	336	646	Nematoda	398	780
Limecola balthica	109	214	*Enchytraeidae spp.*	308	592	*Hediste diversicolor*	373	731
Biomass 2015 (g, Ash Free Dry Weight)								
Upper Shore			Mid Shore			Lower Shore		
Species	(51 x 0.01m² samples)	per m²	Species	(52 x 0.01m² samples)	per m²	Species	(51 x 0.01m² samples)	per m²
Corophium volutator	0.33258	0.65211	*Corophium volutator*	0.72478	1.39381	*Hediste diversicolor*	1.33878	2.62505
~~SPA~~*Nephtys hombergii*	0.0614	~~88~~0.12027	~~13.5~~ *Hediste diversicolor*	~~10 1.5~~ 0.21216	0.40800	*Corophium volutator*	0.41734	0.81832
~~SAC~~*Abra alba*	0.0570 4	~~73.4~~0.11185	~~21.2~~ *Tubificoides benedii*	~~94.6~~0.10621	0.20425	*Tubificoides spp.*	0.03022	0.05926
Limecola balthica	0.04267	0.08563	*Tubificoides spp.*	0.06882	0.13235	*Nereididae spp.*	0.02663	0.05221

Hediste diversicolor	0.01894	0.03713	*Limecola balthica*	0.06552	0.12600	*Diptera Larvae*	0.02404	0.04713
Total biomass per m2 (g, AFDW)		**1.0571 5**			**2.4054 9**			**3.73170**

Abundance 2016 (15cm cores)

Upper Shore			Mid Shore			Lower Shore		
Species	(36 x 0.01m² samples)	per m²	Species	(36 x 0.01m² samples)	per m²	Species	(36 x 0.01m² samples)	per m²
Corophium volutator	1040	2889	*Tubificoides benedii*	1566	4350	*Corophium volutator*	881	2447
Baltidrilus costatus	550	1528	*Corophium volutator*	1274	3539	*Tubificoides benedii*	281	781
Enchytraeidae spp.	272	756	Nematoda	303	842	*Streblospio shrubsolii*	86	239
Nematoda	238	661	*Limecola balthica*	100	278	*Limecola balthica*	49	136
Tubificoides benedii	139	386	*Baltidrilus costatus*	62	172	*Eteone flava / longa agg.*	21	58

Biomass 2016 (g, Ash Free Dry Weight)

Upper Shore			Mid Shore			Lower Shore		
Species	(36 x 0.01m² samples)	per m²	Species	(36 x 0.01m² samples)	per m²	Species	(36 x 0.01m² samples)	per m²
Hediste diversicolor	0.39190	1.08861	*Limecola balthica*	0.31335	0.87042	*Corophium volutator*	0.14946	0.41515
Corophium volutator	0.19690	0.54693	*Corophium volutator*	0.25050	0.69582	*Limecola balthica*	0.11563	0.32119
Limecola balthica	0.05382	0.14950	*Hediste diversicolor*	0.20368	0.56578	*Nephtys hombergii*	0.01874	0.05206
Baltidrilus costatus	0.02455	0.06820	*Tubificoides benedii*	0.09908	0.27522	*Tubificoides benedii*	0.00777	0.02159
Tubificoides benedii	0.01090	0.03027	*Scrobicularia plana*	0.03646	0.10129	*Streblospio shrubsolii*	0.00197	0.00547

Total biomass per m^2 (g, AFDW)	1.9143			2.52351			0.82561

~~2.1.4 A combination of direct and indirect losses associated with the site together with long term losses in the Humber identified by the Environment Agency provide a requirement to replace a long term loss of 101.5 ha of habitat of which 88 ha is intertidal and 13.5 ha is sub tidal. This total reflects the SPA habitat losses which are higher than those of the SAC (21.2 ha of estuarine and 73.4ha of intertidal) as they include functional loss of use to birds through disturbance. They also reflect the requirement to replace intertidal habitat on 2:1 basis (due to uncertainty) and other habitats on a 1:1 basis. Sub-tidal habitat can be replaced by other estuarine habitats such as saltmarsh.~~

2.1.7 ~~Nine~~Comparison of the data from the original baseline and the updated information (2015/2016) indicates that whilst the assemblage remains largely similar, there is some change in species abundance dominance, for instance in the abundance of the amphipod crustacean *Corophium volutator*, and an increase in overall invertebrate abundance, in particular in the lower shore. A difference in core depth in 2015 (30cm), compared to the other surveys (15cm) should also be noted.

2.1.8 A comparative assessment of biomass values cannot be made as the analysis techniques differ between the original and updated datasets.

2.1.9 Potentially differences between the two surveys may also have introduced non-ecological artefacts into the data, but the data do indicate potential variations over time in the assemblage structure, not the least possibly influenced by changes in shore profile and vegetation cover.

2.2 IMPACTS - NKM

Habitats

2.2.1 Habitat losses are detailed in Table 3 below, including the change from 2012 to 2024 due to the conversion of mudflat to saltmarsh on the NKM foreshore.

Table 3: Habitat Loss Figures

	HABITAT LOSS (ha)		
Habitat Type	Original HRA, 2014 (paragraph 6)	Appendix UES 11-2 Revision 2, 2021	Appendix UES 11-2 Revision 3, 2024
1130	13.5	10.4	10.4
1140/1310	43.1	39	37.5
1330	2	8.6	10

2.2.2 In short, sub-tidal habitat loss (1130) reduced in Material Change 2 due to the re-configuration of the quay, meaning that less of the estuary was being reclaimed. In addition, the quantity of mudflat has declined since 2012, and

the quantity of saltmarsh has increased, due to the ongoing conversion of the NKM foreshore to saltmarsh pursuant to accretion that is unrelated to the AMEP development.

2.2.3 At the time of the DCO application, the applicant proposed to create a 101.5ha managed realignment site at Cherry Cobb Sands, and the details were described in the SoCG as:

'Provision of new estuarine habitat at a ratio of 1:1 through a managed realignment / Regulated Tidal Exchange (RTE) scheme at CCS. Sub-tidal loss (part of the estuary feature) will be replaced with estuarine habitat', and

'Provision of new intertidal mudflat based on an overcompensation target ratio of 2:1 (based on permanent direct loss and permanent functional loss for birds). The current design proposals demonstrate that the site could provide an initial area of c86 ha of which c66 ha remains after 5 years and c57 ha after 10 years (which >1:1) … Options for increasing the area of mudflat and for maintaining more of it in the longer term are the subject of ongoing discussions', (SoCG, Table 5.1).

2.2.4 At the time, the outline design of the compensation site was being actively developed and Natural England did not agree these particular proposals within the SoCG, but did confirm the following:

It will be necessary to provide a compensatory ratio of at least 2:1 for the loss of intertidal mudflat, and a ratio of 1:1 for the loss of estuary (subtidal) habitat. (SoCG, paragraph 5.1.2).

2.2.5 Following extensive design development of the compensation scheme during the DCO Hearings, the Applicant proposed to create a more engineered proposal comprising four 18ha fields with water levels managed by significant hydraulic structures together with a smaller managed realignment site of around 30ha that would develop as estuarine habitat.

2.2.6 Following the Secretary of State's '*minded to approve'* letter to the Applicant dated 28 August 2013, Natural England advised the Applicant in correspondence dated 11 October 2013[1] that:

'Able UK has confirmed that the RTE will create c60ha of long-term sustainable mudflat, which will be reduced to c45ha as part of the operational management of the RTE when during neap tide cycles one of the 15ha cells will be impounded. This amounts to a compensation ratio of 1.5:1 (on occasions 1:1) as compared to the 2:1 ratio that was initially proposed by Able UK and agreed by Natural England. Natural England subsequently advised that a ratio of 1:1 is acceptable provided the RTE/MR meets its quality objectives and targets', (underline added).

2.2.7 In the subsequent HRA completed by the Secretary of State prior to issuing his consent for the development to proceed, it is recorded (at paragraph 6) that there would be a direct loss of 31.5ha of inter-tidal mudflat, an additional

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002128-Natural%20England%20%20-%20Submitted%20for%20the%20DfT%20deadline%20of%2015%20November%202013%20.pdf

loss of 11.6ha of functional mudflat habitat, a direct loss of 13.5ha of estuarine habitat (all from Killingholme Marshes foreshore) and a permanent loss of 2ha of saltmarsh from Cherry Cobb Sands due to the breach of the sea wall for the compensation site. The appropriate assessment then recorded Natural England's confirmation that a 'ratio of 1:1 (habitat loss: compensatory habitat) is acceptable provided that the RTE and Managed Realignment site meets its quality objectives and targets', (paragraph 38(b)).

2.2.8 The detailed design provides for 72 ha of RTE fields (providing a maximum of 66.7ha of functional habitat, but 50.4ha when one field is impounded), and 30.4ha of estuarine/saltmarsh habitat.

2.3 BASELINE OVER-WINTERING BIRDS

~~2.1.5~~2.3.1 In relation to avifauna, in the original ES nine species of bird were identified as ~~likely to be displaced by direct habitat loss and functional disturbance to the extent that an impact on site integrity was anticipated.~~present in significant numbers (Table 4). This assessment was based on peak counts. These peaks were all recorded from the Through the Tide Counts (TTTC) reported in Annex 11.9 of the original ES, '*Marine Energy Park Bird Survey Results April 2010 to April* ~~2011 of the ES.~~*2011'.* These peaks were all higher than the five year mean peaks reported from ~~WeBs~~WeBS counts for the period 2004/05-2008/09.

2.3.2 Where data availability has allowed, the baseline information in Table ~~3~~4 is updated in Table 5.

2.3.3 Comparison of the data Tables 4 and 5 for the nine key species indicates some change in site utilisation. This includes variation for species abundance and for foraging percentage, as well as for percentage utilisation values of the Humber (SPA qualifying) population.

2.3.4 For instance we can see an increase in utilisation by avocet and lapwing, but a reduction in numbers of dunlin and ringed plover.

2.3.5 These changes will reflect natural variations in populations using the site, particularly when using the survey programme peak record, together with changes in the habitats available at the NKM site.

2.3.6 However, it is also noted that abundance values (minimum and maximum) for the key species have also changed between years, for instance with an increase in the avocet and black-tailed godwit populations on the Humber and a reduction in curlew and ringed plover values.

2.4 IMPACTS – OVER-WINTERING BIRDS

2.4.1 The birds present on the North Killingholme foreshore will be displaced by the AMEP development.

Table 4: Bird Species (NKM CEMMP Original Baseline)

Species	Humber Qualifying Population	Humber Min & Max Peaks (WeBS 2004/5-2008/09)	NKM Peak & % of Humber qualifying population ~~represented~~ by Peak	% Foraging during ~~peak count~~Peak
Avocet (breeding)	493	374-652	4 (0.8%) TTTC	100
Bar-tailed Godwit	~~5926~~5,926	~~1490-5926~~1,490-5,926	123 (3.2%) TTTC	98
Black-tailed Godwit	~~3887~~3,887	~~2435-5323~~2,435-5,323	~~2566~~2,566 (66%) TTTC	49
Curlew	~~4440~~4,440	~~3071-5180~~3,071-5,180	158 (3.6%) TTTC	49
Dunlin	~~21518~~21,518	~~14733-26305~~14,733-26,305	~~1029~~1,029 (4.8%) TTTC	99
Lapwing	~~18756~~18,756	~~11700-27421~~11,700-27,421	325 (1.7%) TTTC	0
Redshank	~~5445~~5,445	~~3886-8494~~3,886-8,494	540 (9.9%) TTTC	98
Ringed Plover	~~2168~~2,168	781-~~2168~~2,168	210 (9.7%) TTTC	88
Shelduck	~~5314~~5,314	~~2892-5804~~2,892-5,804	109 (2.0%) TTTC	95

~~2.1.6 Effects arising from piling on marine mammals and sea lamprey are dealt with in the MEMMP.~~

Table 5: Bird Species (NKM 2023-2024 (Cutts & Hemingway, 2024))

Species	Humber Qualifying Population	Humber Min & Max Peaks (WeBS 2018/19-2022/23)	NKM Peak & % of Humber qualifying population by Peak (TTTC)	% Foraging during Peak
Avocet (breeding)	493	1,255-3,143	341 (69.2%)	26
Bar-tailed Godwit	5,926	1,369-2,130	0 (0%)	0
Black-tailed Godwit	3,887	4,825-8,076	2,973 (76.5%)	86
Curlew	4,440	2,104-2,473	163 (3.7%)	6
Dunlin	21,518	13,366-22,516	517 (2.4%)	100
Lapwing	18,756	2,913-2,0247	825 (4.4%)	1
Redshank	5,445	2,237-2,994	212 (3.9%)	99
Ringed Plover	2,168	422-1,690	18 (0.8%)	100
Shelduck	5,314	3,089-13,012	64 (1.2%)	100

2.5 BASELINE CHERRY COBB SANDS SALTMARSH

~~2.1.7~~2.5.1 The original baseline is recorded in Annex 35.1 of the ~~AMEP Environmental Statement (~~original ES~~). A description of~~, with further reference to status and changes in the UES for the consideration of Material Change 2. Although changes (expansion) to the wider saltmarsh of Cherry Cobb Sands has been noted e.g. in the 2021 UES, the area that will be affected by the works remains broadly as was. A description of this saltmarsh is included in Annex 34.1 of the original ES, and briefly summarised below.

~~2.1.8~~2.5.2 The upper saltmarsh in the vicinity of Cherry Cobb Sands varies in width from five metres seaward from the base of the existing sea defences at Stone Creek in the south of the site, up to 330m at the Outstray in the north of the site (2010 data). In a similar manner, the width of the mid saltmarsh zone also varies from 60 m in the south to around 300m in the north of the site.

~~2.1.9~~2.5.3 There is dense saltmarsh vegetation cover in the upper and mid saltmarsh zones, with little or no signs of erosion, which indicates that the habitat quality is good. These zones are dominated by sea couch grass *Elytrigia atherica* (*Elymus pycnanthus*) with other species of note including sea plantain *Plantago maritima*, red fescue *Festuca rubra* and Orache ~~atriplex~~*Atriplex* sp. A network of saltmarsh creeks runs through these zones, allowing water to drain off following high tide as well as allowing freshwater from the land to discharge into the estuary.

~~2.1.10~~2.5.4 The lower saltmarsh zone is extensive, stretching up to 800m from the edge of the mid saltmarsh zone. It is thought that this zone is gradually accreting. The lower saltmarsh is dominated by 'pioneer' species including annual glasswort *Salicornia europea* agg. and common cord grass *Spartina anglica*.

2.5.5 Changes e.g. expansion and consolidation, to the wider saltmarsh of Cherry Cobb Sands are described in the Chapter 10 of the UES (2021) document, but with the area of saltmarsh affected by the works, remaining largely unaltered as it is only the area between the sea wall and Cherry Cobb Sands Creek over the 250m width of the proposed breach of the existing defences that is to be removed.

2.6 IMPACTS – CCS SALTMARSH

~~2.1.11~~2.6.1 Creation of the compensation site will require the removal of 2ha of saltmarsh ~~for the channel~~to create a breach in the flood defences and lower intertidal levels in the immediate term.

~~2.1.12~~2.6.2 Compensation for saltmarsh losses will be provided in the managed re-alignment (MR) component of the compensation site.

2.7 BASELINE ~~*FOR*~~ CHERRY COBB SANDS INTERTIDAL

~~2.1.13~~2.7.1 Bird surveys (EX35.14 of the original ES) that were undertaken between August 2010 and April 2011, in an area which covered both the intertidal habitats at CCS and the farmland which will form the compensation site, showed that the foreshore was used by important numbers of one or more of the qualifying interest species of the SPA/Ramsar site throughout the period August to April. Species such as shelduck, grey plover, curlew, redshank, knot and dunlin were present in numbers usually well in excess of

1% of the Humber Estuary SPA/Ramsar population at both high and low tides in almost all the months surveyed. Curlew was also present on the compensation site fields in important numbers over the autumn passage period (September – October). Other species such as teal, lapwing and golden plover were present in numbers exceeding 1% in October and December to March, with black tailed godwit present in December and January, and bar-tailed godwit in most months between November and April. Passage interest included ringed plover and greenshank both of which were present on the foreshore in important numbers in August, ruff in September, and little egret on the foreshore in October. WeBS counts (see Section 35.7.9 of the original ES) show that important numbers of some species can occur even over the summer months (e.g. ringed plover in May and dunlin in July).

2.7.2 A more recent year-long TTTC survey programme was conducted at the CCS site between 2023 and 2024. Key species maxima data from this programme (low and high water) are shown in Table 6 below, together with similar data from the 2010-2011 baseline programme.

2.7.3 Waterbirds were again recorded using the compensation site fields, including curlew, although with utilisation reducing as rank ruderal vegetation developed, the fields no longer being under arable cultivation.

Table 6: Key Bird Species Maxima CCS 2010-11 vs 2023-2024 and percentage change (Cutts & Hemingway, 2024))

	Cherry Cobb Sands Frontage: High Water			Cherry Cobb Sands Frontage: Low Water			2010-2011 Low Water Percentage of Humber Maxima (2010-2011)	2023-2024 Low Water Percentage of Humber Maxima (2022-2023)
	2010-11 Maxima	2023-2024 Maxima	Population Percentage Change	2010-11 Maxima	2023-2024 Maxima	Population Percentage Change		
Pink-footed Goose	48	400	833	400	0	0	11.0%	0.0%
Shelduck	869	2368	272	2408	1344	56	58.8%	13.7%
Wigeon	85	20	24	133	20	15	7.3%	0.7%
Mallard	240	66	28	125	59	47	7.0%	4.0%
Teal	529	1193	226	215	940	437	4.5%	22.4%
Lapwing	72	1090	1514	2073	2810	136	31.9%	96.5%
Golden Plover	7800	2200	28	11735	7400	63	40.0%	90.1%
Grey Plover	248	500	202	623	1501	241	28.1%	104.3%
Ringed Plover	284	0	0	351	167	48	24.8%	17.9%
Curlew	994	523	53	1703	747	44	56.1%	30.2%
Bar-tailed Godwit	358	1153	322	282	462	164	9.5%	21.7%
Black-tailed Godwit	53	550	1038	544	287	53	13.4%	3.6%
Knot	2600	1000	38	5180	1600	31	25.1%	7.8%
Dunlin	2940	3426	117	2790	9685	347	15.2%	57.0%
Redshank	579	1060	183	801	631	79	25.9%	21.1%

2.7.4 Table 6 provides an indication of population trends between the two programmes, expressed as percentage change, as well as the percentage contribution of the CCS area in the context of the wider Humber estuary.

2.7.5 Examination of the data presented in Table 6 shows a complex pattern of utilisation between species, with some undergoing an increase in status across the area, and others a decline. Furthermore, there is variation between high and low water periods.

2.7.6 There are a range of potential causes for this abundance variability, including the inherent dynamism of some habitats and species within the system, for instance with a considerable expansion of saltmarsh across parts of the CCS site and a concomitant reduction in open mudflat.

2.7.7 This may explain to some extent, a reduction in the numbers of some species around low water e.g. with less foraging and extensive open loafing areas now present e.g. affecting golden plover and curlew, but with areas of the upper-mid shore to upper shore remaining available to roost during periods of tidal compression e.g. grey plover and black-tailed godwit.

2.7.8 However for other species, the increase in saltmarsh may be beneficial e.g. for foraging teal.

~~2.1.14~~2.7.9 EX34.2 of the original ES provides some information on the temporal and spatial distribution of benthic communities within the Humber estuary, including abundance data for the Cherry Cobb ~~sands~~Sands area. ~~This is~~These data are summarised in ~~the~~ Table ~~4~~7 below;

Table 47: Prey Abundance at Cherry Cobb Sands (2000, 2002 & 2002 (Original CEMMP), 2015 (Allen, 2017) & 2016 (Allen, 2020))

Mean per m²	2000	2001	2002	Autumn 2015	Spring 2016
Abra tenuis	1367	937	0	472	256
Corophium volutator	51	51	0	2	2
Crangon crangon	0	25	0	0	0
Cyathura carinata	51	0	0	51	64
Enchytraeidae	10937	83443	8759	12254	2042
Eteone longa	228	76	152	163	78
Hediste diversicolor	582	1367	1190	319	100
Hydrobia ulvae	152	0	329	568	343
Macoma (Limecola) balthica	3165	4557	6203	568	743
Manayunkia aestuarina	3823	25	0	705	541
Nematoda	0	39595	0	7330	2758
Nephtys	0	25	0	7	2
Nephtys hombergii	0	0	51	53	20
Paranais litoralis	101	0	0	0	88
Pygospio elegans	0	51	1975	1091	705
Scrobicularia plana	0	0	456	0	31
Streblospio shrubsolii	0	51	0	26	44
Tubificoides benedii	14532	6582	1215	1558	1810
TOTAL	34987	136785	20329	26481	11286

2.7.10 The most recent benthic data collected at CCS was in autumn 2015 (Allen, 2017) and spring 2016 (Allen, 2020), and where appropriate abundance data have been added to Table 7. It should also be recognised that the autumn 2015 surveys recovered 30cm depth cores whilst the spring 2016 survey used 15cm cores.

~~2.1.15~~2.7.11 Key prey species for black-tailed godwit are highlighted in yellow and occur in higher abundance than sites on the south ~~shore sites~~bank of the estuary during the same period.

2.7.12 The data in Table 7 suggest the 2015 and 2016 intertidal invertebrate assemblages at Cherry Cobb Sands are broadly similar to that sampled in 2000-2002, although importantly, there has been a reduction in the abundance of the important prey species (*Hediste diversicolor* and *Macoma (Limecola) balthica*) for black-tailed godwit identified in the original baseline.

2.7.13 However, importantly, the ash free biomass values from the autumn 2015 survey show these two invertebrate species to provide the greatest biomass within the assemblage with 1.97990g per m^2 for *Macoma (Limecola) balthica* and 1.82852g per m^2 for *Hediste diversicolor,* with for the spring 2016 survey, 2.68345g per m^2 for *Macoma (Limecola) balthica* and 1.75983g per m2 for *Scrobicularia plana*, with *Hediste* ranked third with 0.83308g per m^2. *Scrobicularia plana* is another bivalve species that can form an important prey item for black-tailed godwit.

2.8 **IMPACTS – CCS INTERTIDAL**

~~2.1.16~~2.8.1 Works to create the compensation site are not predicted to have significant effects on the SPA bird species~~.~~ using the intertidal areas. This is largely due to the visual and acoustic screening of the works which is expected from the existing sea defence wall, the diversion inland of the coastal footpath which will remove a source of disturbance to birds on intertidal habitats (which may be having effects at present) without increasing the effects on birds on inland fields, and the timing of the works to cover predominantly the summer months. This is a period when the intertidal habitats are typically less well used by waterbirds, the birds have more choice of location in which to forage and roost, and there is more daylight and good benthic invertebrate food availability across the intertidal mudflats. In addition the creation of the new embankment is several hundred metres away from the edge of the intertidal habitat which is very extensive.

~~2.1.17~~2.8.2 Mitigation to reduce impacts includes timing of the work so that potentially disturbing activities closest to intertidal bird populations occur April to October.

3 ENVIRONMNETAL BASELINE AND IMPACTS FOR TERRESTRIAL HABITATS

3.1 ~~*BASELINE* FOR THE~~ COMPENSATION SITE

Baseline

3.1.1 The compensation site comprises ~~the~~a Regulated Tidal Exchange (RTE) and a Managed Re-alignment (MR), ~~together with the Cherry Cobb Sands Wet Grassland (CCSWG)~~ and is described in EX28.3 Parts 3 & 4~~.~~ of the original ES. In consultation with Natural England, the requirements of the associated grassland site outside the intertidal habitat have been amended from a freshwater habitat to a brackish habitat. The ~~existing~~new proposals have been consented by East Riding of Yorkshire Council (planning reference 23/01384/STPLF) to replace the previously consented wet grassland (referred to as CCSWG in previous documents). The new proposals for the supplementary habitat outside of the intertidal site are referred to as Cherry Cobb Sands Brackish Lagoons or CCSBL.

~~3.1.1~~3.1.2 The baseline is provided in Chapter 35 of the original ES but updated in EX28.3 Part 6 ~~EIA Review~~, to reflect the movement of the wet grassland and roost site from Old Little Humber Farm to ~~CCSWG.~~CCS, the wet grassland provision subsequently altered to that of brackish lagoons. The current use of the area, as at the time of the ES, is arable farmland. The landscape was assessed as having low ecological value. No water voles (*Arvicola amphibius*) were present, but colonisation by transient animals cannot be ruled out.

~~3.1.2~~3.1.3 A badger (*Meles meles*) survey is reported in Annex 35.8 of the ES and updated by EX35.13. It found two main social groups associated with two mains setts and a number of outlying and subsidiary setts, with some evidence of a decline in use between surveys.

3.1.4 A series of subsequent badger surveys have been undertaken, the most recent in 2021. These surveys identified a number of active setts, predominantly along Keyingham Drain, but with outliers also actively used and a series of latrines identified (as described in Chapter 35 of the UES).

3.1.5 The UES also noted recent surveys having recorded the presence of Otter (*Lutra lutra*) utilising badger setts along Keyingham Drain

Impacts

~~3.1.3~~3.1.6 These are described in EX28.3 Part 6 EIA Review and it is concluded that ecological impacts will be largely the same as those predicted in the original ES and be negligible or of minor adverse significance only.

~~3.1.4~~3.1.7 Badger surveys indicated the proposals would result in the loss of 4 outlying setts associated with the group of badgers based at ~~Sett 28~~one sett, and 5 outlying setts associated with the group of badgers based at ~~Sett 11. None~~another sett. The original ES noted that none of the affected setts received high levels of use from badgers in either 2011 or 2012, and none were located close to a key seasonal food source or other resource likely to be crucial to the badgers' survival. ~~Given the availability of alternative setts elsewhere within their range, this loss would be unlikely to have a detrimental impact on badgers. A licence to close outlier setts will be required but overall the increase in foraging habitat will be beneficial~~However, the recent studies

have concluded that there remains a relatively high concentration of badger activity within the area.

3.1.8 Due to the known presence of badgers within the CCS site boundary, any works in the vicinity that have the potential to disturb the sett(s) will need to be carried out under a licence issued by Natural England, and if a sett is required to be closed, a licence will also need to be issued.

3.1.9 The potential for otter holts along Keyingham Drain requires consideration and localised modified working, depending on status at the time of construction.

3.1.10 A dedicated protected species survey will be necessary prior to construction commencement to assess the current status and distribution of these protected mammal species and identify any potential impacts.

3.1.11 Appropriate mitigation measures will need to be incorporated into the works methods to prevent impacts. These will include those open excavations must be covered outside of working hours or left with an escape ramp positioned at an angle no greater than 45°, to prevent trapping of animals. Materials should be stacked securely on site to prevent any injury to nocturnal mammals exploring the site. Furthermore, it is recommended that a toolbox talk is provided to all site staff prior to any works occurring giving details of any site-specific mitigation requirements.

~~3.1.5~~3.1.12 Minor construction impacts could occur for reptiles without mitigation.

~~3.1.6~~3.1.13 The greatest change in impacts related to the Compensation Scheme is apparent during the operation of the scheme, where there will be minor changes to views from a nearby property (Fair View) because of the widened embankment around the RTE scheme, and a minor change to the landscape as a result of the wind pumps at the ~~wet grassland~~brackish lagoon site.

Baseline for North Killingholme Haven Pits (NKHP)

~~3.1.7~~3.1.14 Operational impacts are dealt with in the Terrestrial Environmental Monitoring and Management Plan (TEMMP).

~~3.1.8~~3.1.15 ~~Baseline~~2011 baseline information on NKHP is in Chapter 11 of the ES ~~and in the sHRA~~. The site holds significant numbers of the Humber bird population, and those species which are present in numbers of 1% or more of the Humber Estuary SPA populations are summarised in Table ~~5~~8. Constraints set out in Schedule 11 of the DCO aim to avoid disturbance of this habitat.

~~**Table 5: NKHP TTTC & WeBs Peaks**~~

3.1.16 The NKHP waterbird utilisation data has been updated in Table 9 to cover, where access allows, more recent data, e.g. the Humber data are based on the most recently published WeBS 5-year mean annual maxima (2018/19-2022/23), and for the NKP site, TTTC data from 2023-2024 (Cutts & Hemingway, 2024). These data indicate that the site continues to be of importance for a number of species, including some which individually qualify under the Humber SPA designation.

3.1.17 The importance of the site for the general waterbird assemblage in the context of the most recent Humber data is noted, with the site supporting 4.9% of the Humber assemblage in August at around high water.

3.1.18 In fact the site is important for several wader species in the late summer, supporting 88% of the Humber black-tailed godwit assemblage these birds predominantly roosting around high water, and almost 19% of the avocet assemblage, again with most birds roosting around high water.

Impacts

3.1.19 No direct impacts are predicted but the loss of intertidal feeding arising from the development may reduce the attractiveness of NKHP as a roost site and lead to displacement resulting in an effect on site integrity.

Table 8: NKHP TTTC & WeBS Peaks (Original CEMMP)

Species	Humber Population	Peak/mean of Peak Count	Proportion of Humber Population (%)	Month	Data Source
Assemblage	140197	4112	2.9	Aug	TTTC
		3787	2.7	Sep	WeBS
Avocet	493	16	3	Mar	TTTC
		27	5.5	Mar	WeBS
Black-tailed godwit*	3887	3 800	97.8	Aug	TTTC
		3 338	85.9	Sep	WeBS
Common sandpiper	(46)	1	2.2	Jul,Aug	TTTC
		-	-	-	WeBS
Dunlin	21518	270	1.3	Oct	TTTC
		380	1.8	Nov	WeBS
Grey heron	74	3	4.1	Oct	TTTC
		3	4.1	Sep,Oct	WeBS
Lapwing*	18756	5	<0.1	Oct	TTTC
		276	1.5	Nov	WeBS
Little egret	38	1	2.6	Jun,Jul	TTTC
		-	-	-	WeBS
Little ringed plover	6	2	34	Apr	TTTC
		-	-	-	WeBS
Mallard	2096	34	1.6	Oct	TTTC
		71	3.4	Sep	WeBS
Moorhen	146	4	2.7	Jul	TTTC
		2	1.6	Sep	WeBS
Redshank	5445	249	4.6	Aug	TTTC
		215	3.9	Aug	WeBS
Shoveler	145	61	42.1	Oct	TTTC
		29	20	Dec	WeBS
Smew	2	1	50	Jan	TTTC
		-	-	-	WeBS
Snipe	118	6	5.1	Oct	TTTC
		4	3.4	Oct	WeBS
Teal	2865	46	1.6	Oct	TTTC
		30	1.0	Nov	WeBS
Water rail	7	2	28	Jun	TTTC
		-	-	-	WeBS

Table Legend
Humber Population – Population taken from Mean of Peak data from 5 Year WeBS Core Count Data between 2004/05 – 08/09 for Sector 38950 the Humber Estuary. () indicates mean calculated from an incomplete 5 year data set.
Peak count – The highest species count recorded within North Killingholme Haven Pits from TTTC data or Mean of Peak Count taken from WeBS data (datasets expanded below).
WeBS – Mean of Peak Count derived from WeBS 5 Year Core Count Data from 2004/05 - 08/09 for Sector 38201 North Killingholme Haven Pits (TA166196).
TTTC – Through the Tide Count, Waterbird Surveys undertaken at Killingholme Marshes by Institute of Estuarine Coastal Studies (IECS) between April 2010 – April 2011
Month – For TTTC data the month(s) refers to when the peak count per species was recorded from the Peak Count column. For WeBS data the month still refers to when the peak count was recorded although the corresponding Peak Count figure for WeBS is a mean of peak rather than a peak of peaks.
Species written in red are those which are individual qualifying interests of the Humber Estuary SPA.
Species with a * by their name are listed as UKBAP species.

Table 9: NKHP TTTC & WeBS Peaks (2023-2024 (Cutts & Hemingway, 2024))

Species	Humber 5-year Mean Population 2018/19 – 2022/23	NKP Peak (2023/24) (Cutts & Hemingway) / NKP Peak 2022/23 (WeBS)	Proportion of Humber Population (%)	NKP Month of Peak (Cutts & Hemingway 2023/24) & (WeBS 2022/23)	Data Source
Assemblage	**136,310**	**6,735**	**4.9**	**Aug**	**TTTC**
		4,943	3.6	Aug	WeBS
Avocet	**2,387**	**445**	**18.6**	**Aug**	**TTTC**
		237	18.9	Oct	WeBS
Black-tailed godwit*	**6,346**	**5,609**	**88.4**	**Aug**	**TTTC**
		4,700	58.2	Aug	WeBS
Common sandpiper	**32**	**1**	**3.1**	**Aug**	**TTTC**
		-	-	-	WeBS
Dunlin	**18,815**	**107**	**0.6**	**Nov**	**TTTC**
		49	0.3	Oct	WeBS
Grey heron	**41**	**1**	**2.4**	**Sep Apr**	**TTTC**
		1	2.2	Sep Nov	WeBS
Lapwing*	**15,951**	**580**	**3.6**	**Nov**	**TTTC**
		114	3.9	Nov	WeBS
Little egret	**215**	**6**	**2.8**	**Sep**	**TTTC**
		3	1.0	Sep	WeBS
Little ringed plover	**16**	**-**	**-**	**-**	**TTTC**
		-	-	-	WeBS
Mallard	**1,459**	**18**	**1.2**	**Oct**	**TTTC**
		14	1.0	Jun	WeBS
Moorhen	**76**	**-**	**-**	**-**	**TTTC**
		-	-	-	WeBS
Redshank	**2,570**	**348**	**13.5**	**Sep**	**TTTC**
		185	6.2	Aug	WeBS
Shoveler	**315**	**9**	**2.9**	**Oct**	**TTTC**
		-	-	-	WeBS
Smew	**1**	**-**	**-**	**-**	**TTTC**
		-	-	-	WeBS
Snipe	**166**	**22**	**13.3**	**Dec**	**TTTC**
		12	7.2	Nov	WeBS
Teal	**5,710**	**788**	**13.8**	**Oct**	**TTTC**
		72	1.7	Oct	WeBS
Water rail	**12**	**-**	**-**	**-**	**TTTC**
		-	-	-	WeBS

Updated Data are in BOLD
Humber Population – Population taken from Mean of Peak data from 5 Year WeBS Core Count Data between 2018/19 – 2022/23 for Sector 38950 the Humber Estuary. () indicates mean calculated from an incomplete 5 year data set.
Peak count – The highest species count recorded within North Killingholme Haven Pits from TTTC data 2023-2024 or Mean of Peak Count taken from WeBS data (datasets expanded below).
WeBS – Mean of Peak Count derived from WeBS 5 Year Core Count Data from 2004/05 - 08/09 for Sector 38201 North Killingholme Haven Pits (TA166196) **(No new data readily available)**.
TTTC – Through the Tide Count, Waterbird Surveys undertaken at Killingholme Pits by Cutts & Hemingway between June 2023 – May 2024.
Month – For TTTC data the month(s) refers to when the peak count per species was recorded from the Peak Count column. For WeBS data the month still refers to when the peak count was recorded although the corresponding Peak Count figure for WeBS is a mean of peak rather than a peak of peaks.
Species written in red are those which are individual qualifying interests of the Humber Estuary SPA.
Species with a * by their name are listed as UKBAP species.

~~***Impacts***~~

3.1.9~~1.1.1.~~ ~~No direct impacts are predicted but the loss of intertidal feeding arising from the development may reduce the attractiveness of NKHP as a roost site and lead to displacement resulting in an effect on site integrity.~~

4 OBJECTIVES

4.1 CONSTRUCTION

Rationale & Objectives

4.1.1 Construction impacts at NKM are dealt with in the MEMMP, and those at NKHP in the TEMMP.

4.1.2 Impacts have been identified during the construction of the compensation site (RTE/MR and ~~CCSWG~~CCSBL) and objectives to ensure appropriate mitigation and legal compliance during construction are required.

4.1.3 Impacts requiring mitigation have been identified for intertidal birds, breeding birds, reptiles, badgers (licensing of sett closures will be required), and water voles (probably not present but pre-survey required given records of transient populations in locality).

4.1.4 The agricultural fields that form the proposed compensation site are only used by curlew in any significant numbers on a regular basis~~.~~ (e.g. original ES and Cutts & Hemingway, 2024). It has been agreed with Natural England that the birds currently supported on the agricultural fields that comprise the compensation site can be supported in adjacent fields. Much of the work on the inland embankment will have been completed prior to the main period of use during the autumn passage, and construction work will not be ongoing across the whole 3 km of the new embankment all at once. Hence there will be adjacent fields that will not be subject to disturbance from the works that will be available for the birds to use throughout the period they are likely to be present.

4.1.5 The intertidal area of CCS was surveyed as described in EX35.14. However this data represents peak counts only over a single non-breeding season. Targets based on ~~WeBs~~WeBS data are difficult to use as the ~~WeBs~~WeBS count area extends from Paull to Cherry Cobb Sands~~. One option~~ , and may not be up-to-~~take~~-date.

4.1.6 As such, an additional TTTC survey programme was undertaken at the ~~peak counts recorded in EX35.14 and apply a natural variability test derived from~~site between June 2023 and May 2024 (Cutts & Hemingway, 2024), and the ~~standard deviation of~~survey programme maxima for low and high water periods for key specie are presented in Table 6.

~~4.1.5~~4.1.7 It is not expected that the ~~WeBs count data for Autumn (22% of~~proposed compensation site will have a disturbance impact on the ~~5 year mean peak) and winter (42% of the 5 year mean peak). Further~~fronting intertidal and further discussions with NE will take place to establish a suitable reference point against which any disturbance can be measured– see Objective C4: Minimise construction disturbance to SPA populations, page ~~16~~24.

~~4.1.6~~4.1.8 The construction of RTE sluices may require piling. As AHPL develop detailed planning for the construction of the sluices, if required construction is to be undertaken between April and July, then auger piling will be used in conjunction with a method statement agreed with Natural England.

~~4.1.7~~4.1.9 Good construction practice and adherence to Pollution Prevention Guidance will be embedded into any works undertaken on site.

Objective C1: Construction will comply with legal requirements and best practice with regard to reptiles and water voles.

Target	No killing or injuring of protected species
Management	• Strim habitat fortnightly to ensure habitat remains unsuitable for colonisation • Ecological briefing for workforce (including recognition, contact procedures, action to be taken)
Monitoring	• Undertake pre-construction survey of suitable habitat for reptiles and water voles
Who	• Survey by suitably experienced surveyor • Briefing by Environmental manager/ Ecological Clerk of Works
When	• Pre-construction
Limits of Acceptable Change	• N/A
Remedial Action	• Cease work if animals found in work area and consult with Environmental Manager
Notes	Likelihood of either reptiles or water voles being present is low given habitat. If habitat has been colonised since the original CCS ES, suitable alternative habitat would need to be created.

Objective C2: Prevent Harm to breeding birds

Target	No damage to nests or eggs, or killing or injuring of chicks of wild birds.
Management	• Remove suitable nesting habitat to north of existing sea wall (i.e. protected from disturbance to birds on intertidal area) during September-March. • Strim areas fortnightly to reduce suitability. • Ecological briefing for workforce (including recognition, contact procedures, action to be taken) • Where potential nesting habitat remains (e.g. close to intertidal) and works take place during April-August site to be checked for nesting birds.
Monitoring	• Undertake pre-construction survey of suitable habitat for nesting birds
Who	• Survey by suitably experienced surveyor • Briefing by Environmental ~~manager~~Manager/ Ecological Clerk of Works
When	• Pre-construction
Limits of Acceptable Change	• N/A
Remedial Action	• Cease work if nesting birds found in work area and consult with Environmental Manager. • Any active nests not to be disturbed until young have fledged and capable of sustained flight.
~~**Notes**~~	

Objective C3: Ensure construction is legally compliant in relation to badgers

Targets	• Safe and licensed exclusion of badgers from setts. • Provision of suitable foraging habitat • Provision of 10 earth mounds for sett building at base of RTE northern bund and/or around ~~CCSWG~~CCSBL site
Management	• Undertake repeat survey to inform licence application. • Licence application (licences are usually only issued for period 1st July-30th November). • Closure of setts under licence. • Adherence to mitigation in licence and EX35.13
Monitoring	• Pre-construction to validate 2012 survey • Post construction walkover survey to check colonisation of earth mounds and sett and latrine usage.
Who	• Monitoring by suitably experienced consultant • Environmental Manager responsible for licensing issues and adherence to conditions.
When	• Repeat survey for licence application June-July 2015 • Licence application September 2015. • Creation and planting of mounds, planting of fruit and berry bearing shrubs ~~at wet grassland~~on terrestrial bund margins from winter May-August 2016. At RTE this process to take place in winter 2016. • Sett closure November - December 2015. • Post construction surveys annually for five years to cease after 3 years if population stable.
Limits of Acceptable Change	• 10% reduction in total number of subsidiary or outlying setts used within three years. • 5% reduction in annex setts used within two years • Cessation of use of any main sett within one year
Remedial Action	• Bait survey to inform analysis • If declines associated with foraging resource introduce supplementary feeding during periods of drought or other hardship • Increase foraging resource (further planting)
Notes	Vegetation on mounds, particularly that at ~~CCSWG~~CCSBL should be unsuitable for raptors and corvids (i.e. should comprise weak stemmed and low growing cover such as raspberry and bramble). No planting should be undertaken on top of any bunds to avoid providing hunting perches for raptors and corvids. Habitat enhancement for badgers would be on Northern slopes (but below top of bund) of RTE site and North ~~East~~-east part of ~~wet grassland~~CCSBL.

Objective C4: Minimise construction disturbance to SPA populations

Targets	No disturbance to feeding or roosting birds on the intertidal area
Management	• Construction work will begin with sea wall area and bunds nearest to proposed ~~CCSWG roost~~CCSBL site to provide visual and acoustic screen. This will be carried out during April-October. • Piling will be undertaken between April-July (or if this cannot be achieved augur piling will be used). • During November-March all work will take place within screen provided by sea wall. • All piling will be conducted in accordance with the Code of Construction Practice (CoCP), which is required under DCO Schedule 11, Requirement 22 and will include controls to minimise waterbird disturbance.
Monitoring	• Numbers of birds within the compensation site and intertidal area will be counted on a monthly basis~~.~~ on a TTTC basis. The reference target will be agreed with NE.
Who	• Suitably experienced surveyor for monitoring. • Ecological ~~manager~~Manager/ Ecological Clerk of Works to manage construction.
When	• Monitoring during construction
Limits of Acceptable Change	• To be agreed with NE (see discussion under rationale)
Remedial Action	• Review construction methods
Notes	See Rationale regarding reference data issues

4.2 REGULATED TIDAL EXCHANGE & MANAGED REALIGNMENT

Rationale & Objectives

4.2.1 It has been agreed with the Regulators that compensation must be put in place to recreate ~~94.6 ha of habitat (73.4 ha of intertidal mudflat, and 21.2 ha of sub-tidal (estuary)) for the SAC, and 101.5 ha for the SPA.~~habitat to be lost due to construction of the quay and associated permanent disturbance of the remaining foreshore..

4.2.2 The RTE & MR will be constructed to provide ~~initially 88 ha of mudflat and~~ a long term mudflat resource of at least ~~44~~72 ha. The MR component of the scheme will comprise 30.~~6~~4 ha of which up to 27 ha is anticipated to revert to saltmarsh. SAC targets for the saltmarsh component are that it recreates typical saltmarsh and mudflat characteristics in terms of topography, zonation and species to that of the middle Humber.

4.2.3 Targets for the mudflat relate to its sediment quality and benthic communities. In turn these underpin its ability to provide functional feeding habitat for displaced bird species (see objective B1)

4.2.4 Long term sustainable mudflat will require managing to maintain principal parameters, and the construction of the four cell RTE structure reflects the need to maintain sufficient mudflat habitat even when being managed.

4.2.5 Benthic targets will be derived from ~~pre-construction surveys~~an assessment to be undertaken by Bournemouth University and set in agreement with Natural England (NE) as detailed in Annex 3: Target Setting Protocol~~.~~ **(ON HOLD PENDING THE AGREEMENT OF THE STUDY BRIEF**).

4.2.6 The managed realignment site offers potential for biodiversity gains particularly for estuarine fish. A fish survey that is as far as possible WFD compliant (EA Operational Instruction 328_07) will be implemented and agreed with the EA. Targets are based on delivering monitoring and therefore numerical targets and limits of acceptable change are not required. There are some practical difficulties in complying with WFD guidance in that whilst fyke nets could be used within the MR, seine nets could not. It may be possible to substitute a small hand hauled epibenthic sledge as a second form of sampling particularly suitable for juvenile fish. This would be dependent on it being safe to do so, and this method is not WFD compliant although it is used on other MR sites. Similarly Fyke nets may be used to sample the RTE components of the site by setting them outside the RTE sluice(s) on the outgoing tide subject to health and safety considerations.

4.2.7 Management will be targeted to produce suitable sediment types and maintain wetness both to assist feeding birds and reduce saltmarsh encroachment within the RTE. Natural processes will be allowed to develop within the MR part of the site.

4.2.8 The warping up phase will be used to inform future management and allow the operations manual to be augmented based on experience of the live system.

4.2.9 A basic manual of operations will be provided prior to the system going live. As part of the ongoing learning process all significant management interventions (e.g. dredging, bed levelling) will be logged (date & time) and photographed from fixed reference points so that they can be referenced against ecological survey data.

Objective COMP1: Construction of site and sluices

Targets	• Delivery of site to include four RTE fields each of 18ha size, with ponds and channel areas of about 1.5ha per field, operational sluices to enable impoundment of a field at near peak spring tide level and operational sluices to enable drainage of impounded water from one field to another. • Leakage into underlying soils to be less than 200mm over a 10 day period from an initial impounded depth of water of 1,000mm.
Management	• Construction to be undertaken by appointed contractor, managed by APHL
Monitoring	• Topographic survey to define extent of site • Engineering analysis to confirm sluice performance and leakage into underlying soils and through bund
Who	• Survey by suitably qualified surveyor • Analysis by suitably qualified engineer
When	• Prior to and during the construction period
Limits of Acceptable Change	• The RTE part of the site must provide a minimum of 66ha of mudflat area. This could be provided in three or more fields. Sluices to be sized accordingly. • Initial level of the RTE fields to be between +1.9m OD and +2.0m OD.
Remedial Action	• Over consolidation of field surface to reduce leakage.

Objective COMP2: Warping up of RTE fields

Targets	• Warping up of RTE fields by an average of 100mm depth of marine muds
Management	• By site managers: ○ After construction inlet sluices for the RTE fields are in general to be operated fully open to facilitate rapid accretion of muds across the RTE fields. ○ After the first winter period following breaching of the realignment site the sluices are to be operated in normal operational mode to avoid extended drying of the mudflat resource over the neap tide period.
Monitoring	• Levels over the RTE fields are to be monitored using a combination of water level monitoring, marked stakes and LiDAR or other monitoring techniques. Method statement to be prepared for the surveying.
Who	• Survey by suitably qualified surveyor
When	• Basic survey of field levels at monthly intervals during warping-up, LiDAR surveys on opportune basis of 1 to 3 year interval
Limits of Acceptable Change	• If average mud levels in the field achieve 100mm before the end of the first winter period after breaching sluices are to begin to be operated in normal operational mode.
Remedial Action	• If warping up is seen to be occurring very slowly the three additional outlet sluices could be opened up to increase exchange.
Notes	• On initial breaching the fields will be operated with the inlet sluices fully open (as per EIA assessment) and the rates of warping up in the fields and scour potential in the breach and Cherry Cobb Sands Creek assessed. If the rate of warping up in one or more of the fields would appear to benefit from increased exchange a trial period of operating the field with the outlet sluices fully open will be instigated. The erosion potential will continue to be examined. A decision will then be made regarding whether to continue exchange with the outlet sluices open. • Changes to the sluice openings from those agreed, would need to be notified to all parties prior to this trial being undertaken. Any longer-term changes to the exchange within the Regulated Tidal Exchange scheme to that currently assessed would need to be discussed with the Environment Agency, due to the potential issues with additional erosion that would occur during this period of time.

Objective COMP3: Operating Manual for water level management

Targets	Operating Manual for water level management by site managers
Management	• By site manager and suitably qualified engineer: ○ During the initial warping up phase sluice operation, impoundment and flushing are to be trialled ○ Operating Manual to be developed and used as the basis for operational management of site during remainder of warping up period. ○ Operational Manual to be reviewed after first year of operations.
Monitoring	• Water level monitoring • Recording of sluice settings
Who	• By site managers assisted by suitably qualified surveyor
When	• Basic Operating Manual to be prepared prior to site being breached. • Revised operating manual to be prepared within 6 months of site being breached taking into account experience of managing live system • Operating Manual to be reviewed within 18-24 months of site being breached. • Operating Manual to be reviewed every 24 months thereafter.
Limits of Acceptable Change	• Operating Manual provides the basis for adaptive management of water levels within the RTE fields. In combination with the sediment management plan for the RTE fields this provides the means of maintaining the sustainable compensatory mudflat resource.
Remedial Action	• Review of Operating Manual and modification of operating procedures

Objective COMP4: Sediment Management for RTE fields

Targets	• Development and implementation of sediment management plan for RTE fields

Management	• By site manager and suitably qualified engineer:
	  ○ To be developed following observation of rates and patterns of mud accretion in the RTE fields.
	  ○ To be optimised over time to optimise mudflat functionality in the RTE fields based on the results of other monitoring.
	• Dredging and bed levelling to be undertaken by suitably experienced organisation

Monitoring	• Bed level monitoring • Photographic records • Particle size and density of accumulating material • Accumulation in channels and pond areas
Who	• By site managers assisted by suitably qualified surveyor
When	• Sediment management plan to be developed within 24-36 months of site being breached. • Implementation of plan, possibly involving initial trials, to be undertaken 5-10 years after breaching of site. • Sediment management plan to be reviewed every 24 months thereafter.
Limits of Acceptable Change	• Sediment management provides the basis for adaptive management of mudflat levels within the RTE fields. In combination with the water level management this provides the means of maintaining the sustainable compensatory mudflat resource.
Remedial Action	• Trialling and implementation of sediment management measures earlier than expected. • Methods and techniques expected to evolve over time. Could involve floating and/or land based techniques.

Objective COMP5: Monitoring of bathymetry outside the RTE fields

Targets	• Topographic monitoring of realignment site, Cherry Cobb Sands Creek, entrance to Stone Creek and wider Foul Holme Sands environment
Management	• By site manager
Monitoring	• Survey by LiDAR of local and wider area at 1-3 year intervals • Regular (3 monthly) photographic surveys of realignment site, Cherry Cobb Sands Creek and Stone Creek form fixed points. • Topographic surveys at. four sections across Cherry Cobb Sands and one section in the entrance of Stone Creek
Who	• Site manager and suitably qualified surveyor
When	• At regular intervals as outlined above. • Photographic record and topographic surveys to commence at time of consent to establish baseline conditions
Limits of Acceptable Change	• Changes in Cherry Cobb Sands channel cross section to be within limits assessed in EX28.3 on compensation site or recorded natural variability whichever is the greater. • Siltation in the entrance to Stone Creek that can be attributed to development or operation of the compensation site to be assessed for removal by AHPL.
Remedial Action	• Modifications to monitoring locations as required and in agreement with Steering Group • Bed levelling or dredging in the entrance to Stone Creek.

Objective COMP6: The RTE & MR site will contain similar infaunal communities to those found at NKM as defined by characteristic species in abundance and biomass.

Targets	• Similar faunal biotope(s) to that found at North Killingholme Marshes based on preconstruction surveys undertaken in and ~~Autumn~~autumn 2015 and ~~Spring~~spring 2016 and any additional surveys or information provided by EA. • This biotope to be provided within 88ha of mudflat of which a minimum of 44ha will always be available. • Quantitative targets are to be defined and agreed following completion of ~~full baseline (pre construction) surveys. The Survey design for this is set out in Annex 2 and the target setting protocol in Annex 3.~~modelling work by Bournemouth University.
Management	• Breach of sea defence to be made if possible within the peak benthic larval recruitment phase (March – May) • Bed levelling to be conducted post spawning/recruitment phase of key species;
Monitoring	• Sampling of the RTE & MR areas is detailed in Annex 2 and replicates the methods used at NKM & CCS • Samples to be taken with hand held corer (0.01 m2), sediment sampled to a depth of c.~~15~~30 cm. 3 replicate benthic samples should be collected at each station (with one additional core sample collected per station to characterise the sediment). • A topographic survey will be used to inform the stratified systematic design. • Analysis will be as stipulated in Annex 2. • Particle size analysis, organic content and water salinity will also be measured.
Who	• Environmental Manager and suitably qualified surveyor
When	• Monitoring to be undertaken annually in August-September (with the optimal time being the last week of August to first week of September) for the first ten years. • Any subsequent change in monitoring to be reviewed and agreed by the Steering Group.
Limits of Acceptable Change	• Community must be characterised by the biotope and AFDW biomass/ individuals per square metre within the tolerance limits identified from the baseline survey to be undertaken in ~~Autumn~~autumn 2015 & ~~Spring~~spring 2016 and other relevant data. See target setting protocol in Annex 3 • ~~Intertidal mudflats across 60 ha~~.
Remedial Action	• Alter sluice management to ensure adequate larval transport and suspended sediment transportation into the cells.

Objective COMP7: The RTE site post warping up will contain similar sediment distribution patterns to those found at NKM as defined by Particle Size Distribution (PSD)

Targets	• Sediment distribution to provide Sandy mud and mud as found at Transect 3 of the characterisation survey. • (79%-95% mud, 4.5%-20% sand) to provide the envelope of Particle Size Distribution
Management	• Management of warping up and sluice gates to maintain desired sediment and fluidity of sediment • However, the mud levels within the fields will continue to rise and some maintenance to clear excess sediment will be required
Monitoring	• Samples taken to support the sediment monitoring programme will be collected by means of hand coring, • When the full distribution has been constructed and the warping up phase is complete the sample should be assigned a description based on the Folk classification system (Folk, 1974) and/or the Wentworth classification system (Wentworth, 1922). • Guidelines to be used in the design and subsequent reporting of benthic monitoring are the Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites (Ware and Kenny, 2011) and the Marine Monitoring Handbook (Davies et al, 2001) unless statutory agency advice indicates an alternative approach. • The sediment will not build up uniformly across the site. High points will be identified by visual inspection, using the water level to identify 'islands', or observing the beginnings of saltmarsh formation.
Who	• Environmental Manager and suitably qualified surveyor
When	• Annually in autumn for the first five years • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains materially unchanged. • Any changes in monitoring to be reviewed and agreed by the Steering Group
Limits of Acceptable Change	• A shift of 2 classifications within the folk system i.e. from mud to sand; OR a shift outside of the desired sediment envelope as defined by the NKM PSD data.
Remedial Action	• Sluice gate management • The high points will be removed using terrestrial based excavation plant with low ground bearing tracks, which will access the fields via ramps from the cross banks. High points will be pushed into perimeter ditches around the site or towards the control structure. • The ditches will be first cleared by holding back water within the fields on a spring tide, then releasing quickly to 'flush' the ditches. If additional assistance is required to clear the ditches, this would be done using a crane mounted suction dredging pump, which would operate from the top of the embankments.

Objective COMP8 (SAC): Provide 21.2 ha of saltmarsh habitat of similar zonation and species composition to that of the middle Humber.

Targets	• Deliver a minimum of 21.2 ha of saltmarsh of a composition typical of the middle Humber estuary to replace estuary and sub-tidal habitat loss. • Within 10 years pioneer and lower saltmarsh community to have established over 10 ha with a minimum of 70% of plant species found within similar communities on Humber • Within 15 years zonation to include middle saltmarsh community. Minimum of 70% of the plant species present over similar zonation patterns in Humber. • Within 20 years ~~Saltmarsh~~saltmarsh extent to be equal to or greater than 21.2 ha
Management	• Natural processes to occur in MR section of compensation site to allow accretion and establishment of saltmarsh.
Monitoring	• Saltmarsh extent, community, zonation and diversity will be ascertained following EA WFD guidance e.g. OI 200_07 or any subsequent relevant revisions. • In advance of each annual survey the most recent available aerial images will be requested from the EA (although it is noted that not every year will be updated by the EA), this information providing additional data and informing the survey process. Where the data are current (e.g. the year of image is current to the year of survey, then depending on coverage, it may be unnecessary to undertake an additional survey flight. • When such images are unavailable, then a survey flight will be undertaken, with aerial colour images captured. These images will be: ○ of resolution of at least 25cm ○ 3 band red green blue (RGB) imagery ○ taken in daylight at low water around a spring tide ○ taken under stable lighting conditions (little or no cloud shadow) ○ taken between June and September each year, with timing to be standardised to a single month per year where possible ○ taken on an annual basis for a minimum of 10 years, the requirements for subsequent surveys to be determined by the Steering Group • In addition to the annual aerial image survey, field survey of the saltmarsh habitat will be undertaken on an annual basis, again following guidelines in the EA's OI 200_07. • This will include a series of transects of sufficient frequency to adequately describe the communities, their zonation and extent (see OI 200_07 for details). Each transect will cover both the seaward and landward extent of the saltmarsh. Transition points will be mapped and two quadrat samples taken to characterise the major community changes, recording species, cover, sward height etc. following OI 200_07 procedures. • The saltmarsh will then be therefore assessed for the following metrics in accordance with the WFD Saltmarsh Index Tool: ○ saltmarsh extent as proportion of "historic saltmarsh" ○ saltmarsh extent as proportion of the intertidal

	○ change in saltmarsh extent over two or more time periods ○ proportion of saltmarsh zones present (out of five) ○ proportion of saltmarsh area covered by the dominant saltmarsh zone ○ proportion of observed taxa to historical reference value or proportion of observed taxa to 15 taxa
Who	Environmental Manager and suitably qualified surveyor in consultation with the Environment Agency
When	• Aerial survey data obtained annually • Annual fixed point photographic surveys of MR site (at same time as vegetation monitoring) for first 10 years • Vegetation monitoring June to September (to aid species identification) for first 10 years. • After 10 years date frequency to reviewed by steering group
Limits of Acceptable Change	• Less than 10ha of saltmarsh and mudflat formed within first 10 years • Absence of lower saltmarsh within 10 years or middle saltmarsh within 15 years • Species composition of zones is less than 70% that of Humber reference sites (e.g. Cherry Cobb sands saltmarsh)
Remedial Action	• Beneficial use of sediment from within RTE to aid saltmarsh formation in MR • Planting up of saltmarsh/removal of undesirable species • Creation of artificial creek system within MR to improve dewatering
Notes	Natural England have indicated that other estuarine habitat (e.g. mudflat) would be acceptable if the full extent of saltmarsh was not achieved. If the mix of estuarine habitats equalled 21.2 ha no remedial action would be required.

Objective COMP9 (SAC): Ensure Compensation site delivers 73.4 ha of SAC intertidal habitat of acceptable depth to ensure no decrease in SAC extent

Targets	• Deliver a minimum of 73.4 ha of intertidal mudflat in the immediate term and a minimum of 44 ha of sustainable mudflat in the long term • Deliver a minimum average depth of 100 mm marine mud including a minimum of 50 mm within the first year • Ensure that shore profile is developing in line with the established baseline elsewhere in the SAC, ~~ie~~i.e. a shallow profile that allows regular tidal inundation providing 3~~-~~-5 hours of tidal movement over the mudflat
Management	• Inlet sluices for the RTE fields are in general to be operated fully open to facilitate rapid accretion of muds. • After the first winter period following breaching of the realignment site the sluices are to be operated in normal operational mode to avoid extended drying of the mudflat resource over the neap tide period. • Sediment Management Plan to optimise mudflat functionality to be developed within 24-36 months of site being breached

Monitoring	• Accretion monitoring in RTE fields to identify change in mudflat extent and elevation • LiDAR, bed level monitoring, marked stakes and photographic records to determine extent, elevation and change over time
Who	Site managers assisted by suitably qualified surveyor
When	• ~~bi~~Bi-annually during first 2-3 years and thereafter at 1-3 year intervals
Limits of Acceptable Change	• If average mud levels in the field achieve 100 mm before the end of the first winter period after breaching sluices are to begin to be operated in normal operational mode.
Remedial Action	• Variation in number of sluices operated to control exchange • Implementation of sediment management measures • Sediment management provides the basis for adaptive management of the mudflat levels
Notes	It is anticipated that bed levels will normally exceed 100mm due to accretion. Where bed levelling or dredging is required this will retain a minimum average of 100mm over the managed area.

Objective COMP10 (SAC): Ensure non-faunal attributes of compensation mudflat habitat are consistent with those of the area of SAC mudflat habitat to be lost

Targets	• PSA of accreted substrate should not differ significantly from that of the SAC area to be lost, i.e. sediment distribution to provide sandy mud and mud, with grain size varying between 0.01-0.3mm • (79%-95% mud, 4.5%-20% sand) to provide the envelope of Particle Size Distribution • High average organic carbon content of accreted sediment- this should not deviate significantly from the established SAC baseline in the area to be lost • Ensure that excessive nutrient enrichment is not taking place, as indicated by development of macroalgal mat cover in excess of the established baseline found in the SAC area to be lost
Management	• Management of sluice gates to maintain desired sediment characteristics • Expected that the sediments which settle will have similar organic content to those which have settled elsewhere in the SAC
Monitoring	• Hand-coring within RTE fields followed by PSA and analysis of organic content • Photographic record and recording of surface conditions- character and composition of surface sediments, evidence of drying, macroalgal cover
Who	Environmental Manager and suitably qualified surveyor
When	• Annually in autumn for the first five years • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains materially unchanged. • Any changes in monitoring to be reviewed and agreed by the Steering Group
Limits of Acceptable Change	• A shift of 2 classifications within the Folk classification system i.e. from mud to sand • A shift outside of the desired sediment envelope for all parameters listed
Remedial Action	Sluice gate management and dredging of material

Objective COMP 11: Monitor Fish within Compensation Site

Targets	To monitor fish using WFD compliant methods as far as possible with reference to Operational Instruction 328_07 Data requirements for WFD transitional fish surveillance monitoring
Management	N/A
Monitoring	• Use of Fyke nets in main MR channel in May-June (~~Spring~~spring WFD) and September-October (~~Autumn~~autumn WFD) • Use of epibenthic sledge (0.9m opening width, dragged for 50m) subject to safe method of work being possible to sample juvenile fish • Fyke nets to be deployed at RTE sluice ~~twices~~twice per annum in May-June (~~Spring~~spring WFD) and September-October (~~Autumn~~autumn WFD) on outgoing tide.

	• Results to include following data in line with 328_07: ○ fish species present; ○ abundance of each species; ○ length measurements (freshwater and migratory species – fork length, marine species – total length). For large catches only the first 50 lengths for each species during each netting occasion are required, the rest can be counted; ○ for exceptionally large catches sub-sampling techniques will be used ; ○ supporting water quality information: dissolved oxygen (% sat), salinity, temperature ○ GPS position at approximate mid-site location (12 figure NGR); • date, time, trawl duration and tide state.
Who	Suitably qualified surveyors in liaison with Environmental Manager and EA
When	• Every two years in spring & autumn for the first ten years • Any changes in monitoring to be reviewed and agreed by the Steering Group
Limits of Acceptable Change	N/A
Remedial Action	N/A
Notes	The epibenthic sledge is not WFD compliant but experience at other MR's has shown it to be a useful tool in providing additional sampling of juvenile fish not monitored by Fyke nets.

Objective COMP 12: Monitor Fish Fatalities within RTE Fields

Targets	To monitor for fish fatalities on a regular basis in accordance with Standard Operating Procedures.
Management	N/A
Monitoring	• Visual check of RTE fields for dead fish • Recording of observations on check list • Reporting of any significant fish kills to Environmental Manager • Taking of photographic evidence
Who	RTE Sluice operators
When	• Every day that RTE sluices are being operated • Any changes in monitoring to be reviewed and agreed by the Steering Group
Limits of Acceptable Change	• More than five dead fish in RTE fields at any one time; and/or • More than two dead fish on consecutive days
Remedial Action	Investigation of reasons for fish mortality

Notes	Fish fatalities will be monitored routinely as part of daily operational activities. Records will be reviewed regularly by Environmental Manager.

~~4.3 WET GRASSLAND & OPEN WATER AREA~~

4.3 BRACKISH LAGOONS

Rationale & Objectives

4.3.1 There are no similar sized RTE schemes which have been created, and especially ones designed to support birds.

~~4.3.2 Creation of wet grassland is a well-established process, and hence there is greater certainty about the ability to develop it, and also about the biomass that will be available as a result for shorebirds and especially black tailed godwits.~~

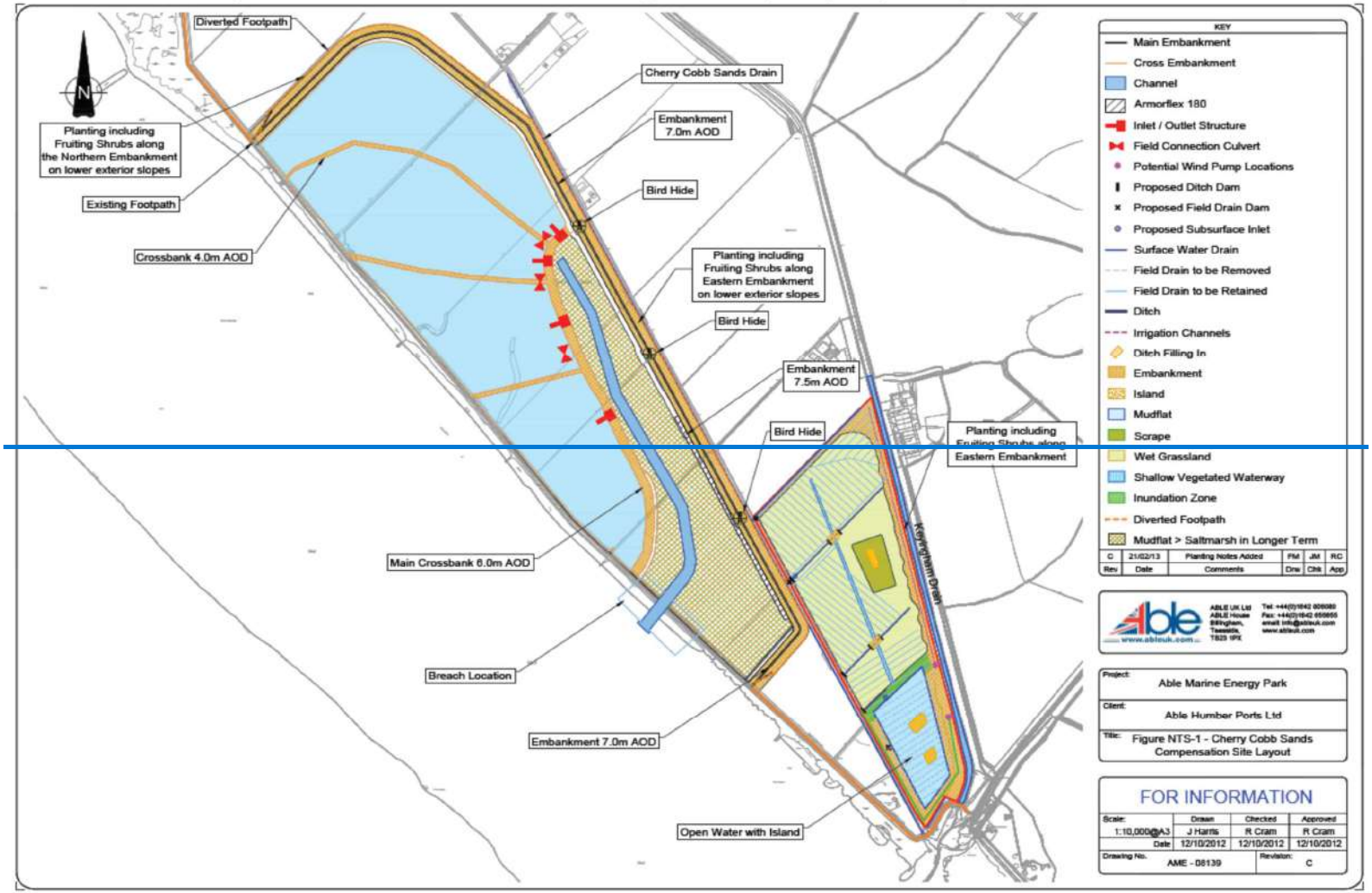
~~4.3.3~~4.3.2 ~~Wet grassland~~Brackish lagoons is a habitat type which is known to be used by foraging black-tailed godwits, especially as the winter progresses and intertidal food resources can become depleted. ~~There is little grassland around the Humber Estuary at present and its~~Its provision will provide a valuable additional food resource, which will also be available to the birds at high tide.

~~4.3.4~~4.3.3 The provision of the ~~roost~~CCSBL site ~~(formed by islands in the open water area at the southern end of the wet grassland site) close to existing mudflats at CCS~~ will mirror the close proximity of NKHP to the mudflats at NKM. The close proximity between a secure roost site and feeding resources is thought to be important in the use of the NKM foreshore by black-tailed godwits, especially during the autumn moulting period. The roost site at CCS is expected to facilitate more extensive use of CCS by black-tailed godwits.

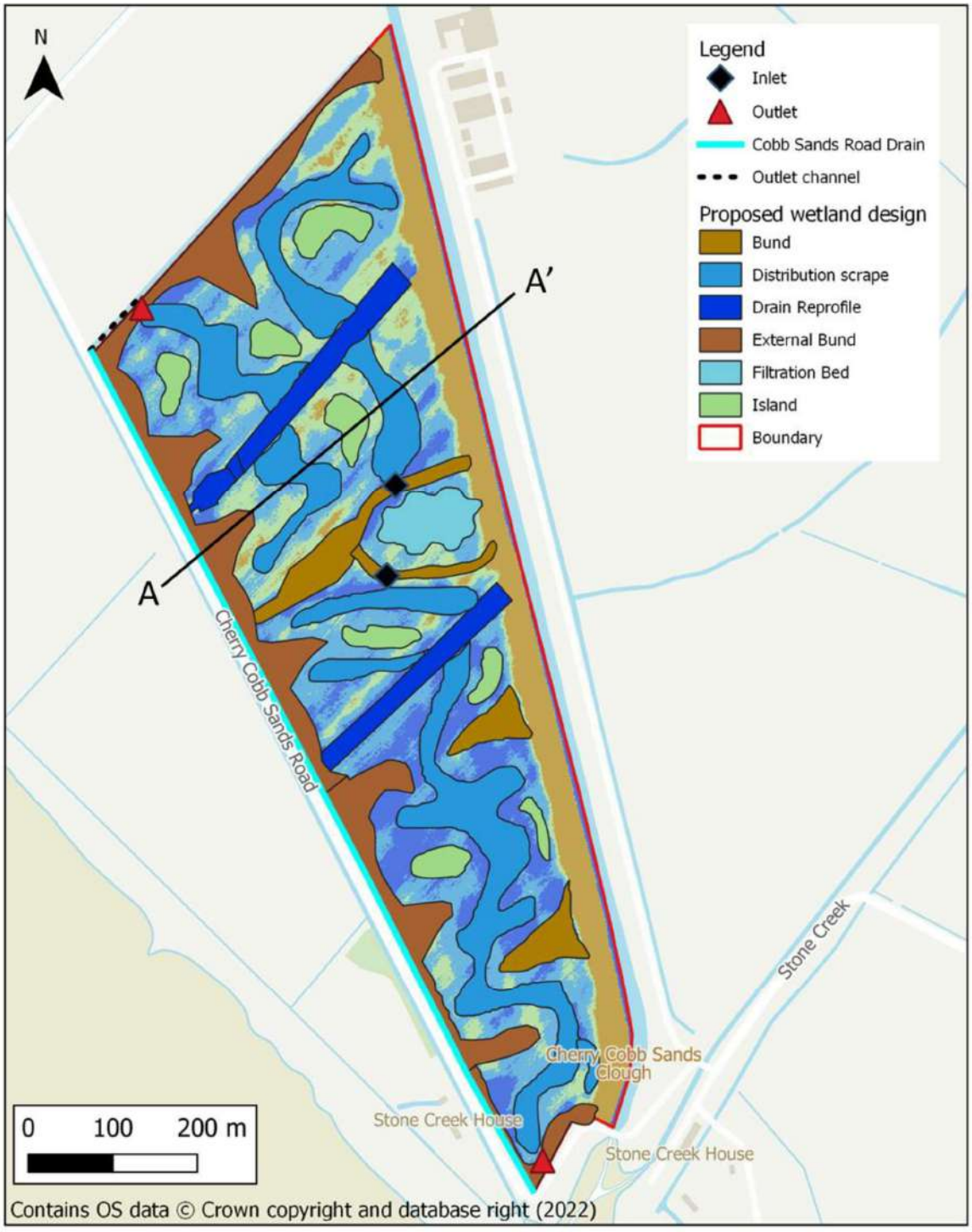
~~4.3.5~~4.3.4 The ~~wet grassland and open water areas~~brackish lagoons at CCS (CCSBL) are therefore included as part of the compensation package to provide additional foraging and roosting habitat in case of any under performance of the RTE.

~~4.3.6~~4.3.5 Objectives are therefore based around the construction, management and maintenance of ~~both the roost site and wet grassland~~the CCSBL habitats to deliver suitable functionality for black-tailed godwits in particular.

Figure 1: Indicative Layout of ~~Wet Grassland~~Brackish Lagoon Complex (JBA, 2023)



~~Objective WG1: The site will contain wide, open expanses of wet grassland habitat with unobscured views of the surrounding area – TARGET 1~~


N
Legend
Inlet
Outlet
Cobb Sands Road Drain
Outlet channel
Proposed wetland design
Bund
Distribution scrape
Drain Reprofile
External Bund
Filtration Bed
Island
Boundary
A
A'
Cherry Cobb Sands Road
Stone Creek
Cherry Cobb Sands Clough
Stone Creek House
Stone Creek House
0 100 200 m
Contains OS data © Crown copyright and database right (2022)

Objective BL1: The site will provide a mosaic of brackish lagoons and marginal habitats to mirror the functional provision of the NKP e.g. to support roosting and foraging waterbirds. Design to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023

BL1 Target 1 **(General Area & Function)**	~~Wet or damp grassland vegetation community across 26ha of the CCSWGS~~20.6ha of (*potential* – see BL1 T3) saline lagoon and supporting marginal habitat with length to breadth ratio of 3:1 and bunds placed along the western and northern site boundaries to provide shelter from the prevailing wind.
Management	~~• Sowing with an appropriate seed mix (for example EG8 Wet Grassland Mix from Emorsgate Seeds) and leaving uncut and ungrazed for 3 to 6 months, as appropriate~~ ~~• 0.2 livestock units per hectare per year in April to June inclusive in Year 1; AND~~ ~~• 0.3 livestock units per hectare per year in April to June inclusive in all subsequent years; OR~~ ~~• Equivalent management by cutting the grassland~~ ~~• No fertilisers to be used except if needed to boost earthworm biomass~~ ~~• No herbicides to be used except if needed to control problem plant species. These to be applied with a weed wipe or via spot control.~~Design to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023 inc. area provision, lagoon cross-sections. • Brackish lagoon area to comprise no less than 20.6ha together with marginal habitats according to the JBA, 2023 specification. • Ongoing management of pumping regime to maximise habitat potential (e.g. invertebrate and waterbird utilisation – see BL2 & BL3). • Ongoing management (removal) of invasive vegetation to ensure open water area is maintained (See BL1 T5).
~~**Monitoring**~~	~~• 60 permanent quadrats to be established measuring 1m x 1m within the wet grassland area~~ ~~• Plant species and abundance to be recorded for each quadrat~~
~~**Who**~~	~~Contractors under supervision of Environmental Manager~~
Monitoring~~**When**~~	• Assume design brief is met and does not need to be checked over-time, subject to marginal vegetation encroachment (see below) • Area (m^2) of open lagoon (water) and marginal wetland habitats (bare ground). ~~**Monitoring** to undertaken annually in June for the first five years~~ • ~~Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged subject to the agreement of the Steering Group.~~

~~Limits of Acceptable Change~~	• ~~At least one species characteristic of wet or damp grasslands must be present in 50 permanent quadrats~~ • ~~Wet grassland vegetation community across 20ha of the CCSWGS~~
~~Remedial Action~~	~~Raise sluice heights to increase soil moisture content, providing incidence or extent of flooding does not exceed limits of acceptable change~~

~~Objective =~~WG1: ~~The site will contain wide, open expanses of wet grassland habitat with unobscured views of the surrounding area – TARGET 2~~

~~Target 2~~	~~No scrub (including bramble) or trees across the entirety of the CCSWGS~~
~~Management~~	~~• 0.2 livestock units per hectare per year in April to June inclusive in Year 1; AND~~ ~~• 0.3 livestock units per hectare per year in April to June inclusive in all subsequent years; OR~~ ~~• Equivalent management by cutting the grassland~~
~~Monitoring~~	~~Visual assessment of scrub~~
~~Who~~	~~Environmental Manager~~
~~When~~	~~• Monitoring to undertaken annually in June for the first five years~~ ~~• Monitoring to occur in June once every three years thereafter if limits of acceptable change have not been exceeded in the first five years subject to the agreement of the Steering Group~~
~~Limits of Acceptable Change~~	~~No more than 5% scrub or trees across the entirety of the CCSWGS~~
~~Remedial Action~~	~~Cutting down vegetation and treatment of stumps with herbicide~~

~~Objective WG2~~: ~~The site should contain open water with at least one island suitable for roosting black-tailed godwits at high tide~~

~~Target 1~~	~~An open water area of 4 to 5ha in size and an average depth of 0.35m to 0.7m in depth, according to season~~
~~Management~~	~~• Topping up with water from external drains to maintain water level and extent to target levels, as and when required~~ ~~• Adjustment of sluice height to retain water at the appropriate depth, during the winter period~~ ~~• Adjustment or cessation of irrigation rate to keep extent and depth of open water within target levels, during the late summer/autumn period~~
~~Monitoring~~	~~Visual assessment of the extent of the open water area~~ ~~Recording the depth of the water within the open water area~~
Who	Environmental Manager
When	• ~~Monitoring~~Area assessment of brackish lagoon (water ~~extent and depth~~coverage) to ~~occur a minimum of twice weekly during~~be undertaken quarterly for the first ~~year; and~~ • ~~Monitoring of water extent and depth to occur a minimum of twice monthly, and more frequently during periods of irrigation, in the next four~~five years~~;~~ (see T3 re potential drying areas). • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged subject to the agreement of the Steering Group. • Management of invasive vegetation to be undertaken annually in the late winter / early spring to minimise bird disturbance (See BL1 T5 & BL3).
~~Limits of Acceptable Change~~	~~• No less than 3ha of open water extent~~ ~~• No less than 0.25m average depth~~
~~Remedial Action~~Limits of Acceptable Change	• ~~Topping up with~~Potential lagoon area to be maintained through water ~~from external drains~~management (see below and in T3) and vegetation control. • However, during periods of excessive atypical weather conditions e.g. precipitation or drought, then a greater divergence permit for two months following cessation of ~~irrigation subject to protocols being~~these conditions e.g. area met at least for 1 month each quarter. Definition of excessive conditions to be agreed ~~with~~between Environmental Manager and representatives of the ~~Environment Agency~~ • ~~Re-instating the integrity of the slowly or impermeable lining of the open water area, if necessary~~Steering Group.
~~Notes~~Remedial Action	~~The Environment Agency carries out periodic maintenance of the Keyingham Drain that requires the maintenance of a head of water for flushing purposes. An abstraction licence will be required and a protocol agreed with the EA~~Modify pumping and sluicing rates until equilibrium is achieved.

	Initiate vegetation control on an annual basis if required (e.g. open water / bare ground area loss e.g. island habitat).

BL1 Target 2 (Habitat)	~~No more than 10% dense stands of rushes (Juncus spp), tall sedges (Carex spp), reeds (Phragmites australis, Phalaris arundinacea, Glyceria maxima, Typha spp) within the open water area~~A mosaic of lagoons (scrapes), shallow islands and marginal habitats. A range of topography including variable scrape depths to ensure variation in habitat and function, and with a maximum edge gradients (scrapes and bunds) of 10%.
Management	• ~~Cutting dense stands of rushes, sedges and reeds in late summer/Autumn, if present~~Design to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023. • Ongoing management of pumping regime to maximise brackish lagoon habitat potential (e.g. invertebrate and waterbird utilisation – see BL2 & BL3).
Monitoring	• Assume design brief is met and does not need to be checked over-time, subject to marginal vegetation encroachment (see below) • Area (m^2 of lagoon and marginal wetland habitats)
Who	Environmental Manager
When~~Monitoring~~	• ~~Visual~~Area assessment of ~~rushes, tall sedges and reeds within the open~~ brackish lagoon (water coverage) to be undertaken monthly for the first five years. • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged subject to the agreement of the Steering Group.~~area~~
Limits of Acceptable Change	• Lagoon area to be maintained through water management (see below). • However, during periods of excessive atypical weather conditions e.g. precipitation or drought, then a greater divergence permit for two months following cessation of these conditions e.g. area met at least for 1 month each quarter. Definition of excessive conditions to be agreed between Environmental Manager and representatives of the Steering Group.
Remedial Action	Modify pumping and sluicing rates until equilibrium is achieved.

BL1 Target 3 (Aquatic Physical Criteria)	The two main lagoons to be subject to rotational drying, with a minimum of 10ha of lagoon habitat available (Jan-Jun) and additional area for the remaining months e.g. not all of the 20.6ha of brackish lagoon will necessarily be operational at any one time (see below). Water depth to be a maximum of 75cm and with marginal wetland equal to c. 50% of the lagoon area to be of between 0-25cm depth. Salinity of 6-24psu to encourage an invertebrate assemblage similar to that of the middle estuary to develop (See BL1 T4)
Management	• Design to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023. • Depth and salinity of brackish lagoons addressed by pumped water from Keyingham Drain with a pumping rate of 9,000m^3 / month if one lagoon is operated as filled and one dry and a salinity range of 5.2-15.9psu,

	averaging 9.6psu. Or 17,000m^3 / month if both lagoons are operated as filled and with a salinity range of 5.0-15.6psu. • Ongoing management of pumping regime to maximise brackish lagoon habitat potential (e.g. invertebrate and waterbird utilisation – see BL2 & BL3).
Monitoring	• Water area (m^2), according to rotational drying status • Four transects to measure physico-chemical parameters from shallow margins to deeper scrapes in each lagoon (Presuming two main lagoons). Details to be agreed with Steering Group: o Salinity range of 6-24psu (or similar agreed metric) across lagoon(s) (See BL1 T4) o Water depth (cm) across brackish lagoon site
Who	Environmental Manager
When	• Area assessment of brackish lagoon(s) (water extent, depth) to be undertaken monthly for the first five years. • Water depth to be measured at 20No locations within each lagoon along two-four transects. Details to be agreed with the Steering Committee. • Salinity measured monthly at 20No locations within each lagoon (if both are 'wet') along two-four transects. Details to be agreed with the Steering Committee. • Monitoring can cease if the targets is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged subject to the agreement of the Steering Group.
Limits of Acceptable Change	• Lagoon area to be maintained through water management (see below) within the agreed rotational drying regime e.g. no less than 10ha available at any time. • Depth to remain within criteria (a maximum of 75cm in the lagoon(s) and with c. 50% of the lagoon area to be of between 0-25cm depth e.g. the shallow margins. • However, during periods of excessive atypical weather conditions e.g. precipitation or drought, then a greater divergence permit for two months following cessation of these conditions e.g. area met at least for 1 month each quarter. Definition of excessive conditions to be agreed between Environmental Manager and representatives of the Steering Group. • Salinity of the brackish lagoon areas less than 5psu.
Remedial Action	Modify pumping and sluicing rates until equilibrium is achieved across site and against required range criteria (see above).

BL1 Target 4 (Salinity)	A salinity level within the lagoons of 6-24 PSU will be maintained
Management	• Variable salinity will occur over time within the lagoons due to extraction sources, time of year weather conditions. However the 6-24psu range should be maintained.
Monitoring	• Measuring salinity within the external drains (subject to agreement with EA and Drainage Boards) • Measuring salinity within the open water area (See BL1 T3).

Who	Environmental Manager
When	• Monitoring of salinity to occur continuously using data loggers during the first year within the Keyingham drain. • Monitoring of salinity in the lagoons to occur continuously during the late summer/autumn period for the next four years. • Monitoring can cease if the limits of acceptable change have not been exceeded in the first five years, subject to the agreement of the Steering Group.
Limits of Acceptable Change	• Salinity of the open water area less than 5psu.
Remedial Action	Adjust extraction regime to return salinity of the open water area to within acceptable limits.

BL1 Target 5 (Emergent / Fringing Vegetation)	No more than 10% dense stands of rushes (*Juncus* spp), tall sedges (*Carex* spp), reeds (*Phragmites australis, Phalaris arundinacea, Glyceria maxima, Typha* spp) within the open water area.
Management	• Cutting dense stands of rushes, sedges and reeds in the late winter, if present.
Monitoring	• Visual assessment of rushes, tall sedges and reeds within the open water area.
Who	Environmental Manager
When	• Monitoring to undertaken annually in June for the first five years • Monitoring to occur in June once every three years thereafter if limits of acceptable change have not been exceeded in the first five years subject to the agreement of the Steering Group
Limits of Acceptable Change	• No more than 20% dense stands of rushes, tall sedges and reeds within the open water area.
Remedial Action	Cutting or excavating and removal of stands of rushes, tall sedges and reeds to give a **maximum** of 5% cover within the open water area. Timing to avoid key waterbird usage periods e.g. late summer and autumn, early to late winter, as well as breeding season (March-June).
Notes	Cutting and removal of swamp vegetation to be undertaken outside the ~~bird~~key bird seasons e.g. late summer, wintering and breeding ~~season~~

BL1 Target ~~3~~6 (Islands)	~~The open water area is to contain freshwater for the purpose of irrigation~~Four islands will be created in the two lagoons to provide potential roosting habitat e.g. for black-tailed godwit (See BL3). These will be designed to be accessible for livestock and periodically accessible for vegetation management if required.
~~**Management**~~	~~Only extracting freshwater from the external drains to top up the open water area, which may require adjustments in the extraction point and timing~~

~~**Monitoring**~~	~~• Measuring salinity within the external drains (subject to agreement with EA and Drainage Boards)~~ ~~• Measuring salinity within the open water area~~
~~**Who**~~	~~Environmental Manager~~
~~**When**~~**Management**	~~• Monitoring~~Removal of ~~salinity to occur continuously using data loggers~~vegetation annually during ~~the first year within the Keyingham drain.~~ ~~• Monitoring of salinity to occur continuously during the late summer/autumn period for the next four years~~ • ~~Monitoring can cease~~ Feb – March as required, (if ~~the~~ limits of acceptable change ~~have not been~~are exceeded). Late summer growth removal may be necessary *in* ~~the first five years, subject to the agreement of the Steering Group~~*extremis*, but consideration needed to roosting black-tailed godwit disturbance at this time.
~~**Limits of Acceptable Change**~~	~~Salinity of the open water area less than 1‰~~
~~**Remedial Action**~~	~~Adjust extraction regime to return salinity of the open water area to within acceptable limits~~

~~**Target 4**~~	~~Two vegetation free islands within the open water area~~
~~**Management**~~	~~• Islands to be capped with butyl rubber and shells/cobbles/gravel to limit vegetation growth~~ ~~• Removal of vegetation annually in June, if limits of acceptable change are exceeded~~
Monitoring	• Mapping of the extent of the vegetation on each island
Who	Environmental ~~manager~~Manager
When	• Monitoring to be undertaken annually in June/July for the first five years • Monitoring to occur in June/July once every three years thereafter if limits of acceptable change have not been exceeded in the first five years, subject to the agreement of the Steering Group
Limits of Acceptable Change	• ~~Up~~Largely bare ground but up to 25% short perennial or ephemeral vegetation but no shrubs, trees or tall ruderal vegetation in the period July to March.
Remedial Action	• Cut and treat shrubs, trees or tall ruderal vegetation as appropriate; OR Remove and replace shells/cobbles/gravel cap if islands are repeatedly colonised and management becomes difficult. • Removal timed to avoid key waterbird sensitivity periods.

Objective ~~WG3~~BL2: The ~~soil~~site will ~~be moist throughout the months of August~~provide an invertebrate assemblage (and thus foraging potential for key waterbird species) comparable to ~~April to concentrate invertebrates at the~~

~~surface and to ensure~~ **that** ~~the soil remains soft enough to be probed by waders~~**of the NKP site. Design to follow that outlined in JBA, 2023**

~~Target 1~~**BL2 Target1** **Aquatic Invertebrate Assemblage**	~~Soil penetration resistance less than 6kg on average in each month from July to March using a soil penetrometer~~An abundant aquatic invertebrate assemblage within the lagoons and ephemeral margins comparable to that present in the NKP site, and on the NKM frontage. Assemblage composition to include species characteristic of the areas being lost, consistent with a brackish 'mid estuary' intertidal.
Management	• ~~Maintenance of damp but unflooded grassland through appropriate sluice management and irrigation~~Pumping and sluicing from Keyingham Drain to provide 20.6ha of wetland with a salinity range of 5.0-15.6psu, averaging 9.4psu. • Rotational drying to mimic 'natural' conditions, replenishment of standing stock and site management. Cycle to follow that in JBA (2023). • Ongoing annual management of invasive vegetation (removal) to ensure no loss of open water area. • Ongoing management of pumping regime to maximise assemblage potential and react to extreme weather events e.g. high rainfall, drought.
Monitoring	• ~~Monitoring to be undertaken at 100 standard sample locations spread across CCSWGS~~'Intertidal' core samples (0.005m^2 or as required by NE) for infaunal analysis and particle size analysis will be taken to a depth of 10cm in the sediment (where possible), and samples will be sieved through a 0.5mm mesh *in situ*. • Laboratory analysis according to WFD or equivalent standard requirements, to include species identification and enumeration, biomass and sediment particle size distribution. • Number of samples to be agreed with NE/Steering Group but likely to be 20No for each lagoon (presuming two lagoons and both containing water. • Relevant Common Standards Monitoring and Water Framework Directive Guidance to be followed. • Comparison to assemblage data from NKP and NKM sites.
Who	Contractors under supervision of Environmental ~~manager~~Manager
When	• Monitoring to undertaken annually in May-June for the first five years. • ~~Monitoring to occur~~ in May-June ~~once per month from July to November annually for 5 years; and~~ • ~~Monitoring can cease if the target is achieved for~~every three ~~consecutive~~ years ~~after~~thereafter if limits of acceptable change have not been exceeded in the first five years ~~of monitoring provided that the management regime remains unchanged,~~ subject to the agreement of the Steering Group.
~~**Limits of Acceptable Change**~~	~~Soil penetration resistance less than 8kg on average in each month from July to March~~

Limits of Acceptable Change~~Remedial Action~~	• ~~Increase irrigation rate in order to increase soil moisture content and reduce soil penetration resistance~~ • ~~Raise sluice heights to increase soil moisture content and reduce soil penetration resistance~~'Intertidal' invertebrate assemblage to contain key species for priority waders e.g. black-tailed godwit (see earlier), and an assemblage characteristic of the NKM and NKP sites. • Abundance and biomass of key species per m^2 to be 'similar' to those on the NKM and NKP, but within natural variation. However, given inherent variability, this may be over +/- 50% of the reference sites (NKM and NKP), and subject to inter-annual variation. Multivariate statistical analyses to define comparability and important determinands. Reference conditions and LoAC to be further clarified with NE/Steering group, and in the light of the modelling outcomes. • Failure of site to deliver other spatial and functional attributes e.g. as under BL1 & BL3.
Remedial Action~~Notes~~	• ~~Soil resistance is based on data from Ausden et al 2001~~ ~~Soil resistance to be sampled using a soil penetrometer details of which can be found at http://www.cemml.colostate.edu/assets/pdf/TPS_04 1_Sampling_Compaction.pdf (see Annex 4).~~Modification to pumping regime (water depth & salinity) Potential to alter the drying cycle and allow for additional ingress of fauna. Water retention/flooding, across the wider site. • Removal of invasive vegetation growth (See BL1 T5).

BL2 Target 2 **Water Quality**	~~Soil moisture content greater than 100% of dry weight on average in each month from July to March~~ To ensure water quality parameters are suitable to support an abundant aquatic invertebrate populations comparable to that at NKM/NKP.
Management	• ~~Maintenance of damp but unflooded grassland through appropriate sluice management and irrigation~~Design and pumping operation to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023. • Good water quality to be maintained across the lagoon(s) to ensure BL2 T1 and BL3 requirements are met over the longer-term operation.
Monitoring	• ~~Monitoring to be undertaken at 100 standard sample locations spread across CCSWGS~~Water quality parameters including pesticide loadings. Important criteria to be agreed with Steering Group, but need to reflect Common Standards/WFD requirements if and when relevant.
Who	Environmental ~~manager~~Manager
When	• ~~Monitoring to occur once annually in the month of September for 5 years; and~~ • Parameters measured quarterly at 10No locations within each lagoon (if both are 'wet'). • Monitoring can cease if the ~~target~~targets is achieved for three consecutive years after the first five years of monitoring provided that

	the management regime remains unchanged~~,~~ subject to the agreement of the Steering Group.
Limits of Acceptable Change	~~• Soil moisture content greater than 80% of dry weight on average in each month from July to March~~Deleterious water quality observed across one or more lagoons against WFD standards. • Pesticide levels are sufficiently high to affect invertebrate assemblage and/or affect the health of wading birds. • Application of WFD criteria and GES to contextualise these.
Remedial Action	~~• Increase irrigation rate in order to increase soil moisture content~~ ~~Raise sluice heights to increase soil moisture content~~Modify pumping and sluicing rates until equilibrium is achieved. • Potential water treatment *in extremis* e.g. activated sludge.

Objective ~~Objective WG4: The site should be largely free of winter flooding to prevent floodwaters from killing soil invertebrates.~~

BL3: The site will support roosting and foraging potential for key wader species (e.g. black-tailed godwit) comparable to that of the NKP site. Design to follow that outlined in JBA Cherry Cobb Sands Wetland Concept Design, 2023

BL3 Target 1 (Aquatic Function)	~~Less than 10% flooding across~~To support a waterbird assemblage consistent with that of the ~~wet grassland~~NKM/NKP area ~~at any time (excluding the scrape~~. See Objective B1 for details and wider context. In particular to provide lagoonal open water habitat to deliver both roosting and foraging function for black-tailed godwit in numbers consistent with that of the NKM/NKP area~~)~~ (to be assessed in conjunction with BL3 T2).
Management	• ~~Appropriate sluice height and irrigation flow rate adjustment~~ ~~—~~Provide aquatic habitat to the extent and water depth as that in BL1 and detailed in JBA Cherry Cobb Sands Wetland Concept Design (2023). • Provide 'intertidal' invertebrate assemblage as described in BL2. • Rotational drying to mimic 'natural' conditions. Cycle to follow that in JBA (2023). • Ongoing management of pumping regime to ensure provision of sufficient aquatic habitat and associated invertebrate prey at key periods and react to extreme weather events e.g. high rainfall, drought. • Minimisation of anthropogenic disturbance through screening and site design as well as access restriction.
Monitoring	• ~~Visual assessment of extent of flooding~~See Objective B1 for details & wider context. • Ornithological surveys with all species, abundance, behaviour (roosting/foraging/displaying) and location noted/mapped. • Recording the environmental conditions (weather, water depth etc) • Recording of any disturbance (natural and/or anthropogenic). • Analysis of data against baseline requirements.
Who	Contractors under supervision of Environmental ~~manager~~Manager
When	~~• Minimum of twice weekly during the first year; and~~ ~~• Minimum of twice monthly, and more frequently during periods of irrigation, in the next four years;~~ *Waterbirds:* • Twice monthly TTT counts (neap and spring tides) over the first five years and then potentially at a reduced frequency (monthly) if conditions are being met for a further two years; ○ Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged~~,~~ ~~subject to the agreement of the Steering Group.~~. ○ Analysis of utilisation and function to be assessed against baseline criteria, potential use of a 'bird days' approach (to be agreed with NE and the Steering Group).

	○ Assessment to be made in the context of ongoing NKM/NKP data on the assemblage e.g. the relevant WeBS section in order to assess changes in the utilisation of the existing NKM/NKP site from the AMEP development, and wider patterns of utilisation. ○ CCSBL usage to be assessed in the context of regional (Humber) and national population trends in order to determine any atypical patterns of utilisation.
Limits of Acceptable Change	• ~~Less than 20% flooding across the wet grassland area at any time (excluding the scrape and open water area)~~Abundance of key species to be 'similar' to those on the NKM and NKP, but within natural variation. Based on baseline data analysis this may be over +/- 50% of the reference sites (NKM and NKP), and subject to inter-annual variation. Multivariate statistical analyses to define difference significance to be employed in conjunction with modelling outcomes . Reference conditions and LoAC to be further clarified with NE/Steering group, and in the light of the modelling outcomes. • Failure of site to deliver key functional attributes e.g. 'obvious' detrimental impacts to the assemblage based on surveyor observations (habitat availability, quality, disturbance).
Remedial Action	~~Appropriate sluice height and irrigation flow rate adjustment to enable flood waters to drain away~~Improvements to inundation regime e.g. water extent and depth Improvements to the invertebrate assemblage (provision of key prey items) and associated water quality parameters. Minimisation of disturbance
Notes	WeBS sector data may be available, but cannot be guaranteed. Humber data tend to be available with a time lag of several years. Whilst high tide Webs data are collected on an ongoing monthly basis, low tide WeBS data are currently considered to be old (collected in 2011/12), and the date of the next survey tranche uncertain

~~Objective WG5~~: ~~The site will have a high density of macro-invertebrate fauna to provide food for wading birds.~~

BL3 Target 2 (Terrestrial e.g. fringing bund margin function)	~~Average earthworm biomass levels of 65gm-2 (wet weight) in less than 5 years and maintained thereafter~~To support a waterbird assemblage consistent with that of the NKM/NKP area. See Objective B1 for details & wider context. In particular to provide terrestrial marginal habitat to deliver both roosting and foraging function for black-tailed godwit in numbers consistent with that of the NKM/NKP area (to be assessed in conjunction with BL3 T1). Fringing marginal grassland to support a characteristic terrestrial invertebrate assemblage to deliver wader foraging function.
Management	• ~~Maintenance of damp but unflooded grassland through appropriate sluice management and irrigation~~Provide terrestrial habitat to the extent as detailed in JBA Cherry Cobb Sands Wetland Concept Design (2023).

	• Ground conditions for terrestrial invertebrate assemblage suitable to support foraging waders within the fringing vegetated margins and bund bases. • Ongoing management of marginal grassland to suit roosting and foraging e.g. short sward wet grassland margins <10cm high, emerging bare mud (rotational drying). Bare ground to be maintained on islands (See BL1 T5). • Removal of encroaching scrub where affecting flight & sight lines and potentially enhancing predator potential. However, consideration as to the value of this habitat for screening of third party disturbance (below). • Minimisation of anthropogenic disturbance through screening and site design as well as access restriction.
Monitoring	• ~~Annual collection of 100 soil samples measuring 25 x 25 x 10cm at standard sample locations, with subsequent soil biomass calculations~~As for (and in conjunction with) BL3 T1. Ornithological surveys with all species, abundance, behaviour (roosting/foraging/displaying) and location noted/mapped. See Objective B1 for details. • Recording the environmental conditions (weather, water depth etc) • Recording of any disturbance (natural and/or anthropogenic). • Analysis of data against baseline requirements. • Habitat extent & quality e.g. as under BL1. • 'Terrestrial' invertebrate sampling using a 0.25 x 0.25 quadrat to a depth of x 0.1m (0.00625m^3), with soil removed for subsequent analysis (earthworm size class and biomass). Number of samples to be agreed with NE/Steering Group but likely to be around 25 samples representative of marginal grassland around the site e.g. following NERS methods.
Who	Contractors under supervision of Environmental ~~manager~~Manager
When	*Waterbirds:* • Twice monthly bird TTT counts (neap and spring tides) over the first five years and then potentially at a reduced frequency (monthly) if conditions are being met for a further two years; • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged. • Analysis of utilisation and function to be assessed against baseline criteria, potential use of a 'bird days' approach (to be agreed with NE and the Steering Group). • Assessment to be made in the context of ongoing NKM/NKP data on the assemblage e.g. the relevant WeBS section in order to assess changes in the utilisation of the existing NKM/NKP site from the AMEP development, and wider patterns of utilisation. • CCSBL usage to be assessed in the context of regional (Humber) and national population trends in order to determine any atypical patterns of utilisation. *Invertebrates (Earthworms as an indicator):* • Annually in September until target is achieved and then for three years thereafter

	• Monitoring may cease if earthworm biomass levels greater than target levels for more than three consecutive years. Any changes in monitoring to be subject to the agreement of the Steering Group.
Limits of Acceptable Change	*Waterbirds:* • In conjunction with BL3 T1 the abundance of key species to be 'similar' to those on the NKM and NKP, but within natural variation. Based on baseline data analysis this may be over +/- 50% of the reference sites (NKM and NKP), and subject to inter-annual variation. Multivariate statistical analyses to define difference significance to be employed in conjunction with modelling outcomes . Reference conditions and LoAC to be further clarified with NE/Steering group, and in the light of the modelling outcomes. • Failure of site to deliver key functional attributes e.g. as under BL3 T1 e.g. 'obvious' detrimental impacts to the assemblage based on surveyor observations (habitat availability, quality, disturbance). *Invertebrates (Earthworms)*: • Earthworm abundance and size to be at least consistent with 'standard' grassland e.g. NERS Handbook. • Minimum average earthworm biomass levels of ~~50gm-2~~50g m^2 (wet weight) after 3 years and/or a suggested mean across the samples of no less than 400 individuals per m^2. • Indicators of good terrestrial grassland quality to be agreed with the Steering group.
Remedial Action	~~Addition~~Improvements to inundation regime e.g. water extent and depth. • Improvements to the invertebrate assemblage (provision of key prey items) inc. addition of organic matter as a top dressing to promote biomass increase ~~Adjustments~~, adjustments to soil moisture content or extent of flooding as appropriate. Management of terrestrial vegetation. • Minimisation of disturbance.
Notes	WeBS sector data may be available, but cannot be guaranteed. Humber data tend to be available with a time lag of several years. Whilst high tide Webs data are collected on an ongoing monthly basis, low tide WeBS data are currently considered to be old (collected in 2011/12), and the date of the next survey tranche uncertain. Biomass target is derived from approximate average of natural, unflooded wet grasslands (Ausden et al, 2001~~)~~), and Earthworm density based on a pasture field at Skeffling (Hodson et al, 2021).

~~Objective WG6~~: ~~The wet grassland will be managed to give a suitable sward for wading birds throughout the months of August to March~~

~~Target 1~~	~~Average sward height of 10cm across the CCSWGS each month from July to March~~
~~Management~~	~~• 0.2 livestock units per hectare per year in April to June inclusive in Year 1; AND~~

	• ~~0.3 livestock units per hectare per year in April to June inclusive in all subsequent years; OR~~ • ~~Equivalent management by cutting the grassland~~
~~**Monitoring**~~	~~Measurement of sward height at 100 sampling points~~
~~**Who**~~	~~Environmental manager~~
~~**When**~~	• ~~Monitoring to occur once per month from July to November annually for 5 years; and~~ • ~~Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged, subject to the agreement of the Steering Group.~~
~~**Limits of Acceptable Change**~~	~~Average sward height of 15cm across the CCSWGS each month from July to March~~
~~**Remedial Action**~~	~~Increase livestock density to achieve shorter swards at the end of June; OR~~ ~~Increase length of time livestock are present on CCSWGS to end July; OR~~ ~~Introduce rotational grazing/cutting from July to September across the CCSWGS; OR~~ ~~Cut grass once in August/early September.~~

~~**Target 2**~~	~~No more than 10% dense stands of rushes (Juncus spp), tall sedges (Carex spp), reeds (Phragmites australis, Phalaris arundinacea, Glyceria maxima) or tall ruderal vegetation (thistles, docks etc) in the North and Middle Fields (including the scrape)~~
~~**Management**~~	• ~~0.2 livestock units per hectare per year in April to June inclusive in Year 1; AND~~ • ~~0.3 livestock units per hectare per year in April to June inclusive in all subsequent years; OR~~ • ~~Equivalent management by cutting the grassland~~
~~**Monitoring**~~	~~Visual assessment of the extent of the species listed above~~
~~**Who**~~	~~Environmental manager~~
~~**When**~~	• ~~Monitoring to undertaken annually in June for the first five years~~ • ~~Monitoring to occur in June once every three years thereafter if limits of acceptable change have not been exceeded in the first five years~~ • ~~Return to annual monitoring for three years following exceeding the limits of acceptable change~~ • ~~Any changes in monitoring to be reviewed and agreed by the Steering Group.~~
~~**Limits of Acceptable Change**~~	~~No more than 15% cover of dense stands of rushes, tall sedges, reeds or tall ruderal vegetation in the North and Middle Fields (including the scrape)~~

~~**Remedial Action**~~	~~• Flailing the areas dominated by unwanted vegetation twice in the year that the limit of acceptable change is exceeded; OR~~ ~~• Herbicide application for severe infestations of rushes~~

4.4 BIRDS

Rationale & Objectives

4.4.1 The objective is to maintain populations of displaced birds within the Humber Estuary. Previous sections describe objectives, management actions, and monitoring of the compensation package required to achieve this.

4.4.2 The compensation package is centred on ~~a secure wet roost~~providing a range of habitat functions that will allow birds to exploit existing mudflat resources on the north shore immediately as well as the new ~~wet~~brackish lagoon and marginal grassland ~~and~~together with the RTE/MR as these develop functionality.

4.4.3 The development of the full package will be incremental and how birds respond to it will require monitoring of all potential resources available to them.

4.4.4 These resources include the mudflat remaining at NKM. ~~The~~Originally, the total mudflat area ~~is~~was 77ha of which 31.5ha will be directly lost to AMEP and 11.6ha predicted to be functionally lost to disturbance~~.~~. (See Table 3). Use of the remaining area will need to be part of the monitoring programme. Over time, due to accretion on the NKM foreshore some of this mudflat has been colonised by saltmarsh.

4.4.5 Early provision of the ~~roost~~new habitats at CCS will require monitoring of the existing mudflat between Paull and Cherry Cobb Sands for evidence of increased use and potential competition effects.

4.4.6 The area monitored for bird numbers will therefore include not only the developing RTE/MR and ~~wet grassland~~brackish lagoons, but also the remaining mudflat at NKM, the existing intertidal area between Paull and Cherry Cobb Sands, and NKHP.

4.4.7 As the compensation site develops functionality it will be required to support the peak count (~~see Table 3~~See Tables 4 & 5) of the birds displaced from NKM within the range of national trends. Functionality from construction for the ~~CCSWG~~CCSBL will be reached within 2-4 years and up to 6 years for the RTE.

4.4.8 As there is a danger that rapid declines could be masked by natural variability as expressed by the national population trend then a review would be required after any one year where declines exceeded any negative change in the national trend, or after two years of consecutive decline even where this was within the range of changes in the national trend.

Objective B1: The Compensation site supports peak counts of displaced species (see Table 3) with the same levels of foraging activity.

Targets	• When RTE/MR & ~~CCSWG~~CCSBL reach full functionality (i.e. when biomass and physical targets are met) they support peak counts of each species as identified in Table 3. It is anticipated the RTE will reach full functionality within 4-6 years and the ~~CCSWG~~CCSBL within 2-4 years. • Foraging use reflects that recorded in ~~Table 3~~Tables 4 & 5 (an exception is allowed for avocet as numbers are small).
Management	• Develop RTE/MR and CCSBL • Provide secure ~~roost~~functional attributes in first instance at the CCS • ~~Develop RTE/MR and CCSWG~~ site
Monitoring	• Through the Tide Counts at NKM, CCS, ~~CCSWG~~CCSBL and RTE/MR and NKHP
Who	Suitably experienced surveyors
When	• Twice monthly on a spring and a neap tide
Limits of Acceptable Change	• Any one year where declines exceeded negative changes in the national trend • Two years of consecutive decline even where this was within the range of negative changes in the national trend
Remedial Action	• Review data to ascertain if population is being maintained within Humber • Review data on national population to ascertain if population maintained within UK • If evidence of range decline, provide additional compensation where this is achievable
Notes	If the area of functional disturbance is less than predicted and birds continue to use areas of NKM these may be counted toward the peak bird target identified for the compensation site.

ANNEX 1: DECISION MATRIX FOR ASSESSMENT OF SUCCESS OR FAILURE OF COMPENSATION SITE FOR BLACK-TAILED GODWIT

Bird Targets	Invertebrate Targets (~~Benthic and Wet Grassland~~RTE/MR & Brackish Lagoon)	Outcome	Management Required
Met	Both met ~~Roost~~Functions Provided	Fully Met	Maintain
Met	Not met ~~Roost~~Functions Provided	Partially Met	Improve RTE/MR & ~~WG~~BL management to meet invertebrate targets.
Met	~~Benthic~~RTE/MR met ~~WG~~BL not met ~~Roost~~Functions Provided	Partially Met	Improve ~~WG~~BL management to meet invertebrate targets.
Met	~~Benthos~~RTE/MR met ~~WG~~BL met ~~Roost~~Functions Provided	Partially Met	Improve RTE/MR management to meet invertebrate targets.
Not met	~~Benthos~~RTE/MR met ~~WG~~BL met ~~Roost~~Functions Provided	Partially Met	Determine if other reasons for birds not being present, and if numbers in SPA maintained. Identify management requirements.
Not met	~~Benthos~~RTE/MR met ~~WG~~BL met ~~Roost~~Functions Provided	Partially Met	Determine if other reasons for birds not being present, and if numbers in SPA maintained. Identify management requirements. Improve ~~WG~~BL management.
Not met	~~Benthos~~RTE/MR not met ~~WG~~BL met ~~Roost~~Functions Provided	Partially Met if overall biomass acceptable	Determine if other reasons for birds not being present, and if numbers in SPA maintained. Identify any additional management requirements.
Not met		Not Met if overall biomass not acceptable.	Determine if other reasons for birds not being present, and if numbers in SPA maintained and Improve RTE/MR management to meet benthic invertebrate targets. Identify any additional management requirements. If the compensation continues to fail then this will be reported through the Steering Group to the Secretary of State.

Bird Targets	Invertebrate Targets (~~Benthic and Wet Grassland~~RTE/MR & Brackish Lagoon)	Outcome	Management Required
Not met		Partially Met if combined sub-optimal biomass is acceptable.	Determine if other reasons for birds not being present, and if numbers in SPA maintained. Identify any additional management requirements. and Improve RTE/MR and ~~WG~~BL management to meet invertebrate targets.
Not Met		Not Met	Determine if other reasons for birds not being present, and if numbers in SPA maintained. Identify any additional management requirements. and Management of RTE/MR and ~~wet grassland~~brackish lagoon to improve invertebrate biomass. If the compensation continues to fail then this will be reported through the Steering Group to the Secretary of State.

Notes:

The outcome column describes targets as fully met if they meet both bird and invertebrate targets; partially met if they achieve some but not all of the target but do so in such a way that either bird targets are met or sufficient mix of the invertebrate targets are met. Where targets have failed they are recorded as not met.

The management column is colour coded. Green indicates management is correct and should be maintained. Amber indicates a partial failure of one or more targets and indicates that action is required to address this and should be implemented for all the failing components. Red indicates a failure of the compensation site and that if remedial action is unable to reverse this failure this will be reported through the Steering Group to the Secretary of State.

Bird targets would be based on the peak numbers presented during the Appropriate Assessment and Panel process~~.~~, but over the longer-term operation may need to take into account wider population trends e.g. regional / national trends (see below). Higher counts of birds using NKM could occur subsequent to that process and it is acknowledged that the compensation design is based on the Appropriate Assessment figures only.

The only circumstances in which bird targets can be lowered is where there has been a significant (>1%) decline in the relevant biogeographical populations.

Where the benthic target is a mixture of RTE (including the MR component) and ~~WG~~CCSBL it is acknowledged that ~~WG~~BL is a buffer against failure rather than the principle feeding resource. Therefore in assessing success or failure based on any mix of sites greater weight will be given to RTE/MR populations. Therefore any combined invertebrate target must represent a combined minimum of 150% of the theoretical 200% (based on 100% of RTE/MR & BBSCL/WG invertebrate targets) subject to the RTE/MR component of that mix never falling below 75%. If the RTE/MR invertebrate population falls below 75% of the target value then the whole invertebrate target fails even where this exceeds a combined value of 150% (e.g. 75% RTE/MR & 75% ~~WG~~BL= 150% would be compliant whereas 65% RTE/MR & 100% ~~WG~~BL= 165% would not).

ANNEX 2: SURVEY DESIGN FOR BENTHIC INVERTEBRATES

RTE & MR

Sampling Approach

Survey rationale: the survey is designed to monitor the status of the intertidal benthic component at the compensation site (RTE and managed realignment) to be assessed against established targets as the site develops overtime. In particular, two aims have been identified for the survey:

1) to provide a good estimate of the community and target species densities in order to be assessed against the target defined at NKM;

2) to assess the development of the compensation site over time and its ability to provide intertidal habitat that is comparable to the natural mudflats in the area.

Effort has been put into devising a survey design that fulfil both aims, although it should be noted that there is not a single survey design that can be optimal for both aims. In addition, it is noted that the target assessment (aim 1) is a priority over the site development assessment (aim 2), in agreement with the importance placed by Natural England on the ability of the compensation site to meet the feeding requirements for ~~Black~~black-tailed ~~Godwit~~godwit. Therefore any modification of the survey design (e.g., following the revision of methods as described in Appendix 3) will be towards an improvement of the design to fulfil the target assessment, even if these modifications might involve a decrease in the power of the analysis for the site development assessment.

The survey design and methods have been devised based on existing guidelines (Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites - Ware and Kenny 2011; the Marine Monitoring Handbook, Davies et al 2001).

Sampling method: hand held corer (0.01 m^2), sediment sampled to a depth of c.15 cm.

Sampling period: monitoring to be carried out annually, in late summer-early autumn (preferably between the last week of August and first week of September, to allow direct assessment against the target defined for this season).

Sampling design: the distribution of the intertidal stations in the compensation site is ~~dependant~~dependent on the extent and distribution of the inundated habitat within the site, a factor that is expected to change over the years during the sites development. It is not possible to identify a priori the number of stations and their location without knowledge of the habitat distribution within the site. In order to allow a detailed survey design a topographic survey will be undertaken soon after breaching and the resulting map will be used to guide the location of the stations within the RTE and MR site.

Although the details of the survey design cannot be defined yet, some general criteria can be identified to guide the choice of the survey stations.

As at NKM, a stratified systematic design is devised as the best way to estimate population size of clustered (patchy) populations (Mier & Picquelle 2008 and references therein). Strata would be defined in order to cover the different sections of the compensation site (four RTE fields and MR site) as well as the different intertidal habitats (e.g., with different degree of inundation). In addition, the even coverage of the available intertidal habitat within the site will provide data for spatial analysis, which will allow biotope mapping as well an assessment of performance against benthic targets (see appendix 3).

Sampling stations will be positioned at regular intervals on the available intertidal habitat, their location being chosen on a pre-defined criterion that will be followed whenever new stations need to be added.

It is of note that the ability of the sampling design to provide good estimates of the benthic species populations (considering the variability in their spatial distribution) will depend on the spatial resolution of the sampling grid (i.e. on the number of stations) rather than on the replication of sampling at each station, as indicated by Ware and Kenny (2011 - Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites). It is suggested that a similar spatial resolution to that one used in the target setting survey at NKM is used in the compensation site (1 station every 0.7 ha ca.).

As a control for the benthic community development within the site, natural mudflats outside the site should also be sampled. It is suggested that 9 stations are located in correspondence of each of the 6 transects identified within the two control sites for the impact monitoring at CCS (north and south of the breach; see Marine EMMP for details), with a total of 54 faunal samples collected. This will allow monitoring of temporal (seasonal and inter-annual) variability in natural mudflats adjacent to the compensation site, thus allowing temporal revision of the targets if required (see Annex 3 on setting and assessing targets).

One sediment sample will be taken at each station for faunal analysis and an additional sample will be collected for PSA and organic matter analysis. Sample locations will be recorded using DGPS.

Sample Analysis

Sample processing: Samples from different replicates should be kept separate. Benthic samples are to be sieved through a 0.5mm sieve. Laboratory analyses will include species (identified to highest taxonomic detail), abundance, size class and biomass (WWTB), with standard AFDW conversion factors applied (using, for example, Rumohr et al., 1987; Ricciardi and Bourget, 1998; and Eleftheriou and Basford, 1989) for comparison with targets.

Supporting parameters: Sediment particle size analysis (PSA) and organic content will also be measured in the additional sediment sample. Also sediment water content is a relevant parameter that should be measured in the sediment samples. Additional supporting parameters recorded on site will include the recording of the character and composition of surface sediments (type, colour, smell), depth of RPD layer, texture and presence of surface features. A photographic record of the sampling station and of the sediment will be also collected. It is recommended also that, during the benthic sampling, a visual estimate of the vegetation coverage and its height is derived within a 10x10 m square area around each benthic station, in order to allow a better characterisation of the wider habitat the benthic station falls within.

Supporting parameters derived from other surveys: As highlighted before, the initial topographic (LIDAR) survey, as well as regular surveys over the years will be important, not only to inform the setting and modification of the stations' location, but also to allow the characterisation of the different benthic stations based on their elevation and derived parameters (e.g., accretion, inundation frequency).

Water salinity measured within the compensation site will be relevant, particularly within RTE fields, as the water retention combined with particular conditions may lead to changes in salinity (e.g. the potential for hypersaline conditions during dry periods with high temperatures) that may affect the benthic community.

Data analysis: With the purpose of characterising the benthic community at the compensation site towards the assessment of the targets derived for NKM (see Appendix

3 for details on these targets setting and assessment), multivariate analysis will be carried out using cluster analysis (combined with similarity profile routine, SIMPROF) and ordination techniques (e.g., MDS, PCO) in order to identify different community types and gradients in the assemblage distribution/variation, as well as applying the SIMPER routine to identify the species which contribute most to the differentiations between groups. Multivariate statistical analysis (e.g., ANOSIM, PERMANOVA) will be applied to detect changes in community structure and composition. Bio-Env routine and linkage trees (BEST) in Primer will be used to explore the relationship between biotic (community) patterns and substrate characteristics.

Benthic fauna in the compensation site will be characterised also based on the main community descriptors (e.g., abundance, richness, biomass, evenness, diversity and biomass-to-abundance ratio) as well as abundance and biomass distribution of target species. Based on these analyses, the main biotope(s) present in the site will be identified and their distribution over the compensation site will be presented in a biotope map to highlight the broad scale homogeneity in terms of MNCR biotopes. Also GIS methods will be used to present maps of the distribution of biomass/abundance/species diversity (e.g., using kernel density interpolation) in order to provide information on the spatial extent of what may be the hotspots of each parameter (biomass etc). Analysis will also be integrated with the findings of the intertidal LiDAR surveys as elevation change can influence benthic community structure hence food availability to bird species.

With the purpose of addressing the compensation site development over time towards conditions reflecting adjacent natural mudflats (aim 2), an analysis of variance will be carried out similarly to that described for the MEMMP (on a BACI-type approach, but there will be no "before" in this case). It is of note that stations within the strata defined by the different intertidal habitats present in the site (e.g. based on shore level) as well as by the distinction between the compensation site and the control areas outside will be will be considered as replicates of the strata for the purpose of the analysis.

The null hypotheses that will be tested during site development is that the mudflat community in the compensation site is developing over time, becoming more and more similar to the community in the control areas outside the site. Therefore an interaction between time (years) and treatment (compensation site/controls) will be expected, with the difference between the compensation site and the controls reducing year after year. The trajectory of change can be visualised also for the community structure through multivariate ordination techniques (e.g., MDS, PCO, in Primer), showing a decreasing dissimilarity between the compensation site and the control areas over the time during development. In turn, when the mudflat community will become established inside the compensation site, then the null hypothesis would be that its changes over the years are in line with the variability observed in the natural mudflat (control sites), hence in this case, the interaction term between time and treatment is expected to be non-significant.

CCSBL

Sampling Approach

The survey should be carried out in accordance with standard methods for lagoonal habitats e.g. as directed by the Common Standards Monitoring and Water Framework Directive Guidance, although with potential modification based on logistical constraints and ecological sensitivities for other management objectives.

Where possible, the sampling sites should be accessed by using a small shore-launched flat-bottomed boat to allow safe access to sampling locations, while also reducing the disturbance to the habitat and speeding up the sampling. Where boat use is not possible, the sampling sites will be accessed on foot from the margins of the lagoon(s). Sediment sampling should be carried out using a small (0.005m^2) hand-held corer.

The survey period will be the summer. Care will need to be taken to minimise disturbance to waterbirds associated with the site, and timed to avoid the main site utilisation e.g. by black-tailed godwit in the late summer and early autumn, as well as over winter. This may then require the survey to be undertaken in the mid-summer (July) and it will be necessary to ensure disturbance to any breeding birds does not occur.

Importantly, the sampling approach needs to be similar to that employed at lagoonal sites in the region, and in particular in terms of existing approaches to characterise the NKP site. As such, methods need to be agreed with NE in advance, in order to ensure comparability of approach.

Core samples for infaunal analysis and particle size analysis to be taken to a depth of 10 cm in the sediment (where possible), and samples will be sieved through a 0.5mm mesh *in situ*. The sieved residues should be gently back-washed into sealable containers and fixed in borax buffered 4% formo-saline solution within 8 hours of collection for the analysis in the laboratory. Given the small size of potentially one of the key species (the tentacled lagoon worm *A. romijni* (length<5mm)), it is suggested that a finer mesh sieve (212 µm) is placed underneath the main sieve in order to increase the probability of detecting the species in the samples, in case smaller individuals are not retained by the larger-meshed sieve. These additional samples should be kept separate from the main one and clearly labelled to identify them. However, if there is not an expectation of the species being present at the CCSBL, then this additional sample treatment may not be required (to be determined with NE).

Sediment samples for PSA should be placed into a sealable plastic bag and will be kept frozen until analysis. Sample containers should be labelled externally detailing client, project, site, replicate, sieve mesh size (infaunal samples), date and analysis required.

Laboratory analysis etc should follow techniques described above for the RTE/MR samples.

ANNEX 3: TARGET SETTING PROTOCOL (ON HOLD)

~~*Target*~~

This will be updated to reflect the outcomes of the modelling work undertaken by Bournemouth University.

Targets for RTE/MR

Targets will be set for metrics measured for the whole benthic community (community target) as well as for specific elements of the community that characterise the observed prey resource for ~~Black~~black-tailed ~~Godwit~~godwit (BW) at NKM (species targets, e.g., *Macoma balthica, Hediste diversicolor*).

~~The community target will be set as the average benthic community recorded at NKM.~~

~~Species targets will be set as the average abundance and biomass density (ind/m2, g/m2 the latter then being converted to AFDW g/m2 using standard conversion factors) recorded at NKM.~~

~~*Target assessment criteria*~~

~~The values recorded at the compensation site will be compared with the target under the management objective set for the compensation site (i.e., they should be equal or higher than the target range). However, in order to take into account the inherent natural variability of estuarine mudflat benthic fauna, an acceptable level of change (ALC) will be identified.~~

~~The ALC will be defined taking into consideration the natural levels of temporal variability associated to the specific metric. These can be quantified in different ways (or a combination of them), depending of on the data availability:~~

- ~~Based on pre-construction monitoring in Autumn 2015;~~
- ~~Based on Autumn 2015 survey with additional context provided by the 2010 characterisation survey.~~
- ~~Based on the inter-annual variability observed in control areas in mudflats at NKM and CCS; it is of note that, as this information will be only available over the years of monitoring of the sites, it will be useful for periodical revisions of the ALC;~~
- ~~Based on existing data (e.g., EA data) on mudflat benthic communities in the middle estuary in the last decade;~~

~~Data from autumn observations will be the primary source of data for the purpose of target setting, and will be under pinned by the long term data for NKM provided by EA.. Intra-annual/seasonal variations will enable the identification of prey depletion during the winter period and provide valuable analysis of the intra annual increase in biomass at NKM when compared to other sites, and the compensation site.~~

~~The data will be reviewed after each annual monitoring survey and as outlined within the Target assessment review section below.~~

~~Hotspot analysis:~~

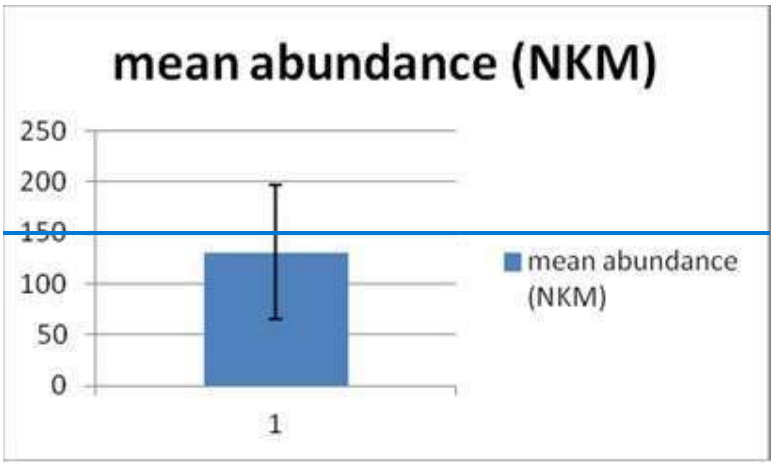
~~A suggested method for the presentation of the baseline results is to interpolate the biomass/abundance utilising a GIS method such as kernel density thus allowing the illustration of the spatial extent of what may be the hotspots of each parameter (biomass etc.) using an objective approach. As described below the target standard deviation would~~

~~then be adjusted based on all data points which fall within these areas of high density infauna (hotspots).~~

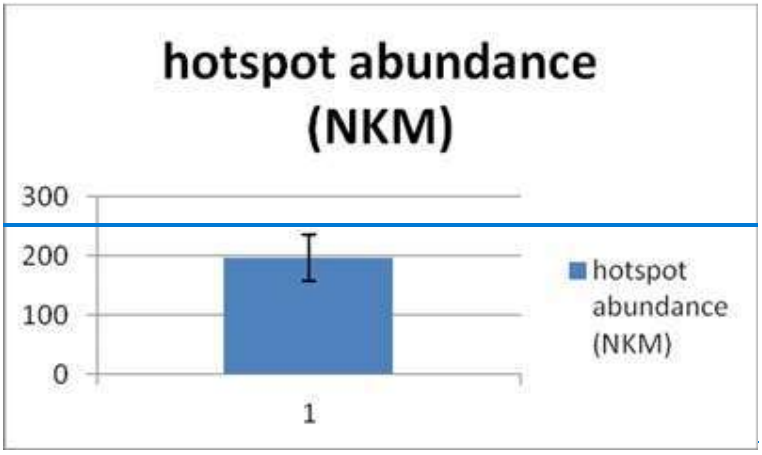
~~Species targets on NKM:~~

~~The target will be set using the mean value (e.g., abundance, biomass) obtained during the NKM baseline survey(s), within a range defined by the standard deviation from the mean abundance of the preferred BW foraging area.~~

~~The following numbers are randomly generated for the purpose of illustration, and should not be taken as indicative of proposed targets, or target ranges. In an example dataset of 144 samples of random numbers (within a range of 20-250 individuals per metre square) the mean is 131.0, with a standard deviation of 65.7 giving a potential target of 131 individuals within a range of 65.3-196.7; displayed graphically below.~~



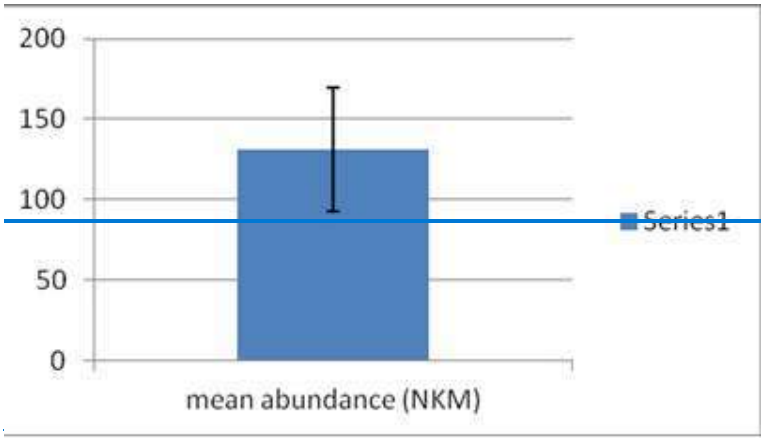
~~Within the preferred foraging area for BW (hotspots), assuming a number of samples (44) with a generally less variable, higher mean abundance (randomly generated numbers within a range of 120-250) the mean is 197 individuals with a standard deviation of 38.7; displayed graphically below.~~



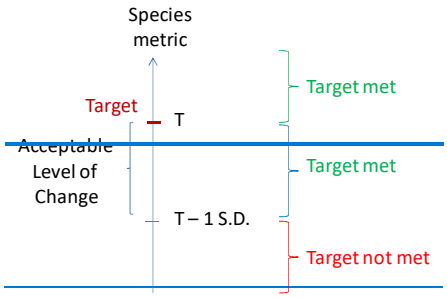
~~In compensating for the loss of intertidal habitat by providing comparable intertidal habitat the appropriate target is the mean abundance (or alternative metric such as biomass) across the site. However in order to provide for a level of precaution, and to reduce the risk associated with the use of the wider variability at NKM which may mask~~

~~the higher density prey requirements of BWs, the range of variability is to be reduced to reflect the standard deviation from the mean biomass found within the preferred foraging area "hotspots".~~

~~Using the random generated numbers above this then provides for a mean of 131 with a standard deviation of 38.7, resulting in a target range of 92.3 169.7, again presented graphically below.~~



~~The target will be considered as met if the value measured at the compensation site is equal or higher than the target, or, if lower, it is within the ALC, i.e. higher or equal to the target minus 1 SD (calculated as described above). The initial target in the above scenario for abundance would therefore be 131 individuals per metre square at the RTE/MR with an ALC of 92.3 individuals per metre square.~~



~~Schematic representation of assessment for species targets.~~

~~Inter-annual Development targets:~~

~~It is recognised that over the longer term there may be a risk of the target being met in terms of comparable habitat but in the lower end of the range, thereby risking failure of providing bird prey. To monitor this risk it is considered that after the community has reached the point of proposed stabilisation (i.e. 5 years post breach) the long term mean biomass/abundance should be equal or greater than the target mean within a range that is linked to the inter-annual variation (measured by Standard Deviation) at the NKM control site.~~

~~A simplified representation of this would be that over 5 years from stabilisation (i.e. years 5 onwards) the annual Parameter X (e.g. abundance) may fluctuate within the target range, the target mean being 5 individuals. The data for these years are:~~

~~Year 5 =4 individuals, year 6 =5, year 7 =3, year 8 =5, year 9 =7, with a mean of 4.8. During the same period of time the Parameter X at the control site is 5, 5, 6, 4, 4.8, with a standard deviation/variation between years of 0.71.~~

~~The long term target mean is therefore 5 individuals +/- 0.7 which means the long term mean of 4.8 indicates a success of the compensation site.~~

~~*Community target on NKM:*~~

~~The MNCR biotopes present at NKM will be identified based on the community analysis at the study sites; allowing for ready comparison in terms of the target of providing comparable intertidal habitat (currently considered to be LS.LMu.MEst.HedMac (Hediste diversicolor and Macoma balthica in littoral sandy mud) in the upper and mid shore at NKM, and LS.LMu.MEst.NhomMacStr (~~***Targets for CCSBL***

Target setting in terms of aquatic benthic invertebrate communities have not been identified in detail for the CCSBL site. The main objectives for the site relate to waterbird utilisation, and in particular roost and foraging provision for black-tailed godwit. As such, requirements for these functions relate predominantly to the provision of shallow water pools and islands.

Targets therefore may need to be established for the CCSBL in terms of invertebrate community structure, although it is presumed, a broad community structure similar to that found within the NKP mosaic would be desirable.~~Nephtys hombergii, Macoma balthica and Streblospio shrubsolii in littoral sandy mud) in the lower shore at NKM. Similarly, community data at the compensation site will inform a biotope analysis, and the results will be compared to those at NKM in order to ensure that the dominant biotopes occur in both sites. The biotopes will be mapped both at the NKM and compensation site.~~

~~The target would be that the main biotopes in NKM are to be present at the compensation site and the dominant biotope at NKM has to be also dominant at the compensation site.~~

~~*Target assessment review*~~

~~The targets will be set according to the methodology defined previously and agreed with the relevant authorities with recognition that the target must be validated against not only the primary objective of providing compensatory estuarine habitat, but also the provision of prey resource for the BW.~~

~~With this in mind the initial target will undergo a sensitivity analysis after the pre-construction survey data has been collated for year 1 pre-construction (PC-1) and if available year 2 pre-construction (PC-2). The PC-1 and PC-2 data will be analysed for inter-annual variation with the longer term data provided by the EA to ensure that both the target (i.e. mean biomass) and the range within which the mean target will sit (i.e. standard deviation around the mean set according to standard deviation found within preferred foraging habitat for BW) is representative of NKM as observed within the long term dataset and appropriate. This will provide the first tier of confidence in the target itself, and will be subject to review by the steering group and where appropriate the SNCBs in a special meeting held as soon as possible after the survey and data analysis has been conducted.~~

~~A second tier of confidence will also be applied whereby the understanding of the foraging behaviour in terms of preferred sediment type and giving up density of key prey species of the BWs will be used as a benchmark against which the target and range is assessed for suitability. Again this will be subject to review by the steering group and where~~

~~appropriate the SNCBs in a special meeting held as soon as possible after the survey and data analysis has been conducted.~~

~~Additional methods of analysis may also be employed which may include an analysis of taxonomic distinctness within a funnel plot as has been suggested by Natural England. The use of this method is that it has the potential to identify areas which are in greater fluctuation than others – habitats under greater levels of perturbation are considered to have lower taxonomic distinctness than stable, established habitats. Whilst an advantage of using taxonomic distinctness is that it is independent of sampling effort, which can strongly influence the values of other commonly used diversity indices owing to the influence of sampling effort on species richness, given the objective to provide comparable habitat and key prey species it is not considered appropriate to use the TD analysis as a specific target setting measure. Rather these forms of analysis may be applied as an ongoing form of validation within the review periods to enable discussion of progression of the community present within the compensation site from settlement to a stable community.~~

~~The assessment of targets will be carried out initially during the 10 years post-construction monitoring, at years 0 as highlighted above, year 5 and year 10. The end of the first 5 years is considered to be a key review period as it is at this point that the initial settlement should be reaching the proposed target and the collected data allows for the monitoring design to be adjusted, in order to ensure that sufficient data are collected at the compensation site to capture the site variability and patchiness. Within the 5 year review relevant information will be incorporated to ensure that not only the objective is on target to be met in terms of providing comparable habitat to that observed at NKM, but also that it is suitable to supporting BWs. Again the relevant information that could be included might be inter alia the giving up density of key prey items such as Macoma balthica and Hediste diversicolor~~

~~ANNEX 4: GUIDE TO USING PENETROMETER~~

THE CENTER for Environmental Management of Military Lands

Guide to Sampling Soil Compaction Using Hand-Held Soil Penetrometers

CEMML TPS 04-1

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