



Hornsea Project Four

B1.1.1: Evidence Plan

Section 51 update, Date: 14 January 2022

Document reference: B1.1.1

Revision: 02

Prepared GoBe Consultants, January 2022
Checked GoBe Consultants, January 2022
Accepted David King, Orsted, January 2022
Approved Julian Carolan, Orsted, January 2022

B1.1.1
Version B

Revision Summary

<i>Rev</i>	<i>Date</i>	<i>Prepared by</i>	<i>Checked by</i>	<i>Approved by</i>
01	29/09/2021	GoBe Consultants	David King	Julian Carolan
02	14/01/2022	GoBe Consultants	David King	Julian Carolan

Revision Change Log

<i>Rev</i>	<i>Page</i>	<i>Section</i>	<i>Description</i>
01	N/A	N/A	Submitted as part of DCO Application.
02	Appendix B	Appendix B	Row heights increased to show obscured text.

Table of Contents

1	Introduction.....	5
1.1	Project Background.....	5
1.2	Background to the Evidence Plan Process.....	5
1.3	The Hornsea Four Evidence Plan.....	6
1.4	Outputs of the Hornsea Four Evidence Plan.....	6
2	The Hornsea Four Evidence Plan – Roles and Responsibilities.....	7
2.1	Introduction.....	7
2.2	The Development Team.....	8
2.3	The Consenting and Other Regulatory Authorities.....	8
2.4	The EP Steering Group.....	8
2.5	EP Technical Panels.....	9
3	Approach to Completing the Evidence Plan.....	10
3.1	Introduction.....	10
3.2	Hornsea Four EP Programme.....	10
3.3	Recording the Evidence Plan Process.....	11
3.4	Presenting the Evidence.....	12
4	EP Status and Progress.....	12
5	References.....	24
	Appendix A – Terms of Reference.....	25
	Appendix B –Evidence Plan Logs.....	26
	Appendix C – Evidence Plan Meeting Minutes.....	27
	Appendix C1 – Steering Group Evidence Plan Meeting Minutes.....	28
	Appendix C2 – Offshore Evidence Plan Meeting Minutes.....	29
	Appendix C3 – Onshore Evidence Plan Meeting Minutes.....	30

List of Tables

Table 1: EP Steering Group membership, role and responsibilities.....	9
Table 2: EP Technical Panel membership.....	10

Table 3: Key stages involved in developing and completing the EP process..... 11
Table 4: EP pre-application and summary..... 13

List of Figures

Figure 1: Structure of the Hornsea Four EP. 7

Glossary

Term	Definition
Commitments	A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in Environmental Impacts Assessment (EIA) terms. Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or Environmental Statement (ES)). Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an ES.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Order Limits	The limits within which Hornsea Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd	The Applicant for the proposed Hornsea Four DCO.

Acronyms

Acronym	Definition
AEol	Adverse Effect on Integrity
AfL	Agreement for Lease
BEIS	Department for Business, Energy and Industrial Strategy
BNG	Biodiversity Net Gain
CEA	Cumulative Effects Assessment
Cefas	Centre for Fisheries and Aquaculture Science
CRM	Collision Risk Modelling
DCO	Development Consent Order
Defra	Department for Food, Environmental and Rural Affairs
DML	Deemed Marine Licence
EIA	Environmental Impact Assessment
EP	Evidence Plan
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
FRA	Flood Risk Assessment

Acronym	Definition
HRA	Habitats Regulations Assessment
MDS	Maximum Design Scenario
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
NSIP	Nationally Significant Infrastructure Project
PEIR	Preliminary Environmental Information Report
PINS	The Planning Inspectorate
PRoW	Public Right of Way
PVA	Population Viability Analysis
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SEL _{cum}	Cumulative Sound Exposure Level
SNCB	Statutory Nature Conservation Body
SoCG	Statement of Common Ground
SoS	Secretary of State
SPL _{peak}	Peak Sound Pressure Level
ToR	Terms of Reference
TWT	The Wildlife Trusts
UXO	Unexploded Ordnance
WDC	Whale and Dolphin Conservation
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
YWT	Yorkshire Wildlife Trust

Units

Unit	Definition
km	Kilometre (distance)

1 Introduction

1.1 Project Background

1.1.1.1 Orsted Hornsea Project Four Limited (hereafter the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and connection to the electricity transmission network. Detailed information on the project design can be found in [Volume A1, Chapter 1: Project Description](#), with detailed information on the site selection process and consideration of alternatives described in [Volume A1, Chapter 3: Site Selection and Consideration of Alternatives](#).

1.1.1.2 This Annex to the Consultation Report ([B1.1: Consultation Report](#)) summarises the processes and outcomes of the Hornsea Four Evidence Plan (EP), which was developed as a mechanism for targeted consultation and agreement between the Applicant and certain key stakeholders on what information and evidence is required for a DCO application and in relation to a number of specific topics addressed by the EIA and RIAA. [Section 4](#) of this report summarises the progress made in each of the relevant topic areas covered by the EP, and the status of agreements and disagreements at the point of DCO application.

1.2 Background to the Evidence Plan Process

1.2.1.1 The EP process was initially developed by the Major Infrastructure Environment Unit (MIEU) of the Department for Environment, Food and Rural Affairs (Defra) to provide a formal mechanism to agree what information and evidence an applicant for a Nationally Significant Infrastructure Project (NSIP) should submit between applicants and statutory bodies. Originally, this process was focused only on Report to Inform Appropriate Assessment (RIAA – [B2.2 Report to Inform Appropriate Assessment](#)) matters, however in practice, the MIEU advised that the topic areas covered by an EP can be expanded to include EIA issues.

1.2.1.2 Guidance on the preparation of EPs is provided within the Defra Guidance Note 'Habitats Regulations: Evidence Plans for National Significant Infrastructure Projects' (Defra 2012). Under this guidance, applicants are expected to:

- Engage with Statutory Nature Conservation Bodies (SNCBs), PINS and other consenting bodies throughout the project process;
- Collect evidence and analyse it using agreed methodologies; and
- Be accepting that evidence requirements may change throughout the project process.

1.2.1.3 Under the Defra guidance, SNCBs are expected to:

- Seek pragmatic solutions;
- Take a proportionate approach;
- Only change evidence requirements under specified conditions; and
- Provide clear guidance and advice.

1.2.1.4 Typically, the Evidence Plan Process is overseen by a Steering Group with Technical Panels established to discuss and agree the evidence and assessment requirements for each topic

area identified. The EP is intended to be a working process that is developed by the parties involved on an on-going basis through the development of the EIA, continuing up until the point of application.

- 1.2.1.5 The process followed in preparation of the EP is aimed at producing a non-legally binding agreement between the developer and the relevant statutory authorities on the matters to be addressed within the EIA and RIAA (the scope), the data that will be used to support the assessments (the evidence), as well as the methods to be applied in the assessment.

1.3 The Hornsea Four Evidence Plan

- 1.3.1.1 In order to ensure key stakeholders were consulted on a regular and formalised basis, an EP process was adopted by the Applicant. The EP process for Hornsea Four commenced in August 2018, forming an extension to the scoping and wider pre-application consultation process and has aimed to agree the evidence required to be submitted within the DCO application.

- 1.3.1.2 For the purposes of the Hornsea Four EP, the remit of the EP has, in agreement with PINS, been expanded from that originally proposed by MIEU, to include EIA topics in addition to RIAA matters. Whilst there is no RIAA EP Technical Panel, RIAA aspects are covered under the relevant EIA Technical Panels relating to RIAA relevant topics (for example marine mammals and offshore and intertidal ornithology).

- 1.3.1.3 The primary objective of the EP process has been to seek agreement with key stakeholders on the data and information to be included in the EIA (and RIAA). The process has also been used to communicate key project information, including the Applicant's approach to proportionate EIA, regular project updates and the Developable Area Process. The EP process is a voluntary, informal process that has provided a record of agreements and disagreements between the Applicant and those key stakeholders included in the EP process. The EP process has also helped to inform the Statements of Common Ground (SoCGs) process for Hornsea Four with those same parties.

- 1.3.1.4 The Terms of Reference (ToR) for the Hornsea Four EP was provided to the EIA Evidence Plan stakeholders prior to the start of the process and discussed at the introductory meetings for the Steering Group and all Technical Panels. Comments on the draft were received from the stakeholders and these comments were incorporated into subsequent drafts of the ToR document. The final version of the ToR is presented in [Appendix A](#).

- 1.3.1.5 This report therefore presents the final EP, reflecting the discussions and agreements made with the EP members throughout the pre-application process. The following sections of the report provide an overview of the roles of those involved and the scope of the EP process.

1.4 Outputs of the Hornsea Four Evidence Plan

- 1.4.1.1 The outputs of the Evidence Plan are intended to make an important contribution to:

- The Applicant's final ES and RIAA that accompany the application;
- Identifying and agreeing any mitigation and/ or monitoring in respect of any of the issues considered by the EIA Evidence Plan where likely significant effects are identified;

- The consideration of a derogation case under the Habitats Regulations, including in particular the need for derogation (in relation to potential adverse effects on integrity for any particular site/feature) and the compensatory measures required;
- Identifying, by way of the EP logs ([Appendix B](#) of this document), those areas of agreement relating to the sufficiency of the evidence provided and the assessment methods employed (and any disagreements that remain in this regard) for each of the statutory and non-statutory bodies involved in the EP process (the EP logs also being intended to subsequently form the basis of the SoCGs between the Applicant and those bodies – some of which are presented in [Volume F3](#) of the DCO Application);
- The examination of the application by PINS for those topics and issues addressed by the EP process;
- The final determination of the application, including any appropriate assessment undertaken by the SoS as the competent authority.

2 The Hornsea Four Evidence Plan – Roles and Responsibilities

2.1 Introduction

2.1.1.1 The roles and responsibilities of the organisations included in the EP process for Hornsea Four were agreed through the ToR for the Steering Group and the Technical Panels. The main roles and responsibilities of the EP members are set out in the sections below.

2.1.1.2 The structure of the Hornsea Four EP is summarised in [Figure 1](#) below, and mainly comprised:

- The Hornsea Four development team (led by the Applicant);
- The EP Steering Group; and
- Topic-specific Technical Panels.

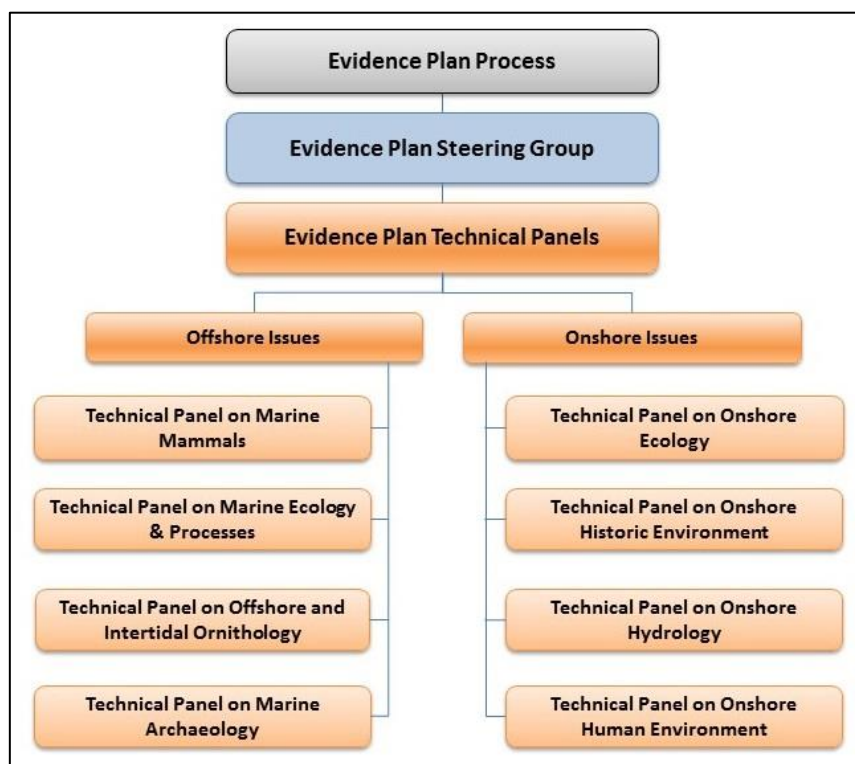


Figure 1: Structure of the Hornsea Four EP.

2.2 The Development Team

2.2.1.1 The development team comprised the Applicant and its appointed advisors for RIAA and EIA. The Applicant had overall responsibility for the DCO application and ensuring that the information required to support the DCO application was obtained and consulted upon. The EP process has been overseen by the development team, whose role it was to define the aims of the project, to develop the overall development programme for the application, and to ensure that this programme was adhered to.

2.2.1.2 In relation to the EP process, the role of the development team can be summarised as follows:

- Draft and maintain the EP report, EP logs and meeting minutes;
- Collect, analyse and assess the evidence;
- Coordinate meetings and other consultation activities with stakeholders, the Steering Group and Technical Panels;
- Ensure that documents are provided in a timely manner to allow review/comment within agreed periods as set out in the ToR;
- Work with the relevant authorities to resolve as many issues as possible at the pre-application stage, and to record the matters that are agreed (or not agreed); and
- Finalise the ES and RIAA in accordance with the evidence agreed through the EP.

2.3 The Consenting and Other Regulatory Authorities

2.3.1.1 The decision-maker for DCO applications under the Planning Act 2008 is the SoS for the Department of Business, Energy and Industrial Strategy (BEIS), who is also the competent authority for the Appropriate Assessment.

2.3.1.2 The National Infrastructure Directorate of PINS is the UK government agency responsible for dealing with procedural aspects of NSIP applications on behalf of the SoS for BEIS. Within their broader remit, PINS have undertaken the role of ensuring that BEIS are informed of progress. In their overarching role, PINS have also taken responsibility for documenting any issues that have remained unresolved throughout the duration of the EP process, for audit trail purposes. PINS have been invited to all Steering Group meetings.

2.3.1.3 The MMO is the statutory body responsible for advising PINS on marine licensing in relation to DCO applications that include deemed Marine Licenses (DMLs). The MMO were invited to be part of the main Steering Group and were represented on relevant Technical Panels along with their advisors (Cefas).

2.4 The EP Steering Group

2.4.1.1 The Steering Group's main function was to oversee the development of the Hornsea Four EP and ensure continual progress of the EIA Evidence Plan process. In addition, they were required to:

- Oversee the resolution of issues that may arise during the development of the EP and through the Technical Panel discussions as recorded in the EP logs, which may ultimately be used as the basis for SoCGs with each interested party;
- Ensure that discussions taking place within the individual Technical Panels were consistent in approach to EIA and RIAA with one another; and

- Ensuring that decisions made by either the Steering Group or Technical Panels are circulated to all participants in the EP process.

2.4.1.2 The Steering Group, which was chaired by PINS, was comprised of the organisations set out in [Table 1](#).

Table 1: EP Steering Group membership, role and responsibilities.

Chair (PINS)	An independent and impartial body. The Applicant invited PINS to chair the Steering Group and oversee the process.
The Applicant	The Applicant, together with input from their appointed advisers, administered the EP process, drafted the EP, any technical documents required as part of the process, collated meeting minutes and maintained the EP logs.
Natural England	Supported the aims of the Steering Group in relation to relevant onshore and offshore aspects of the EP process.
MMO	Supported the aims of the Steering Group in relation to relevant offshore aspects of the EP process.
ERYC	Supported the aims of the Steering Group in relation to all relevant onshore aspects of the EP process (as well as involvement with marine archaeological issues).
Historic England	Supported the aims of the Steering Group in relation to relevant onshore and offshore archaeological and cultural heritage aspects of the EP process.

2.5 EP Technical Panels

2.5.1.1 The Technical Panels comprised the Applicant and experts from relevant organisations with a clear statutory role or non-statutory interest in the topics to be considered, with the following roles and responsibilities:

- Agree the final scope of the EIA, the impacts to be considered and the approach to be take in terms of proportionality;
- Agree scope of and methods for data collection where necessary (if not already agreed);
- Following collection of data, discuss and agree the appropriateness and sufficiency of data for the assessments to be undertaken;
- Agree realistic worst-case parameters (Maximum Design Scenario (MDS)) for assessment;
- Discuss and agree the assessment and analysis methods for the EIA (or RIAA) including agreement on appropriate thresholds, and agreeing terms for interpretation of impact and levels of significance; and
- If significant effects are identified following assessment, discuss and agree the mitigation or management requirements to avoid or reduce adverse effects.

2.5.1.2 The individual Technical Panels and the membership of each of these groups is described in [Table 2](#) below.

Table 2: EP Technical Panel membership.

Technical Panel	Membership
Marine ecology and processes (including marine processes, benthic and intertidal ecology and fish and shellfish ecology)	Natural England; and MMO (advised by Cefas).
Offshore and intertidal ornithology	Natural England; and RSPB.
Marine mammals	Natural England; MMO (advised by Cefas); WDC; and TWT.
Marine archaeology	Historic England ¹ .
Onshore ecology	Natural England; ERYC; and YWT.
Onshore hydrology	Environment Agency; Natural England; ERYC; The Yorkshire Consortium of Internal Drainage Boards; and Beverly and North Holderness Internal Drainage Board.
Onshore historic environment	Humber Archaeological Partnership (The Humber Historic Environment Record); Historic England; and ERYC.
Onshore human environment	ERYC ² ; and Historic England.

3 Approach to Completing the Evidence Plan

3.1 Introduction

3.1.1.1 This section presents the working arrangements and the timetable for drafting and finalising the EP for Hornsea Four and relevant RIAA and EIA consultation. The Applicant has sought to reach agreement with all key parties on the evidence plan process in line with key project milestones agreed with the EP member organisations.

3.2 Hornsea Four EP Programme

3.2.1.1 **Table 3** sets out the key stages and milestones involved in developing and completing the EP.

¹ ERYC and Hull County Council were invited to take part in the Marine Archaeology Technical Panel but declined.

² Natural England were invited to take part in the Onshore Human Environment Technical Panel but have not attended any meetings. Additionally, correspondence with Highways England and Hull City Council was also undertaken through this Technical Panel.

Table 3: Key stages involved in developing and completing the EP process.

Stage	Key dates	Overview
1	June 2018	Drafting the EP ToR and circulating with the proposed stakeholders for review.
2	August – September 2018	Kick-off meetings with Technical Panels to discuss the EP process, gain feedback on and agree the proposed approach, key topic areas and programme.
3	December 2018	Issuing of the revised EP ToR to the Steering Group, taking account of the comments received following the kick-off meetings.
4	October – December 2018	Provision of additional information to the Technical Panels.
5	January – April 2019	Follow up meetings with Technical Panels (as required) to discuss the additional information required and any outstanding issues to agree (where possible) the sufficiency of data, key impacts to be addressed, methodologies and scoping out of impacts.
6	October – November 2019	Following formal consultation under Section 42 and Section 47 of the Planning Act 2008 informed by the production of the PEIR, further Steering Group and Technical Panel meetings as required to review and discuss the PEIR and draft RIAA.
7	January – December 2020	Further Steering Group and Technical Panel meetings as required to continue to review and discuss the PEIR and draft RIAA, forming the basis of the SoCGs going forward post-application.
9	August – September 2021	Finalisation of the EP prior to the DCO application being made.

3.2.1.2 During the EP process, the EP logs have been kept up to date to highlight the matters that have been discussed and those where agreement has been reached and, where relevant, any areas that remain under discussion.

3.3 Recording the Evidence Plan Process

3.3.1.1 As outlined in the Defra Guidance on EIA Evidence Plans for NSIPs (Defra, 2012), the EP has been a live document throughout the pre-application period. A record has been maintained of all EP consultation that has been undertaken during its drafting with the EP members incorporating consenting bodies, statutory and non-statutory stakeholders. In addition, EP Logs for each topic area were developed to document areas of agreement and disagreement and these logs have been updated as the EP process progressed.

3.3.1.2 The EP Logs have been used as a basis for the SoCG with consultees as required by PINS, enabling a clear audit trail of discussions and decision making with the intention that this should negate the need for any reiteration of previous discussion on issues considered and agreed during the EP process.

3.3.1.3 The offshore and onshore EP logs for Hornsea Four are presented as [Appendix B](#) of this document.

3.3.1.4 The Technical Panels and the Hornsea Four development team have been responsible for agreeing the meeting records (minutes) which form the basis of the EP logs, with participants required to comment on, and approve these records throughout the EP process.

3.4 Presenting the Evidence

- 3.4.1.1 The reports and draft documents issued as part of the EP process were supplied to the Steering Group and relevant Technical Panels as electronic copies via email.
- 3.4.1.2 Through the later stages of preparing the DCO application, SoCGs have been developed with key stakeholders, and will continue to be developed as the application progresses into Examination. The SoCGs presented within the DCO application can be found in [Volume G3: Statements of Common Ground](#).

4 EP Status and Progress

- 4.1.1.1 The status of issues relevant to each of the topic areas discussed by the Technical Panels and informed by the information provided by the Applicant, are set out in detail in the EP logs ([Appendix B](#) of this document) as maintained throughout the EP process.
- 4.1.1.2 [Table 4](#) provides details on all Hornsea Four EP meetings and their associated key discussion points. Further details on the specific meetings can be found within the meeting minutes presented in [Appendix C](#).

Table 4: EP pre-application and summary.

Panel	Meeting date	Key discussion points and activities
Steering Group	7 August 2018	Steering Group Meeting 1 <ul style="list-style-type: none"> • Introduction to the proposed project and project teams; and • Summary, reflections, agreement and sign off on the ToR.
	12 December 2018	Steering Group Meeting 2 <ul style="list-style-type: none"> • Update on the project development activities; • Review Scoping Opinion responses; and • Discussion on the next steps in relation to seeking agreement with key stakeholders on the data to be included in the PEIR and draft RIAA.
	25 June 2019	Steering Group Meeting 3 <ul style="list-style-type: none"> • Update on project information and local information events; • Update on onshore and offshore Technical Panels; and • Update on non-EP consultation.
	6 November 2019	Steering Group Meeting 4 <ul style="list-style-type: none"> • Update on project information and overview of the programme to DCO application; • Update to ToR to reflect Historic England joining the EP Steering Group; • Updates to the Impacts Register and Commitments Register; and • Discussion on the Draft DCO and DMLs.
	16 March 2020	Steering Group Meeting 5 <ul style="list-style-type: none"> • Review of draft ES documents by the relevant Technical Panels; • Overview of planned seabed investigations; and • Project updates and updates to the Impacts Register, Commitments Register, Draft DCO and DMLs;
	21 October 2020	Steering Group Meeting 6 <ul style="list-style-type: none"> • Review of draft ES documents by the relevant Technical Panels; • Project updates on change to Hornsea Four Order Limits, DCO application submission programme, SoCGs and Derogation; and • Overview of Design Vision Statement and planned seabed investigations.
	29 July 2021	Steering Group Meeting 7 <ul style="list-style-type: none"> • Review of draft ES documents by the relevant Technical Panels and updates being made; • Project updates on SoCGs, the consultation on the compensation measures, seabed geophysical surveys and the recent suite of Technical Panel meetings; and

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> Overview of onshore updates (beach and landfall surveys, Parish Council meetings, and targeted consultation about construction access.
Marine Ecology and Processes Technical Panel	12 September 2018	<p>Marine Ecology and Processes Technical Panel Meeting 1</p> <ul style="list-style-type: none"> Introduction to the project; Introduction to the Technical Panels and the principles of the EP process; Proportionate approach to EIA; and Discussion on the approach to the EIA Scoping Report and key position papers relevant to the Technical Panel in terms of marine processes, marine ecology and HRA screening.
	12 December 2018	<p>Marine Ecology and Processes Technical Panel Meeting 2</p> <ul style="list-style-type: none"> Project updates; Review of scoping responses; and Discussion of next steps in relation to seeking agreement with stakeholders on the data to be included in the PEIR and ES.
	30 April 2019	<p>Marine Ecology and Processes Technical Panel Meeting 3</p> <ul style="list-style-type: none"> Project updates; since receipt of Scoping Opinion; Review of responses to both the Scoping Report and the HRA Screening Report, and the approach to the RIAA; Discussion on the next steps to seeking agreement in relation to data to be included in the PEIR and ES; and Discussion on Biodiversity Net Gain.
	13 November 2019	<p>Marine Ecology and Processes Technical Panel Meeting 4</p> <ul style="list-style-type: none"> Project updates including the reduction in the developable area; Discussion on the impacts register and impacts 'not considered in detail in the ES'; and New commitments in relation to the Dogger Bank Creyke Beck cable crossing and Smithic Bank.
	11 May 2021	<p>Marine Ecology and Processes Technical Panel Meeting 5C – Fish and Shellfish Ecology</p> <ul style="list-style-type: none"> Project updates including the reduction in the developable area; Discussion on key issues raised in the consultee comments (spawning timings for Banks herring and the conclusions of assessments); and Updates required to the draft ES documents as a result of the change to Order Limits.
	13 May 2021	<p>Marine Ecology and Processes Technical Panel Meeting 5A – Marine Processes</p> <ul style="list-style-type: none"> Project updates including the reduction in the developable area and the change to the project programme; Review of consultee comments on the draft ES Chapter and Technical Report and the key issues identified in these comments (geophysical evidence, sandwave clearance, Smithic Sands, HDD exit pits, cliff recession/stability, gravity base structures, Flamborough Front, HVAC booster station seabed preparation, mitigation and monitoring); and

Panel	Meeting date	Key discussion points and activities
	13 May 2021	<ul style="list-style-type: none"> • Updates required to the modelling as a result of the change to Order Limits. <p>Marine Ecology and Processes Technical Panel Meeting 5B – Benthic and Intertidal Ecology</p> <ul style="list-style-type: none"> • Project updates including the reduction in the developable area and the change to the project programme; • General agreements from consultee comments on the draft ES Chapter and Technical Report; • Discussion on key issues raised in the consultee comments (increases in the Maximum Design Scenario (MDS) from PEIR to ES, gravity base structures, permanent habitat loss, cumulative assessment and monitoring); and • Updates required to the draft ES documents as a result of the change to Order Limits.
Offshore and Intertidal Ornithology Technical Panel	13 September 2018	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 1</p> <ul style="list-style-type: none"> • Introduction to the project; • Introduction to the Technical Panel, the EP process and the proportionate approach to EIA; and • Discussion on key position papers.
	17 December 2018	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 2</p> <ul style="list-style-type: none"> • Project updates; • Review of scoping responses; and • Discussion of next steps in relation to seeking agreement with stakeholders on the data to be included in the PEIR and ES.
	10 April 2019	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Project updates; • Discussion on the proportionate approach to EIA; • Review of responses received through the Scoping Opinion and HRA Screening Report consultation; • Discussion on next steps in relation to seeking agreement with key stakeholders on the data sources for baseline characterisation; and • Discussion on the next steps to agree appropriate methods for estimating potential impacts for the PEIR and ES.
	11 June 2019	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 4</p> <ul style="list-style-type: none"> • Project updates; • Discussion of the scope of the PEIR and ES chapters; • Further discussion relating to agreement of baseline data and assessment methodology for CRM and displacement analysis; and • Summary of key areas of agreement and disagreement between the Applicant and Technical Panel members.
	29 October 2019	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 5</p> <ul style="list-style-type: none"> • Project updates and updates to the project programme; • Review of Section 42 responses;

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Next steps to agree the key species and assessment methods for the assessment of displacement and disturbance; and • Discussion on PVA tools.
	12 November 2019	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 6</p> <ul style="list-style-type: none"> • Review of impact assessment methodology including values used to define value, sensitivity and importance, and the use of a matrix approach to determine significance; • Approach to the cumulative assessment including key data sources for displacement analysis and CRM; and • Discussion on barrier effects and approach to the lighting impact assessment.
	26 November 2019	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 7</p> <ul style="list-style-type: none"> • Discussion on designated sites screened in for assessment, and defining the designated features and assemblages of those sites screened in for assessment; and • Updates on species-specific work undertaken to inform the EIA.
	27 February 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 8</p> <ul style="list-style-type: none"> • Project updates; • Discussions over additional camera analysis, CRM, cumulative effects assessment and species densities; and • Updates to foraging ranges based on the Woodward et al (2019) paper.
	21 April 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 9</p> <ul style="list-style-type: none"> • Project updates and programme; • Additional camera analysis; • Species-specific data to inform populations and densities; and • Data sources for intertidal ornithology.
	9 June 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 10</p> <ul style="list-style-type: none"> • Project updates, programme and derogation update; • CRM and PVA assessments; and • Productivity , Mortality Rates and Seabird Populations.
	15 July 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 11</p> <ul style="list-style-type: none"> • Presentation of revised offshore ornithology data, following changes to the Hornsea Four Order Limits; • Presentation of results from CRM and PVA workstreams; • Discussion on other ongoing offshore wind farm examinations; and • Apportionment methodology for RIAA.
	19 October 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 12</p> <ul style="list-style-type: none"> • Discussion on CRM and displacement assessments; • Discussion on the potential for AEol with respect to gannet and razorbill; and

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Discussion on securing agreement on the ornithological baseline data characterisation.
	23 November 2020	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 13</p> <ul style="list-style-type: none"> • Review of Baseline and MRSea ES deliverables; • Discussion on the cumulative and in-combination totals for other offshore wind farms; and • Presentation of updated PVA modelling results.
	4 March 2021	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 14</p> <ul style="list-style-type: none"> • Project updates including the reduction in the developable area and the change to the project programme; • Discussion on the auk habituation and displacement report and associated feedback; • Discussion on guillemot conclusions on AEol; and • Discussion on potential mitigation options.
	18 August 2021	<p>Offshore and Intertidal Ornithology Technical Panel Meeting 15</p> <ul style="list-style-type: none"> • Project updates including the reduction in the developable area and the change to the project programme; • Discussion on the auk habituation and displacement report and associated feedback; • Discussion on guillemot conclusions on AEol; and • Discussion on potential mitigation options.
Marine Mammals Technical Panel	13 September 2018	<p>Marine Mammals Technical Panel Meeting 1 and 2</p> <ul style="list-style-type: none"> • Introduction to the project; • Introduction to the Technical Panel, the EP process and the proportionate approach to EIA; and • Discussion on key position papers.
	3 October 2018	
	14 January 2019	<p>Marine Mammals Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Project updates; • Review of responses received during the Scoping process; and • Discuss the next steps in relation to seeking agreement with stakeholders on the data and information to be included in the PEIR and ES.
	30 April 2019	<p>Marine Mammals Technical Panel Meeting 4</p> <ul style="list-style-type: none"> • Project updates; • The proportionate approach to EIA; • Review of responses received on the Scoping Report; • Comments on the Noise modelling methodology; • RIAA; and • Biodiversity net gain.
	26 June 2019	<p>Marine Mammals Technical Panel Meeting 5</p> <ul style="list-style-type: none"> • Project updates;

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Discuss the scope of the PEIR and ES; • Review of the impacts register; and • Discussion on next steps to seeking agreement with stakeholders on the data and information to be included in the PEIR and ES.
	6 November 2019	<p>Marine Mammals Technical Panel Meeting 6</p> <ul style="list-style-type: none"> • Data collection and description of the baseline environment and the inclusion of bottlenose dolphin in the baseline; • Impact assessment methodology in response to Section 42 comments regarding simultaneous piling, ramp-up hammer energy scenarios and Unexploded Ordnance (UXO); and • RIAA.
	17 December 2019	<p>Marine Mammals Technical Panel Meeting 7</p> <ul style="list-style-type: none"> • Project and programme updates; and • Updates to the Impacts Register.
	4 June 2020	<p>Marine Mammals Technical Panel Meeting 8</p> <ul style="list-style-type: none"> • Discussion on the draft ES documents (Technical Report, Outline Site Integrity Plan and Outline Marine Mammal Mitigation Protocol) that were provided for review prior to the meeting; • Presentation of updated HRA screening for marine mammals; • Discussion on the approach to the UXO assessment; and • Presentation of grey seal information that will form part of the RIAA.
	10 May 2021	<p>Marine Mammals Technical Panel Meeting 9</p> <ul style="list-style-type: none"> • Project updates including the reduction in the developable area and the change to the project programme; • Discussion on the bottlenose dolphin Management Unit and assessment; • Presentation of approach to the cumulative assessment in relation to seismic surveys, disturbance impacts, simultaneous piling and a new form of result presentation; and • Updates required to the modelling as a result of the change to Order Limits.
Marine Archaeology Technical Panel	12 September 2018 (meeting cancelled)	N/A
	18 December 2018	<p>Marine Archaeology Technical Panel Meeting 1</p> <ul style="list-style-type: none"> • Introduction to the project; • Introduction to the Technical Panel, the EP process, and the proportionate approach to EIA; and • Discussion on the landfall location.
	13 November 2019	<p>Marine Archaeology Technical Panel Meeting 2</p> <ul style="list-style-type: none"> • Project updates;

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Update on the programme to DCO application; • Impacts register and the scope of the EIA; and • Review of Section 42 consultation responses in relation to baseline data collection and assessment outcomes.
	12 May 2020	<p>Marine Archaeology Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Project updates; • Update on the programme to DCO application; • Impacts register and the scope of the EIA; and • Review of Section 42 consultation responses in relation to baseline data collection and assessment outcomes.
Onshore Ecology Technical Panel	12 September 2018	<p>Onshore Ecology Technical Panel Meeting 1</p> <ul style="list-style-type: none"> • Introduction to the project; • Introduction to the Technical Panel, the EP process and the proportionate approach to EIA; and • Discussion on key position papers.
	8 January 2019	<p>Onshore Ecology Technical Panel Meeting 2</p> <ul style="list-style-type: none"> • Project updates; • Overview of the methodology and preliminary results of ecology surveys; • Discussion of the responses received on the Scoping Report; and • Discussion on the next steps in relation to seeking agreement in the data and information to be included in the PEIR and ES.
	8 April 2019	<p>Onshore Ecology Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Project updates; • Approach to the PEIR; • Biodiversity net gain; and • Discussion of next steps in relation to seeking agreement on the evidence base, baseline data, assessment methodology and mitigation and enhancement measures.
	9 July 2019	<p>Onshore Ecology Technical Panel Meeting 4</p> <ul style="list-style-type: none"> • Hornsea Four update; • Approach to PEIR; and • RIAA update.
	13 November 2019	<p>Onshore Ecology Technical Panel Meeting 5</p> <ul style="list-style-type: none"> • Hornsea Four update; • Design Evolution update; • Air Quality and RIAA; • Discussion of key Section 42 responses; and

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> Impacts Register and proportionality.
	1 April 2020	<p>Onshore Ecology Technical Panel Meeting 6</p> <ul style="list-style-type: none"> Project updates; Discussion on all onshore baseline survey reports; Discussion to agree mitigation and licensing requirements for protected species; and Letter of No Impediment process and timescales.
	30 June 2020	<p>Onshore Ecology Technical Panel Meeting 7</p> <ul style="list-style-type: none"> Hornsea Four update; Wintering bird and breeding bird survey scope, methodology and results; To agree further survey requirements Discussion of proposed mitigation measures; and Discussion of key Section 42 comments.
	1 July 2020	<p>Onshore Ecology Technical Panel Meeting 8</p> <ul style="list-style-type: none"> Discuss and agree mitigation measures for crossing designated sites of sensitive habitats; Discuss and agree the mitigation measures (if required) for managing impacts to habitats; To present the initial findings from the Air Quality modelling assessment with regards to dust and/or nitrogen pollution; Discuss updates to mitigation and follow up actions relating to bat mitigation and the draft Great Crested Newt (GCN) European Protected Species (EPS) licence; Updates to the ecology commitments since PEIR and how they link to the rest of the EIA documentation; Agree the impacts register for onshore ecology receptors; and The Hornsea Four crossings schedule.
	16 September 2020	<p>Onshore Ecology Technical Panel Meeting 9</p> <ul style="list-style-type: none"> The Hornsea Four response to Natural England's comments; Discussion and agreement on the Ecology and Nature Conservation chapter and the Outline Ecological Management Plan; Updates to commitments; Updates to the impacts register as relates to onshore ecology; and Updates to the commitments register.
Onshore Hydrology Technical Panel	12 September 2018	<p>Onshore Hydrology Technical Panel Meeting 1</p> <ul style="list-style-type: none"> Introduction to the project; Principles of the Evidence Plan process; The Proportionate Approach to EIA; and

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Discussion of key position papers.
	15 January 2019	<p>Onshore Hydrology Technical Panel Meeting 2</p> <ul style="list-style-type: none"> • Project updates; • Overview of preliminary results from current surveys; • Review of responses in the Scoping Opinion; and • Discussion on next steps to agree the key data and information to be used in the PEIR and ES.
	5 April 2019	<p>Onshore Hydrology Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Hornsea Four update; and • Approach to PEIR.
	27 June 2019	<p>Onshore Hydrology Technical Panel Meeting 4</p> <ul style="list-style-type: none"> • Hornsea Four update; • Approach to PEIR; and • Alternative landfall scenario.
	5 November 2019	<p>Onshore Hydrology Technical Panel Meeting 5</p> <ul style="list-style-type: none"> • Hornsea Four update; • Design Evolution updates; • Discussion of key Section 42 responses; and • Discussion of the Impacts Register and EIA proportionality.
	5 February 2020	<p>Onshore Hydrology Technical Panel Meeting 6</p> <ul style="list-style-type: none"> • Hornsea Four and programme update; • Additional opportunities for enhancement; • Update on commitments and mitigation; • Discussion of key Section 42 comments; • Abstraction and dewatering; and • SoCG.
	15 May 2020	<p>Onshore Hydrology Technical Panel Meeting 7</p> <ul style="list-style-type: none"> • Outstanding Environment Agency Section 42 comments to be agreed; • Statements of Common Ground; • Agreement of meeting minutes; and • Opportunities for enhancement.
	7 September 2021	<p>Onshore Hydrology Technical Panel Meeting 8</p> <ul style="list-style-type: none"> • Flood defence investment; • Onshore substation excavation;

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Peak flow allowances; • Withdrawal of flood defences and flood defence investments; and • Statements of Common Ground;
Onshore Historic Environment Technical Panel	11 September 2018	Onshore Historic Environment Technical Panel Meeting 1 <ul style="list-style-type: none"> • Introduction to Hornsea Four; • Principles of the Evidence Plan process; • Proportionate approach to EIA; and • Discussion of key position papers.
	16 January 2019	Onshore Historic Environment Technical Panel Meeting 2 <ul style="list-style-type: none"> • Project updates; • Overview of the methodology and preliminary results of current surveys; • Discussion of responses received during the scoping process; and • Discussion on the next steps in relation to seeking agreement with stakeholders on the data and information to be included in the PEIR and ES.
	2 April 2019	Onshore Historic Environment Technical Panel Meeting 3 <ul style="list-style-type: none"> • Project update; • Discussion on alignment with the Hornsea Four approach to proportionate EIA; • Updates on the existing baseline and ongoing surveys; • Next steps to reaching agreement on the scope of the EIA; and • Next steps leading to the submission of the PEIR.
	14 November 2019	Onshore Historic Environment Technical Panel Meeting 4 <ul style="list-style-type: none"> • Hornsea Four update; • Updates to the baseline characterisation; • Discussion of key Section 42 responses and discussion; and • Impacts register and proportionate EIA.
Onshore Human Environment	7 January 2019	Onshore Human Environment Technical Panel Meeting 1 <ul style="list-style-type: none"> • Project updates; • Review of responses received during the scoping process; and • Next steps in relation to baseline data acquisition, assessment methodology and mitigation.
	1 May 2019	Onshore Human Environment Technical Panel Meeting 2 <ul style="list-style-type: none"> • Update on Hornsea Four activities; • Presentation and alignment on Hornsea Four's approach to proportionate EIA; • Discussion on public rights of way and Cycle Network;

Panel	Meeting date	Key discussion points and activities
		<ul style="list-style-type: none"> • Updates on traffic and transport surveys; • Discussion on assessment methodology; and • Next steps leading up to submission of the PEIR.
	5 September 2019	<p>Onshore Human Environment Technical Panel Meeting 3</p> <ul style="list-style-type: none"> • Update on Hornsea Four activities; • Discussion and agreement on Hornsea Four’s approach to proportionate EIA including the study area, traffic derivation and assessment methodology; • Discussion regarding the A63 Castle Street Improvement Scheme; and • The next steps between PEIR and DCO Application.
	2 October 2019	<p>Onshore Human Environment Technical Panel Meeting 4</p> <ul style="list-style-type: none"> • Project updates; • Update on the findings of the PEIR; • Access strategy for the onshore substation; • Abnormal loads; and • Cumulative effects assessment.
	29 October 2019	<p>Onshore Human Environment Technical Panel Meeting 5</p> <ul style="list-style-type: none"> • Discussion of Public Rights of Way (PRoW) and cycling routes with the East Riding of Yorkshire Council.
	17 January 2020	<p>Onshore Human Environment Technical Panel Meeting 6</p> <ul style="list-style-type: none"> • Introduction by Public Health England on their expectations regarding offshore wind development; • Hornsea Four project updates; • Discussion on Section 42 comments received; and • EIA methodology approach
	29 April 2020	<p>Onshore Human Environment Technical Panel Meeting 7</p> <ul style="list-style-type: none"> • Discussion of the Hornsea Four Outline Construction Traffic Management Plan.
	30 May, 7 May 2020, 22 January 2021	<p>Onshore Human Environment Technical Panel Additional Meetings and Correspondence</p> <ul style="list-style-type: none"> • Discussions specifically with Hull City Council regarding traffic and transport and air quality matters within their jurisdiction; and • A Position Paper was created, outlining matters such as traffic demand, sensitive junctions and air quality assessment methodology. Several separate calls were held, and comments provided via email between the Applicant and Hull City Council. • Draft versions of the Traffic and Transport ES Chapter (with accompanying Annex) and the oCTMP were issued for comment and subsequent updates, via email correspondence.

5 References

Defra (2012). Habitats Regulations – Evidence Plans for Nationally Significant Infrastructure Projects, September 2012. [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69601/pb13825-habitats-evidence-plans.pdf [Accessed: May 2020].

Appendix A – Terms of Reference

Hornsea Four Offshore Wind Farm

Evidence Plan Terms of Reference

Prepared Lauren Kirkland (GoBe), 22 October 2018
Checked Steve Bellew (GoBe), 22 October 2018
Accepted Julian Carolan (Ørsted), 22 October 2018
Approved David King (Ørsted), 5 February 2019

Table of Contents

1.	Introduction.....	5
1.1	Aim and Purpose of this Document	5
1.2	The Evidence Plan Process	6
2.	The Steering Group.....	7
2.1	The Role of the Steering Group.....	7
2.2	The Steering Group Members.....	8
2.3	Meeting Frequency.....	8
3.	Technical Panels	9
3.1	The Scope of the Technical Panels.....	9
3.2	Offshore Issues Workstream (offshore topics of relevance to HRA and EIA)	9
3.3	Onshore Issues Workstream (offshore topics of relevance to HRA and EIA)	11
3.4	Meeting Frequency.....	12
4.	Project Details and Timelines	12
4.1	Project Description	12
4.2	Project Timeline.....	13
4.3	Evidence Plan Timelines	13
5.	Roles and Responsibilities	15
5.1	The Planning Inspectorate	15
5.2	The Applicant	16
5.3	East Riding of Yorkshire Council.....	16
5.4	Natural England	16
5.5	Marine Management Organisation.....	17
5.6	Environment Agency.....	17
5.7	Historic England.....	18
5.8	Other Offshore Authorities.....	18
5.9	Other Onshore Authorities	18
6.	The Evidence Plan Process	18
6.1	General Principles.....	18
6.2	Principles of the Assessment Approach	19
6.2.1	Characterisation data	19

6.2.2	Data analysis and impact assessment	19
6.2.3	Project data.....	20
6.3	Cumulative and In-Combination Impact Assessment Principles	20
6.4	Transboundary	21
6.5	Assessment 'Cut-Off' Point.....	21
6.6	Review of Previous Decisions and Suggested Changes within the Evidence Plan Process.....	21
6.7	Approach to Mitigation.....	22
6.8	Approach to Monitoring	22
6.9	Meeting Minutes and Evidence Plan Log.....	22
Appendix 1 – Evidence Plan Log Template		1
Appendix 2 – Indicative Logistics Plan		1

Tables

Table 1 – Organisations invited to form the Hornsea Project Four Evidence Plan Steering Group	8
Table 2 – Offshore Issues Workstream Topics and Consultees.....	11
Table 3 - Onshore Issues Workstream Topics and Consultees	12
Table 4 - Hornsea Project Four Milestones	13
Table 5 – Indicative Key Dates and Activities for the Hornsea Project Four Evidence Plan.....	14

Figures

Figure 1 - Evidence Plan Process Structure.....	6
---	---

Acronyms

BAP	Biodiversity Action Plan
CIA	Cumulative Impact Assessment
cSAC	candidate Special Area of Conservation
DCO	Development Consent Order
dML	deemed Marine Licence
EA	Environment Agency
EIA	Environmental Impact Assessment
EIR	Environmental Information Requests
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
FoI	Freedom of Information
HRA	Habitat Regulations Assessment
LSE	Likely Significant Effect
MCZ	Marine Conservation Zones
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MPS	Marine Policy Statements
NERC	Natural Environmental Research Council
NPPF	National Planning Policy Frameworks
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Projects
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
pSAC	proposed Special Area of Conservation
pSPA	potential Special Protection Areas
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SCI	Sites of Community Importance
SoCG	Statement of Common Ground
SPA	Special Protection Area
TWT	The Wildlife Trusts
WDC	Whale and Dolphin Conservation
YWT	Yorkshire Wildlife Trust

1. Introduction

1.1 Aim and Purpose of this Document

This Evidence Plan (hereafter the “Plan”) will be developed by Ørsted Hornsea Project Four Limited (hereafter the “Applicant”) as tool for agreeing the information that the Applicant will supply to the Planning Inspectorate (hereafter referred to as PINS) to inform the Development Consent Order (DCO) application for the Hornsea Four Offshore Wind Farm (hereafter the “Project”).

The primary aim of the Evidence Plan process is to seek agreement with key stakeholders on the data and information to be included in the Environmental Statement that will be drafted to support the application to PINS for a DCO (pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017). The Evidence Plan will also incorporate matters relevant to the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and will also seek to ensure that sufficient information is provided to support the Habitat Regulations Assessment (HRA) that will also accompany the DCO application (and in accordance with PINS Advice Note 10)¹.

The HRA and Environmental Impact Assessment (EIA) topics covered by this Plan are detailed in Section 1.2.

The aim of this Plan is to seek consensus between all parties on the amount and range of evidence required to be collected, and to address and agree issues early in the DCO application process and as the application evolves. The Plan also seeks to make discussions more structured and efficient, allowing key environmental and consenting issues to be identified between multiple interested parties.

The Plan enables time and resources to be planned and allocated to this process by all participants. The development of this Plan and involvement of all parties should also follow the following general rules.

- Advice relating to specific topics should be compliant with planning requirements and regulation, and follow current guidance;
- Evidence should be proportionate to the Project’s potential impacts; evidence levels, assessment methodologies and interpretation criteria should be appropriate, and evidence requested should be justified and consistent with the matters being considered;
- Evidence requirements should only change if new areas of concern are identified following initial assessment; if new relevant evidence, case law, or research comes to light that would affect what information is required; or there is a material change to the Project or new proposed nature conservation designations come to light prior to the agreed “cut-off” date;
- All parties to engage pro-actively and constructively in the pre-application phase and adhere to agreed timelines specified in this Plan; and
- This Plan does not replace or duplicate existing requirements and will be developed to fit with the DCO application process as it evolves for this Project.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf>

The Evidence Plan process is a voluntary informal process and this Plan will form a non-legally binding record of the agreements and disagreements between the Applicant and the interested parties at the point of the application being made (and a record of the discussions leading up to that point). This Plan will form the basis for many of the documents produced during the application process which will be consulted on formally as part of the DCO application. It is hoped that the Evidence Plan log which will be used to record agreements and disagreements between the Applicant and the interested parties will help inform such Statements of Common Ground (SoCG) such as may be required by the Examining Authority.

This document is intended to be a working document, provided initially as the Terms of Reference for the process the Applicant wishes to follow with all interested parties. Once the Terms of Reference have been agreed, any subsequent amendments will be made as an addendum to ensure a clear and transparent audit trail is maintained. All updates will be agreed by the Steering Group before being implemented.

1.2 The Evidence Plan Process

The Plan will incorporate certain EIA matters as well as HRA matters. The topics that the Applicant wishes to include within the Evidence Plan are illustrated in Figure 1:

- Offshore Issues: Covering offshore and intertidal topics of interest to be assessed within the EIA and HRA up to and including Mean High Water Springs (MHWS); and
- Onshore Issues: Covering topics of interest landward of MHWS.

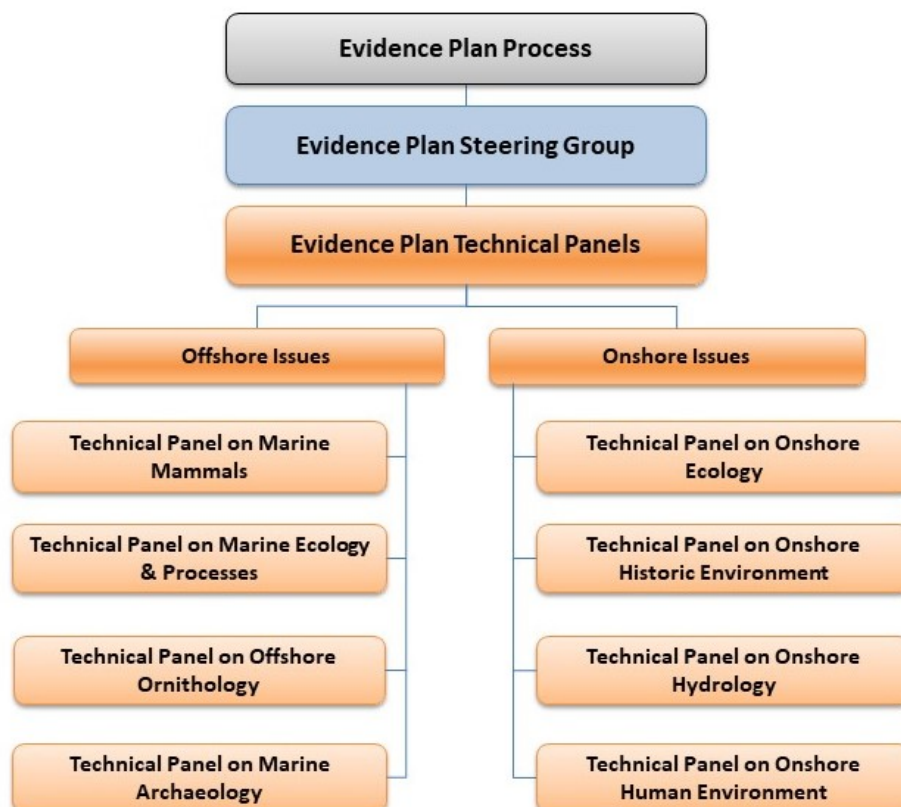


Figure 1 - Evidence Plan Process Structure

The inclusion of topics within the Plan is dependent on the outcomes of the Scoping Opinion received from PINS; the scope of the Plan may be subject to review following scoping, in discussion with the Steering Group.

The Applicant currently proposes to exclude all other onshore and offshore topics not listed in Figure 1 from the Evidence Plan Process; however, the list of topics to be included will be subject to agreement with the Steering Group at an early stage.

Where topics are excluded from the Plan, the relevant key outcomes of these assessments related to any other topics can be shared with the Evidence Plan process where it is appropriate and necessary to do so.

The Evidence Plan Process will be overseen by a Steering Group with Technical Panels established to discuss and agree the evidence and assessment requirements for each EIA & HRA topic area identified.

Further details about the workstreams are provided in Section 3.

The Evidence Plan process will be fully documented. All documents prepared for meetings will normally be available one week prior to the meeting although all efforts will be made to issue the documents as soon as available in advance of the meetings. Meeting minutes will be taken for each meeting and decisions clearly stated; these will be circulated following the meeting and should be agreed, or comments provided, within two weeks. Should the person attending the meeting not have authority to make such a decision, minutes should endeavour to be ratified by the relevant person or organisation within two weeks of the meeting. Minutes will then be finalised and submitted to all attendees for their records.

An Evidence Plan Log has been developed and the template form is provided in Appendix 1.

A Log will be produced for each Technical Panel which will document areas of consensus and concern, and ultimately identify areas of agreement and disagreement; summaries of agreed meeting minutes will be used as a basis to produce these logs, and the logs will be circulated for agreement with the relevant Technical Panel members prior to significant project milestones (e.g. pre-Preliminary Environmental Information Report (PEIR) submission, pre-application).

2. The Steering Group

The Steering Group will monitor and oversee the Evidence Plan process ensuring progress. Any technical issues raised by the Steering Group will be documented and discussed at the Technical Panel meetings. Furthermore, any issues of concern raised by the Technical Panels shall be communicated to the Steering Group to ensure that all parties are informed and up to date on progress, or otherwise.

2.1 The Role of the Steering Group

The Steering Group's main function will be to oversee the development of this Plan and ensure continual progress of the EIA Evidence Plan process. In addition, they will be required to:

- Oversee the resolution of issues that may arise during the development of this Plan and through the Technical Panel discussions (Section 3). Discussions will be recorded within the Logs, and may ultimately be used as the basis for SoCGs with each interested party. The Steering Group will require the clear and systematic documentation of agreements and disagreements in order to aid resolution of issues.
- Ensure that discussions taking place within the individual Technical Panels are consistent in approach to EIA and HRA with one another.
- Decisions made by either the Steering Group or Technical Panels will be circulated to all participants in the Evidence Plan process.

2.2 The Steering Group Members

The following organisations have been invited to form the Steering Group:

Table 1 – Organisations invited to form the Hornsea Project Four Evidence Plan Steering Group

Organisation	Specifics	Section Where Role Detailed
PINS	An independent and impartial body. The Applicant has invited PINS to chair the group and oversee the process.	Section 5.1
Ørsted	The Applicant, together with input from their consultants, will draft the Plan and any technical documents required as part of the process and will maintain the Evidence Plan Logs.	Section 5.2
Marine Management Organisation (MMO)	Shall provide feedback to the drafting and agreement of this Plan and support the aims of the Steering Group in relation to relevant offshore aspects of the Plan.	Section 5.5
Natural England²	Natural England will provide feedback to the drafting and agreement of this Plan and support the aims of the Steering Group in relation to relevant onshore and offshore aspects of the Plan.	Section 5.4
East Riding of Yorkshire Council (ERYC)	ERYC will provide feedback to the drafting and agreement of this Plan and support the aims of the Steering Group in relation to all relevant onshore aspects of the Plan.	Section 5.3

2.3 Meeting Frequency

The Steering Group will meet initially to agree this Evidence Plan and the process that will be followed going forward. Meeting frequency will be agreed by the Steering Group at the initial meeting. All meetings will be arranged and facilitated by the Applicant,

² It should be noted that pursuant to an authorisation made on the 9th December 2013 by the JNCC under paragraph 17(c) of Schedule 4 to the Natural Environment and Rural Communities Act 2006, Natural England is authorised to exercise the JNCC's functions as a statutory consultee in respect of applications for offshore renewable energy installations in offshore waters (0-200nm) adjacent to England. This project/s is included in that authorisation and therefore Natural England will be providing statutory advice in respect of that delegated authority. JNCC retains responsibility for the (joint) management of offshore designated sites and therefore where applicable Natural England will consult directly with JNCC to provide the Statutory Nature Conservation Bodies (SNCBs) advice to the applicant/examiners.

A Logistics Plan has been developed and is included in Appendix 2. This preliminary plan has been developed to outline logistics of meetings, specifically scheduling around key project milestones, possible locations and durations, subject to ratification by the Steering Group. The aim of the Logistics Plan is to help interested parties plan and manage resources accordingly.

3. Technical Panels

In order to agree and discuss the EIA and HRA evidence requirements included within this Plan, Technical Panels will be established for each topic area set out in Figure 1 with experts from relevant organisations invited to attend.

3.1 The Scope of the Technical Panels

The Technical Panels will be formed of the Applicant and experts from relevant organisations with a clear statutory role or non-statutory interest in the topics to be considered. They will have the following responsibilities:

- Agree the final scope of the EIA, the impacts to be considered and the approach to be taken in terms of proportionality;
- Agree scope of and methods for data collection where necessary (if not already agreed);
- Following collection of data, discuss and agree the appropriateness & sufficiency of data for the assessments to be undertaken;
- Agree realistic worst-case parameters (Rochdale Envelope) for assessment, with the Steering Group having overall oversight of the worst-case parameters from each Technical Panel. These worst-case parameters will be combined to form an overall set of project parameters;
- Discuss and agree the assessment and analysis methods for the EIA (or HRA) including agreement on appropriate thresholds, and agreeing terms for interpretation of impact and levels of significance;
- If significant issues are present following assessment, discuss and agree the mitigation or management requirements to avoid or reduce adverse effects; and
- It is recognised that this process can be iterative as the process develops, each topic group should follow the above process and agree as much as is reasonably practicable in the pre-application phase. Anything that cannot be agreed during pre-application will be documented in the consultation log and may form the basis for any subsequent SoCG and as a basis for the examination.

Technical panel engagement may take the form of workshops, face to face meetings or telecons as appropriate to the issues being discussed and the number/availability of attendees required; organisation of technical panel meetings will be ad hoc and as required to progress the issues outstanding. However, an indicative frequency/scheduling of meetings is outlined within the Logistics Plan (Appendix 2). As noted above, all meetings will be arranged and facilitated by the Applicant.

3.2 Offshore Issues Workstream (offshore topics of relevance to HRA and EIA)

The Offshore Issues Workstream will cover all topics related to offshore ecology and physical processes, and marine archaeology (seaward of MHWS) which are relevant to the HRA and EIA. The

topics to be covered include those where the potential impacts arising from the Project have the potential to affect features relevant to or designated under the following legislation:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") as implemented by the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations");
- Council Directive 2009/147/EC on the Conservation of Wild Birds (the "Birds Directive");
- Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended);
- Marine and Coastal Access Act 2009;
- Protection of Wrecks Act 1973;
- Ancient Monuments and Archaeological Areas Act 1979;
- Protection of Military Remains Act 1986;
- Wildlife and Countryside Act 1981; and
- The Infrastructure and Planning (Environmental Impact Assessment) Regulations 2009 (as amended).

In consideration of the above, potential effects on the following will be included for consideration by the Technical Panels:

- Special Protection Areas (SPA) and potential Special Protection Areas (pSPA) the bird features of interest. Rare and Vulnerable bird species as listed in Annex I of the Birds Directive will also be considered.
- Special Areas of Conservation (SAC), proposed and candidate Special Areas of Conservation (pSAC and cSAC) and Sites of Community Importance (SCI) as listed in Annex I of Habitats Directive;
- UK Marine Policy Statement and East Marine Inshore and Offshore Marine Plans;
- Marine Conservation Zones (MCZs);
- Protected Species as listed in Annex II of the Habitats Directive;
- Protected Species and Habitats listed under UK Biodiversity Action Plan (BAP), OSPAR and Natural Environmental Research Council (NERC) Act; and
- Indirect effects to designated features.

As stated previously in this Plan, the Applicant intends to use the Evidence Plan process to agree the scope and assessment for both EIA and HRA purposes as it is acknowledged that there is much overlap in the evidence requirements for the two assessments and the key principles to be agreed are applicable to both EIA and HRA (e.g. cumulative impact assessment principles).

Evidence will be collected to support EIA and HRA assessments in the following topic areas and the key stakeholders that the applicant intends to include in each of the Technical Panels are listed. Roles and responsibilities of participants are provided in Section 5 of the Plan.

Table 2 – Offshore Issues Workstream Topics and Consultees

Topic	Consultees
Marine Ecology & Processes	<ul style="list-style-type: none"> • Natural England³; and • MMO (and Cefas).
Offshore Ornithology	<ul style="list-style-type: none"> • Natural England³; and • Royal Society for the Protection of Birds (RSPB).
Marine Mammals	<ul style="list-style-type: none"> • Natural England³; • MMO (and Cefas); • Whale and Dolphin Conservation (WDC); and • The Wildlife Trusts.
Marine Archaeology	<ul style="list-style-type: none"> • Historic England; and • ERYC.

3.3 Onshore Issues Workstream (offshore topics of relevance to HRA and EIA)

Subject to Scoping, Workstream 2 will cover a number of the key onshore topics (above MHWS) to be covered in the EIA and HRA (and subject to the receipt of the scoping opinions from PINS and the agreement with the Steering Group).

The topics to be covered will include those where the impacts arising from the Project have the potential to effect features relevant to or designated under the following legislation:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) as implemented by the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”);
- Council Directive 2009/147/EC on the Conservation of Wild Birds (the “Birds Directive”);
- Wildlife and Countryside Act 1981;
- Countryside and Rights of Way Act 2000;
- National Parks and Access to the Countryside Act 1949;
- Natural Environment and the Rural Communities Act 2006; and
- The Infrastructure and Planning (Environmental Impact Assessment) Regulations 2017 (as amended).

The Plan will also consider the requirements of relevant National Policy Statements (NPS) and National Planning Policy Frameworks (NPPF), Marine Plans and Marine Policy Statements (MPS) as appropriate together with local planning policy.

Evidence will be collected to support EIA and HRA assessments in the following topic areas and the key stakeholders invited to form the Technical Panels are listed below:

³ Depending on the location of Hornsea Four, JNCC may also be involved in the Technical Panels as their role is to advise Natural England on offshore designations. This will be confirmed after the Scoping stage.

Table 3 - Onshore Issues Workstream Topics and Consultees

Topic	Consultees
Onshore Ecology	<ul style="list-style-type: none"> • Natural England; • ERYC; and • Yorkshire Wildlife Trust (YWT).
Onshore Hydrology⁴	<ul style="list-style-type: none"> • Environment Agency (EA); • ERYC; and • Beverley and North Holderness Internal Drainage Board.
Onshore Historic Environment	<ul style="list-style-type: none"> • Humber Archaeological Partnership; • Historic England; and • ERYC.
Onshore Human Environment	<ul style="list-style-type: none"> • ERYC; • Natural England; and • Historic England.

Where there is overlap between topic areas these will be combined for Technical Panel meetings to allow efficient use of time and allows participants to contribute to overlapping topic areas.

3.4 Meeting Frequency

Wherever possible the Evidence Plan steering group and technical panel meetings will be scheduled to coincide with key project milestones which are outlined below. Preliminary, specific logistics are set out within the Logistics Plan in Appendix 2, subject to ratification by the Steering Group. All meetings will be arranged and facilitated by the Applicant.

4. Project Details and Timelines

4.1 Project Description

The Hornsea Project Four Offshore Wind Farm will be located approximately 80 km offshore and will be to the west of Hornsea Project One, Two and Three. The project is investigating an offshore generating area of up to 860 km². The Project will comprise of up to 180 wind turbines in water depths of 24-63m.

The key offshore components of the wind farm are likely to include:

- Offshore wind turbines;
- Foundations;
- Scour protection;
- Offshore substation platform(s);
- Offshore accommodation platform(s)
- Array cables linking the individual wind turbines to an offshore substation; and
- A HVAC or HVDC Transmission System offshore including either:

⁴ Depending proposed onshore cable route and the potential interaction, Natural England may wish to be involved with the Onshore Hydrology group. This will be confirmed after the Scoping stage.

- HVAC
 - Offshore transformer substation(s);
 - Offshore interconnector cables(s)
 - Offshore export cable(s);
 - Offshore reactive compensation substation(s);
- HVDC
 - Offshore transformer substation(s);
 - Offshore interlink cables(s);
 - Offshore converter substation(s);
 - Offshore export cables(s);

The key onshore components of the wind farm are likely to include

- A HVAC or HVDC Transmission System onshore including either:
 - HVAC
 - Onshore export cable(s);
 - Onshore Substation; and
 - Grid Connection Export Cable(s).
 - HVDC
 - Onshore export cables(s);
 - Onshore substation; and
 - Grid Connection Export Cable(s).

4.2 Project Timeline

The currently anticipated, key project dates are presented in the table below. Any changes to the key project milestones will be communicated to the Steering Group at the earliest opportunity.

Table 4 - Hornsea Project Four Milestones

Milestone	Date
Scoping Report Submission	October 2018
PEIR Submission	Summer/Autumn 2019
DCO Application Submission	Winter/Spring 2020

4.3 Evidence Plan Timelines

Appendix 2 presents the detail of the key dates for the Evidence Plan; however, these are based on trying to achieve the principal project dates presented above:

Table 5 – Indicative Key Dates and Activities for the Hornsea Project Four Evidence Plan

Evidence Plan Group	Activity	Approximate Date
Steering Group	Initial Meeting to discuss Steering Group aims and objectives and agree outline Evidence Plan	July 2018
Technical Panel	Pre-scoping meeting(s): Initial meeting to discuss the approach to the Scoping report, the proposed survey scopes of any outstanding surveys, scope of HRA/EIA including assessment methodology, and preliminary discussion of key issues or areas of concern. (It should be noted that Scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns).	August 2018
Technical Panel	Post-scoping meeting; to further discuss the required scope of the EIA (and HRA) based on the PINS scoping opinion.	November/December 2018
Steering Group	Post-scoping meeting; to ratify the required scope of the EIA (and HRA) based on the PINS scoping opinion; to provide an update on any changes to Project design or programme; to provide an opportunity to discuss key issues and concerns.	December 2018
Technical Panel	Meeting(s) to discuss results of initial assessments and need for additional evidence or mitigation prior to PEIR. There should be sufficient data available to have a meaningful discussion regarding assessment outcomes.	January – May 2019
Steering Group	Post-PEIR meeting to discuss PEIR responses and key issues resolved/outstanding and approach to resolving areas of disagreements and/or refining mitigation/management plans and requirements.	Q3 2019
Technical Panel	Post PEIR meeting(s) to discuss the consultation responses received as part of formal consultation. The purpose will be to discuss concerns raised and changes/updates to assessments required for final submission.	June –September 2019
Technical Panel	Final pre-application meeting to discuss any significant changes following PEIR consultation and what will be presented in the Final Environmental Statement (ES).	Q4 2019/Q1 2020
Steering Group	Final pre-application meeting to identify final positions (agreements/disagreements) as set out in the logs and for all parties to ratify the EIA Evidence Plan to be submitted as part of the application.	Q4 2019/Q1 2020

The technical panel meetings will be held separately and as required and in a format appropriate to the issues being discussed and the number/availability of the required attendees; whilst a preference

will be for face to face meetings, in some cases telecons may be appropriate. For some technical panels it is anticipated that relatively few meetings might be required; for those on key issues with greater stakeholder concerns more frequent engagement might be required.

Further interim meetings may be required with specific Technical Panels in-between the key meetings outlined above. For instance, where there are specific topics of concern, the requirement and timing of these meetings will be determined at the initial Technical Panel meeting and throughout the process.

If consultation is required with a specific interested party e.g. if they raise a specific area of concern, *ad hoc* meetings can be scheduled, however no decisions should be taken without the consensus of the whole Technical Panel for that Topic and separate meetings should be avoided wherever possible in order to make the best use of time available and ensure an efficient process.

A final meeting may be required to complete and agree the Evidence Plan Log and any SoCGs that may be prepared prior to application.

5. Roles and Responsibilities

The general responsibilities of all Steering Group and Technical Panel members are detailed in Section 3.1. In addition to these, the following sections detail the specific roles and responsibilities of each consultee.

5.1 The Planning Inspectorate

Having an impartial Chair to the Evidence Plan process is fundamental for ensuring progress and driving the process to a successful conclusion. The Applicant will ask PINS to Chair the Steering Group; as Chair the main responsibilities will include:

- Attendance at Steering Group meetings (sufficient notice will be provided);
- Review material provided prior to the meetings;
- Chair the meeting, including open and close of the meeting and run the agenda according to the allotted times;
- Ensure good order is maintained at the meetings, including fairness and equality;
- Ensure all discussions points and conclusions are understood by all parties;
- Provide a summary of main points of agreement and disagreement and action points;
- Ensure progress by prompting and discussing outstanding actions; and
- Review the meeting minutes ensuring they accurately reflect the discussions and actions.

It is expected that PINS will publish a note of the meeting on the PINS planning webpage to be agreed by the Steering Group prior to publication, the note will be limited to the following information; attendees, location of meeting, high-level agenda items, and a summary of any Section 51 advice given. No summary of the discussions or comments made would be included.

If Section 51 advice is requested, this would be provided during the meeting wherever possible, and a summary provided in the notes. If the advice cannot be provided at the meeting due to the complexity of the request, the PINS would seek to provide the advice within 2 weeks.

The Chair will not be expected to make the arrangements for the meetings or take the minutes of the meetings; these responsibilities remaining with the Applicant. The Applicant will also be responsible for providing the required pre-meeting documentation and circulating this within the agreed timescales (normally at least one week although all efforts will be made to issue the documents as soon as available in advance of the meetings) prior to the meeting.

The Chair will not be expected to participate in the Technical Panel meetings. The Chair will also not act as arbiter or decision maker for any issues arising, they will act completely independently.

5.2 The Applicant

Ørsted Hornsea Project Four Limited as the Applicant, along with their lead EIA consultant will provide the Secretariat for the process, undertaking the organisation of all Steering Group and Technical Panel meetings and all secretarial duties at these meetings, providing agendas and minutes and leading the discussions.

In addition to all secretarial duties, the Applicant will also provide all required evidence and documentation to facilitate discussions including the Evidence Plan itself and all other technical documents prior to meetings.

Documentation to be discussed at meetings will be provided in a timely manner.

5.3 East Riding of Yorkshire Council

In addition to a role on the Steering Group, ERYC will be involved in those Technical Panels detailed in Section 3. They will be required to review and assess the evidence provided by the Applicant and provide advice on the evidence requirements and evidence provided in so far as it pertains to its statutory remit, ensuring at all times consistency of advice. ERYC will also be expected to work to resolve any issues in the pre-application phase and enter into a SoCG with the Applicant.

ERYC will provide any relevant information that is in the public domain which may be relevant to the DCO application and the EIA/HRA process.

5.4 Natural England

In addition to a role on the Steering Group, Natural England will be involved in those Technical Panels detailed in Section 3. They will:

- Engage with the Applicant at the start of pre-application process to discuss the Project's possible environmental impacts with a focus on potential likely impacts on a European site(s) and their conservation objectives and EIA topics;
- Assess and review evidence provided by the Applicant at agreed regular reviews, giving written feedback on progress to timescales agreed within the Technical Panels;

- Provide any relevant public domain information (e.g. conservation objectives, monitoring reports, site condition assessment data; grey literature) which they hold to inform the EIA/HRA process;
- Review evidence requirements and propose changes, when applicable, which are realistic and proportionate. Clear rationale for any evidence changes will be required;
- Ensure consistency of approach to advice between this Project and other Nationally Significant Infrastructure Projects (NSIPs);
- Provide advice to the applicant on evidence requirements. Evidence requirements will only change following:
 - The assessment of evidence provided by the applicant identifying new areas of concern.
 - Relevant evidence, information or research coming to light that would have an impact on what information is required.
 - A material change to the NSIP proposal that is likely to change the potential impacts and therefore the evidence requirements to address these.
- Work with the Applicant to resolve as many issues as possible during the pre-application period, to agreed timescales, including through the SoCG. Consultation and timescales/deadlines should be agreed within Technical Panels or the Steering Group.

5.5 Marine Management Organisation

The MMO, in addition to participating in the Steering Group will also take part in relevant Technical Panels providing an overview as required and coordinating the input of Cefas. They will:

- Assess and evaluate evidence provided by the Applicant at agreed regular reviews, giving consistent feedback on progress.
- Advise on issues relating to the draft DCO and deemed Marine Licences (dMLs).
- Propose changes to the evidence requirements which are proportionate and based on findings of the evidence assessed.
- Provide any public domain data that they hold, relevant to this application.
- Ensure that the representative(s) on the Steering Group or Technical Panels have the authority that any position formally agreed in writing within the plan process is an agreed corporate position and not the advice of the officer only. This may require that meeting minutes are ratified following the meeting and within 2 weeks of the meeting.
- Work with the Applicant to resolve as many issues as possible during the pre-application phase and to be concluded through the SoCG.

5.6 Environment Agency

EA will participate in the Technical Panels outlined in Section 3 and will be required to review, assess and provide written feedback on the documents and evidence provided ensuring consistency of advice and in accordance with this document and on request can provide any public domain data that they hold, relevant to this application.

EA will endeavour to work to resolve any issues in the pre-application phase and may enter into a SoCG with the Applicant.

5.7 Historic England

Historic England will participate in the Technical Panels outlined herein and engage with the Applicant in the early pre-application phase to discuss potential environmental impacts (positive and negative) relating, in particular, to risk to the known and unknown historic environment as described by the UK Marine Policy Statement and relevant National Policy Statements.

Historic England will be required to review, assess and provide written feedback on the documents and evidence provided ensuring consistency of advice and in accordance with this document and on request can provide any public domain data that they hold, relevant to this application.

Historic England will endeavour to work to resolve any issues in the pre-application phase and may enter into a SoCG with the Applicant.

5.8 Other Offshore Authorities

Cefas will provide advice as requested by the MMO and will attend relevant Technical Panels as directed by the MMO.

TWT will be required to provide input to the Marine Mammal Technical Panels.

RSPB will be required to provide input to the Offshore Ornithology Technical Panel.

5.9 Other Onshore Authorities

YWT will be required to provide input into the Onshore Ecology Technical Panel.

Beverley and North Holderness Internal Drainage Board shall be required to provide input into the Onshore Hydrology Technical Panel.

6. The Evidence Plan Process

6.1 General Principles

This Evidence Plan process will abide by the following general rules:

- Meetings will always be scheduled with adequate advance warning to maximise attendance;
- All documents prepared for meetings will normally be available one week prior to the meeting although all efforts will be made to issue the documents as soon as available in advance of the meetings;
- All documents, guidance and advice provided should be as comprehensive as possible, be clear and unambiguous;
- Deadlines for responses will be realistic and agreed by participants, it is noted that some participants may require longer to respond if they need to consult with advisors, deadlines should be met, or alternate timescales agreed;

- Participants of meetings are expected to be fully prepared for meetings, having read the required information, in order to facilitate an efficient meeting; and
- Clear routes of communication should be established with the Applicant and other plan participants.

6.2 Principles of the Assessment Approach

Detailed method statements for the analysis and assessment of specific topics covered within this Plan will be agreed as part of the process; however, this Plan also sets out the high-level principles that are applicable to all topics, these are detailed in the sections below.

6.2.1 Characterisation data

This Evidence Plan has been developed primarily to agree the data and evidence requirements for the purposes of the HRA and EIA, with the prime function of such data and evidence being the characterisation of the areas subject to development and appropriate buffer areas. The collection of detailed baseline data for post construction compliance monitoring is not within the scope of the Evidence Plan process will be subject to further discussion post consent.

The Applicant is required to provide sufficient data, as may reasonably be required, to undertake the assessments as part of the HRA and EIA and proportionate to the likely significance of the effects arising from the construction, operation and decommissioning of the Project. The data should be sufficient to enable the assessment of the potential impacts arising from the Project on receptors at site specific level and also the wider environment sufficient to adequately quantify the effects arising.

Data requirements (be that site specific or existing sources) will be agreed through the Evidence Plan process.

Requests for additional data/evidence will be assessed in the context of the benefit to the overall assessment i.e. would additional data change the likely outcome of the assessment and the likely significance of the effects (i.e. with regards to proportionality).

6.2.2 Data analysis and impact assessment

The detailed data requirements and the approaches to data analysis and the assessment process will be agreed primarily within the Technical Panels, such agreements (or disagreements) being notified to the Steering Group; the matters to be considered by the technical panels should cover (but not necessarily be limited to) the following areas:

- Study Areas (spatial and temporal);
- Definition of terminology (magnitude, sensitivity, uncertainty);
- Reference populations;
- Assessment methodologies, analysis techniques including statistical analysis tools or models to be used;
- Potential impacts scoped into or out of the assessment process (and based on but not limited to the scoping opinion);

- Approach to Screening of sites for HRA (in and out);
- Sites with the potential for Likely Significant Effect (LSE) and no LSE; and
- Apportionment of impacts to designated sites.

6.2.3 Project data

PINS will publish a high-level summary of the Steering Group meetings on their website. The detailed minutes of the Steering Group and the Technical Panels will not be published. It is understood, however, that this information may be subject to Freedom of Information (Fol) and Environmental Information Requests (EIR) as information held by public bodies.

Documents should be labelled “work in progress” or “commercially sensitive” as appropriate.

It is acknowledged that statements by participants do not necessarily reflect statutory advice on the application or a final position, unless otherwise indicated. It is important to note that participants are giving their advice within meetings without prejudice and that this may be subject to clarification upon further consideration with their respective organisations.

Any information of a confidential nature will be treated accordingly by all parties, subject to legal duties of disclosure.

6.3 Cumulative and In-Combination Impact Assessment Principles

The requirements for Cumulative Impact Assessment (CIA) and in-combination assessment will be provided by regulators and advisors (e.g. Natural England) to ensure that there is a consistent approach between this project and other developments.

The Applicant will ensure that the basis for assessment of cumulative and in-combination impacts is transparent and clearly documented. In addition, the Applicant will clearly document the list of plans and projects that are scoped in and out of the CIA, it is noted that this will be an iterative process up to the assessment “cut-off” point detailed in Section 6.5.

All assessments will need to be underpinned by a proportionate amount of evidence based on the currently available information and best practice. Where there is a lack of evidence relating to cumulative or in-combination assessment e.g. where a third-party project may be in very early stage of development, it would not be appropriate to include such a project as no quantitative assessment could be undertaken. It would not be appropriate for the Applicant or any other stakeholder to make unsubstantiated assumptions about the future development plans of a third-party project. Inclusion of relevant projects will be agreed by the Technical Panels and based on relevant guidance at the time of application, such as, for example, PINS Guidance notes 102 and 173. In such cases justification would be provided as to the exclusion of certain projects based on uncertainty and the inability to undertake a meaningful assessment.

Spatial and temporal boundaries should be appropriate, taking into consideration individual receptors and project specific parameters.

6.4 Transboundary

It is proposed to scope transboundary impacts out of this Evidence Plan (except in so far as they may be relevant to HRA matters). However, if required, the assessment of transboundary impacts, plans or project will be undertaken in the same manner as the assessment of UK based plans/projects and will follow the process described in Section 6.3.

Transboundary stakeholders will be contacted according to best practice and current guidance.

6.5 Assessment 'Cut-Off' Point

It is reasonable to have a 'cut-off' point within the assessment process, after which no more plans or projects will be included within the cumulative and in-combination assessment and so that the assessment can be finalised for the application. The Applicant proposes that a reasonable 'cut-off' point would be the close of the Section 42 consultation following receipt of comments on the PEIR, unless new information presented subsequent to this that would be considered to be likely to significantly change the outcome of the assessment (e.g. a new designation or additional survey results).

It is important to note that the Evidence Plan process will continue after this cut-off date to allow any additional information to be considered by Evidence Plan members.

It is acknowledged that further information and assessment may be requested by the Examining Authority during the Examination in accordance with, for example, the PINS Advice note 17: Cumulative Effects Assessment.

6.6 Review of Previous Decisions and Suggested Changes within the Evidence Plan Process

In order that progress is made through the Evidence Plan process, decisions taken throughout the process will only be revisited under certain circumstances as outlined below; this will also inform the assessment cut-off point:

- The project design is significantly changed e.g. the project boundary or the infrastructure to be installed changes the worst-case parameters previously agreed;
- Errors in the data or analysis are detected requiring reassessment;
- Considerable new evidence is produced and there is general consensus this should be incorporated because it is considered is likely to change the outcome of the original assessment; and
- Changes can be agreed where they do not affect the overall project timescales for submission of the application to PINS.

6.7 Approach to Mitigation

Where impacts are anticipated, mitigation is likely to be suggested and will be discussed through the Evidence Plan process. It is anticipated that mitigation measures will subsequently form a Requirement within the DCO, or in the case of marine elements, conditions in the dMLs.

Mitigation should be feasible from an engineering and cost perspective. It should be suitable, proven and proportionate to the impacts. The requirement for mitigation should be flexible and allow the mitigation to be informed and developed on the basis of best scientific understanding and knowledge, noting that different mitigation could be applied at different phases of the project.

6.8 Approach to Monitoring

In addition to mitigation there may be monitoring requirements discussed through the Evidence Plan process and secured via DCO Requirements or dML conditions. Future monitoring requirements should be sufficiently flexible and be informed and developed on the basis of best scientific understanding and knowledge. Monitoring requirements should be appropriate for the different phases of the project.

6.9 Meeting Minutes and Evidence Plan Log

Meeting minutes will be taken for each and every meeting held during the process; these will be circulated following the meeting and should be agreed, or comments provided, within two weeks. If the minutes include decisions made during the meeting these should be ratified at the appropriate level within each organisation.

In addition, an Evidence Plan Log will be developed to document areas of agreement and disagreement, this will be updated as the Evidence Plan process progresses. The Evidence Plan Log will be used as a basis for the SoCG with each Organisation as may be required by PINS, enabling a clear audit trail of discussions and decision making and should negate the need for reiteration of previous discussion.

This Plan outlines an iterative process and may therefore be updated as the process progresses. If updates are required to this Plan they will be made as an addendum, thereby maintaining a clear and transparent audit trail. This Plan will be agreed by all members of the Steering Group at the initial meeting outlined in Appendix 2 and will also be ratified and signed off by all stakeholders prior to the application being made.

Appendix 1 – Evidence Plan Log Template

Introduction

Background

This document has been prepared by Ørsted Hornsea Project Four Limited (the Applicant) and [Organisation Name] to document the areas of agreement and disagreement regarding discussions undertaken during the Evidence Plan process up to the point of submission of the Development Consent Order (DCO) application. Minutes of meetings have been used as a basis for this document.

The primary aim of the Evidence Plan process is to seek agreement with key stakeholders on the data and information to be included in the Environmental Statement that will be drafted to support the application to PINS for a DCO (pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017). The Evidence Plan will also incorporate matters relevant to the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and will also seek to ensure that sufficient information is provided to support the Habitat Regulations Assessment (HRA) that will also accompany the DCO application (and in accordance with PINS Advice Note 10)⁵.

This document covers only those HRA and Environmental Impact Assessment (EIA) topics of interest for which [Organisation Name] has been involved in the Technical Panels.

This document first lists the consultation that has been undertaken with [Organisation Name] and then the following tables list matters of agreement, disagreement and any actions to be taken to resolve matters not agreed.

Areas of disagreement will inform ongoing discussions between the Applicant and [Organisation Name] with the intention of trying to resolve these issues prior to submission. Should resolution prior to submission not be possible this process will serve to focus the Examination Process.

These consultation logs will also inform the Statements of Common Ground (SoCG) to be entered into as part of the Examination process.

The Development

The Application is for a DCO to construct and operate the Hornsea Project Four Offshore Wind Farm. The Hornsea Project Four Offshore Wind Farm will be located approximately 80 km offshore and will be to the west of Hornsea Project One, Two and Three. The project is investigating an offshore generating area of up to 860 km². The Project will comprise of up to 180 wind turbines in water depths of 24-63m.

The key offshore components of the wind farm are likely to include:

- Offshore wind turbines;
- Foundations;
- Scour protection;
- Offshore substation platform(s);
- Offshore accommodation platform(s)

⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf>

- Array cables linking the individual wind turbines to an offshore substation; and
- A HVAC or HVDC Transmission System offshore including either:
 - HVAC
 - Offshore transformer substation(s);
 - Offshore interconnector cables(s)
 - Offshore export cable(s);
 - Offshore reactive compensation substation(s);
 - HVDC
 - Offshore transformer substation(s);
 - Offshore interlink cables(s);
 - Offshore converter substation(s);
 - Offshore export cables(s);

The key onshore components of the wind farm are likely to include

- A HVAC or HVDC Transmission System onshore including either:
 - HVAC
 - Onshore export cable(s);
 - Onshore Substation; and
 - Grid Connection Export Cable(s).
 - HVDC
 - Onshore export cables(s);
 - Onshore substation; and
 - Grid Connection Export Cable(s).

HRA and EIA Topics Considered by [Organisation Name] through the Evidence Plan Process

The topics for which [Organisation Name] has provided input to the Technical Panels are:

- XXXX; and
- XXXX

Overview of Consultation

Table 1 provides the dates and overview of the consultation undertaken between the Applicant and [Organisation Name].

Table 1 – Overview of consultation

Date of consultation	Type of Consultation (e.g. meeting, emails, verbal communication)	Overview of Discussions

Topic 1

Topic 1 was discussed during the Technical Panel workshops on [insert dates], with issues detailed in Table 2 below.

Table 2 – Topic 1 Evidence Plan Log

ID	Issue on which the Applicant Seeks Agreement	Applicant Comments	[Organisation Name] Comments	Agreed/Disagreed & Actions
1. Data Collection and Description of Baseline Environment				
1.1				
1.2				
2. Impact Assessment Methodology (including definition of terms)				
2.1				
2.2				
3. Outcome of EIA				
3.1				
3.2				
4. Cumulative Assessment (including identification of project scoping in and out)				
4.1				
4.2				
5. HRA Screening				
5.1				
5.2				
6. HRA Assessment				
6.1				
6.2				

Topic 2

Topic 2 was discussed during the Technical Panel workshops on [insert dates], with issues detailed in Table 3 below.

Table 3 – Topic 3 Evidence Plan Log

ID	Issue on which the Applicant Seeks Agreement	Applicant Comments	[Organisation Name] Comments	Agreed/Disagreed & Actions
7. Data Collection and Description of Baseline Environment				
1.1				
1.2				
8. Impact Assessment Methodology (including definition of terms)				
2.1				
2.2				
9. Outcome of EIA				
3.1				
3.2				
10. Cumulative Assessment (including identification of project scoping in and out)				
4.1				
4.2				
11. HRA Screening				
5.1				
5.2				
12. HRA Assessment				
6.1				
6.2				

Agreement

It is agreed between the Applicant and [Organisation Name] that this document is a true reflection of the discussions that have taken place as part of the Evidence Plan Process up to the point of DCO submission.

Signed for and on behalf of the Applicant

Signed:

Name:

Position:

Date:

Signed for and on Behalf of [Organisation Name]

Signed:

Name:

Position:

Date:

Appendix 2 – Indicative Logistics Plan

Introduction

Background

This document has been prepared by Ørsted Hornsea Project Four Limited (the Applicant) to plot the timescales for the projects development against an indicative programme for the Evidence Plan Process. It is intended to be a helpful document to assist participants with resource planning.

This document provides details on the indicative development milestones in relation to Evidence Plan activities, indicative dates, locations and likely agenda or reasons for the meetings/workshops to be held.

The Evidence Plan Structure

As detailed in the Terms of Reference (ToR) document, this Evidence Plan Process will involve the input of two distinct groups of participants: The Steering Group will provide the overview and ensure progress; and the Technical Panels will discuss the detail of the evidence requirements.

The Technical Panels have been further split into two workstreams:

- Offshore Issues: Covering offshore and intertidal topics of interest to be assessed within the Environmental Impact Assessment (EIA) and HRA up to and including Mean High Water Springs (MHWS); and
- Onshore Issues: Covering topics of interest landward of MHWS.

Offshore Issues Workstream

The following topics will be covered by the Offshore Issues Workstream and in order to make the best use of time and due to potential overlaps in topic areas in terms of data requirements and assessment methodology a number of topic areas will be combined to form the following Technical Panels are therefore proposed:

- Marine Ecology & Processes;
- Offshore Ornithology;
- Marine Mammals; and
- Marine Archaeology.

Ornithology and Marine Mammals have been given an individual topic group due to the complexities of the assessments involved, the data requirements and ever-developing technicalities of the assessment.

It is intended to run the Technical Panels as workshop days covering more than one topic/group of topics over the course of the day to make the most efficient use of time, although it is acknowledged that the Ornithology Technical Panel may require more meetings than other topic groups.

Onshore Issues Workstream

Subject to Scoping, the following topics will be covered by the Onshore Issues Workstream, and as with the Offshore Issues Workstream above, a number of the topic areas will be combined where there is overlap, the following structure is proposed:

- Onshore Ecology;
- Onshore Hydrology;
- Onshore Human Environment; and
- Onshore Historic Environment.

As stated within the ToR document, the inclusion of all Onshore Technical Panels is dependent on the outcome of Scoping. It is anticipated that all nearshore aspects will be discussed within the offshore groups.

Project and Evidence Plan Timescales

Key project milestones are outlined within the ToR document (Section 4.2), however further detail is provided within Table 1 of this document.

It should be noted that the project is still in the early feasibility stage and therefore timescales may be subject to change.

Wherever possible meetings and workshops will be undertaken to coincide with key Development Consent Order (DCO) milestones e.g. formal consultation under Section 42 on the Preliminary Environmental Information Report (PEIR). This is to allow the Applicant and consultees to discuss the comments and feedback on the PEIR, therefore ensuring that comments provided are fully addressed in the final Environmental Statement (ES).

It is intended that the final Technical Panel meetings will be to provide feedback on the updates made to the final ES chapters and also to finalise the Evidence Plan logs.

The Final Steering Group meeting would be used allow the final sign-off of the logs for inclusion in the application. This does not infer that all items are agreed; it is acknowledged that some matters may not be able to be agreed until after the application has been made.

Table 1 – Project Timescales and Evidence Plan Activities

Date (indicative)	Project Stage	Steering Group	Offshore Issues Workstream	Onshore Issues Workstream
July/August 2018	Pre-Scoping	<p><u>Steering Group (SG) kick-off meeting</u> Location: TBC Duration: ½ day Purpose: 1. Provide an introduction to Hornsea Project Four 2. Discussion and potentially agree the ToR, 3. Discuss principles of the Evidence Plan process, 4. Steering Group members’ roles and responsibilities, 5. Discuss Logistics Plan and content of next SG</p>	<p><u>Initial Technical Panel Workshop</u> Location: TBC Duration: 1 day (1.5 hours per topic group) Purpose: 1. Introduction to the project 2. Introduce the process and Technical Panel members 3. Initial discussions about proposed scoping approach and topic areas 4. Produce Log Agreement of Minutes via email.</p>	<p><u>Initial Technical Panel Workshop</u> Location: TBC Duration: 1 day (1.5 hours per topic group) Purpose: 1. Introduction to the project 2. Introduce the process (inc ToR) and Technical Panel members 3. Initial discussions about proposed scoping approach and topic areas 4. Produce Log Agreement of Minutes via email.</p>
November – December 2018	Post scoping pre PEIR	<p><u>Progress meeting</u> Location: TBC Duration: ½ day Purpose: 1. Project progress and update on Scoping 2. Feedback on initial Technical Panel meeting/workshop</p>	<p><u>Post-Scoping Technical Panel progress meeting</u> Location: TBC Duration: 1 day (1.5 hours per topic group) Purpose: 1. Project update 2. Scoping responses 3. Discuss results of surveys 4. Discuss any updates to assessments (methods, guidance etc) 5. Update log Agree minutes and papers via email</p>	<p><u>Post-Scoping Technical Panel progress meeting</u> Location: TBC Duration: 1 day (1.5 hours per topic group) Purpose: 1. Project update 2. Scoping responses 3. Discuss methods and scope of onshore surveys 4. Discuss any updates to assessments (methods, guidance etc) 5. Update log Agree minutes and papers via email</p>

Date (indicative)	Project Stage	Steering Group	Offshore Issues Workstream	Onshore Issues Workstream
Q2-Q3 2019	PEIR (to be held after close of consultation so responses available)	<u>Progress meeting</u> Location: TBC Duration: 2 hours Purpose: 1. Feedback on PEIR assessments and topics of concern	<u>PEIR Workshop</u> Location: TBC Duration: topics split over 1-2 days (dependant on issues) Purpose: 1. Project Update 2. Overview of PEIR doc 3. Discuss stakeholder comments on PEIR 4. Stakeholder comments on draft HRA 5. Update log Agree minutes and papers via email	<u>PEIR Workshop</u> Location: TBC Duration: topics split over 1-2 days (dependant on issues) Purpose: 1. Project Update 2. Overview of PEIR doc 3. Stakeholder Comments on PEIR 4. Stakeholder comments on draft HRA 5. Update log Agree minutes and papers via email
Q4 2019/Q1 2020	Pre-Submission	<u>Final wrap up meeting</u> Location: TBC Duration: 2 hours Purpose: 1. Feedback on PEIR comments 2. Agree presentation of Evidence Plan Process within DCO application	<u>Final wrap up meeting</u> <u>Location: TBC</u> Duration: As required Purpose: 1. Dependant on remaining issues of concern (assessment updates and overview of conclusions) 2. Update log 3. Next steps Likely to be required for Ornithology Agree minutes and papers via email	<u>Final wrap up meeting</u> Location: TBC Duration: As required Purpose: 1. Dependant on remaining issues of concern (assessment updates and overview of conclusions) 2. Update log 3. Next steps Agree minutes and papers via email
Q1 2020	Submission of DCO			

Appendix B –Evidence Plan Logs

Marine Ecology & Processes

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
OFF-ME&P-1.1	Marine Processes Data - Scoping	12/09/18: Data sources for the Marine Processes baseline was presented by Bill Cooper and feedback was invited.	12/09/18: John Rees (Cefas) agreed to review evidence list and provide comment on its sufficient and add any other data sources that would be useful.	JR to provide brief advice note to MMO on review of evidence list and environmental topics for consideration. All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.
OFF-ME&P-1.2	Benthic & Intertidal Ecology Data - Scoping	12/09/18: Data sources for the Benthic & Intertidal Ecology baseline was presented by Fraser Malcolm and feedback was invited.	12/09/18: Jacqueline Eggleton (Cefas) agreed that feedback would be provided on the Scoping Report and not the Position Paper.	All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.
OFF-ME&P-1.3	Fish & Shellfish Data - Scoping	12/09/18: Data sources for the Fish & Shellfish baseline was presented by Fraser Malcolm and feedback was invited.	12/09/18: Frances Mynott (Cefas) agreed that feedback would be provided on the Scoping Report and not the Position Paper.	All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.
OFF-ME&P-1.4	Marine Processes -Operational Wave Monitoring for HOW01	12/12/18: Initial results of the operational wave monitoring for HOW01 was presented. Bill Cooper suggested the provision of a Technical Note to detail the results.	12/12/18: Jon Rees (Cefas) agreed to review Technical Note.	All participants agreed that feedback would be provided on the Operational Wave Data Technical Note.
OFF-ME&P-1.5	Benthic & Intertidal Ecology Data Availability	12/12/18: Fraser Malcolm presented the data availability for the benthic baseline, including the data availability heat mapping and proposed that predictive habitat modelling would be carried out. Fraser Malcolm suggested the provision of a Technical Note to detail the methodology of this predictive habitat modelling.	12/12/18: Jacqueline Eggleton (Cefas) agreed to review Technical Note.	All participants agreed that feedback would be provided on the Technical Note on the predictive habitat modelling methodology and to include information on the data availability heat mapping.
OFF-ME&P-1.6	Fish & Shellfish - Use of IHLS Data	12/12/18: Phil New presented the IHLS heat mapping that GoBe Consultants have undertaken as part of the 'ORJIP Impacts from Piling on Fish at Offshore Wind Sites: Gap Analysis and Appraisal of Mitigation Options (June 2018)' project. Phil New suggested that Hornsea Four should rely on the IHLS data as opposed to the spawning habitat mapping suggested by Cefas. It was agreed that a Technical Note setting out the data sources proposed would be produced for the Evidence Plan Technical Panel.	12/12/18: Georgina Eastley (Cefas) agreed to review Technical Note.	All participants agreed that feedback would be provided on the Technical Note on the proposed reliance on IHLS herring spawning data and other data to be used for the fish and shellfish assessment.
OFF-ME&P-1.7	Marine Processes - Operational Wave Note	30/04/19: Bill Cooper provided a summary of the Operational Wave Monitoring Note that have been provided to all Panel members on 25/02/19.	30/04/19: Jon Rees (Cefas) noted the operational wave monitoring methodology was appropriate and agreed but noted that the findings of the note are subject to further discussions to achieve consensus.	Standalone discussion to be held with Jon Rees and Bill Cooper and to provide an update on these discussions at the next meeting.
OFF-ME&P-1.8	Benthic Ecology - Baseline Strategy Note	30/04/19: Angie de Burgh provided a summary of the Benthic Baseline Strategy document that sets out proposed approach to developing a robust baseline description sufficient to inform EIA. Note was provided to all Panel members on 30/01/19.	30/04/19: MMO, Cefas and Natural England formal responses were provided - see below. • MMO: The approach may be sufficient if the recommendations the MMO have provided above are considered in the methodology. Further information is required regarding the use of faunal data collected as part of the 2018/2019 survey campaign. • NE: The scope of the standalone benthic survey to be conducted in 2019 is yet to be determined and as such the suitability of the baseline strategy is yet to be fully established. However, assuming the standalone benthic survey will address any remaining data gaps or uncertainties the baseline strategy will be sufficient to inform the EIA when all data is incorporated.	Agreed that the benthic baseline strategy is sufficient (if MMO's comments addressed within the PEIR).
OFF-ME&P-1.9	Benthic Ecology - Survey Strategy Note	30/04/19: Angie de Burgh provided a summary of the Benthic Survey Strategy document that outlines the rationale and specification of additional subtidal and intertidal benthic surveys, to supplement the existing benthic survey data across the Hornsea Four array area and offshore ECC. Note was provided to all Panel members on 25/02/19.	30/04/19: MMO, Cefas and Natural England formal responses were provided - see below. • MMO: The proposed survey strategy appears to be appropriate, however no information has been provided on the location of proposed physical sample stations. This information must be provided within the PEIR, even if the data itself is not available for inclusion in the preliminary characterisation. As such, the MMO cannot comment on potential data gaps. • NE: No response received.	Agreed that the proposed strategy is appropriate, pending further detail to be presented at PEIR in order to address MMO's queries.
OFF-ME&P-1.10	Fish & Shellfish Ecology - Spawning Habitat Note	30/04/19: Phil New provided a summary of the Spawning Habitat Note that sets out proposed approach to the characterisation of suitable spawning habitats for both herring and sandeel to inform EIA. Note was provided to all Panel members on 30/01/19.	30/04/19: Georgina Eastley (Cefas) confirmed that the responses provided by PN in relation to the fish baseline note answer all queries raised by Cefas.	Agreed that the methods presented in the spawning habitat note are appropriate (if the MMO's comments addressed within the PEIR).
OFF-ME&P-1.11	Benthic & Fish and Shellfish Ecology - PSA data	13/11/19: Addition of ECC grab sample data now means have comprehensive coverage of the ECC and array.	13/11/19: Attendees requested to see a figure showing the PSA sample locations before this could be confirmed.	Agreed to provide a figure and get agreement via email that the coverage is appropriate.
OFF-ME&P-1.12	Fish & Shellfish Ecology - Species Considered within Baseline	13/11/19: PN suggested inclusion of baseline for scallops, crab, lobster & Nephrops in line with Cefas S42 response.	13/11/19: CB (Cefas) confirmed that would be acceptable.	Agree (with Cefas) that only scallop, crab, lobster and Nephrops to be added to the baseline section. No other species required.
OFF-ME&P-1.13	Marine Processes - Baseline Presented Within Draft ES	09/10/20: Baseline presented in Marine Processes Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England consider that the baseline characterisation is incomplete in regard to the underlying geology, seabed sediments, and dominant morphological features in the vicinity of, and within, the proposed project area.	Disagreement on the Marine Processes baseline.
OFF-ME&P-1.14	Benthic & Intertidal Ecology - Baseline Presented Within Draft ES	09/10/20: Baseline presented in Benthic & Intertidal Ecology (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England is generally satisfied with the baseline characterisation.	Agreement on the Benthic & Intertidal Ecology baseline.

Marine Ecology & Processes

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ME&P-1.15	Fish & Shellfish Ecology - Baseline Presented Within Draft ES	09/10/20: Baseline presented in Fish & Shellfish Ecology (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: Natural England notes that more survey data has been provided since the PEIR stage as requested. Site specific grab surveys were conducted for habitat classification for the array area and along the ECC. PSA survey data is therefore considered sufficient.	General agreement on the Fish & Shellfish Ecology baseline.
OFF-ME&P-1.16	Fish & Shellfish Ecology - Use of Surveys from Other Hornsea Projects	09/10/20: Baseline presented in Fish & Shellfish Ecology (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: The MMO agrees that the Hornsea Zone otter trawl surveys and HOW01, HOW02 and HOW03 epibenthic beam trawl surveys are sufficient to inform the baseline.	Agreement on the Fish & Shellfish Ecology baseline.
2. Impact Assessment Methodology (including definition of terms)				
OFF-ME&P-2.1	Fish & Shellfish Ecology - Underwater Noise Methodology Note	30/04/19: Phil New provided a summary of the Underwater Noise Methodology Note that details the proposed noise modelling methodology for marine mammals and fish. Note was provided to all Panel members on 15/01/19. Separate noise call held with Cefas and MMO.	30/04/19: Cefas noise expert not present so it was agreed to discuss this at a standalone call.	Noise modelling methodology agreed - specifically agreements reached to present both fleeing and stationary impact ranges, and both impulsive and non-impulsive noise scenarios.
OFF-ME&P-2.2	Fish & Shellfish Scope of Assessment	30/04/19: Phil New stated that in line with the Hornsea Four proportionate approach, the project propose to limit the fish and shellfish assessment to impacts on sandeel and herring as these species have spawning grounds in the area and are sensitive to temporary localised increases in SSC and smothering; direct and indirect seabed disturbances leading to the release of sediment contaminants; long term loss of habitat; and increased hard substrate and structural complexity.	30/04/19: Georgina Eastley (Cefas) stated that Cefas consider that it would be appropriate to focus only on these two species in the Hornsea Four EIA. No objections to this proposal raised by other attendees.	Agreed that the fish and shellfish assessment will be limited to impacts on sandeel and herring.
OFF-ME&P-2.3	Fish & Shellfish Ecology - Herring Spawning Season	13/11/19: PN confirmed that he is happy to consider a general spawning season of August to October but base the assessment on the peak spawning periods.	13/11/19: GE (Cefas) confirmed that an assessment of the peak spawning would be appropriate but noted that she would need to consult with Louise Cox from Cefas.	Agreed to consider a general spawning season of August to October but base the assessment on the peak spawning periods.
OFF-ME&P-2.4	Marine Processes Maximum Design Scenario	09/10/20: MDS presented in Marine Processes Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England cannot agree that the MDS has been presented.	Disagreement on the Marine Processes MDS.
OFF-ME&P-2.5	Marine Ecology & Processes Impact Assessment Significance Matrix	New DMRB matrix used in Marine Processes, Benthic and Fish Chapters (as submitted to EP in Q4 2020).	Response to Chapters - 20/11/20: Natural England consider that the terminology of the impacts assessment has changed as well and the matrix to attribute the significance of impacts. We do not agree with these changes and these should have been discussed with the technical panel.	Disagreement on significance matrix.
OFF-ME&P-2.6	Marine Processes Impacts Identified	09/10/20: Impacts presented in Benthic & Intertidal Ecology Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England consider that a number of potential pressures/impacts appear to still be missing from the chapter including cliff stability and bentonite leakage due to HDD push through of the seabed. The likely impacts of climate change should also be fully assessed across the project area in terms of cliff erosion, changing wave climate, increased storminess and sea level rise, for the lifespan of the project.	Disagreement on the Marine Processes impacts identified.
OFF-ME&P-2.7	Benthic and Intertidal Ecology Maximum Design Scenario	09/10/20: MDS presented in Benthic & Intertidal Ecology Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England generally agrees that the WCS is presented except specific details that need including / updating (e.g. presence of drill arisings or calculations).	General agreement on the Benthic & Intertidal Ecology MDS.
OFF-ME&P-2.8	Benthic and Intertidal Ecology Impacts Identified	09/10/20: Impacts presented in Benthic & Intertidal Ecology Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England is generally satisfied with the impacts identified.	General agreement on the Benthic & Intertidal Ecology impacts identified.
OFF-ME&P-2.9	Fish & Shellfish Ecology Maximum Design Scenario	09/10/20: MDS presented in Fish & Shellfish Ecology Chapter (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: Natural England Natural England generally agrees that the WCS has been presented.	General agreement on the Fish & Shellfish Ecology MDS.
3. Outcome of EIA				
OFF-ME&P-3.1	Benthic Ecology - Monitoring	13/11/19: AdB noted the MMO's S42 response - no broadscale benthic monitoring required.	13/11/19: MMO confirmed (in S42 response) that no broadscale benthic monitoring required.	Agreed (with MMO) that no broadscale benthic monitoring is required.
OFF-ME&P-3.2	Marine Processes - Outcome of Assessment	09/10/20: Marine Processes Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England do not agree with the overall assessment conclusion, for the reasons stated here, and in the detailed comments section.	Disagreement on the outcome of the Marine Processes assessment.
OFF-ME&P-3.3	Benthic and Intertidal Ecology - Outcome of Assessment	09/10/20: Benthic and Intertidal Ecology Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England do not agree with the overall assessment conclusion particularly regarding the impact assessment of habitat loss/change.	Disagreement on the outcome of the Benthic and Intertidal Ecology assessment.
OFF-ME&P-3.4	Fish & Shellfish Ecology - Outcome of Assessment	09/10/20: Fish & Shellfish Ecology Chapter (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: Natural England are not convinced with the conclusion that there are no significant effects on fish and shellfish receptors from any impacts from any phase.	Disagreement on the outcome of the Fish & Shellfish Ecology assessment.
OFF-ME&P-3.5	Fish & Shellfish Ecology - Outcome of Assessment for Finfish Species (excluding Herring and Sandeel)	09/10/20: Fish & Shellfish Ecology Chapter (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: The MMO is content that for other finfish species (i.e. excluding herring and sandeel), the magnitude of effect can be classified as 'negligible' and the significance of the impact as 'not significant' due to the wider habitat available to these species and their pelagic spawning habitats.	Agreement on the outcome of the Fish & Shellfish Ecology assessment. In relation to finfish species (excluding herring and sandeel).
OFF-ME&P-3.6	Fish & Shellfish Ecology - Outcome of Assessment for Herring and Sandeel - Agreements	09/10/20: Fish & Shellfish Ecology Chapter (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: The MMO agrees with the following assessments: • Sandeel - increased SSC and deposition, underwater noise	Agreement on the outcome of some of the Fish & Shellfish Ecology assessments for Herring and Sandeel.

Marine Ecology & Processes

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ME&P-3.7	Fish & Shellfish Ecology - Outcome of Assessment for Herring and Sandeel - Disagreements	09/10/20: Fish & Shellfish Ecology Chapter (as submitted to EP on 23/10/20).	Response to Chapter - 20/11/20: The MMO disagrees with the following assessments: <ul style="list-style-type: none"> • Sandeel - direct damage and disturbance • Herring - direct damage and disturbance, increased SSC and deposition, underwater noise 	Disagreement on the outcome of some of the Fish & Shellfish Ecology assessments for Herring and Sandeel.
4. Cumulative Assessment (including identification of project scoping in and out)				
OFF-ME&P-4.1	Marine Processes - Projects in the CEA	09/10/20:CEA presented in the Marine Processes Chapter (as submitted to EP on 09/10/20).	Response to Chapter - 20/11/20: Natural England note that a number of projects have been screened into the CEA, but these do not include the Humber Estuary or north of Flamborough Head.	Disagreement on the projects that should be included in the Marine Processes CEA.
5. HRA Screening				
OFF-ME&P-5.1	Approach to HRA Screening	12/09/18: Sally Kazer provided a summary of the approach being taken for the HRA Screening at Hornsea Four.	12/09/18: Emma Brown (Natural England) concluded that the approach to the HRA Screening at Hornsea Four seems appropriate.	None
6. HRA Assessment				

Marine Mammals

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
OFF-MM-1.1	Scoping Data Sources	13/09/18 & 03/10/18: Data sources for the Marine Mammals baseline was presented by SMRUC and feedback was invited.	13/09/18 & 03/10/18: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.	13/09/18 & 03/10/18: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.
OFF-MM-1.2	Appropriateness of Data Collected & Data Sources	26/06/19: SMRUC asked participants to confirm if they considered that the data collected and the sources being used to define the baseline characterising marine mammals in the vicinity of Hornsea Four are fit for the purpose of the Hornsea Four impact assessment?	26/06/19: RW confirmed that Natural England are happy with the data collected and the data sources. AS noted that the MMO would defer to the judgement of other stakeholders. TD confirmed that she (on behalf of The Wildlife Trusts) considered the baseline data was adequate but noted it would be good to add the humpback whale data. RF confirmed that if Natural England are content then Cefas would also consider it adequate.	26/06/19: All agreed that the data collected and the sources being used to define the baseline characterising marine mammals in the vicinity of Hornsea Four are fit for the purpose of the Hornsea Four impact assessment
OFF-MM-1.3	Adequacy of 24 Months Aerial Data	06/11/19: SMRUC requested confirmation that there are no consultee concerns with the 24 months of aerial data for the baseline.	06/11/19: All participants agreed that the baseline data was adequate.	06/11/19: All participants (NE, TWT, WDC, Cefas, MMO) agreed that the baseline data was adequate.
OFF-MM-1.4	Use of JCP Data	04/06/20: RS outlined the reasons why the JCP data wasn't being being taken forward to the marine mammal assessment.	04/06/20: RW noted that the limitations of the JCP data were understood and highlighted that Natural England are happy for the site-specific data to be used in the assessment.	04/06/20: Agreed with NE that JCP data will not be used in the assessment and more text on the context of the density estimates and the variability between different datasets is required.
2. Impact Assessment Methodology (including definition of terms)				
OFF-MM-2.1	TTS Approach	14/01/19: SMRUC confirmed that as discussed in the previous meeting and has been agreed on Hornsea Three, it is proposed that the TTS assessment will present ranges but not take a view on the significance of the impact – quantifying the number of animals at risk will not be undertaken.	14/01/19: NE confirmed they were happy with this approach. MMO confirmed that if NE are happy with the approach then the MMO are content. MMO will check with Cefas, but it is unlikely to be an issue.	14/01/19: MMO to confirm Rebecca Faulkner (Cefas) content with proposed approach for TTS assessment. 30/04/19: All participants confirmed that the approach proposed for the TTS assessment was appropriate.
OFF-MM-2.2	Operational Noise	14/01/19: SMRUC stated that empirical data will be used and extrapolated to provide an assessment of operational noise. CS noted that the Scoping Report didn't consider operational noise in relation to the offshore substations and that any consideration in the ES would be in relation to vessel noise rather than any noise generated by the offshore substations themselves.	14/01/19: NE noted that the comment could be in relation to birds, but NE would clarify this, and all attendees would advise if there are anything the assessment should be considering other than vessel movements around substations	14/01/19: All attendees to provide comment if they consider that the operational noise assessment needs to consider anything other than noise related to vessel traffic. 30/04/19: All participants confirmed that there is no need for the operational noise assessment needs to consider anything other than noise related to vessel traffic.
OFF-MM-2.3	Issue of Noise Impact Assessment Methodology Note	14/01/19: Technical note outlining the proposed underwater noise modelling methodology for Hornsea Four would be issued to all Technical Panel members for comment - issued 15/01/19.	14/01/19: All participants agreed to review the methodology note.	14/01/19: All attendees to provide comments on the underwater noise modelling methodology technical note.
OFF-MM-2.4	Impulsive vs Non-impulsive Noise Paper (NE advice)	14/01/19: SMRUC proposed the use of range-dependent loss of pulse characteristics in the prediction of PTS and TTS ranged as discussed in the Hastie & Merchant 2019 paper. It is proposed that contours are initially predicted using impulsive thresholds, but non-impulsive thresholds will be considered beyond 5 km	14/01/19: NE stated that in the absence of any definitive evidence, this should be done in addition to the typical scenarios impulsive thresholds. TWT outlined that this information should be used for illustrative purposes only.	14/01/19: Agreed to present both impulsive and non-impulsive PTS and TTS impacts ranges.
OFF-MM-2.5	Underwater Noise Modelling Methodology	30/04/19: SMRUC provided a summary of the Underwater Noise Methodology Note that details the proposed noise modelling methodology for marine mammals. Note was provided to all Panel members on 15/01/19.	30/04/19: MMO, Cefas and Natural England formal responses were provided.	30/04/19: Noise modelling methodology agreed - specifically agreements reached to present both impulsive and non-impulsive noise scenarios.
OFF-MM-2.6	Impulsive vs Non-impulsive Noise (Cefas advice)	26/06/19: Outstanding action to get Cefas advice on the use of the Hastie paper.	26/06/19: Cefas stated that the results are preliminary and stated that it is recommended that any assessment of PTS and TTS in marine mammals should continue to be based on current noise exposure criteria (i.e. NOAA, 2018) for impulsive sources, until more definitive guidance becomes available.	26/06/19: Agreed to present both impulsive and non-impulsive PTS and TTS impacts ranges.
OFF-MM-2.7	Cetacean sensitivity to PTS	06/11/19: SMRUC noted that evidence is building to support the fact that PTS as a result of exposure to piling noise is not necessarily going to cause a significant negative effect (e.g. work conducted by Ron Kastelein on both seals and porpoise).	06/11/19: All agreed that the assessment will consider the impact of the PTS change rather than the PTS itself.	06/11/19: All agreed with the exception of VJ (WDC) and TD (TWT) that the assessment will consider the impact of the PTS change rather than the PTS itself.

Marine Mammals

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-MM-2.8	Impacts Not Considered Further in ES	<p>17/12/19: SMRUC proposed the following impacts are 'not considered in detail in the ES':</p> <ul style="list-style-type: none"> • Construction - Non-piling noise (e.g. cable laying, dredging); • Operation - Operational noise; Vessel collision risk; Disturbance from vessels; • Decommissioning - PTS from underwater noise; Disturbance from underwater noise; TTS from underwater noise; Vessel collision risk; and Disturbance from vessels. 	<p>17/12/19: Natural England are content with not considering these impacts in detail in the ES but noted that it was really important to have a clear audit trail within the ES chapters stating where these impacts have been considered (e.g. PEIR chapter), why they are not considered further and links to the Impacts Register.</p> <p>Cefas would like to see adequate justification provided in the ES as to why certain impacts have not been considered further. Provided that the evidence to support any justification is appropriate, then Cefas are satisfied with this approach on this occasion.</p> <p>Via email (07/05/20): TWT agrees to the specific impacts listed in the minutes not being considered further and agree with NE on the need for an audit trail.</p>	<p>17/12/19: Natural England, Cefas & TWT agree with impacts proposed to be 'not considered further in the ES' provided there is adequate justification in the ES and a clear audit trail.</p>
OFF-MM-2.9	UXO Assessment	<p>04/06/20: RS noted that at the Marine Mammals Evidence Plan Meeting Six (06/11/2019), RW highlighted that Hornsea Project Two modelled UXO up to 800 kg so suggested that this information could be used in the Hornsea Four assessment. RS confirmed that the Hornsea Four UXO assessment now uses the Hornsea Project Two predicted ranges for charges up to 800 kg.</p> <p>RS noted that Natural England's Section 42 comments requested that the UXO assessment is undertaken using aerial or acoustic plus SCANS III densities, not just SCANS III densities. RS confirmed that the Hornsea Four UXO assessment now uses the density surfaces to calculate the number impacted.</p>	<p>04/06/20: RW noted this and was in agreement with the approach.</p>	<p>04/06/20: Approach to UXO assessment agreed with Natural England.</p> <p>09/07/20: TWT disagree with the approach to the UXO assessment and consider that the UXO clearance and associated mitigation must be included in the DCO Application.</p>
3. Outcome of EIA				
OFF-MM-3.1	Approach to MMMP (instantaneous PTS vs cumulative SEL ranges.	<p>04/06/20: RS noted that at PEIR, the MMMP mitigation was for SPLpeak PTS-onset only and highlighted that no Section 42 comments were received in relation to this approach. RS stated that SELcum PTS-onset impact ranges are highly over-precautionary and unrealistic and there is growing empirical evidence that the equal energy hypothesis assumption behind the SELcum threshold is not valid.</p>	<p>04/06/20: It was agreed that Natural England and Cefas would provide a formal response on the approach to the MMMP by the start of July. RF stated that Cefas will discuss this inhouse but their initial thoughts are that the MMMP should be based on both SPLpeak and SELcum.</p>	<p>04/06/20: Disagreed with Cefas. Cefas wish to see MMMP to be based on both SPLpeak and SELcum</p> <p>14/07/20: Disagreed with Natural England who do not believe mitigation of the SPLpeak distance is sufficient.</p>
4. Cumulative Assessment (including identification of project scoping in and out)				
OFF-MM-4.1	Approach to Seismic Survey Cumulative Approach	<p>10/05/21: RS proposed an approach for seismic surveys from BEIS (2020) which will assume an Effective Deterrent Radius (EDR) of 12 km and utilise average density of porpoise populations.</p>	<p>10/05/21: OH stated that from a Natural England perspective she agreed that this is the best approach available at the EIA level. OH requested the inclusion of the caveats for this approach and references utilised to be included within the technical report. LW stated the MMO did not have anything else to add to Natural England's comments.</p>	<p>10/05/21: Agreed with NE and MMO on the approach to the seismic survey cumulative approach.</p>
OFF-MM-4.2				
5. HRA Screening				
OFF-MM-5.1	Approach to HRA Screening	<p>13/09/18 & 03/10/18: Sally Kazer provided a summary of the approach being taken for the HRA Screening at Hornsea Four.</p>	<p>13/09/18 & 03/10/18: : Emma Brown (Natural England) concluded that the approach to the HRA Screening at Hornsea Four seems appropriate.</p>	<p>None</p>
6. HRA Assessment				
OFF-MM-6.1	Grey seal assessment - RIAA	<p>04/06/20: RS noted that the draft RIAA at PEIR required further consideration of grey seals and this additional work has been undertaken by SMRUC looking at site connectivity. RS gave an overview of the work presented within the Position Paper.</p>	<p>04/06/20: RW stated that she really liked this approach and noted that seals at sea can often be forgotten so it is good to see some steps being made.</p>	<p>04/06/20: Agreed with NE on the approach to the grey seal RIAA assessment.</p>

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
OFF-ORN-1.1	Purpose of the 1st evidence plan meeting.	13/09/18: Initial meeting to discuss the approach to the scoping report, the methods and scope of data collection and surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.	13/09/18: Natural England were under the impression that this was an Evidence Plan Meeting e.g. to discuss the methods and scope of the data collection and surveys, which species to include etc - but the reality is that the survey data have already been collected and the scoping report is about to be submitted to PINS. We are therefore unclear about the extent to which this meeting was really an Evidence Plan Meeting and how much scope there is/was to influence the process or scoping report	13/09/18: Comment noted. Whilst this meeting was close to the Scoping Report deadline, your input is key to influence the process overall. Please refer to the Evidence Plan Terms of Reference for full details regarding the scope of these meetings.
OFF-ORN-1.2	Baseline Data	13/09/18: Data sources for the Ornithology baseline was presented by APEM and feedback was invited.	13/09/18: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.	13/09/18: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.
OFF-ORN-1.3	Tracking Data	13/09/18: Data sources for the Ornithology baseline was presented by APEM and feedback was invited.	13/09/18: MK and AJ requested that the latest tracking studies and data be used in order to provide for the most robust assessment of connectivity of seabirds from colonies to the Array Area during the breeding season.	13/09/18: Agreed
OFF-ORN-1.4	Precision Data	13/09/18: SS presented a slide of the aerial digital video surveys undertaken by HiDef for Hornsea Four covering the Array Area and a 4 km buffer surrounding.	13/09/18: MK requested that Orsted present all population estimates with information on precision to allow Natural England and RSPB to judge what reliance can be placed on the population estimate.	13/09/18: Agreed
OFF-ORN-1.5	DAS Coverage	17/12/18: SS gave an overview of data issues raised in scoping consultation responses.	17/12/18: AM agreed that 24 months of data is sufficient, with the data of good quality and suitable for assessment. AM stated that the 20% coverage is more of a 'nice to have' but noted that the RSPB understand implications in terms of costs and timescales. JD confirmed that if the project is confident in the 10% coverage then RSPB are happy	17/12/18: Noted
OFF-ORN-1.6	DAS Data	10/04/19: Scoping comments discussion.	10/04/19: MK confirmed that 24 months of data is acceptable and advised that information from tracking and sensitivity analysis could also be used to provide longer-term characterisation of the site.	10/04/19: Noted
OFF-ORN-1.7	DAS Methodology	10/04/19: SS noted that the DAS methodology note had been issued to consultees prior to the meeting.	10/04/19: AB confirmed that this approached was acceptable if the methodology was clearly demonstrated in the baseline technical report.	10/04/19: Agreed
OFF-ORN-1.8	DAS Methodology	11/06/19: SS asked for consultee comments on DAS Methodology & Final Survey Report	11/06/19: Natural England stated agreement with 24 months of survey data collection; the resolution of imagery; the frequency of surveying; and the overall methodology. Only query is about the amount of data that is being used. RSPB agreed with Natural England comments.	11/06/19: Agreed
OFF-ORN-1.9	DAS Precision	11/06/19: SS asked for consultee comments on Precision Note	11/06/19: RSPB & Natural England stated that in relation to the precision note, this needs to be replicated for the PEIR boundary before consultees can properly comment.	11/06/19: Noted
OFF-ORN-1.10	Baseline Data	11/06/19: EA asked if attendees could give positions on the baseline data.	11/06/19: EB noted that Natural England will comment on the baseline in the PEIR review.	11/06/19: Noted
OFF-ORN-1.11	SeaMast Data	11/06/19: EA asked whether attendees were all in agreement that use of SeaMast data is fit for purpose for baseline?	11/06/19: AB stated yes, but as discussed there are a few items that require thought. AM stated that it would be useful to sense-check the Sea Mast data in Bradbury et al (2014) to ensure the correct range of densities were used in the PEIR assessments of displacement of red-throated diver within the ECC.	11/06/19: Agreed (with caveats)
OFF-ORN-1.12	DAS - 2 vs 4 cameras	11/06/19: Two cameras worth of data collected to define the baseline characterisation of seabirds within the Hornsea Four array area and 4 km buffer are fit for the purpose of impact assessment	11/06/19: Both Natural England & RSPB disagree.	11/06/19: Disagreed
OFF-ORN-1.13	DAS - 2 vs 4 cameras	<p>Email correspondence 14/11/19: we plan to include confidence limits as part of the statistics we will be presenting for each key species. We will also include a description of how the precision has been calculated and a visual representation of how species distribution patterns are affected by the additional cameras. The statistics we will be presenting are as follows:</p> <ul style="list-style-type: none"> • Bootstrapped mean density • Bootstrapped median density • Measure of skewedness in the data • Bootstrapped standard deviation • Bootstrapped standard error • Bootstrapped 95% confidence limits • Coefficient of variation (CV - standard deviation divided by mean and the usual method) • Alternative CV of CV' (standard error divided by the mean, not the usual method, but equates well to the size of the confidence limits compared to the mean) <p>Please can you confirm that this covers all the areas you would like us to investigate? If not, please can let us know what additional statistics you would like us to present?</p>	<p>Email correspondence 21/01/20: Natural England are happy with the statistics listed and in terms of additional areas we would be interested that you cover that would be on spatial data – i.e. the distribution of bird sightings on a map.</p>	21/01/20: Agreed with Natural England.

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-1.14	DAS - 2 vs 4 cameras	29/10/19: EA stated that Hornsea Four will analyse three additional months of data within the breeding season and suggested April, May and July 2017.	29/10/19: AB noted it would be more useful to have the same month across years, and that the key month seemed to be August as there were large post-breeding abundances, particularly of guillemot. AB therefore recommended June 2016 is analysed to match up with the June 2017 data already analysed and also August 2016 and August 2017. AM also agreed with the additional months selections of June 2016, June 2017, August 2016 and August 2017.	29/10/19: Agreed with RSPB and Natural England.
OFF-ORN-1.15	Precision Data	12/11/19: SS noted that precision has been calculated for abundance estimates using the standard error over mean.	12/1/19: Natural England confirmed they were happy with that calculation.	12/1/19: Agreed with Natural England.
OFF-ORN-1.16	DAS - 2 vs 4 cameras	21/04/20: EA asked if attendees could agree that there is no value to analysing any additional data and the matter can be closed if the 7 month report has similar results to the 4 month report?	21/04/20: AB confirmed that Natural England would be happy to close the matter, depending on the outcome of the camera scenario query and whether the 7 month report has the same results as the 4 month report. AM stated that the RSPB have a similar opinion to Natural England on this and will be content to close the matter (pending review of 7 month report) and will provide a formal response once the 7 month report is received.	21/04/20: Agreed with Natural England and RSPB as long as 7 month report shows same results as 4 month report.
OFF-ORN-1.17	Little gull population estimate	21/04/20: SS gave an overview of the work that has been done to calculate a population estimate for little gull (as no population estimate for little gull provided by Furness (2015)). SS noted that a range of 23,500 to 37,500 in English North Sea waters was calculated with an estimate of BDMPS for autumn migration for use in assessment of offshore windfarms of 30,500.	21/04/20: MK stated that Natural England is content with the use of the calculated population estimate within the note, highlighting that it provides the best available evidence and a clear audit trail but that it is important to acknowledge in the assessment the low data confidence and how poor the understanding of the population of little gulls is with quite broad estimates. AM noted that RSPB hadn't done a full review of the note so would defer to Natural England on this.	29/10/19: Agreed with RSPB and Natural England.
OFF-ORN-1.18	Data sources for intertidal ecology	21/04/20: SS asked Natural England/RSPB to confirm the data sources outlined in Table 1 (Offshore and Intertidal Ornithology Baseline Characterisation Report) are the most appropriate to use data sources to use for intertidal ornithology.	21/04/20: MK stated that if the Hornsea Four landfall was within a designated site then Natural England would be requiring an intertidal site-specific survey but since the Hornsea Four landfall isn't within a designated site nor has the potential for significant connectivity with one, then Natural England consider that the data sources outlined in Table 1 is appropriate.	21/04/20: Agreed with Natural England.
OFF-ORN-1.19	2 vs 4 cameras report	18/05/20: EA presented HCO0029-406_The relationship between aerial survey coverage and data precision at Hornsea Four_F... (05992618_A) and APEM Review of 2 v 4 Camera Data.pdf	15/07/20: Both Natural England and RSPB agreed with the outcome that the use of 2 vs 4 cameras did not significantly change the results of baseline data and have no issues with Hornsea Four going forward using 2 camera data only.	15/07/20: All agreed
OFF-ORN-1.20	MRSea Model Performance	29/10/20: A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A) was provided to Natural England for review.	23/11/20: Natural England requested that further narrative in relation to model testing (plots of observed versus fitted values, cumulative residual plots, and autocorrelation function plots) to provide reassurance over design-based estimates. SS provided commentary on this matter during EP#13, NE requested that the commentary be added to MRSea Report.	23/11/20: Noted
OFF-ORN-1.21	MRSea Wider Dataset	29/10/20: A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A) was provided to Natural England for review.	23/11/20: Natural England questioned why the use of the wider AFL dataset is used over a "clipped" densities to the reduce Hornsea Four Project Four area. SS provided commentary on this matter during EP#13 and were content with the explanation.	23/11/20: All agreed
OFF-ORN-1.22	MRSea Variables	29/10/20: A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A) was provided to Natural England for review.	23/11/20: Natural England queried if any other factors apart from Water Depth and distance from SPA were considered. SS confirmed they were the only factors used due data availability and scale. Natural England confirmed they are content with this explanation.	23/11/20: All agreed
OFF-ORN-1.23	MRSea smoothing terms	29/10/20: A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A) was provided to Natural England for review.	23/11/20: Natural England advised it would be helpful to understand what smoothing terms were applied – e.g. how many knots/splines etc – and how were these selected? SS confirmed that further explanation will be added to the report.	23/11/20: Noted
OFF-ORN-1.24	MRSea Confidence	29/10/20: A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A) was provided to Natural England for review.	23/11/20: Natural England and RSPB confirmed that they have confidence in the model with the caveat that additional explanation is provided in relation to OFF-ORN-1.24 & OFF-ORN-1.20.	23/11/20: All agreed
2. Impact Assessment Methodology (including definition of terms)				
OFF-ORN-2.1	BDMPS Populations	13/09/18: SS explained that standard BDMPS populations from Furness (2015) would be used to assess against during the non-breeding seasons. Data from a variety of sources would be sought for assessing against during the breeding season depending on the level (regional, national, international).	13/09/18: MK and AM agreed in principle to this approach.	13/09/18: Agreed
OFF-ORN-2.2	Use of Furness (2015) for Biological Seasons	13/09/18: SS explained that at this stage the use of Furness (2015) would be used as the starting point for compiling different biological seasons. On completion of the analysis of the 24 months of site-specific data it is possible that there may be amendments to the seasonal definitions used in the assessment for individual species, colonies or populations in order to provide a more evidence led approach to individual species-specific bio-seasons.	13/09/18: MK and AM agreed in principle to this approach.	13/09/18: Agreed in principle
OFF-ORN-2.3	CRM - Nocturnal Rates	13/09/18: SS stated that the intention was to use the latest peer reviewed levels for nocturnal activity in the CRM from Furness (2018) for gannet (and potentially for kittiwake subject to a further paper being issued).	13/09/18: MK and AM suggested that this would not be acceptable on its own and variation of multiple parameters would be more acceptable. MK suggested reference to Hornsea P3 and Norfolk Vanguard (pending) relevant representations from Natural England in order to see their formal advice on this topic.	13/09/18: Disagreed, but Applicant has now applied variation of multiple parameters taken forward for DCO application as advised by Natural England.

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-2.4	CRM - Avoidance Rates	13/09/18: SS stated that the intention was to use the latest peer reviewed paper on avoidance rates in the CRM, including from Bowgen & Cook (2018).	13/09/18: MK and AM suggested that this would not be acceptable, as SNCB guidance had not changed since the UK SNCB response to Cook et al's previous paper in 2014 (UK SNCBs, 2014)	13/09/18: Disagreed, but Applicant has now applied agreed avoidance rates as presented in the SNCB guidance in the UK SNCB response to Cook et al's previous paper in 2014 (UK SNCBs, 2014).
OFF-ORN-2.5	Displacement	13/09/18: Similar levels of displacement mortality for gannet, guillemot, puffin and razorbill would be used in the initial assessments.	13/09/18: MK and AM agreed in principle to using the same starting point for initial assessments of displacement.	13/09/18: Agreed
OFF-ORN-2.6	Scope of intertidal ornithology assessment	17/12/18: SS proposed that a more detailed analysis would be conducted for sanderling, but not any other intertidal species and the Hornsea Four team were hoping to speak to Natural England about this. JD noted that he was inclined to agree but would have to check with a colleague and will confirm.	17/12/18: JD confirmed that RSPB happy for intertidal section to consider sanderling alone.	17/12/18: Agreed
OFF-ORN-2.7	Marine Scotland CRM Model	17/12/18: SS requested RSPB's opinion on the new Marine Scotland R-implemented CRM model, noting that Natural England suggested this would be the preferred option for CRM.	17/12/18: AM noted that presenting both the new model and the older Band model is Natural England's current position. AM agreed with this approach.	17/12/18: Agreed. sCRM model will be used to model Basic Band CRM Option 1 with site-specific flight heights, Basic Band CRM Option 2 with generic flight heights and Extended Band CRM Option 3 with generic flight heights.
OFF-ORN-2.8	CRM - Nocturnal Rates	10/04/19: SS confirmed that this more precautionary approach to CRM would be undertaken alongside scenarios considering other nocturnal activity rates from more recent evidence in the literature.	10/04/19: MK noted that discussions are ongoing in relation to nocturnal activity rates, but currently Natural England advocate the use of the nocturnal activity rates for gannet, kittiwake and large gulls based on a 1 to 5 scoring index for each species in Garthe and Hüppop (2004) or King et al., (2009).	10/04/19: Disagreed, but Applicant has now applied agreed range of Nocturnal Activity Rates for gannet, kittiwakes and large gulls as recommended by Natural England.
OFF-ORN-2.9	CRM - Avoidance Rates	10/04/19: SS confirmed that this more precautionary approach to CRM would be undertaken alongside scenarios considering other avoidance rates from more recent evidence in the literature.	10/04/19: MK noted that currently Natural England advocate the use of the avoidance rates for gannet, kittiwake and large gulls based on the JNCC et al., (2014) paper in response to Cook et al., (2014), and that discussions regarding the recent Bowgen & Cook paper are ongoing amongst the SNCBs.	10/04/19: Disagreed, but Applicant has now applied agreed avoidance rates as presented in the SNCB guidance in the UK SNCB response to Cook et al's previous paper in 2014 (UK SNCBs, 2014).
OFF-ORN-2.10	Displacement Seabirds	10/04/19: SS asked for confirmation of the seabirds set out for assessment of potential impacts from displacement within the array and an appropriate buffer in the Scoping Report, these being gannet (array and out to 2 km), guillemot (array and out to 1-2 km), razorbill (array and out to 1-2 km) and puffin (array and out to 1-2 km).	10/04/19: MK confirmed that these species follow the SNCBs interim displacement guidance note and that these four species only would be expected to be assessed for potential displacement impacts during the operational phase of Hornsea Four.	10/04/19: Agreed
OFF-ORN-2.11	CRM Species	10/04/19: CRM has been carried out on five species identified at risk of collision.	25/10/19: NE Provided feedback through S42 responses, agreeing with the 5 seabird species to be modelled using CRM.	25/10/2019: All agreed
OFF-ORN-2.12	Construction Phase Displacement Assessment	11/06/19: SS stated that a simple assessment for the construction phase would be carried out for auk species associated within the array area. SS also described the proposed method for assessing red throated diver within the ECC (construction phase) considering a single extended non-breeding bio season spanning months of September to April. SS asked if Natural England and RSPB were in agreement with this approach for the construction phase assessment?	11/06/19: MK asked if there were no common scoter in the inshore waters? SS confirmed that there were none, only red throated diver. MK stated that Natural England were content with that, but it would be useful to capture that narrative in the report.	11/06/19: Agreed
OFF-ORN-2.13	Construction Impacts	11/06/19: Simple assessment will be carried out for construction phase impacts	11/06/19: Natural England & RSPB agreed	11/06/19: Agreed
OFF-ORN-2.14	Barrier Effects	11/06/19: Detailed assessment of barrier effects would not form part of the PEIR, as species most at risk not likely to forage as far as Hornsea Four.	11/06/19: Natural England disagreed	11/06/19: Disagreed, but the Applicant has provided for assessment of barrier effect within the DCO application as requested by Natural England.
OFF-ORN-2.15	Displacement of RTD in ECC	29/10/19: SS suggested that the impacts could be defined as birds south of the cable laying vessel being potential SPA birds and those to the north would not be SPA birds.	29/10/19: Natural England agreed this approach could work.	29/10/19: Natural England agreed.
OFF-ORN-2.16	CRM Methodology	29/10/19: SS proposed to use sCRM ShinyApp for CRM.	29/10/19: AM confirmed that unless issues with sCRM sorted, RSPB would like to see three options: (1) Band 2012 Excel Spreadsheets, (2) Shinyapp – deterministic and (3) Shinyapp – stochastic. Natural England agreed.	29/10/19: Disagreed initially with all, though the Applicant has since undertaken rigorous testing of the sCRM in consultation with SNCBs and has now reached agreement on the use of the sCRM for collision risk assessments.
OFF-ORN-2.17	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 2 (Seabird Species Biometrics in CRM) • Natural England are in agreement with the seabird species biometrics in CRM for both body length and wingspan • RSPB agree with the proposed SDs • Since they are the best available, Natural England agree with the proposed SDs, as long as the uncertainties are recognised in the CRM Technical Report	27/02/20: All agreed
OFF-ORN-2.18	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 2b (Avoidance Rates Seabirds in CRM) - Natural England have some issues with use of Bowgen & Cook avoidance rates figures but do not currently have a set of avoidance rates that they are comfortable in advocating in the sCRM.	27/02/20: Disagreed, but Applicant has now applied agreed avoidance rates as presented in the SNCB guidance in the UK SNCB response to Cook et al's previous paper in 2014 (UK SNCBs, 2014).
OFF-ORN-2.19	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 4 (Seabird Flight Speeds in CRM) - Natural England are in agreement with the species flight speeds and the use of SDs surrounding seabird flight speed	27/02/20: Natural England agreed.
OFF-ORN-2.20	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 5 (Nocturnal Activity Factor rates and Seabirds Flight Types in CRM) – Natural England are in agreement with this table as it is based on their advice	27/02/20: Natural England agreed.

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-2.21	CRM deterministically	27/02/20: SS presented CRM VS sCRM comparison in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: RSPB would be happy if the sCRM was run deterministically Natural England would not be happy if the sCRM was run deterministically because the differences between the sCRM and Band (2012) in the APEM document (Table 1 Collision estimates using Band (2012) CRM and Table 2 Collision estimates using MSS (2018) sCRM through Shiny App (with SDs removed)) show differences larger than 1%	27/02/20: RSPB agreed and Natural England disagreed, but Applicant has now applied agreed avoidance rates as presented in the SNCB guidance in the UK SNCB response to Cook et al's previous paper in 2014 (UK SNCBs, 2014).
OFF-ORN-2.22	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 7 (Wind Availability and Mean Downtime of WTGs) - Natural England are in agreement with the SDs of mean downtime, subject to the clarification requested regarding the lack of downtime variation.	27/02/20: Natural England agreed.
OFF-ORN-2.23	CRM Parameters	27/02/20: SS presented CRM Parameters in the following document: 2. Hornsea Four CRM Parameters & sCRM Test.pdf	27/02/20: Table 6 (Estimated Proportion of Seabirds Flying at PCH) - Natural England currently do not agree and have had long-standing concerns with the use of site-specific boat-based data in the Hornsea zone.	27/02/20: Natural England disagreed. Following a review of Natural England's comments, the Applicant has agreed to rely on Band Option 2 rather than rely on the use of site-specific boat data and Band Option 1 for collision risk assessment for seabirds.
OFF-ORN-2.24	Abundance Estimates over Extended Non-Breeding Bio-Seasons	21/04/20: SS outlined the two methods to calculate abundance estimates for the extended non breeding season, noting that the Hornsea Four preferred choice is Method 2 (calculating the weighted mean of the three component bio season peaks within the extended non-breeding season for year one and year two separately) as it offers a more precautionary approach and considers a more refined weighting of these data across the entire non breeding bio season.	21/04/20: AB highlighted that from Natural England's perspective, advice has been provided on how this should be calculated and this should be followed. AB noted that the BDMPS report underpins that advice and uses the smallest geographic unit that can't be broken down further. AB stressed that there would be limited value in trying to breaking it down and there would be lots of complications inherent in that process, noting that is unlikely that Natural England will agree with the methodology. AB considers that Method 2 does not adequately consider the worst-case.	21/04/20: Natural England disagreed with this new approach. Following a review of Natural England's comments, the Applicant has reverted to the use of standard methodologies to calculate the extended non-breeding season abundance estimates.
OFF-ORN-2.25	RTD Displacement	21/04/20: SS gave an overview of the discussions that have taken place in relation to the methodology for calculating red throated diver densities, noting that abundance estimates have been produced for each of the SeaMaST datasets used for assessment of divers present within a 2 km buffer of a cable laying vessel. MK stated that a maximum of three red throated divers are estimated to be at potential risk of disturbance & displacement.	21/04/20: AB stated that if the note follows the outline approach discussed then it will be acceptable but will review and confirm acceptance of the use of these calculations. AM noted that the approach seems appropriate.	21/04/20: Natural England & RSPB agreed following receipt of final methodologies for the DCO application.
OFF-ORN-2.26	sCRM deterministically	21/04/20: SS presented the results of their CRM vs sCRM comparison and noted the difference for kittiwake of 0.001% for Band Option 1 and 0.002% for Band Option 2, and that we are confident that we are in a good position to use the sCRM in the Hornsea Four impact assessments.	21/04/20: Natural England agree it is appropriate to use sCRM in a deterministic way.	21/04/20: Natural England agreed
OFF-ORN-2.27	PVA species selection	31/03/20: SS presented PVA parameters in the following document: 1.Consultation PVA Parameters.xlsx	15/05/20: Natural England provided feedback via document: 309535 Hornsea 4 Ornithology Natural England Advice PVA.pdf. Natural England do not agree with no PVA modelling required for large gull species	15/05/20: Natural England disagreed with the initial input parameters proposed by the Applicant for use in the NE Seabird PVA. Following further consultation between the Applicant and SNCBs agreement has since been reached on the most appropriate parameters to be used for all species within the NE Seabird PVA. As the risk to large gull species is considered to be of no consequential contribution to any cumulative impacts, PVA modelling were not undertaken for these species.
OFF-ORN-2.28	PVA EIA Scale populations	31/03/20: SS presented PVA parameters in the following document: 1.Consultation PVA Parameters.xlsx	15/05/20: Natural England Disagreed with the PVA being ran for the Biogeographic population scale due to difficulties of including all OWF impacts across an entire range at that scale. Instead they recommend the BDMPS as the largest reference population for EIA scale.	15/05/20: Natural England disagreed with the initial input parameters proposed by the Applicant for use in the NE Seabird PVA. Following further consultation between the Applicant and SNCBs agreement has since been reached on the most appropriate parameters to be used for all species at the biogeographic and BDMPS scales within the NE Seabird PVA.
OFF-ORN-2.29	PVA Demographic rates	31/03/20: SS presented PVA parameters in the following document: 1.Consultation PVA Parameters.xlsx	15/05/20: Natural England disagreed with the demographic options selected for EIA scale and suggested further refining the values to greater reflect the population presented, for example BDMPS scale to reflect demographic rates for the North Sea only.	15/05/20: Natural England disagreed with the initial input parameters proposed by the Applicant for use in the NE Seabird PVA. Following further consultation between the Applicant and SNCBs agreement has since been reached on the most appropriate demographic options to be used for all species for EIA scale within the NE Seabird PVA.
OFF-ORN-2.30	FFC PVA Parameters	31/03/20: SS presented PVA parameters in the following document: 1.Consultation PVA Parameters.xlsx	15/05/20: Natural England agree with the starting abundance values for gannet, kittiwake, guillemot and razorbill. Natural England do not agree with the value for puffin and have recommended an average abundance value from counts conducted in 2017 and 2018.	15/50/20: In agreement for all species.
OFF-ORN-2.31	FFC PVA Parameters	31/03/20: SS presented PVA parameters in the following document: 1.Consultation PVA Parameters.xlsx	15/05/20: Natural England Disagreed with the productivity values, instead recommended that productivity be calculated using data from a range of years (2009-2019) instead of only using the 2017 productivity values.	15/05/20: Natural England disagreed with the initial input parameters proposed by the Applicant for use in the NE Seabird PVA. Following further consultation between the Applicant and SNCBs agreement has since been reached on the most appropriate productivity values to be used for all species within the NE Seabird PVA.
OFF-ORN-2.32	CRM Species Biometrics	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England provided feedback via document: 309535 Hornsea 4 Ornithology Natural England Advice CRM parameters.pdf. Natural England agree with the wingspan and body lengths put forward in Table 2. Due to the uncertainty regarding the SD calculation, they recommend that no variability is model for these parameters.	15/05/20: Natural England agreed
OFF-ORN-2.33	CRM Flight Speeds	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England agree with the values presented in table 4 for flight speeds and recommend running with zero variability.	15/05/20: Natural England agreed

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-2.34	CRM Nocturnal Activity	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England agree with the values presented in table 5 for nocturnal activity.	15/05/20: Natural England agreed
OFF-ORN-2.35	CRM PCH Values	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England do not agree with the PCH site specific values presented in table 6. Natural England do not believe the site specific flight height data is reliable and therefore recommend that only Band Option 2 values are considered using the Johnston et al. (2014) maximum likelihood data and upper / lower 95% Confidence limits for variability. Natural England also raised concerns regarding the current Band Option 2 Johnson et al., (2014) flight height data only presents values up to 300m; 45m shy of the height of the proposed HOW04 WTGs.	15/05/20: Natural England disagreed. The Applicant has since reviewed Natural England's comments and has since based all collision risk assessments of seabirds on Band Option 2 with confidence limits for variability around seabird density. It has also since been agreed that there are no further concerns regarding the Band Option 2 values being used up to 300m, as sufficient precaution is captured.
OFF-ORN-2.36	CRM Avoidance Rates	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England agree with the 'lower' (the SNCB 2014 advocated Avoidance rates plus corresponding SDs) values only presented in table 2 (numbering error) and recommend running 3 times using the mean +/- 2SD around the lower values to produce variability.	15/05/20: Natural England agree with the 'lower' avoidance rates which the Applicant has taken forward for assessment.
OFF-ORN-2.37	CRM Bird Density	18/02/20: SS presented CRM parameters in the following document: 1. Proposed Hornsea Four CRM Parameters for use in ES Chapter / RIAA. Pdf	15/05/20: Natural England do not agree with the bird density values due to how the SDs were calculated. Natural England refer back to the sCRM guidance document and propose bird density is calculated using the options recommended with a detailed description and justification as to which method is selected.	15/05/20: Natural England disagreed. The Applicant has since reviewed Natural England's comments and has agreed on an appropriate methodology to calculate seabird density for use within the sCRM.
OFF-ORN-2.38	stochastic Collision Risk Model (sCRM) for ornithology impact assessment	31/03/20: SS provided the following documents, providing input data for testing and comparison between Band models and sCRM: 1. Kittiwake CRM Audit Trail.zip 2. Simulated Windfarm sCRM Test_Kittiwake Parameters_Issued 140420.pdf 3. Gannet CRM Audit Trail.zip 4. Hornsea Four sCRM Test_Gannet Parameters_Issued 310320.pdf	15/05/20: Natural England provided feedback via document: 309535 Hornsea 4 Ornithology Natural England Advice sCRM.pdf. Natural England agree that the variance between the sCRM and Band 2012 model is negligible, therefore suitable to be used for running the CRM but did include the following caveats: 1. solution regarding flight height distribution above 300m needs to be resolved. 2. Testing of kittiwake using Hornsea Four parameters and advice from Natural England to ensure variance is negligible (this has been completed).	15/05/20: Natural England agreed (with caveats)
OFF-ORN-2.39	RTD Displacement	20/04/20: SS presented RTD Displacement methodology and results in the following document: 1. Red-throated Diver Displacement within the HOW04 ECC Plus 2km Buffer.pdf	15/05/20: Natural England provided feedback via document: 309535 Hornsea 4 Ornithology Natural England Advice on red throated divers.pdf. Natural England agree with the methods and results presented and have suggested including the document in the Technical Appendix. Natural England have requested that the implied criticism of the recent HiDef surveys (Natural EnglandCR260,20192) be redacted from the document.	15/05/20: Natural England agreed
OFF-ORN-2.40	Productivity, mortality rates and populations of seabirds	28/05/20: SS presented average mortalities across all seabird age classes and population values in the following document: Dem Rates & Coll Cots Hornsea Four Issued 20200528.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England queried if Site specific data could be used to proportion out age classes. Natural England also recommended that for population scale EIA is to sum impact across the season and compare with the largest biologically defined minimum population scale (BDMP5) unit.	15/05/20: Natural England agreed with the demographic rates, baseline mortality rates and colony counts.
OFF-ORN-2.41	Migratory species collision risk modelling screening	26/05/20: SS presented the species selected for migratory collision risk modelling in the following document: Hornsea Four Migropath CRM Species Screening_Issued 20200506.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England advises avocet nb, ruff nb, pink-footed goose, white-fronted goose (european), teal, goldeneye, oystercatcher, avocet, ruff, whimbrel, turnstone and hen harrier.	17/06/20: Natural England agree with the species we selected, but advise additional species to be added
OFF-ORN-2.42	PVA parameters	06/05/20: SS presented PVA parameters in the following document: Hornsea Four PVA Parameters_Issued 20200506.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. For demographic rates in relation to Biogeographic and BDMP5, Natural England recommended using Horswill & Robinson (2015) data.	17/06/20: Noted, the Applicant has reviewed the Horswill & Robinson (2015) data and has integrated the data for assessment accordingly.
OFF-ORN-2.43	SNCB Displacement rates	15/07/20: SS queried at EP#11 what displacement and mortality rates Natural England advocated?	15/07/20: At EP#11 Natural England recommended using a range of 30-70% displacement for auk species and a range of 1-10% mortality. For Gannet Natural England accepted the use of 60-80% displacement used in previous OWF examinations	15/07/20: Noted
OFF-ORN-2.44	Bowgen and Cook (2018)	15/07/20: SS asked at EP#11 if Natural England position on the Bowgen and Cook (2018) avoidance rates had changed due to the Hornsea Three decision.	15/07/20: Natural England confirmed they still do not advise the use of Bowgen and Cook (2018) avoidance rates, and whilst still reviewing the decision, do not consider that the SoS has endorsed or used these rates at Hornsea Three. Ne also advised that a revised review and guidance paper on Ars would be published later in 2020.	15/07/20: Noted
OFF-ORN-2.45	300m vs 500m Flight height for CRM	15/07/20: EA queried whether the issue regarding flight heights had now been resolved.	15/07/20: Natural England and RSPB agree that due to no alternate method available and the agree with using the Johnston et al. (2014) 300m flight height data.	15/07/20: All agreed
OFF-ORN-2.46	PVA Simulations	06/05/20: SS presented PVA parameters in the following document: Hornsea Four PVA Parameters_Issued 20200506.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England recommended that number of simulations should be 5,000 for each PVA model run.	17/06/20: All agreed
OFF-ORN-2.47	CRM Species	10/04/19: CRM has been carried out on five species identified at risk of collision.	25/10/19: NE Provided feedback through S42 responses, agreeing with the 5 seabird species to be modelled using CRM.	25/10/19: All agreed
OFF-ORN-2.48	Confidence Intervals	19/10/20: SS confirmed during EP#12 that assessments will not consider upper and lower confidence intervals as Hornsea Four consider that there is already a lot of precaution built in.	19/10/20: Natural England requested during EP#12 that they want to see confidence limits presented in the assessment and will request that during Examination if it is not presented in the ES.	19/10/20: Noted

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-2.49	Displacement Rate	04/03/21: SS asked for Natural England's thoughts on the use of a 50% displacement rate and 1% mortality rate, based on the evidence put forward in the auk habituation note.	04/03/21: Natural England stated they have previously provided a response as to why they do not agree with the assumption of 50% displacement based on the Dierschke report in the Vanguard examination. Natural England recommend that the Hornsea Four should focus on reviewing displacement rates for comparable projects but overall focus should be on the matrix approach. They also suggest reviewing Leopold et al. (2013) study in relation to turbine spacing and displacement.	04/03/21: Natural England disagree with the use of 50% as an appropriate displacement rate.
OFF-ORN-2.50	70% Displacement Rate and 10% Mortality Rate	04/03/21: SS asked Natural England if they agree that the use of 70% displacement and 10% mortality is too precautionary.	04/03/21: Natural England confirmed that has never been their opinion in regards to the likely displacement and mortality rate. They stated that although the matrix approach is a crude measure it is currently the best approach. They state that there is no evidence to quantify mortality effects from displacement and so presenting a range is better than focusing on a single value to show the level of risk involved with the impact.	04/03/2021: Noted
OFF-ORN-2.51	Displacement Range	04/03/21: MH/PG noted that for compensation measures there is a requirement for a single value to be compensated for and so assessing a wide range is unfeasible.	04/03/21: Natural England stated there are two workstreams that could be undertaken to narrow the range - using tools such as SeabORD and/or exploring mitigation such as turbine spacing and layouts.	04/03/2021: Noted
OFF-ORN-2.52	Hornsea Four Array Area Importance	04/03/21: EA asked how Natural England have come to the conclusion of their displacement range.	04/03/21: Natural England stated that they have derived their range of values based on looking at how important this area is in the breeding and post-breeding season. The Cleasby et al. (2020), Kirsten Kober (JNCC) paper, the Marine Ecosystems Research Programme (MERP) data and Seabird Mapping & Sensitivity Tool (SeaMaST) data could be used to corroborate that to identify the importance of the Hornsea Four array area.	04/03/2021: Noted
OFF-ORN-2.53	Gannet mortality rate for displacement analysis	18/08/21: MB asked Natural England whether the range of 1 -10% mortality was suggested in error, as requested in their draft ES and RIAA feedback note.	18/08/21: Natural England stated this was not an error and that their position for gannet displacement has always been to assess for a mortality rate of 1-10%.	18/08/2021: Noted
OFF-ORN-2.54	Breeding Season North Sea and English Channel Natural England Calculation Method	18/08/21: MB queried the method used to derive Natural England's Breeding season for the North Sea and English Channel BDMPS.	18/08/21: Natural England clarification on method pending.	18/08/2021: Noted
OFF-ORN-2.55	PVA reflective demographic rates	18/08/21: During EPH15 MB stated that an issue they had encountered with the PVA recommended rates resulted in population declines of species which currently are stable and growing even when no impacts are applied. He asked whether Natural England would agree with amending demographic rates to provide a more reflective representation of the current health of the colony.	18/08/21: Natural England said it would be reasonable to try and tweak the demographic parameters to match the current state of the colony.	18/08/2021: Noted
3. Outcome of EIA				
4. Cumulative Assessment (including identification of project scoping in and out)				
OFF-ORN-4.1	Use of TCE Spreadsheet for Cumulative Assessment	13/09/18: SS put forward proposed cumulative (and in-combination) assessment methods to include an update to the TCE spreadsheet to work out overall numbers for collision mortality.	13/09/18: MK did not agree that this spreadsheet should be used and said that Natural England do not agree with the ratios, assumptions and outputs from this or the associated report from MacArthur Green (TCE, 2017).	13/09/18: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.2	Cumulative CRM	27/02/20: SS noted that there had been a recent cumulative CRM update from TCE (TCE, Dec 2019) document and asked if Natural England have been involved in consultation with TCE for this?	27/02/20: AB noted that Natural England had not been involved in TCE CRM spreadsheet, and cumulative CRM comments made by Natural England at PEIR still apply. There will be an update in an upcoming Norfolk Boreas OWF submission about Natural England's position on the consented vs as built OWF cumulative situation.	27/02/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.3	Cumulative CRM tables kittiwake and Gannet	17/05/20: SS presented cumulative CRM tables in the following document: Hornsea Four Cumulative CRM Tables_Issued 20200527.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England do not agree with using the non-material change results for Dogger Bank OWF projects, the values presented for the Forth & Tay OWFs and recommended referring to latest submissions by Norfolk Boreas.	17/06/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.4	Cumulative Displacement tables Gannet	17/05/20: SS presented cumulative displacement tables in the following document: Hornsea Four Cumulative Displ Tables_Issued 20200527.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England recommend that gannet displacement should be based on OWF plus 2km buffer.	17/06/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.5	Cumulative Displacement tables Guillemot	17/05/20: SS presented cumulative displacement tables in the following document: Hornsea Four Cumulative Displ Tables_Issued 20200527.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England queried the values presented for Hornsea One, Two and Three.	17/06/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.6	Cumulative Displacement tables Razorbill	17/05/20: SS presented cumulative displacement tables in the following document: Hornsea Four Cumulative Displ Tables_Issued 20200527.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England queried the values presented for Hornsea Three.	17/06/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-4.7	Cumulative Displacement tables Puffin	27/05/20: SS presented cumulative displacement tables in the following document: Hornsea Four Cumulative Displ Tables_Issued 20200527.pdf	17/06/20: Natural England provided feedback via document: 319443 Ornithology Technical Panel Meeting 10 Natural England Advice.pdf. Natural England referred to advice given to Norfolk vanguard in relation to Hornsea Three totals. Natural England advised including Gunfleet Sands, Methil, Rampion, Scroby Sands, EA1N and EA2 OWFs.	17/06/20: Natural England Disagreed. Following further consultation on cumulative (and in-combination) assessments, the Applicant and Natural England are in agreements with the values to be used for all consented Offshore Wind Farms.
OFF-ORN-4.8	Cumulative Displacement rates	27/05/20: SS presented cumulative displacement tables in the following document: Hornsea Four Cumulative Displ Tables_Issued 20200527.pdf	15/07/20: Natural England advised during EP#11 the use of a displacement matrix to present a range of values for auk displacement and mortality as per the SNCB advice note rather than the use of a single figure for both displacement and mortality.	15/07/20: Natural England disagreed. The Applicant has since provided displacement matrices within assessments within the final DCO application.
OFF-ORN-4.9	Cumulative CRM Results	27/05/20: SS presented cumulative CRM tables in the following document: Hornsea Four Cumulative CRM Tables_Issued 20200527.pdf	15/07/20: Natural England Recommended during EP#11 using a ranged approach to present CRM results due to uncertainties around these assessments, in regard to bird densities and the difficulty to capture variation in a survey programme.	17/07/20: Noted
5. HRA Screening				
OFF-ORN-5.1	Northumberland Marine SPA	26/11/19: Northumberland Marine SPA – all clear on features of this site to be included in the assessment are those within the individual SPAs within this wider area (see below sites).	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.2	Northumbria Coast SPA	26/11/19: Northumbria Coast SPA – It was agreed that Arctic tern would be the only species screened in, through connectivity during migratory periods.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.3	Lindesfarne Ramsar	26/11/19: Lindesfarne Ramsar – It was agreed that no species would be screened in for this site.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.4	Farne Islands SPA	26/11/19: Farne Islands SPA - MK stated that there has not been recent nesting of roseate tern at this site. SS confirmed that cormorant and shag have been screened out with puffin screened in and black-legged kittiwake screened in only for the non-breeding season. MK agreed with that and also noted that the seabird assemblage of this site is also important – razorbill in particular for this project. SS confirmed that the assemblage would also be considered.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.5	Coquet Island SPA	26/11/19: Coquet Island SPA – SS noted that the four tern species have been screened in with black-headed gull screened out due to the lack of connectivity and no evidence to suggest they would be migrating out to sea. AB agreed that approach sounds reasonable if none have been seen in the survey data. AM agreed.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.6	Teesmouth and Cleveland Coast SPA	26/11/19: Teesmouth and Cleveland Coast SPA – SS confirmed that Sandwich tern have been screened in and noted that the key assemblage components would be screened out due to a lack of connectivity with the Hornsea Four array area. MK agreed with this.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.7	Flamborough and Filey Coast SPA	26/11/19: Flamborough and Filey Coast SPA – Seabird assemblage – MK noted that the named components of the seabird assemblage are fulmar and the non-named components are puffin, herring gull, shag and cormorant. SS noted that shag and cormorant are screened out due to distance, but this may change depending on the updated foraging range paper. MK noted that in-combination justifications for screening in/out must be clear. SS asked what other projects Hornsea Four would be interacting with in relation to herring gull in-combination – MK confirmed that it could be Westernmost Rough and Humber Gateway.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.8	Hornsea Mere SPA	26/11/19: Hornsea Mere SPA - MK confirmed that there is only one SPA feature and that is gadwall; all other features are SSSI features. SS noted that both mute swan and gadwall are noted as qualifying features within the latest conservation objectives on Natural England's designated sites website.	26/11/19: All agreed	26/11/19: All agreed
OFF-ORN-5.9	Greater Wash SPA	26/11/19: Greater Wash SPA – SS proposed the screening out of common scoter on the basis of it being a distributed towards the southern end of the site and not found in numbers warranting assessment within the ECC. MK stated that a narrative should be provided to say that the bulk of population is further south off of Norfolk, and only the sightings in this area met the threshold of the maximum curvature analysis needed to delineate potential site boundaries for common scoter. MK confirmed that it probably needed to be considered as LSE, but no AEOI could be readily concluded with through the above narrative.	26/11/19: All agreed	26/11/19: All agreed

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
6. HRA Assessment				
OFF-ORN-6.1	Furness (2015) for apportionment during Non-breeding season.	15/07/20: SS asked at EP#11 if Natural England and RSPB agree with the use of Furness (2015) for apportionment during the non-breeding bio season?	15/07/20: Natural England and RSPB agreed with the use of Furness (2015) for non-breeding season apportionment but stated that during breeding periods site-specific data should be used for defining the breeding season and for apportioning during the breeding season.	15/07/20: All agreed
OFF-ORN-6.2	SNH guidance note on apportionment	15/07/20: SS asked at EP#11 if Natural England and RSPB agree with the multi layered approach to apportionment set out in the SNH guidance note (2018)	15/07/20: Natural England and RSPB agreed that the SNH guidance note is currently the best method available. Natural England noted the SNH tool was principally developed for apportioning impacts between multiple SPAs whereas at Hornsea 4 only one SPA is likely to be relevant in the breeding season. Accordingly apportioning to the colony should be considered at 100% in the first instance. 3/09/20: Natural England provided further written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England stated that due to the SNH tool using a simple geometric relationship based on the square of distance, the density of birds foraging closer to the nest site is likely to decline at a greater rate than that predicted by the SNH tool. Therefore Natural England request a range of breeding season apportioning rates including up to 100%.	15/07/20: Natural England consider that this is better treated as a matter for ongoing discussions rather than as something agreed.
OFF-ORN-6.3	Displacement values for HRA	07/08/20: SS presented the following document: O&M Displ Values & Imp Ass_Hornsea Four_20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England emphasise the importance of a matrix approach (covering up to 100% displacement and 100% mortality) of potential displacement impacts with the species specific range of rates considered highlighted (e.g. 30-70% displacement and 1-10% mortality for auks). Gannets should also be considered on the basis of the array area and 2km buffer. Additionally Natural England recommended exploring the upper and lower 95% confidence intervals around the abundance estimates when assessing displacement impacts.	03/09/20:Noted
OFF-ORN-6.4	Population Estimates for SPA Features	07/08/20: SS presented the following document: O&M Displ Values & Imp Ass_Hornsea Four_20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England advised that where impacts are being assessed against an SPA Qualifying Feature population for Habitat Regulations Assessment (HRA), the relevant population will be the most recent population estimate for that population, rather than a wider BDMPs or Biogeographic population scale.	03/09/20:Noted
OFF-ORN-6.5	Guillemot in-combination FFC totals	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England agree with the in-combination abundance totals up to and including Norfolk vanguard for displacement of guillemot.	03/09/20: Agreed up to and including Norfolk vanguard
OFF-ORN-6.6	Razorbill in-combination FFC totals	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England agree with the in-combination abundance totals up to and including Norfolk vanguard for displacement of razorbill.	03/09/20: Agreed up to and including Norfolk vanguard
OFF-ORN-6.7	Puffin in-combination FFC totals	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. For puffin, Natural England referred to their Written Reps for Norfolk Boreas, we believe totals for Beatrix Demonstrator, Gunfleet Sands, Kentish Flats and extension, Methil, Rampion, and Scroby Sands should be included, where data is available. Even if data isn't available, or values are 0, this should be made clear in the assessment so that it is clear that these projects have been considered.	03/09/20: Noted
OFF-ORN-6.8	Kittiwake in-combination FFC totals	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England agree with the in-combination collision totals up to and including Norfolk vanguard for kittiwake.	03/09/20: Agreed up to and including Norfolk vanguard
OFF-ORN-6.9	Gannet in-combination FFC totals (Displacement)	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England believe the abundance total for gannet in the autumn should be 807 as per their Written Reps for Norfolk Boreas.	03/09/20: Noted for further investigation
OFF-ORN-6.10	Gannet in-combination FFC totals (CRM)	07/08/20: SS presented in-combination totals apportioned to the FFC SPA in the following document: Alone and In-Combination Note.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England agree with the in-combination collision totals up to and including Norfolk vanguard for gannet.	03/09/20: Agreed up to and including Norfolk vanguard
OFF-ORN-6.11	Hornsea Four Breeding Season Apportionment	07/08/20: SS presented an apportionment example in the following document: Hornsea Four RIAA_KI Apportionment Note 20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England provided there recommended breeding season months in relation to the FFC SPA qualifying species and assemblage components.	03/09/20:Noted
OFF-ORN-6.12	Hornsea Four Auk Post-breeding Season Apportionment	07/08/20: SS presented an apportionment example in the following document: Hornsea Four RIAA_KI Apportionment Note 20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England considers that the standard approach to the months immediately following the breeding seasons defined above is unlikely to be appropriate for assessing impacts of auk species on FFC SPA. This is due to the proximity of Hornsea Project Four to FFC SPA and the associated likelihood that a larger proportion of auks using the proposed array area will be adults and dependent young from FFC SPA. Natural England recommend a bespoke approach in relation to Hornsea Four.	03/09/20:Noted

Offshore & Intertidal Ornithology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
OFF-ORN-6.13	Hornsea Four Non-breeding Season Apportionment	07/08/20: SS presented an apportionment example in the following document: Hornsea Four RIAA_KI Apportionment Note 20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. for the non-breeding seasons Natural England's general advice is that the data presented in the tables in Appendix A of Furness (2015) for the relevant species Biologically Defined Minimum Population Scale (BDMPS) for each season (e.g. migration, winter etc.) are used. Natural England advise that the proportion the relevant colony figure (adults) represents of the total number of birds of all ages in the relevant BDMPS in the season in question is used as the apportionment figure.	03/09/20: Noted
OFF-ORN-6.14	Non-Sabbatical rate	07/08/20: SS presented an apportionment example in the following document: Hornsea Four RIAA_KI Apportionment Note 20200806.pdf	03/09/20: Natural England provided written response via document: 326008 Hornsea 4 CRM and Displacement NE advice. Natural England doesn't agree that a 10% sabbatical rate should be included in the calculation of impact. Natural England accept that there is likely to be a proportion of adult birds at sea not breeding in that season, and that the proportion proposed may be reasonable on the basis of the evidence presented. However, it is also clear that kittiwake have high site fidelity and visit the colony they normally breed at even when taking a sabbatical. Therefore, the majority of non-breeding adults are likely to be birds that would breed at FFC in subsequent years and would contribute to the abundance target for that SPA, and should be included in the assessment.	03/09/20: Natural England Disagreed. The Applicant undertook a review of the evidence-base supporting the breakdown of species populations in order to quantify the most appropriate apportionment of breeding adults associated with the FFC SPA.
OFF-ORN-6.15	Extended Breeding Season Apportionment	19/10/20: SS suggested during EP#12 the use of 50% overall abundance of birds apportioned to the FFC SPA for months outside of the migration-free breeding season when assessing using the extended breeding season.	19/10/20: Natural England responded during EP#12 confirmed that there position was to use 100% apportionment during the whole of the extended breeding season and to include juveniles into consideration (do not agree with the use of 10% sabbatical rate).	19/10/20: Natural England Disagreed. The Applicant undertook a review of the evidence-base supporting the breakdown of species populations in order to quantify the most appropriate apportionment of breeding adults associated with the FFC SPA.
OFF-ORN-6.16	FFC PVA Productivity	23/10/20: SS presented the following document: FFC SPA Productivity Calculation.xlsx	06/11/20: Natural England provided written response via the document: 326008 Hornsea 4 Gannet and Razorbill AEoI Position Paper NE advice. NE calculated there productivity values using the plot data available from the SMP database. Hornsea Four productivity data was taken from the FFC SPA Annual reports however NE concurs that the both datasets used appear to be the same values. NE calculated there productivity values using the mean for each individual plots, instead of the aggregated productivity value used by Hornsea Four.	06/11/20: Noted
OFF-ORN-6.17	Razorbill FFC Productivity	23/10/20: SS presented the following document: FFC SPA Productivity Calculation.xlsx	06/11/20: Natural England provided written response via the document: 326008 Hornsea 4 Gannet and Razorbill AEoI Position Paper NE advice. NE recommended for razorbill using only the productivity values from 2010 - 2019 due to only 5 out of the 8 plot monitored in 2009.	06/11/20: Noted
OFF-ORN-6.18	Razorbill and Gannet No AEoI up to Norfolk Vanguard	23/10/20: SS presented the following document: APEM (2020). Assessment of Potential for an AEoI Alone and In-Combination with Respect to the Gannet and Razorbill Features of the FFC SPA. APEM Scientific Report P00004622. Ørsted, Issued 23rd September 2020, 43 pp	06/11/20: Natural England provided written response via the document: 326008 Hornsea 4 Gannet and Razorbill AEoI Position Paper NE advice. NE agreed that the tables presented for gannet and razorbill in combination figures up to Norfolk Vanguard had not reached the point of an AEoI for gannet and razorbill.	06/11/20: Natural England Agreed
OFF-ORN-6.19	FFC SPA Productivity Calculation	23/10/20: SS presented the following document: FFC SPA Productivity Calculation.xlsx	06/11/20: Natural England provided written response via the document: 326008 Hornsea 4 Gannet and Razorbill AEoI Position Paper NE advice. NE advised that the annual productivity values should be calculated as the mean of each individual plot, as set out in Walsh et al. 1995.	06/11/20: Noted
OFF-ORN-6.20	No AEoI Gannet Alone	23/11/20: SS presented gannet alone results apportioned to the FFC SPA gannet feature at Evidence Plan Meeting #13.	16/12/20: Natural England provided written response via the document: Hornsea 4 Ornithology Technical Panel Meeting 13 questions-NE response.pdf. Natural England responded that based on the value presented and the likely future growth rates it is likely that an AEoI can be ruled out for gannet alone.	16/12/20: All Agreed
OFF-ORN-6.21	Kittiwake Productivity FFC SPA	23/11/20: SS presented kittiwake productivity value for the FFC SPA gannet feature at Evidence Plan Meeting #13.	16/12/20: Natural England provided written response via the document: Hornsea 4 Ornithology Technical Panel Meeting 13 questions-NE response.pdf. Natural England agree with the use of 0.722 +/-0.210 (2009-2017) in the PVA, however note that this might be over optimistic, due to recent declines at file.	16/12/20: All Agreed

Marine Archaeology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
OFF-ARCH-1.1	Geophysical Surveys	18/12/18: Maritime Archaeology gave an overview of the reduced coverage geophysical surveys that have been undertaken in 2018 which will form the basis of characterisation and mitigation development at PEIR, noting that full coverage surveys will be undertaken in 2019, the results of which will be included in ES. GoBe also noted that benthic grabs have been and will be undertaken alongside geophysical survey and geotechnical surveys will also be taking place in 2019, both offshore and in the intertidal area.	18/12/18: Historic England noted that the survey detail is similar to what is usually presented in these kind of projects.	18/12/19: Noted
OFF-ARCH-1.2	Impacts & Effects Register	13/11/19 Ørsted and CH confirmed that surveys will be undertaken ahead of cable works and cable repairs, therefore there will be no direct impact on seabed not surveyed.	13/11/19 Historic England advised that a consideration of impacts from cable repair and remediation activities on new areas of the seabed should be included. A change of wording to the impact register was agreed upon.	13/11/19: Impact MA-0-7 Will be updated to read: Scour, penetration, draw down and compression effects caused by (a) the presence of WTG substation foundations, and (b) the exposure and replacement of inter-array and export cables or the use of cable protection measures (such as remedial cable burial), impacting archaeological receptors and exposing such material to natural, chemical or biological processes and causing or accelerating loss of the same.
2. Impact Assessment Methodology (including definition of terms)				
OFF-ARCH-2.1	Proportionate Approach - Introduction to Proposed Approach	18/12/18: Hornsea Four presented an overview of the proportionate approach to EIA. Maritime Archaeology noted that this proportionate approach is new to all parties and founded on the basis of utilising the evidence base from other projects in the area, applying embedded mitigation measures, with the outcome resulting in no or a negligible impact on archaeological receptors.	18/12/18: Historic England appreciated the explanation provided about the proposed process and how Hornsea Four were trying to conduct the EIA exercise in support of a DCO application. However, Historic England highlighted that corporately their primary concern with the approach relates to the exclusion of aspects of the historic environment from the full statutory EIA process, which could limit Historic England's ability to input during the examination process of any eventual DCO application and therefore in our statutory role as heritage advisors. As such, it is likely that Historic England would have to object to the approach on principle, despite the explanation provided by Hornsea Four.	18/12/18: Disagreed
OFF-ARCH-2.2	Proportionate Approach - Presentation of Approach within PEIR	13/11/19: Hornsea Four held a proportionate workshop with Historic England in June 2019 where we explained our approach in detail and addressed any concerns. Through highlighting the commitments and mitigation measures that support any "scoped out" impacts, Historic England acknowledged how this was presented in the PEIR.	13/11/19: Historic England noted the explanation provided that marine archaeology was 'scoped out' of the EIA exercise, Historic England are aware of the 'proportionate approach' as described by the Applicant and used within the PEIR and the use of a 'Commitments Register'. Historic England noted the Impacts Register updates post-PEIR consultation and which will be included within the ES prior to formal submission.	13/11/19: Noted
3. Outcome of EIA				
OFF-ARCH-3.1	Appropriateness of Commitments	12/05/2020: CH gave an overview of the Hornsea Four commitments in relation to marine archaeology, noting that there had been no change to these from those detailed in the Outline Marine WSI that had been reviewed by Historic England.	12/05/20: Historic England noted the contents of the draft Commitments Register. Post-Meeting Note: Historic England is aware from the Minutes of the Evidence Plan Steering Group Meeting No 6 held on 21/10/2020 that the Design Envelope has been updated to include gravity base foundations. Therefore, the appropriateness of project documentation such as any Outline Marine Written Scheme of Investigation, Commitments Register and Impacts Register should also be revised accordingly.	12/05/20: Commitments agreed as appropriate with Historic England.
4. Cumulative Assessment (including identification of project scoping in and out)				
7. Outline Marine WSI				
OFF-ARCH-7.1	Section 42 Comments on Outline Marine WSI	13/11/19: CH noted that all comments on the Outline WSI will be addressed and the document updated and confirmed that there are no disagreements on Historic England's comments on the document.	13/11/19: Historic England confirmed that once these updates are made then Historic England would be content with the document at this stage.	13/11/19: Noted that if that updates are made as agreed then the Outline WSI should be fit for purpose given present design details provided.
OFF-ARCH-7.2	Pre-Application Outline Marine WSI Review (May 2020)	12/05/2020: CH noted that all comments on the Outline WSI will be addressed and the document updated and confirmed that there are no disagreements on Historic England's comments on the document.	12/05/20: Historic England agree that the Hornsea Four draft Outline Marine WSI is proceeding in the right direction and understand that all comments made by Historic England will be incorporated in the next revision of the document as per Historic England's review in May 2020 as discussed and minuted (Hornsea Four Marine Archaeology Evidence Plan Meeting Minutes Three (06171228_A). Historic England understand that we will therefore receive an updated revision of the draft Outline WSI to be able to provide further comments, pending the review of all DCO application documents after formal submission.	12/05/20: Agree that the Hornsea Four draft Outline Marine WSI is proceeding in the right direction and further review will be undertaken once all DCO application documents are received after formal submission.

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
	Designated Sites	Data on statutory and non-statutory designated sites were collected from North & East Yorkshire Ecological Data Centre (NEYEDC) August 2018 by ERM. Sites that overlap with the onshore scoping boundary plus a 1 km buffer were presented in the onshore ecology technical panel position paper and in the presentation by Josie Preece 12.09.2018 and feedback was invited.		Vaughn Graham of ERYC informed the panel that there is a review of local wildlife sites in October 2018 and will check the maps produced based on the data from NEYEDC and inform Orsted/ERM if there are any changes. Josie Preece will send Vaughn a shapefile of the scoping boundary.
	Phase 1 Habitat Survey Methodology	High resolution (3cm) imagery was taken end of May 2018 and beginning of June 2018 of the indicative centre line of the onshore cable route plus a 1 km buffer either side and the onshore substation search area. This imagery was used as the basis of the Phase 1 Habitat Assessment combined with ground-truthing ~35% of the route. Ground-truthing was targeted on areas of habitat outside of the arable fields that dominate the landscape e.g. areas of grassland, woodland, watercourses, ponds etc. This approach was presented to the onshore ecology technical panel by Josie Preece 12.09.2018 and feedback was invited.		All parties of the onshore ecology technical panel agreed in principle with the approach subject to review of the Phase 1 Habitat maps.
	Phase 2 Survey Scope	The Phase 2 survey scope was presented by Josie Preece 12.09.2018 and feedback invited.		All parties of the onshore ecology technical panel agreed in principle with the scope subject to review of the Phase 1 Habitat maps and scoping report. There will be further engagement on methodologies of the proposed phase 2 surveys with the Technical Panel.
ON-ECO-1.1	Designated sites	08/01/19 - applicant agreed that all relevant SSSI will be included and presented in the PEIR/ES	12/09/18 - YWT requested that all SSSIs are named in the commitment table where relevant to do so.	08/01/19 - agreed
ON-ECO-1.2	Data sets (non-designated sites)	08/01/19 - applicant agreed that all data provided by YWLT will be used to inform the baseline environment presented in the PEIR/ES and referenced within the data sources used to inform the assessment.	08/01/19 - YWLT to check and provide any additional data sets for which they hold that would be used to inform the baseline conditions.	08/01/19 - agreed
ON-ECO-1.3	Non-designated sites	08/04/19 - applicant agreed to provide the proposed crossing method for the Moor Lane former LWS. The agreement of which will be included within the assessment and committed to by the Project.	08/04/19 - YWLT advised that information on LWSs that had recently lost their designation status to be reviewed and referenced within PEIR/ES accordingly. However, YWLT advised that Moor Lane in particular should be considered.	08/04/19 - agreed
ON-ECO-1.4	Baseline surveys (soil)	08/04/19 - confirmed that a comparison of the EP1HS with the soil data had not as yet been undertaken but that this will be addressed through the Geology & Ground Conditions and/or the Land Use and Agriculture PEIR/ES chapter, with a cross reference included in the Ecology PEIR/ES chapter.	08/04/19 - EA asked whether Hornsea Four had compared the data from the EP1HS with the soil data.	08/04/19 - agreed
ON-ECO-1.5	Baseline surveys (otter)	08/04/19 - confirmed that the water vole survey effort would also check and record where present evidence of otter.	08/04/19 - YWLT advised that evidence of otter should be checked for as part of the water vole survey effort.	08/04/19 - agreed
ON-ECO-1.6	Baseline surveys (GCN)	08/04/19 - advised that a 250m buffer had been applied given the nature of the habitats within the Order Limits and that this approach had been taken for projects of similar scale and scope.	08/04/19 - NE asked why a 250m buffer for GCN has been used rather than NE's request for 500m. 08/04/19 - YWLT advised that 250m buffer was generally standard for this type of project.	08/04/19 - agreed
ON-ECO-1.7	Baseline surveys (bats)	08/04/19 - advised that the findings from the EP1HS has been used to devised the proposed activity transect and static detector locations. This also included the consideration of river systems.	08/04/19 - YWLT request to review proposed bat activity transect survey locations and proposed static bat detector survey locations to confirm acceptance of proposed survey approach. In addition, species-poor hedgerows with low connectivity should also be considered when devising the proposed survey transect locations. 08/04/19 - EA advised that river systems were also important for bat species, so should also be considered and included within survey effort.	08/04/19 - agreed
ON-ECO-1.8	Scope of baseline surveys	08/04/19 - presented proposed approach to all Phase 1 and Phase 2 surveys - including scope and methodologies to be followed.	08/04/19 - All stakeholders agreed that the proposed approach and scope of Phase 1 and 2 surveys was acceptable.	08/04/19 - agreed
ON-ECO-1.9	Baseline surveys (crayfish)	08/04/19 - advised no surveys for crayfish will be undertaken.	08/04/19 - EA agreed that crayfish should be scoped out as no crayfish are known to be present in the catchment.	08/04/19 - agreed
ON-ECO-1.10	Baseline surveys (fish)	09/07/19 - applicant advised that no baseline surveys for fish would be undertaken as fish had been scoped out.	09/07/19 - no comments received from stakeholders (NE, EA, YWLT, RSPB)	09/07/19 - no agreement made
ON-ECO-1.11	Baseline surveys (water voles)	01/04/20 - applicant advised that 70 watercourses had been identified for survey - 11 were dry and 59 were therefore subject to a water vole presence/absence survey in accordance with industry guidance.	01/04/20 - NE agreed with methodology, scope of surveys and results	01/04/20 - agreed with NE
ON-ECO-1.12	Baseline surveys (otters)	01/04/20 - applicant advised that 14 watercourses were surveyed for otter and concurrently with the water vole survey effort.	01/04/20 - NE agreed with methodology, scope of surveys and results	01/04/20 - agreed with NE
ON-ECO-1.13	Baseline surveys (OWB)	01/04/20 - applicant advised that VP and transect surveys for OWB had been undertaken in 2018/19 in accordance with industry guidance. A total of 6 visits were undertaken.	01/04/20 - NE advised that they have not reviewed the OWB survey report but it is unlikely that there will be any licensing requirements relating to OWB. Furthermore, NE advised that there are no concerns relating to OWB as there are none within the SSSI impact zones.	01/04/20 - n/a as only NE attended meeting. Follow up meeting with RSPB needed.

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-ECO-1.14	Baseline surveys (badger)	01/04/20 - applicant advised that badger presence/absence surveys had been undertaken and in accordance with industry guidance. Also advised that pre-construction surveys for badgers would be undertaken given the mobility of this species.	01/04/20 - NE agreed with methodology, scope of surveys and results	01/04/20 - agreed with NE
ON-ECO-1.15	Baseline surveys (GCNs)	01/04/20 - applicant advised that 60 ponds had been subject to an eDNA survey effort and in accordance with industry guidance.	01/04/20 - NE agreed with methodology, scope of surveys and results	01/04/20 - agreed with NE
ON-ECO-1.16	Baseline surveys (bats)	01/04/20 - applicant outlined approach taken in respect to assessing features for their suitability to support roosting bats as well as identifying features suitable for foraging/commuting bats (including the static bat detector survey effort).	01/04/20 - NE agreed with methodology, scope of surveys and results	01/04/20 - agreed with NE
ON-ECO-1.17	Static bat detector survey limitations	01/04/20 - applicant advised NE that some equipment malfunction of the static detectors had been experienced during the survey effort.	01/04/20 - NE accepted that technical malfunction of equipment can be experienced and no concerns were raised. NE acknowledged that this had been taken into consideration in the survey report. Furthermore, the results from the static detector surveys were used to supplement the findings from the transect surveys.	01/04/20 - agreed with NE
ON-ECO-1.18	Extended Phase 1 Habitat Survey scope and methodology	01/04/20 - applicant explained that 95% of the order limits has been surveyed, in accordance with industry guidance and at the appropriate time of year.	01/04/20 - NE advised that only a rapid review of the survey report had been undertaken. However, accepted survey methodology and results.	01/04/20 - agreed with NE
ON-ECO-1.19	Baseline surveys (OWB and BB)	30/06/20 - applicant explained and summarised the baseline survey methodology and scope to RSPB to see agreement on its coverage, methodologies employed and in turn used to establish the baseline environment of OWB and BB species.	30/06/20 - RSPB advised that the VPs seem to provide a fairly good coverage, however a detailed review by RSPB would be required to confirm this.	30/06/20 - awaiting agreement from RSPB
ON-ECO-1.20	Bat emergence/re-entry survey report	01/07/20 - applicant explained the text that had been updated to the bat emergence/re-entry report to acknowledge the pre-construction survey effort that will be undertaken relating to hibernating bats.	01/07/20 - NE agreed with amended wording and content that all aspects of roosting bats had now been covered.	01/07/20 - agreed with NE
ON-ECO-1.21	Identifying AADT movements along haul road to determine whether AQ im	13/11/19 - applicant advised that AADT movements along the haul road are being calculated and once they have been advised, they will be screened against the AQ criteria in order to establish whether a detailed assessment is required.	13/11/19 - NE confirmed this approach as being acceptable	13/11/19 - agreed by NE
ON-ECO-1.22	AQ modelling assessment and approach in relation to onshore ecological receptors	01/07/20 - applicant outlined the approach taken to the AQ assessment and that the AQ study area had changed slightly since PEIR but the same principles as applied at PEIR remain unchanged. . Humber Estuary, Bryan Mills Field and River Hull Headwaters SSSI – for the SSSI's the project traffic flows have not breached the significant criteria – the project alone did not trigger an assessment but it was triggered for the in-combination impacts. AQ assessment methodology has been adapted since PEIR to reflect and address the comments provided by NE previously. Re construction dust, NE advised that guidance only considered sites within 50m whereas NE wanted up to 200m. HOW04 has committed to adherence to the dust mitigation measures as part of a commitments. NOx critical levels have been calculated at the three designated sites. Consideration of the traffic flows along the haul road have also been made – project traffic flows have been reviewed for three specific areas. In-combination projects for AQ assessment using the SSSI impact risk zones. Humber Estuary identified one project, Bryan Mills Field identified – most projects were agricultural and ammonia was the key consideration. One project required consideration of airborne oxides of nitrogen but ammonia was the key pollutant.	01/07/20 - NE agreed with approach and principles applied and also confirmed that all previous comments from NE had been addressed.	01/07/20 - agreed by NE
ON-ECO-1.23	Baseline data validity	13/04/2021 - Applicant issued onshore ecology baseline data validity position paper to Natural England. This document outlined the findings from the baseline data review and the proposed 2021 survey effort.	30/04/2021 - NE agreed with the information presented in the baseline data validity position paper.	30/04/2021 - agreed by NE
ON-ECO-1.24	Findings from 2021 survey effort	10/08/2021 - applicant issued to Natural England via email the position paper outlining the updates that have been made to onshore ecology documents following completion of the 2021 survey effort.	31/08/2021 - NE provided comments and responses to the questions that had been posed to them in the onshore ecology position paper. Agreements made on the findings of the 2021 surveys and how they had been incorporated within the relevant onshore ecology documentation.	31/08/2021 - agreed by NE
2. Impact Assessment Methodology (including definition of terms)				
ON-ECO-2.1	EIA terminology	08/01/19 - agreed that the impact assessment presented at PEIR/ES will include reference to the likely significant effect where identified.	08/01/19 - NE requested that all future references includes "the likely significant affects (applicable to the 2017 EIA Regulations)".	08/01/19 - agreed
3. Commitments and/or mitigation				

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-ECO-3.1	Commitment wording	08/01/19 - applicant agreed to update the commitment wording for Co2.	08/01/19 - Josie Preece (JP) was to propose wording of Co2 (avoiding sensitive sites) to JC, which would encapsulate all sites avoided in the RPSS process e.g. Local Nature Reserves, Local Wildlife Sites, Yorkshire Wildlife Trust sites, priority habitats etc to provide further reassurance to stakeholders.	08/01/19 - agreed
ON-ECO-3.2	Reptile mitigation	08/04/19 - applicant agreed that the PEIR/ES will present where identified the areas where reptile mitigation is proposed, in accordance with the mitigation measures agreed with NE.	08/04/19 - ERYC advised that reptile mitigation should focus on areas suitable for reptiles only so as to not make it an onerous task that could become overlooked.	08/04/19 - agreed
ON-ECO-3.3	OnSS access track and avoidance of ancient woodland	13/11/19 - applicant advised that the OnSS access track had been moved away from Birkhill Wood ancient woodland. This change was as a result of consultation feedback.	13/11/19 - NE agreed with proposed change as this is in line with NE's guidance on ancient woodland buffers.	13/11/19 - agreed
ON_ECO-3.4	Barn Owl mitigation	13/11/19 - applicant advised that due to the proximity of the access track to the nesting barn owl site, and taking into consideration the guidance from Shawyer (2011) and Ruddock and Whitfield (2007), a 100m buffer around the barn owl nesting site has been applied.	13/11/19 - EA advised that there may be barn owl boxes located on the Humber and suggested that the project commits to incorporating barn owl boxes in and around Bryan Mills Beck. NE also advised that in ERYC barn owls are known to use the watercourses, so it may be possible to provide other boxes within the wider area.	13/11/19 - no agreement made as RSPB did not attend meeting
ON-ECO-3.5	GCN mitigation	13/11/19 - applicant requested NE's guidance and comments on the GCN mitigation requirements for the ponds where a HSI survey was not possible.	13/11/19 - NE advised that HSI suitability modelling could be an option. District licencing has not been set up for ERYC, however the evidence base has been set up, therefore NE could look into providing the project with this data. NE advised that surrounding ponds could be used as supporting evidence base but it would be too precautionary to assume that there were newts in all ponds that could not be accessed. NE also suggested that compensatory measures could be more appropriate and effective than installing fencing.	13/11/19 - no agreement made
ON-ECO-3.6	Water vole mitigation (habitat displacement)	13/11/19 - applicant advised that a low density water vole population had been recorded on one watercourse that is planned to be crossed using open-cut.	13/11/19 - EA advised that displacement mitigation measure was acceptable for a low density water vole population. YWLT advised that displacement measures should be treated carefully as it can fragment already fragmented water vole populations.	13/11/19 - agreed
ON-ECO-3.7	Avoidance of sensitive sites	13/11/19 - applicant advised that the project has made a commitment to locate the HDD entry and exit pits a minimum of 200m from the River Hull Headwaters SSSI.	13/11/19 - NE accepted that this was a positive change and commitment made by the project.	13/11/19 - agreed
ON-ECO-3.8	Bat mitigation (lighting)	13/11/19 - applicant advised that any lighting associated with the project would be designed in accordance with the ILE guidance 2018.	13/11/19 - YWLT advised that usually a maximum LUX level fo 0.5 is considered appropriate. YWLT also advised that they be looking for the project to commit to taking no more than 5m section of hedgerow directly to the south of the OnSS and along the onshore ECC.	13/11/19 - not agreed
ON-ECO-3.9	Badger mitigation and licensing	13/11/19 - applicant requested agreement that to excavate disused badger setts, this would be possible without the need for a licence.	13/11/19 - EA advised that setts would need to be soft-backed (which would require a licence) and/or use camera traps to confirm its usage or not by badgers. YWLT advised that use of sticks in front of entrances in combination with sand traps would also be useful. NE advised that if the specialist checking the setts is satisfied that the sett is disused, then a licence would not be required.	13/11/19 - agreed
ON-ECO-3.10	Invasive non-native species	13/11/19 - applicant advised that the outline CoCP will include measures relating to the management and control of invasive non-native species e.g. wheel washers.	13/11/19 - EA advised that vehicles can bring in invasive non-native species on their tyres and therefore preventative measures alongside a management plan will need to be included in the project.	13/11/19 - agreed
ON-ECO-3.11	Water vole mitigation and LONI	01/04/20 - applicant advised that proposed mitigation measure for the one watercourse where water voles had been recorded. However, all 70 watercourses identified at the outset of the 2019 survey effort will be subject to a pre-construction survey effort.	01/04/20 - NE advised that all 3 tests are needed for water voles (i.e. method statement and draft licence application). NE's review period of documentation is 30 working days. NE agreed with conclusions of water vole surveys and commitment to undertaken pre-construction surveys.	01/04/20 - agreed by NE

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-ECO-3.12	Otter mitigation	01/04/20 - applicant advised that no evidence of otters was recorded during the survey effort. Although no evidence of otters has been recorded, all 14 watercourses will be subject to a pre-construction survey and avoidance of night working will also be made by the project in locations where otter has been recorded.	01/04/20 - NE advised that consideration of impacts to otter, i.e. avoidance of night working should also be used. NE also advised that consideration of compensation for otters also needed should otter evidence be recorded during the pre-construction surveys.	01/04/20 - agreed by NE
ON-ECO-3.13	Breeding bird mitigation	01/04/20 - applicant advised that a barn owl nesting site had been recorded adjacent to a proposed access track near to the landfill. A 100m buffer had been applied to this location.	01/04/20 - NE agreed with application of a 100m buffer around the barn owl nesting site.	01/04/20 - agreed by NE
ON-ECO-3.14	Badger mitigation	01/04/20 - applicant acknowledges NE's concerns and agreed to include reference to camera traps, damp sand, sticks for monitoring of badger activity. This will be referred to within the oEMP.	01/04/20 - NE advised that they do not agree with the use of tight packed wedge of straw for checking for badger presence as this has potential implications of infringement of welfare act. NE advised that use of sticks, camera traps, damp sand etc are acceptable alternatives.	01/04/20 - agreed by NE
ON-ECO-3.15	Bat mitigation	01/04/20 - applicant advised NE of the limitations associated with low lighting levels during the 2019 survey effort, particularly of two features at the OnSS. Applicant also advised NE that no planned construction works will be undertaken within 15m of these potential features. Furthermore, for those features assessed as having low potential to support roosting bats, these would be felled (if removal is required) in accordance with a soft-fell technique. All features identified as being suitable to support roosting bats will be subject to a pre-construction survey effort - reference for which will be included in the oEMP.	01/04/20 - NE advised applicant that the bat survey report does not consider hibernating or transitional bat roosts - this can be captured within the oEMP. NE advised that use of thermal imagery and at height inspection may need to be considered for those trees where low light was a limiting factor.	01/04/20 - agreed by NE
ON-ECO-3.16	OnSS access track and ancient woodland	01/04/20 - applicant advised of change regarding the location of the OnSS access track now being closer to Birkhill Wood ancient woodland. Applicant advised that although the OnSS access road had been moved closed, in accordance with NE guidance, a distance of 15m from the ancient woodland boundaries had been applied to avoid direct and indirect impacts.	01/04/20 - NE agreed with revised OnSS location and its distance from the ancient woodland.	01/04/20 - agreed by NE
ON-ECO-3.17	Bat mitigation at the OnSS	16/09/20 applicant presented an updated plan of the OnSS and proposed mitigation measures. The applicant explained that any land which may remain to the north of the final position of the OnSS permanent access track will be used for mitigation planting.	16/09/20 - NE agreed with proposals and principles being applied.	16/09/20 - agreed by NE
ON-ECO-3.18	Consideration of dust impacts on ecological and human receptors	13/11/19 - applicant advised that no assessment of dust impacts at human and ecological receptors has been undertaken as the project has committed to the mitigation measures recommended in the IAQM guidance, which comprise embedded mitigation.	13/11/19 - NE agreed that this approach was acceptable but would only apply to designated sites more than 50m from construction works, e.g. the River Hull Headwaters SSSI, which is sensitive.	13/11/19 - agreed by NE
ON-ECO-3.19	GCN LoNI	15/04/2021 - Applicant issued draft GCN mitigation licence to Natural England to seek agreement and LoNI.	02/07/2021 - NE agreed with draft GCN licence application and provided GCN LoNI.	02/07/2021 - agreed by NE
3. Outcome of EIA				
ON-ECO-3.1	Scoping out of direct impacts on designated sites during construction	08/04/19 - sought agreement to scope out direct impacts on designated sites during construction. Also agreed to provide information relating to trenches and how they will be dewatered and how potential bentonite breakouts would be dealt with.	08/04/19 - EA highlighted that water itself can be a pollutant if the project were to cross-contaminate between watercourses and/or catchments. Similarly bentonite breakouts could also potentially contaminate. 08/04/19 - YWLT also highlighted that transporting soil could leave scope for cross-contamination. 08/04/19 - ERYC in favour of Hornsea Four using a CEMP to tie up areas of embedded mitigation related to construction.	08/04/19 - agreed
ON-ECO-3.2	Scoping out of impacts on fish during construction	08/04/19 - sought agreement to scope out fish due to EA main rivers and IDB drains being crossed using HDD and therefore impacts to fish are unlikely.	08/04/19 - all stakeholders (EA, YWLT, NE and RSPB) agreed that fish can be scoped out.	08/04/19 - agreed
ON-ECO-3.3	Proposed approach to scoping out impacts on habitats and species during decommissioning phase	08/04/19 - sought agreement to scope out decommissioning impacts	08/04/19 - all stakeholders agreed that decommissioning impacts can be scoped out.	08/04/19 - agreed
ON-ECO-3.4	Consideration of decommissioning in the EclA	09/07/19 - applicant sought agreement on the criteria and approach that was to be taken for the project regarding decommissioning, i.e. it would no worse than that identified during construction. Cables would be left in situ and the link boxes and joint bays would only be removed if it made sense environmentally.	09/07/19 - No comments received from attendees (EA, NE, RSPB, YWLT)	09/07/19 - no agreement made
ON-ECO-3.5	Scoping out of impacts on white clawed crayfish	09/07/19 - applicant advised that impacts to white clawed crayfish are scoped out as no records of this species has been found within the project order limits.	09/07/19 - stakeholders at meeting (EA, NE, RSPB and YWLT) agreed with this conclusion.	09/07/19 - agreed

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-ECO-3.6	Impacts on habitats or species during construction	09/07/19 - applicant advised that impacts to River Hull Headwaters SSSI (and other habitats/species) will be considered in the EIA. Applicant advised that no ground investigations would be undertaken as the project has committed to the use of HDD (or other trenchless techniques) to cross the River Hull Headwaters SSSI (Co1) and that a hydrogeological risk assessment would be carried out prior to its crossing. Any risk assessment and crossing method statement would be agreed with NE and EA prior to any survey works and construction works being undertaken (Co18). Applicant also advised that a full bentonite breakout measures will be provided in the CoCP and ensure that entry and exit pits for the HDD will be outside of the SSSI risk zones.	09/07/19 - NE questioned the approach to the River Hull Headwaters SSSI stating the NE will need to understand the potential impacts that the project may have on the SSSI, especially long term impacts. NE also advised that they would expect ground investigations to be undertaken.	09/07/19 - no agreement made
ON-ECO-3.7	Direct impacts on habitats	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.8	Impacts on non-designated sites	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.9	Impacts on white clawed crayfish and fish	13/11/19 - presented I&E register to show that this has been scoped out	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.10	Impacts on reptiles	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.11	Impacts on habitats or species during construction	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.12	Impacts on habitats during operation phase	13/11/19 - presented I&E register to show that this has been scoped out	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.13	Impacts on protected species during operational phase	13/11/19 - presented I&E register to show that this has been scoped out	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.14	Impacts on habitats or species during operational phase	13/11/19 - presented I&E register to show that this has been scoped out	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.15	Impacts on habitats along onshore ECC during decommissioning phase	13/11/19 - presented I&E register to show that this has been scoped out	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.16	Impacts on habitats at ONSS during decommissioning phase	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.17	Impacts on habitats or species during decommissioning phase at the ONSS	13/11/19 - presented I&E register to show that this would not be considered in detail in the ES as no LSE identified at PEIR.	13/11/19 - EA, YWLT and NE agreed	13/11/19 - agreed by EA, YWLT and NE
ON-ECO-3.18	Reptile mitigation	13/11/19 - applicant advised that the project has made a commitment to avoid storing of topsoil and subsoil in the floodplain. Applicant advised that plastic sheeting would not be used to covered stored material as this would result in greater vehicle movements as well as requiring a high plastic resource.	13/11/19 - EA advised that stockpiles (i.e. topsoil and subsoil bunds) would be covered with plastic sheeting and not stored in the flood plain	13/11/19 - agreed by EA
ON-ECO-3.19	Bat mitigation (hedgerows)	01/04/20 - applicant advised that temporary structures would be placed within sections of removed hedgerows to maintain connecting links for foraging/commuting bats.	01/04/20 - NE agreed that use of planted drums have been used successfully on other projects and therefore could be considered. NE advised that the project will need to consider growth rates of any planted mitigation to ensure full reinstatement is achieved at its earliest opportunity, particularly if it is being relied on to mitigate impacts to foraging/commuting bats.	01/04/20 - agreed with NE
ON-ECO-3.20	OWB and BB related commitments	30/06/20 - applicant explained that Hornsea Four has adopted several bird related commitments (namely Co33,122 and Co168) to protect/reduce the impacts on bird species.	30/06/20 - RSPB confirmed acceptance of proposed commitments and no other comments or concerns raised.	30/06/20 - agreed with RSPB
ON-ECO-3.21	Barn owl mitigation	30/06/20 - applicant explained that there is a barn owl site immediately adjacent to an existing farm track that has been identified for access to the landfill with a sign attached to the derelict barn which indicates that it is a RSPB managed site. Surveys undertaken to date has noted the presence of barn owls and agreed with NE that the track will be 100m away and no construction activities will be undertaken near it (just traffic). Pre-construction surveys will also be undertaken. Agreement was sought on this from RSPB.	30/06/20 - RSPB confirmed that a 100m buffer was appropriate but did query the RSPB managed sign that is in place. RSPB advised that they would confirm site ownership to minimise disturbance from survey checks.	30/06/20 - agreed with RSPB
ON-ECO-3.22	Bird mitigation	30/06/20 - applicant advised of proposed mitigation measures that will be implemented as part of the project relating to birds.	30/06/20 - RSPB welcomed the use of them i.e. use of measures to deter ground nesting birds but the reference to when necessary is rather vague but if discussions will be had before them being used then this removes the vagueness of the statement. Would ideally want more details on timing etc - i.e. not to be used during nesting/breeding/chicks. Would assume the "relevant stakeholders" would include RSPB, NE etc. RSPB requested wording to be reviewed to clarify this.	30/06/20 - agreed with RSPB
ON-ECO-3.23	Water vole LONI	01/07/20 - applicant had submitted water vole survey report and method statement to NE in support of request for LONI.	01/07/20 - NE advised that a review of the documentation would be undertaken. Water vole LONI received.	01/07/20 - agreed with NE
ON-ECO-3.24	I&E register	16/09/20 - applicant explained and presented the onshore ecology tab of the I&E register to attendees, as well as providing a copy prior to the meeting.	16/09/20 - NE confirmed acceptance and raised no comments or issues with the information contained or presented to them.	16/09/20 - agreed with NE
ON-ECO-3.25	In-combination assessment of AQ impacts on ecological receptors	13/11/19 - applicant confirmed that at the Humber Estuary, other potential industriak sources will be considered in-combination where necessary. With regard to farming, given the immediate area is primarily urban, it is not anticipated that there would be any air emissions from these sources. Applicant advise that the most likely in-combination effects of agriculture are anticipated to be on Bryan Mills SSSI.	13/11/19 - NE highlighted that the in-combination assessment only includes traffic growth, it does not include other sources e.g. farming, industry etc. NE advised that any projects under construction up to 2018 would already be included in the background AQ data. NE also advised that they hold Impact Risk Zone data, which prescribe different thresholds for different activities.	13/11/19 - agreed

Onshore Ecology

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-Eco-3.26	AQ outcome for informing RIAA in respect to onshore ecological receptors	<p>01/07/20 - LSE identified for 3 sites – SAC, SPA and Ramsar. NE raised this at PEIR and this has now been addressed for ES and now taken through to Stage 2 – project on its own does not trigger Stage 2 but it is the in-combination aspect that triggers the Stage 2.</p> <p>Project alone does not result in a 1% above critical load so does not trigger the Stage 2.</p> <p>Estimate extent of saltmarsh within each site. Data to inform baseline extent of saltmarsh has used 2011 EA data – this is not consistent with the conservation objectives as there is a difference in the extent of salt marsh.</p> <p>The assessment has referred to the critical load range (20 - 30 (kg N ha-1 year-1) and noted that the values fall at the lower end of that range.</p> <p>•For NN, it is estimated, that 0.36% and 0.33% of the saltmarsh within the SAC and SPA would be subject to NN deposition totalling 23.15 (kg N ha-1 year-1), respectively from the project acting in combination.</p> <p>•For NOX, is estimated that 0.19% of the total saltmarsh within the SAC and 0.18% of the saltmarsh within the SPA saltmarsh would fall within the area of threshold exceedance, due to in-combination sources.</p> <p>Concluded no adverse effect on the site integrity.</p>	<p>01/07/20 - NE agreed with the outcome of the assessment and conclusions drawn.</p>	<p>01/07/20 - agreed with NE</p>
4. Cumulative Assessment (including identification of project scoping in and out)				
5. Biodiversity Net Gain (BNG)				
ON-ECO-5.1	Biodiversity Net Gain Opportunities	<p>08/04/19 - applicant requested stakeholder's view on biodiversity net gain and sought identified of potential opportunities and/or locations for where BNG could be explored.</p>	<p>08/04/19 - ERYC advised that it might be good to focus on more meaningful BNG opportunities in fewer locations, which can be managed better on a long-term basis. For example, at the landfall and OnSS.</p> <p>08/04/19 - RSPB also advised that the project should perhaps use a similar strategy to Hornsea Three in looking to fill gaps in hedgerows.</p> <p>08/04/19 - YWLT also advised that hedgerows and grass verges might be a good opportunity as it might be that these areas could add up sufficiently if applied along the entire route.</p>	<p>08/04/19 - agreed with all stakeholders</p>
ON-ECO-5.2	BNG metric	<p>01/04/20 - applicant advised that no net loss has been calculated but further consideration is required that is subject to project approval.</p>	<p>01/04/20 - NE queries the use of the BNG metric to identify if there is no net loss using the habitat information obtained to date.</p>	<p>01/04/20 - agreed with NE</p>
ON-ECO-5.3	BNG Metric - 2.0 vrs 3.0	<p>10/08/2021 - applicant issued to Natural England via email the position paper outlining the updates that have been made to onshore ecology documents following completion of the 2021 survey effort, which also included a request to confirm with Natural England the use of the Defra Metric 2.0 for the outline net gain strategy.</p>	<p>31/08/2021 - Natural England confirmed that the outline net gain strategy for the DCO application could remain to use the Defra Metric 2.0.</p>	<p>31/08/2021 - agreed with NE</p>

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
ON-HYD-1.1	Desk based data collection	05/04/19 - sought from stakeholders (EA) that the scope of the desk based data collection (including the data sources used) is sufficient.	05/04/19 - EA advised that they hold more models including surface water and catchment data and models which may aid the flood risk mapping. Some of the data might be larger than the project needs but it should nonetheless be included and/or incorporated where relevant to do so in the flood risk considerations. 05/04/19 - EA also flagged that potential impacts on historical assets should be considered.	05/04/19 - agreed
ON-HYD-1.2	Geomorphological survey	05/04/19 - application sought agreement that the scope of the geomorphological surveys is sufficient. Clarified to stakeholders (EA) that the purpose of baseline surveys was to characterise the geomorphological form and function of the watercourse and allow the potential impacts of temporary crossings of these features to be evaluated.	05/04/19 - EA questioned the purpose of the geomorphological surveys and agreed following explanation provided by the applicant.	05/04/19 - agreed
ON-HYD-1.3	Proposed land drainage surveys	05/04/19 - applicant sought agreement from EA that the proposed land drainage surveys are sufficient to characterise drainage issues.	05/04/19 - EA advised that this cannot be confirmed until they have had sight of the FRA	05/04/19 - remains open as FRA has not been drafted or issued.
ON-HYD-1.4	OnSS flood modelling	27/06/19 - applicant acknowledges the limitations of the EA flood modelling data and will approach National Grid to obtain their data.	27/06/19 - EA advised that the existing EA flood modelling for the OnSS is out of date (approx 15yrs old) and will therefore not be considered a robust baseline. Furthermore, the OnSS is significantly influenced by surface water flooding. EA suggested that the applicant undertakes their own modelling to reduce uncertainty. However, EA also advised that National Grid had undertaken some more recent modelling for which the applicant could seek to obtain.	27/06/19 - agreed with EA
2. Impact Assessment Methodology (including definition of terms)				
ON-HYD-2.1	PEIR/ES approach	15/01/19 - applicant advised that the definitions of receptor value and sensitivity will be based in accordance with industry guidance. All watercourses within a catchment will be assigned the highest value and sensitivity identified in that catchment. Also advised stakeholders that the hydrology and flood risk assessment will make reference to the ecology and ground conditions chapters with regards to impacts on designated sites and contaminated land.	15/01/19 - agreed with the approach presented	15/01/19 - agreed
3. Outcome of EIA				
ON-HYD-3.1	Potential impacts on water quality	15/01/19 - applicant sought agreement that potential impacts on water quality resulting from the mobilisation of soil and sediment can be scoped out provided that a commitment is made to adhere to relevant PPG. It was also agreed that impacts associated with cable decommissioning could be scoped out because the cables would be de-energised and left in situ.	15/01/19 - YIDB asked whether once the onshore cables have been decommissioned whether they may be subject to deterioration and therefore potentially cause leakage/conveyance routes and subsidence.	15/01/19 - agreed
ON-HYD-3.2	Impacts on hydrology and water quality of designated sites.	15/01/19 - applicant outlined potential impacts on hydrology and water quality associated with designated sites, specifically the River Hull Headwaters SSSI.	15/01/19 - EA advised that there would be impacts on permitting and there would be a need to consult with NE on permitting.	15/01/19 - agreed
ON-HYD-3.3	Decommissioning	05/11/19 - applicant acknowledged this	05/11/19 - IDB noted it would be preferable to remove all above ground structures during decommissioning phase.	05/11/19 - agreed
ON-HYD-3.4	Disturbance of watercourses during construction phase	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HYD-3.5	Access across watercourses during construction phase	05/11/19 - advised that this will not be considered in detail in the ES as no LSE identified at PEIR.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.6	Disturbance of minor drainage ditches during construction phase	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.7	Access across minor drainage ditches during construction	05/11/19 - advised that this will not be considered in detail in the ES as no LSE identified at PEIR.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.8	Disruption of local land drainage during construction phase	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.9	Changes in water quality during construction phase	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.10	Mobilisation of pollutants during construction	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.11	Hydrological and water quality effects on designated sites during construction phase	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.12	Alteration in run-off characteristics at OnSS	05/11/19 - advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.13	Thermal impacts on water resources during operation	05/11/19 - applicant advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.14	Impacts associated with operation	05/11/19 - applicant advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.15	Impacts associated with decommissioning (onshore ECC)	05/11/19 - applicant advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.16	Impacts associated with the decommissioning of the OnSS	05/11/19 - applicant advised that this impact has been scoped out and is not considered in detail in the ES as no LSE identified at Scoping.	05/11/19 - EA and IDB agreed	05/11/19 - EA and IDB agreed
ON-HYD-3.17	Mitigation measures for crossing designated sites or sensitive habitats	<p>01/07/20 - applicant explained that direct impacts on the SSSI are likely if no mitigation measures are put in place. However, a suite of mitigation measures have been identified, namely Co1 and Co18, to prevent impacts. Trenchless crossing techniques will be used, with HDD entry and exit pits at least 20m from SSSI and cable depth will be at least 1.2m deep. Because there would be no direct interaction with the channel, the proposed HOW04 infrastructure is not considered to have an impact on the channel, its stability and/or natural movement during struction or operation.</p> <p>More detailed geomorphological work will be undertaken to confirm mitigation measures and further work are acceptable and meet Natural England's requirements.</p> <p>NE agreed with the commitments that have been presented relating to the geomorphological and sediments and contaminates. Consideration needs to be made to the decommissioning aspect regarding long term.</p>	<p>01/07/20 - NE advised that the SSSI may be assessed as unfavourable condition on geomorphological grounds. NE advised that we need to avoid being prevented in the future in undertaking any works to improve the SSSI that may not be possible due to HOW04 being consented.</p> <p>NE advised that this part of the channel may be able to become more naturalised in the future and HOW04 should not prevent this as being possible.</p>	01/07/20 - agreed with NE

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HYD-3.18	Sediments and contaminants mitigation	<p>01/07/20 - applicant explained the potential consideration of sediment and contaminants. Fine sediments are a potentially major impact with regards to chalk rivers. Measures have been identified to control the supply of sediment and contaminants – secured through Co14 and Co124.</p> <p>No significant impact anticipated on the river from HOW04 relating to sediments and/or contaminants.</p>	<p>01/07/20 - NE happy with approach taken on the location. Risks associated with HDD (frackout, stability) need to be duly considered and mitigated for. Previous experience by NE for another project crossing the River Leven (information available via ERYC so is publicly available). Similar principles from that project will apply to the River Hull. NE advised that information will need to demonstrate how risks will be dealt with need to be considered and adequately addressed.</p>	01/07/20 - agreed with NE
ON-HYD-3.19	Dewatering	<p>01/07/20 - applicant advised that EA had already been advised that NE will need to be consulted. Applicant also confirmed that appropriate mitigation measures will be agreed with NE post consent.</p>	<p>01/07/20 - NE queried if the HDD pits will be dewatered as if this is undertaken in low flow times this will have a potentially significant impact on the SSSI. NE also advised that dewatering of HDD pits may need to be programmed to be within an agreed period to avoid potentially significant impacts on the SSSI.</p>	01/07/20 - agreed with NE
4. Commitments and/or mitigation				
ON-HYD-4.1	Commitment register and crossing schedule	<p>15/01/19 - confirmed to stakeholders that the commitment register and crossing schedule is being updated and will include confirmation that all IDB maintained watercourses will be crossed using HDD. Also advised that where HDD has not been committed to, both options of open cut/HDD or bailey bridge/culvert, will be specified.</p>	<p>15/01/19 - YIDB agreed and thanked project for committing to use HDD and for identifying them in the crossing schedule. Advised that bailey bridges and culverts used for crossings will need to be consented, and that it should be noted that there may be as much water flowing under the rivers as in the channel itself, and that this should be considered.</p>	15/01/19 - agreed
ON-HYD-4.2	Access requirements	<p>15/01/19 - noted and advised that this would be fed back to the technical team for consideration.</p>	<p>15/01/19 - YIDB explained that tracked excavators are used on IDB and EA watercourses and so it is preferable that a 9m margin around these watercourses should be maintained for HDD entry and exit pits as well as link boxes.</p>	15/01/19 - agreed
ON-HYD-4.3	Trenchless crossing techniques	<p>05/04/19 - noted and will be considered in the further development and updating of the crossing schedule.</p>	<p>05/04/19 - ERYC commented that when using trenchless techniques, ground conditions will be important. Advised that all crossings would need to be agreed with landowners as well as the consenting authority.</p> <p>05/04/19 - YIDB advised that they would prefer trenchless crossing techniques such as HDD for crossing their watercourses based on experience from other projects. Also highlighted that maintaining access would be critical for the entire period of construction.</p>	05/04/19 - agreed
ON-HYD-4.4	Over-pumping requirements	<p>05/04/19 - advised that temporary structures would be installed up and downstream of the crossing area and flows maintained through the use of a pump, pipe or flume with sufficient capacity to prevent upstream impoundment. Following trenching, the bed and banks of the watercourse would be reinstated.</p>	<p>05/04/19 - ERYC asked whether over-pumping would be required.</p> <p>05/04/19 - EA added that water from one river should not be transferred to another river or catchment, as this would increase the risk of spreading diseases and non-native species and contamination.</p> <p>05/04/19 - EA also advised that timing of crossing activities will be important as to avoid sensitive timings for fish spawning and/or nesting water fowl.</p>	05/04/19 - agreed
ON-HYD-4.5	Bentonite	<p>05/04/19 - advised that bentonite would be used, however measures will be put in place should a breakout occur.</p>	<p>05/04/19 - EA asked whether bentonite would be used and how potential breakout would be managed.</p>	05/04/19 - agreed
ON-HYD-4.6	Fire risk (OnSS)	<p>05/04/19 - advised that Orsted were aware of recent fire at Creyke Beck and that information relating to fire risk for Hornsea Four will be provided at DCO submission.</p>	<p>05/04/19 - ERYC asked whether fire risk at the OnSS had been considered.</p> <p>05/04/19 - EA asked whether ground excavation had been considered.</p>	05/04/19 - agreed
ON-HYD-4.7	Storage of materials	<p>05/04/19 - advised that the CoCP would address how soil generation will be managed and the appropriate mitigation measures that will be implemented.</p>	<p>05/04/19 - EA commented that soil storage would be critical in relation to crossing any designated sites.</p>	05/04/19 - agreed
ON-HYD-4.8	Disturbance of watercourses during installation	<p>27/06/19 - applicant advised that as per Co1, all EA main rivers and IDB drains will be crossed using HDD or other trenchless techniques. This method will avoid direct disturbance of the watercourse and in turn this impact will be scoped out of further consideration.</p>	<p>27/06/19 - EA agreed that this approach would be appropriate, providing that the commitment is set out in sufficient detail to provide reassurance that no impact would occur.</p>	27/06/19 - agreed with EA

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HYD-4.9	Disturbance of minor drainage ditches during installation	27/06/19 - applicant advised that temporary cofferdams would be installed either side of the open cut to create a dry working area. This would be removed and area reinstated following installation. Furthermore, there will be no plan to dewater groundwater.	27/06/19 - EA asked if there were any plans to dewater groundwater.	27/06/19 - agreed with attendees (EA, IDB, ERYC)
ON-HYD-4.10	Disruption of local land drainage during construction phase	27/06/19 - applicant advised on the measures that will be implemented to minimise the effects of disruption to the existing surface water drainage network.	27/06/19 - EA advised that pre and post construction drainage system would need to be agreed with the IDB as well as the EA.	27/06/19 - agreed with attendees (EA, IDB, ERYC)
ON-HYD-4.11	Mobilisation fo pollutants in the event of disturbance of contaminated soils during construction	27/06/19 - applicant advised that where high risk areas have been identified, these would be avoided in the first instance as well as including appropriate measures within the CoCP (which includes a SWMP).	27/06/19 - EA confirmed that there would be protocols and processes to cover unexpected contaminated land.	27/06/19 - agreed with attendees (EA, IDB, ERYC)
ON-HYD-4.12	Thermal impacts on fish	27/06/19 - applicant advised that the burial depth and cable insulation would minimise impacts on fish.	27/06/19 - EA questioned thermal effects on surface waters and in particular fish populations. Furthermore, agreeing the depths of the HDD would be instrumental in ensuring this impact is avoided/minimised as much as possible.	27/06/19 - agreed with attendees (EA, IDB, ERYC)
ON-HYD-4.13	OnSS permanent access track design	05/11/19 - applicant noted comments and to ensure considered within the design.	05/11/19 - EA advised that the design of the permanent access track at the OnSS should not impound or reduce the floodplain storage, i.e. it should be kept as close to existing ground levels as much as possible, or incorporating drainage to allow the water to flow in the same way across the floodplain.	05/11/19 - agreed with EA
ON-HYD-4.14	Carr Lane logistics compound	05/11/19 - applicant advised that although alternative sites for the Carr Lane logistics compound had been explored, it had not been possible to relocate it so that it is outside of Flood Zone 2/3.	05/11/19 - EA advised that where logistic compounds are located within Flood Zone 3, the project should aim to limit their use to be as temporary as possible during construction. Also the use of storage mounds should be avoided.	05/11/19 - agreed with EA
ON-HYD-4.15	Access tracks	05/11/19 - applicant advised that access tracks had been reviewed alongside the flood risk. Where the locations of the access tracks conflicted with flood zones, or where watercourses are located within 9m, the access tracks were reviewed and re-located.	05/11/19 - EA advised that a 8m buffer is sufficient for EA main rivers and 16m from tidal rivers. IDB advised that 9m is preferred by them.	05/11/19 - agreed with EA and IDB
ON-HYD-4.16	Storage of materials and stockpiling	05/11/19 - applicant advised that stockpiling in Flood Zone 2 and 3 would be avoided wherever possible, but that the areas are large and therefore the project could not necessarily commit to not stockpiling at all in these areas.	05/11/19 - EA advised that no materials are to be stockpiled in Flood Zone 2 and 3 wherever possible.	05/11/19 - not agreed
ON-HYD-4.17	Damming of watercourses	05/11/19 - applicant clarified that main river and IDB drains would not be dammed or re-routed. These would be crossed using HDD or other trenchless techniques.	05/11/19 - IDB stated that they may have concerns about damming of any watercourses not just IDB drains and main rivers, especially when water levels are high.	05/11/19 - not agreed
ON-HYD-4.18	Bentonite breakouts	05/11/19 - applicant advised that the project has committed to the production of a bentonite breakout plan and this will be agreed with all relevant stakeholders.	05/11/19 - EA asked how deep the HDD would be and the risk of a bentonite breakout.	05/11/19 - agreed
ON-HYD-4.19	Commitment wording (Co18)	05/02/20 - applicant agreed to amend wording of Co18	05/02/20 - EA requested wording of Co18 is updated to specifically name embanked watercourses along with SSSI etc.	05/02/20 - agreed
ON-HYD-4.20	Commitment wording of Co64 and Co197	15/05/20 - applicant sought agreement from EA that the wording of commitments 64 and 197 met the requirements to demonstrate and agree that impacts to the management of topsoil would not be of significant concern.	15/05/20 0 EA confirmed agreement of commitment wording	15/05/20 - agreed
4. Cumulative Assessment (including identification of project scoping in and out)				
5. Water Framework Directive (WFD)				
ON-HYD-5.1	Scope of WFD	15/01/19 - agreed and advised that a WFD will be produced and will accompany the chapter as a technical annex. The WFD will be prepared in accordance with industry guidance.	15/01/19 - EA advised that some sort of WFD will be required even if HDD is used.	15/01/19 - agreed

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
6. Flood Risk Assessment (FRA)				
ON-HYR-6.1	Scope of FRA	15/01/19 - noted the request but advised that sight of the updated guidance will be required in order for it to be incorporated.	15/01/19 - EA questioned whether the FRA would consider the new UKCP18 climate change allowances, as the EA will be publishing new allowance in Spring 2019.	15/01/19 - agreed
ON-HYD-6.2	Flood risk implications	05/04/19 - noted and will be considered within the FRA	05/04/19 - YIDB highlighted that there are potential flood risk implications of project activities across and adjacent to watercourses restricting access for maintenance. Temporary access tracks should avoid running alongside watercourses where possible.	05/04/19 - agreed
7. Post-PEIR / Pre-DCO				
ON-HYD-7.1	Potential Freeboard at the OnSS	15/05/20 - noted that there was considerable freeboard and therefore this addresses the EA concerns in relation to freeboard.	15/05/20 - EA agreed that there is sufficient natural freeboard levels within the site levels and therefore no further consideration is necessary.	15/05/20 - agreed
ON-HYD-7.2	Updated Commitments and CoCP wording	15/05/20 - noted that the CoCP needs additional wording added and some text updating to reflect EA's comments	15/05/20 - EA agreed that if text discussed is added and/or amended, they will be satisfied	15/05/20 - agreed subject to CoCP amendments
ON-HYD-7.3	Draft SoCG	15/05/20 - noted to update the SoCG with red/amber/green colour coding and to potentially include commentary explaining the colour. Impact ID's also to be included.	15/05/20 - EA agreed that if these changes are made to the SoCG then it will be easier to follow and update	15/05/20 - agreed
ON-HYD-7.4	Restoration	16/09/20 - discussion around impacts of restoration and buried cable infrastructure on bed and banks of river channels.	16/09/20 - It was agreed with Natural England that any future river restoration measures, including measures to address the pressures associated with Foston Mill Weir, are unlikely to interact with buried cable infrastructure that is offset from the bed and banks of the river channel	16/09/2020 - agreed
ON-HYD-7.5	Flood Defence Investment	07/09/21 - Applicant outlined the technical considerations regarding the depths of cables under a particular asset for the trenchless crossing – primarily influenced by soil conditions, ensuring suitable separation distance. Further details regarding the timings and methodology of the proposed flood defence works also request from the Environment Agency. Applicant stated a strong preference for the flood defence piles to be installed prior to the Hornsea Four cables, to mitigate potentially significant health and safety risks.	07/09/21 - Environment Agency advised that timings of the flood defence works are unknown and are unlikely to be known in the short-term – funding constraints were raised as a principal factor. It was acknowledged that piling is not the only construction method available to facilitate the flood defence works; however, this is dependant on ground conditions. PG noted that at a similar location, piles were installed to approximately 0 m AOD (4 m under existing ground level). Agreed that a primary focus should be on establishing whether piles will be needed for the flood defence works.	07/09/21 - agreed with Environment Agency
ON-HYD-7.6	Maximum depth of OnSS excavation	07/09/21 - Applicant advised that excavation depth for Hornsea Four is anticipated to be 3-6 m (for buildings, transformer sump and tanks), with a very small risk excavation would need to go deeper (to approximately 10m). This is dependant on the ground conditions – Hornsea Four are undertaking SI works in October and will be in a position to provide greater certainty once completed.	07/09/21 - Environment Agency highlighted that excavations associated with the nearby Dogger Bank A and B substations have been deeper than anticipated – requiring a substantial basement. It was noted that groundwater impacts must be considered adequately pre-construction.	07/09/21 - agreed with Environment Agency

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HYD-7.7	Peak Flow Allowances	<p>07/09/21 - Applicant confirmed that a review of the Environment Agency Flood Map for Planning has been undertaken and the flood risk around the Hornsea Four OnSS has not changed. There is still an area at risk of flooding along the southern boundary and in the SEsoutheast corner, which is in line with the information previously discussed with the Environment Agency in previous ETG meetings.</p> <p>Applicant confirmed that there had been no additional modelling undertaken by the EA in this area and that the 2016 Mott McDonald modelling for the Creyke Beck substation remains the most detailed modelling for this area. Applicant advised that only the modelling report / summary (as previously advised to the EA) is available; however, the report confirms that the climate change allowance utilised in the modelling is 20%.</p> <p>Applicant clarified the peak flow values applicable to this location, in light of the recent update to NPPF and the supporting guidance on climate change (varies between 9%, 17% and 37%, although 37% should be assessed as a sensitivity test). Applicant highlighted that the 2016 Mott McDonald Creyke Beck modelling utilises a more conservative scenario than the 17% 2050s High Central allowance, which should be applied to the design.</p>	<p>07/09/21 - Environment Agency agreed with values being used for peak flows and climate change variance.</p>	<p>07/09/21 - agreed with Environment Agency</p>
ON-HYD-7.8	Peak Flow Allowances - freeboard at the OnSS	<p>07/09/21 - Applicant noted that although the allowance used in the modelling is less than the 37% for sensitivity testing Hornsea Four OnSS is sufficiently elevated within FZ1 that it is unlikely to change the outcomes of the previous assessment.</p>	<p>07/09/21 - Environment Agency confirmed that the surrounding area is very flat and low-lying such that the freeboard to the OnSS should be sufficient to ensure flood risk associated with the 37% climate change value is unlikely to affect the OnSS.</p>	<p>07/09/21 - agreed with Environment Agency</p>
ON-HYD-7.9	Peak Flow Allowances - flood mapping	<p>07/09/21 - Applicant confirmed that a review of the mapping for the updated East Riding of Yorkshire Council Level 1 Strategic Flood Risk Assessment (2019) has been undertaken, including a review of the layer entitled "Indicative climate change extent of areas not covered by detailed modelling". Applicant confirmed that this mapping shows the flood extent relevant to the OnSS in the future is similar to the current Flood Zone 2 i.e. limited to the southern boundary and SE corner.</p> <p>Applicant advised that on the basis of the above, despite updates to the information available, there is no change to the present and future flood risk in this location.</p>	<p>07/09/21 - Environment Agency agreed that as it has been demonstrated previously that the OnSS site will be elevated (with a 2-3m of freeboard allowance) (via the position paper entitled Hydrology and Flood Risk - Assessment of modelled water levels for Onshore Substation and attenuation feature Position Paper(insert reference)), no modelling is required. It was agreed that the position paper can be updated and appended to the FRA to support the DCO application.</p>	<p>07/09/21 - agreed with Environment Agency</p>

Hydrology & Flood Risk

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HYD-7.10	Withdrawal of flood defences and flood defence investment	<p>07/09/21 - Applicant explained that once cables are installed, an increase in flood frequency should not have a negative impact on the cables. Regarding construction phase impacts, it was acknowledged that construction drainage needs to have some consideration for the current state of defences</p> <p>Applicant outlined that the Hornsea Four impact assessment has been completed assuming no flood defences, so this is not considered to be a problem.</p> <p>Applicant clarified that the location of link boxes would need to be carefully considered to be located away from areas of flood risk where possible, whilst ensuring access is retained.</p> <p>Applicant clarified that as there are no formal flood defences around the OnSS, this matter is not relevant to that aspect of the impact assessment. In addition, the OnSS is elevated.</p>	<p>07/09/21 -Environment Agency explained the funding issues (notably the lack of funding for flood defences that do not protect residential properties).</p> <p>Environment Agency advised that it cannot be guaranteed that flood defences will not fail.</p> <p>Environment Agency noted that there are multiple abstraction points in the area surrounding the OnSS and that Hornsea Four should be cautious of springs.</p> <p>Environment Agency agreed that no changes are required to the impact assessment presented in the Hydrology & Flood Risk chapter of the ES.</p>	<p>07/09/21 - agreed with Environment Agency</p>

Historic Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Pre-scoping				
ON-HIS-1.1	Nature of the proportionate approach to scoping	11/09/18 - proportionate approach to be adopted for the EIA, in line with current EIA regulations	11/09/18 - for the historic environment topic this will be represented through the presentation of information in the PEIR and the final ES. Presentation will take the form of a main chapter and appendices	11/09/18 - all in agreement
ON-HIS-1.2	Proposed assessment methodology	11/09/18 - method of assessment based on guidance provided by the Design Manual for Roads and Bridges, support by relevant guidance from the Chartered Institute for Archaeologists and Historic England.	11/09/18 - noted that the regional research framework for Yorkshire would be used where possible to support assessment	11/09/18 - all in agreement
ON-HIS-1.3	Scoped out impacts	11/09/18 - direct impacts on designated sites	n/a	11/09/18 - all in agreement
2. Data Collection and Description of Baseline Environment				
ON-HIS-2.1	Baseline data sets	16/01/19 - advised that the HLC dataset would be requested from Humber HER and incorporated into the historic environment baseline data.	16/01/19 - HCC mentioned that the acquisition of HLC data was included in their scoping opinion and stated that the National Mapping Projects data for the area may only be point data, as line data is not always available.	16/01/19 - agreed
ON-HIS-2.2	Accuracy of baseline data sets	16/01/19 - noted and agreed to address when the information is re-presented.	16/01/19 - ERYC pointed out that the designated heritage data scheduled monument data in the scoping report were offset.	16/01/19 - agreed
ON-HIS-2.3	Non-designated asset data set	16/01/19 - applicant noted and advised that the temporary works areas would be viewed in the same way as the permanent footprint of the cable corridor.	16/01/19 - ERYC do not hold a list of non-designated sites as these would be identified through the development process. ERYC added that they would not have any issues with the temporary effects resulting from the cable corridor but the OnSS and Creyke Beck substation would be of greater interest. In particular, the presence of unlisted historic farmsteads in this area. Also advised that the construction compound and storage areas should be investigated as to the effects of compaction on potential archaeological sites.	16/01/19 - agreed regarding temporary effects on potential archaeological sites along the cable corridor. 16/01/19 - no agreement noted regarding compaction on potential archaeological sites.
ON-HIS-2.4	ZTVs	16/01/19 - applicant advised that ZTVs will be undertaken for the OnSS and will be used to inform the assessment. Applicant also advised that any non-designated sites would be included in the ZTV.	16/01/19 - HE asked whether ZTVs would be carried out for the OnSS.	16/01/19 - agreed
ON-HIS-2.5	Baseline data sets (enclosure records)	16/01/19 - noted and agreed	16/01/19 - ERYC suggested the enclosure records which would give a historic record of how the lay of the land had changed over time are looked at.	16/01/19 - agreed
ON-HIS-2.6	Geophysical survey	16/01/19 - advised that a geophysical survey effort would be undertaken in the landfill search area and OnSS with a targeted effort at specific areas along the cable corridor. These targeted areas would be identified through the findings of the desk based assessment.	16/01/19 - HE questioned the reasoning behind the trial trenching position as it would be seen that these should be undertaken at this time.	16/01/19 - agreed regarding scope of geophysical survey extent. 16/01/19 - agreed that trial trenching will be undertaken post-application.
ON-HIS-2.7	Baseline survey (historical assets)	02/04/19 - sought agreement on methodology that will be followed when surveying all heritage assets (e.g. setting assessment).	02/04/19 - ERYC confirmed scope of baseline survey as being appropriate.	02/04/19 - agreed on scope and methodology used for historic walkover surveys.
ON-HIS-2.8	Baseline survey (geophysical survey)	02/04/19 - sought agreement on scope and methodology of priority geophysical survey effort.	02/04/19 - Priority geophysical survey scope agreed and that magnetometers will be used. Query raised on whether an archaeologist would be on site during construction. It was agreed that this is not a matter to be agreed at this time.	02/04/19 - agreed
ON-HIS-2.9	Proposed scope of study area	02/04/19 - sought agreement of the proposed study area for informing the baseline of known heritage and in turn to form the basis of the EIA.	02/04/19 - scope and approach to historic assessment agreed.	02/04/19 - agreed
ON-HIS-2.10	Historic environment baseline survey scopes and methodologies	14/11/19 - Applicant provided a detailed overview of the historic environment baseline updates that had been undertaken. These included AP&Lidar, Priority geophysical survey and DBA (including a setting assessment). The Applicant advised that findings from all baseline surveys would be used to inform the ES assessment and all surveys were undertaken in accordance with industry guidance and as previously presented to stakeholders at previous technical panel meetings.	14/11/19 - Historic England welcomed the projects commitments and baseline surveys that had been undertaken to date.	14/11/19 - agreed with Historic England
ON-HIS-2.11	Baseline data validity (2021)	26/05/21 - Applicant provided a a baseline validity position paper to set out their approach to updating the baseline for the onshore Historic Environment assessment (where necessary).	02/06/21 - Historic England, HCC and HAP is content to agree with the suggested Next Steps, and will be ready to provide their advice on all subsequent heritage related project documents when they are circulated for comment.	02/06/21 - agreed with Historic England, HCC and HAP
3. Impact Assessment Methodology (including definition of terms)				
4. Commitments and/or mitigation				
ON-HIS-4.1	Outline WSI	14/11/19 - the Applicant discussed the outline WSI, including a run through of the suggested structure. The evaluation approach and mitigation approaches were identified and explained to stakeholders, advising that a draft outline WSI will be issued for review and comment once it had been prepared. The Applicant requested confirmation from stakeholders that the WSI which had been previously agreed for the pre-application priority geophysical survey to be appended to the outline WSI to support the DCO application.	14/11/19 - County archaeologist confirmed and accepted proposed approach.	14/11/19 - agreed
ON-HIS-4.2	Site specific WSI	14/11/19 - applicant explained that survey specific WSIs will be produced for the evaluation stage and a single main WSI will be provided detailing the mitigation requirements. It was highlighted that the applicant will not intend to create individual site specific WSIs for the mitigation stage; however if necessary, method statements could be produced for specific sites where archaeological evaluation is required.	14/11/19 - County archaeologist enquired whether site specific WSIs would be completed.	14/11/19 - agreed
5. Outcome of EIA				
ON-HIS-5.1	Proportionate EIA and scoping out of impacts	02/04/19 - advised that due to the project commitments, i.e. avoidance of all designated assets, direct impacts on designated heritage assets is proposed to be scoped out and not formally assessed. Designated assets will still be presented as part of the baseline and justification for why they are not being formally assessed will be presented.	02/04/19 - HE were not in attendance at this meeting and therefore follow up with them will be undertaken outside of this meeting.	02/04/19 - not agreed as discussions remain ongoing.

Historic Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HIS-5.2	Decommissioning impacts	02/04/19 - raised the matter of additional matters being previously scoped in to the assessment with respect to decommissioning activities.	02/04/19 - agreed in principle of the approach presented as long as the working area is largely similar to construction activities, an assessment may not be required.	02/04/29 - agreed
ON-HIS-5.3	Section 42 responses	14/11/19 - applicant presented the s42 comments and responses whilst noting that no response had been received from the Humber Historic Environment Record.	14/11/19 - Historic England advised that he had discussed the PEIR document with Lucie McCarthy and that no issues had been raised.	14/11/19 - agreed with Historic England and County Archaeologist
ON-HIS-5.4	I&E register	14/11/19 - applicant explained the purpose of the I&E register and how impacts assessments from the ES would be removed where no significant effects were identified at PEIR. It was noted that this is subject to no material changes to the project which would affect the impact assessment undertaken. The applicant explained the I&E register and all impacts within the document, noting all indirect impacts are intended to be removed from the ES chapter as the refinement to the order limits have no material changes to the outcome of the impact assessment presented at PEIR.	14/11/19 - Historic England noted the difference between indirect and direct impacts, clarifying that significant effect does not always align with not having an effect on the significance of an asset. Historic England subsequently agreed that they can only agree with the substance of the proposition if indirect impacts does not directly equate to impacts within the setting of designated and non designated heritage assets. Impacts within the setting of heritage assets, especially during the operational phase, can have a direct effect on the significance of those heritage assets. The key will always be that the significance of designated and undesignated heritage assets is assessed, the contribution that setting makes to that significance is assessed and understood, and thereafter the impact of x on that significance is understood and then removed, moderated or mitigated.	14/11/19 - agreed with Historic England and County Archaeologist
6. Cumulative Assessment (including identification of project scoping in and out)				

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
1. Data Collection and Description of Baseline Environment				
ON-HUM-1.1	Driver delay on local roads	07/01/19 - applicant advised that PINS had agreed that driver delay on local roads can be scoped out of the assessment and explained that the feasibility of access for HGVs and abnormal loads is the key matter to focus on – inclusive of the geometric and structural capability of roads to support heavy loads.	07/01/2019 - ERYC agreed with this approach	07/01/19 - agreed
ON-HUM-1.2	Severance	07/01/19 - context to the PINS scoping opinion was provided and noted that when the IEMA severance screening threshold is to be used, very few if any links will require an assessment. Therefore, the IEMA thresholds will therefore be used to screen out the assessment by providing a suitable evidence base.	07/01/19 - ERYC highways agreed with this approach	07/01/19 - agreed
ON-HUM-1.3	Public Rights of Way (PRoW)	07/01/19 - agreed with approach	07/01/19 - ERYC RoW team advised that all proposed rerouting and disruption to PRoWs should be included within the DCO application.	07/01/19 - agreed
ON-HUM-1.4	Amenity assessment	07/01/19 - explained that pedestrian amenity would be reviewed only where there is demand and noted that IEMA guidance would be used to undertake a qualitative approach.	07/01/19 - ERYC agreed with approach and to provide a list of sensitive areas for consideration in the amenity assessment.	07/01/19 - agreed
ON-HUM-1.5	Baseline noise survey	07/01/19 - presented the proposed approach to noise surveys and that short-term noise surveys will only be undertaken.	07/01/19 - ERYC agreed in principle and requested to review and approve the noise survey methodology and proposed survey locations.	07/01/19 - agreed
ON-HUM-1.6	Air quality evidence base	07/01/19 - applicant provided a summary of the AQ section of the Scoping Report and the subsequent Scoping Opinion from PINS. It was agreed that for all potential effects associated with air quality, an improved evidence base would be developed to support the intention to scope all assessments out of the PEIR and ES. It was agreed that operational activities would not require assessment within the PEIR or ES.	07/01/19 - ERYC agreed on the approach to improving the evidence base. ERYC also agreed that operational activities would not be considered in the PEIR or ES.	07/01/19 - agreed
ON-HUM-1.7	PRoW baseline data	01/05/19 - the applicant explained the data sources that had been used to obtain data relating to the PRoWs within the project's order limits.	01/05/19 - ERYC agreed with data sources that had been used and confirmed no additional routes had been identified.	01/05/19 - agreed
ON-HUM-1.8	Traffic study area and construction access points	01/05/19 - requested agreement that the proposed access locations and in turn the study area is appropriate.	01/05/19 - ERYC highways advised that the B1236 to the east of Beverley should be added to the study area as this road is often used to avoid the A164. ERYC agreed that with the exception of this additional road, the study area presented is appropriate.	01/05/19 - agreed
ON-HUM-1.9	Gathering and factoring baseline traffic flows	01/05/19 - applicant advised that it is proposed to use TEMPro to factor traffic flows to future years.	01/05/19 - ERYC highways agreed	01/05/19 - agreed
ON-HUM-1.1	Driver delay on local roads	07/01/19 - applicant advised that PINS had agreed that driver delay on local roads can be scoped out of the assessment and explained that the feasibility of access for HGVs and abnormal loads is the key matter to focus on – inclusive of the geometric and structural capability of roads to support heavy loads.	07/01/2019 - ERYC agreed with this approach	07/01/19 - agreed
ON-HUM-1.2	Severance	07/01/19 - context to the PINS scoping opinion was provided and noted that when the IEMA severance screening threshold is to be used, very few if any links will require an assessment. Therefore, the IEMA thresholds will therefore be used to screen out the assessment by providing a suitable evidence base.	07/01/19 - ERYC highways agreed with this approach	07/01/19 - agreed
ON-HUM-1.3	Public Rights of Way (PRoW)	07/01/19 - agreed with approach	07/01/19 - ERYC RoW team advised that all proposed rerouting and disruption to PRoWs should be included within the DCO application.	07/01/19 - agreed

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-1.4	Amenity assessment	07/01/19 - explained that pedestrian amenity would be reviewed only where there is demand and noted that IEMA guidance would be used to undertake a qualitative approach.	07/01/19 - ERYC agreed with approach and to provide a list of sensitive areas for consideration in the amenity assessment.	07/01/19 - agreed
ON-HUM-1.5	Baseline noise survey	07/01/19 - presented the proposed approach to noise surveys and that short-term noise surveys will only be undertaken.	07/01/19 - ERYC agreed in principle and requested to review and approve the noise survey methodology and proposed survey locations.	07/01/19 - agreed
ON-HUM-1.6	Air quality evidence base	07/01/19 - applicant provided a summary of the AQ section of the Scoping Report and the subsequent Scoping Opinion from PINS. It was agreed that for all potential effects associated with air quality, an improved evidence base would be developed to support the intention to scope all assessments out of the PEIR and ES. It was agreed that operational activities would not require assessment within the PEIR or ES.	07/01/19 - ERYC agreed on the approach to improving the evidence base. ERYC also agreed that operational activities would not be considered in the PEIR or ES.	07/01/19 - agreed
ON-HUM-1.7	PRoW baseline data	01/05/19 - the applicant explained the data sources that had been used to obtain data relating to the PRoWs within the project's order limits.	01/05/19 - ERYC agreed with data sources that had been used and confirmed no additional routes had been identified.	01/05/19 - agreed
ON-HUM-1.8	Traffic study area and construction access points	01/05/19 - requested agreement that the proposed access locations and in turn the study area is appropriate.	01/05/19 - ERYC highways advised that the B1236 to the east of Beverley should be added to the study area as this road is often used to avoid the A164. ERYC agreed that with the exception of this additional road, the study area presented is appropriate.	01/05/19 - agreed
ON-HUM-1.9	Gathering and factoring baseline traffic flows	01/05/19 - applicant advised that it is proposed to use TEMPro to factor traffic flows to future years.	01/05/19 - ERYC highways agreed	01/05/19 - agreed
ON-HUM-1.10	Traffic links	01/05/19 - applicant advised that 5 years of collision data has been requested for all roads within the current study area. Applicant then presented all of the indicative access points (north to south) to highlight key areas of interest of which local highways input would be beneficial. These comprise accesses in proximity to: <ul style="list-style-type: none"> •Fraisthorpe; •Boston on the Wolds; and •Button Cranswick. Applicant requested confirmed from ERYC as to whether any additional links require surveying.	01/05/19 - ERYC highways confirmed that the main links are covered in the transport assessment and no additional links are necessary,	01/05/19 - agreed
ON-HUM-1.11	Critical transport junctions	01/05/19 - requested agreement of any additional critical junctions to the A165/B1249 that required consideration.	01/05/19 - ERYC explained that during the peak summer season, the Fraisthorpe junction with the A165 can experience delays associated with beachfront parking and requested that this junction is also considered.	01/05/19 - agreed
ON-HUM-1.12	Baseline survey (transport - Highways England)	05/09/19 - agreement sought on transport study area.	05/09/19 - Highways England confirmed study area is appropriate as it covers the main A63/A15/A164 junction and anything beyond this junction would be predominately through traffic.	05/09/19 - agreed
ON-HUM-1.13	Extension of study area	05/12/19 - agreement sought from HCC on the traffic & transport study area	05/12/19 - HCC requested that the initial traffic and transport study area also be extended to include roads within their administration area.	05/12/19 - agreed VIA EMAIL

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-1.14	LVIA position paper	22/05/19 - agreement sought on the LVIA position paper with HE, NE, HCC and ERYC	<p>22/05/19</p> <p>HE response: The bulk of the LVIA document is fine, although I would say that for any assessment of a tall structure in a largely flat landscape we would require a dynamic assessment of the site rather than an assessment solely taken from fixed points. Understanding the impact of a proposal as one moves through the landscape is an important aspect of assessing impact and possible harm. The suggested size of the search areas is fine.</p> <p>NE response: <ul style="list-style-type: none"> • Considering the onshore corridor, as the cable route is located outside of a nationally designated landscape and some distance from Flamborough Head Heritage Coast, Natural England does not have any comments on the landscape effects of the scheme. This is in line with our Operational Standard. • However considering offshore infrastructure, Natural England has provided some comments at the scoping stage regarding the turbines and their potential effect on the setting of the Flamborough Head Heritage Coast. The LVIA position paper sent only addresses the onshore cable route and so we would like to query if there are any updates on the effects from the offshore turbines. Hornsea Four will engage with Natural England on the SLVIA. </p> <p>HCC don't consider there will be any issues regarding landscape and visual impact.</p> <p>ERYC response: <ul style="list-style-type: none"> • The decision to separate the SLVIA and LVIA appears to make sense, and the rationale for doing so is reasonable. Also noted is the idea to provide mitigation evidence where effects have been scoped out • The position paper identifies that the methodology for the assessment will conform to current guidance, including the Landscape Institute/EMA (2013) Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLIVA). This is important and will help to ensure that the assessment is undertaken using a consistent, standardised methodology and is in accordance with current and emerging recognised guidance. The assessment also identifies the updated East Riding of Yorkshire Landscape Character Assessment, and this will provide particularly useful baseline information regarding local and wider landscape character in the area and, more specifically, offer a suitable basis upon which to assess the impacts on those Landscape Character Areas that are likely to be affected by the proposed development. • The study areas proposed for both the cable corridor (2km) and the substation (5km) appear to be suitable. The position paper also sets out a series of proposed viewpoint locations to be used to inform the appraisal. These appear to be from a suitable geographic spread, and from a broad range of aspects and distances. They also, based on the outline descriptions provided, appear to cover locations that are representative, specific and illustrative, as recommended in GLVIA3. </p>	22/05/19 - agreed VIA EMAIL
ON-HUM-1.15	Human health monitoring requirements	17/01/20 - agreement sought on requirement for (or not) of health monitoring measures. However, justification for the reasons why would be presented in the ES.	17/01/20 - PHE advised that this reference in their consultation response is standard and that there would be no requirement for specific health monitoring measures to be undertaken for the project. Furthermore advised that all mitigation measures are to be detailed (and in turn) secured within the CoCP.	17/01/20 - agreed
ON-HUM-1.16	Baseline data validity (2021)	26/05/21 - Applicant provided a a baseline validity position paper to set out their approach to updating the baseline for the onshore noise and vibration assessment (where necessary).	03/09/21 - The Public Protection manager has confirmed that he is happy with the noise position paper and therefore ERYC can confirm that the Council is satisfied with this aspect of the proposal.	03/09/21 - agreed with ERYC
ON-HUM-1.17	Baseline data validity (2021) for traffic and transport	14/05/2021 - Applicant provided a baseline validity position paper to ERYC	27/05/2021 - ERYC confirmed agreement on the issued traffic and transport position paper.	27/05/2021 - agreed with ERYC

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
2. Impact Assessment Methodology (including definition of terms)				
ON-HUM-2.1	Distribution of HGV traffic from the south on the A164 towards Hull	01/05/19 - sought agreement on the assumptions made in distribution of HGV traffic from the south on the A164 towards Hull.	01/05/19 - ERYC highways confirmed that this is an appropriate assumption. It was acknowledged that a worst-case assumption for HGCs to originate from the A63 and travel north on the A165. It was also agreed that traffic movements from any local suppliers (such as quarries) within the study area would be captured within the existing permissions and would therefore not require assessment. 05/12/19 - HCC confirmed agreement	01/05/19 - agreed 05/12/19 - agreed
ON-HUM-2.2	Distribution of employee traffic	01/05/19 - applicant confirmed for the PEIR assessment, a worst-case scenario of construction employees driving directly to each individual access would be assumed and modelled.	01/05/19 - ERYC highways agreed approach taken.	01/05/19 - agreed
ON-HUM-2.3	Approach to road safety	01/05/19 - explained that due to the extent of the study area, the road safety review (presented in the PEIR and ES) will first seek to identify those roads that have collision rates above or close to the national average for comparable road types. Where roads have collision rates above or close to the national average, a further detailed review of the collisions along these roads will then be undertaken to establish any trends that could be exacerbated by the project. The findings of which will be presented in the PEIR and/or ES.	01/05/19 - ERYC highways agreed approach taken.	01/05/19 - agreed
ON-HUM-2.4	Approach to managing the passing of two vehicles, in particular the promotion of escort/pilot vehicles	01/05/2019 - advised that Hornsea Four will not be providing that level of detail at the moment but would provide typical priority junction layouts for all accesses.	01/05/19 - ERYC highways confirmed that the principles of the proposed approach are appropriate. Also highlighted that to help highlight accesses distance warning signs are installed for some lins affected.	01/05/19 - agreed
ON-HUM-2.5	Capacity assessments for junctions on the A63/A1033	05/09/19 - agreement sought on capacity assessment taken for the junctions on the A63/A1033.	05/09/19 - Highways England identified that a capacity assessment for the A63/A15/A164 junction may be required but these will be dealt with post consent.	05/09/19 - agreed
ON-HUM-2.6	Approach to road safety assessment	05/09/19 - agreement sought on approach taken in respect to road safety.	05/09/19 - Highways England agreed with approach taken.	05/09/19 - agreed
ON-HUM-2.7	Presentation of transport assessment	05/09/19 - agreement sought on presentation of transport assessment at DCO application, i.e. that it will be contained within the ES chapter and supporting technical annex. A copy of the excel spreadsheet detailing the traffic flow derivation was provided to Highways England.	05/09/19 - Highways England confirmed that this is appropriate as long as the chapter includes everything typically detailed within a transport assessment. If Hornsea Four could share an excel spreadsheet detailing the traffic flow derivation, it would make interpretation of the methodology and numbers easier.	05/09/19 - agreed
ON-HUM-2.8	Approach to assessment (presented at PEIR) and extension to study area	02/10/19 - applicant provided an overview of the traffic and transport assessmnet, detailing the study area and an explanation of how traffic levels have been derived for both HGVs and employee movements. Applicant also provided a summary of the approach taken to the derivation and distribution of onshore construction traffic as previously agreed with ERYC (second Human Environment Technical Panel of the 1 May 2019). Applicant also clarified that detail regarding traffic derivation and distribution was presented in a technical annex to the PEIR. A summary of how the peak daily flows have been established and noted that significant contingency has been accounted for, which has resulted in a worst-case assessment. Applicant advised that it is anticipated that through refinement to some of the worst-case engineering assumptions that these peak traffic flows will be reduced for the DCO submission.	02/10/19 - ERYC highways identified that HGVs travelling from the ports in Hull could also travel via the A165 (rather than the A164) to the east of Hull to link with the A1035 near Leven. Therefore, it was requested that the transport study area to be extended to encompass the A165 south from the A1035.	02/10/19 - agreed

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-2.9	HGV movements and junctions to be included in assessment	01/06/2020 - Applicant provided a draft oCTMP to HCC for review and confirmation of any additional junctions that needs to be included within the assessment, as well as advising on any additional HGV monitoring requirements.	01/06/2020 - HCC reviewed oCTMP and advised on additional junctions to be included within the assessment.	
3. Commitments and/or mitigation				
ON-HUM-3.1	Noise complaints procedure	07/01/19 - advised that a complaints procedure will be prepared and will be in line with industry guidance (BS 5228).	07/01/19 - ERYC EHO advised that a complaints procedure will need to be implemented.	07/01/19 - agreed
ON-HUM-3.2	Commitments register	01/05/19 - the use of primary mitigation secured within the commitments register was explained and acknowledged and identified as a key attribute of the route planning an site selection process. This was for all human environment topics.	01/05/19 - approach agreed	01/05/19 - agreed
ON-HUM-3.3	PRoW mitigation measures	01/05/19 - applicant confirmed that Hornsea Four intends to work with stakeholders and the local community to build upon and improve and PRoWs that are permanently disrupted by Hornsea Four. ERYC and local parish councils will be engaged as part of this process. 29/10/19 - permanent PRoW diversions for Skidby Footpath No.16 and Rowley Bridleway No. 13 presented and agreed.	01/05/19 - ERYC advised that management measures will need to be looked at on a case by case basis.	01/05/19 - yet to be agreed
ON-HUM-3.4	Highway movement timings	05/09/19 - a commitment to avoid peak hours would be unlikely at this stage. Applicant advised that the peak hour HGV movements through the A63/A15/A164 junction could significantly reduce once a contractor has been appointed. Therefore requested to agree that modelling of peak hour construction traffic impacts on this junction to form part of the CTMP.	05/09/19 - Highways England agreed with approach.	05/09/19 - agreed
ON-HUM-3.5	Highway mitigation works	02/10/19 - explained the locations where the existing highway is narrow and therefore where mitigation measures/road safety measures will be required. Such measures include road widening, new passing places, improvements to existing passing places and the use of a pilot/escort vehicle. It is also proposed that the final measures will be agreed with ERYC post consent and once a contractor is appointed.	02/10/19 - ERYC agreed with approach.	02/10/19 - agreed
ON-HUM-3.6	PRoW mitigation at the landfall	29/10/19 - applicant advised that following stakeholder engagement the southern landfall site has been selected, reducing red line boundary area and moving the landing point away from the Cow Shed Tea Shop and associated recreational usage to the north. Trenchless technology will be committed to at landfall, removing the option to utilise open cut techniques and avoiding routine closure on the beach – with only emergency access required to the beach itself during construction.	29/10/19 - ERYC agreed with approach	29/10/19 - agreed subject to agreement of meeting minutes
ON-HUM-3.7	PRoW disruption and management measures	29/10/19 - applicant explained that impacts relating to PRoW disruption will be likely to be experienced during ground preparation, haul road construction and then trenching works. Trenching activities would cover up to approximately 700m a day. This disruption would be for no longer than three months at one point. The applicant advised that the project teams generic approach would be to stop up the PRoW, with adequate warning but not to implement specific diversions. Should PRoW with heavy use be identified, a diversion could be required. A number of PRoW would be crossed using trenchless techniques due to proximity to roads, access tracks of field drains and so would not be stopped up and so were not discussed further.	29/10/19 - ERYC advised that where the PRoW would cross, it would be ideal to leave 2 m gap in bunds to avoid public access over bunds and clear location for access gates to be added.	29/10/19 - agreed subject to agreement of meeting minutes

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-3.8	HGV movements (oCTMP)	<p>29/04/20 - Section 2 of the oCTMP explained the measures that will be implemented to control HGV movements on specific road links and access points. Routeing will be secured via temporary signing, to be agreed with ERYC pre-construction. Each supplier would also be issued specific delivery instructions to avoid alternative routes being used.</p> <p>An identifier (e.g. contractor logo) would be proposed in the HGV cab to clearly indicate to members of the public that the vehicles are working on Hornsea Four, to allow for direct contact with the contractor.</p> <p>The movement of abnormal loads for both the OnSS and onshore ECC have been left separated from the oCTMP process as they are covered by separate statutory (ESDAL) process.</p>	29/04/20 - agreed by ERYC	29/04/20 - agreed by ERYC
ON-HUM-3.9	Employee movements	<p>29/04/20 - applicant outlined that the construction employee traffic management measures will include the promotion of car sharing and walking and cycling will not be discouraged. Lockers and welfare facilities will be provided. Furthermore, appropriate loading and parking areas will be provided to avoid parking on the street.</p>	29/04/20 - agreed by ERYC	29/04/20 - agreed by ERYC
ON-HUM-3.10	Traffic management mitigation measures	<p>29/04/20 - applicant advised that the package of access and road crossing designs would be provided post consent and pre construction of the relevant part of the construction works.</p>	29/04/20 - agreed by ERYC	29/04/20 - agreed by ERYC
ON-HUM-3.11	Road improvement works	<p>29/04/20 - applicant advised that there will likely be a requirement for some road improvement works, or introduction of management measures such as the use of pilot vehicles.</p>	29/04/20 - agreed by ERYC. ERYC also advised that they typically use Section 62 for the offsite works for highway upgrade works.	29/04/20 - agreed by ERYC
ON-HUM-3.12	Driver delays	<p>29/04/20 - applicant advised that detailed modelling would not be undertaken pre-application and this would be undertaken once firmer and final traffic numbers, routes and peak hours are known.</p>	29/04/20 - agreed by ERYC	29/04/20 - agreed by ERYC
3. Outcome of EIA				
ON-HUM-3.1	Driver delays	<p>07/01/19 - advised that PINS had agreed that driver delay on local road can be be scoped out of the assessment and explained that the feasibility of access for HGVs and abnormal loads is the key matter to focus on.</p>	07/01/19 - ERYC highways agreed.	07/01/19 - agreed
ON-HUM-3.2	Operation and maintenance	<p>07/01/19 - explained that Hornsea Four would not generate enough vehicles to require an assessment. Therefore, this would be scoped out from any further consideration.</p>	07/01/19 - ERYC highways agreed.	07/01/19 - agreed
ON-HUM-3.3	Decommissioning impacts	<p>07/01/2019 - highlighted that PINS confirmed that traffic effects from decommissioning activities can be scoped out.</p>	07/01/19 - ERYC highways agreed.	07/01/19 - agreed
ON-HUM-3.4	Assessment of construction traffic	<p>07/01/19 - applicant summarised the PINS comments and provided some context as to the origin of the comment to 'assess construction traffic generation'. It was confirmed that effects of construction traffic on the highway network will be assessed within the PEIR and ES.</p>	07/01/19 - ERYC highways agreed.	07/01/19 - agreed
ON-HUM-3.5	Noise from temporary construction compounds	<p>07/01/19 - explained that the noise impacts from the temporary construction compounds would be scoped out.</p>	07/01/19 - ERYC EHO confirmed approach.	07/01/19 - agreed
ON-HUM-3.6	Operational impacts on air quality receptors	<p>07/01/19 - explained that operational activities would not require assessment.</p>	07/01/19 - ERYC EHO confirmed approach.	07/01/19 - agreed
ON-HUM-3.7	Impacts on current land use practices	<p>07/01/19 - sought agreement and/or highlighting of concerns about the impacts of the project on the current land use practices.</p>	<p>01/05/19 - ERYC highlighted that the DCO will need to include all details on proposed approaches to PRoW disruption. ERYC also advised that cycle route 1 is used frequently and its operation should be maintained. PRoW SKID10 leading to SKID11 and SKID12 are the most popular PRoW routes. Helping to upgrade footpaths would be welcomed.</p>	01/05/19 - agreed

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-3.8	Transportation of offshore infrastructure	01/05/19 - applicant requested confirmation that the ERYC scoping opinion on the transportation of offshore infrastructure on the highway network can be scoped out. This is due to the uncertainty around the port selection during the pre-application process.	01/05/19 - ERYC confirmed that this was appropriate and that the scope of assessment (effects scoped in and scoped out) outlined is agreed.	01/05/19 - agreed by ERYC
ON-HUM-3.9	Transport access and crossing locations (including access concept drawings)	<p>02/10/19 - applicant provided an overview of all the proposed access and crossing locations working from landfall and moving south towards the OnSS. For those locations where changes to access and crossing locations are proposed for the DCO (from those included within the PEIR), these were individually presented and explained.</p> <p>As each of the access and crossing locations was presented individually, ERYC was asked for any concerns or requests for each individual access and/or crossing location.</p> <p>Applicant advised that preliminary access concept drawings will be provided at DCO application. It was also advised that detailed access designs for each access would be developed post consent and agreed with ERYC through the development of the CTMP.</p>	<p>02/10/19 - no issues or concerns raised by ERYC and therefore agreement obtained.</p> <p>02/10/19 - ERYC highways agreed with approach and would be happy to see plans prior to the formal submission of them.</p>	02/10/19 - agreed
ON-HUM-3.10	Monitoring of road (condition surveys)	29/04/20 - applicant explained that the condition surveys are proposed to be undertaken on roads not designed to take HGV traffic, omitting the majority of A and B roads. Applicant also advised that a video capture survey will be undertaken, the approach to which will be agreed ERYC.	29/04/20 - ERYC queries if a video capture survey would be used. Also advised that the A and B roads would be designed to cope with HGV traffic demand and would not require a survey. Requested for a road sweeper to be added to the oCTMP.	29/04/20 - agreed by ERYC
ON-HUM-3.11	Lockington junction requirements	12/05/2021 - Applicant sought views of ERYC in relation to HGV movements along Station Road		
ON-HUM-3.12	Draft DCO documents relating to traffic and transport	19/05/2021 - Applicant issued draft oCTMP, ES chapter and technical annex		
4. Cumulative Assessment (including identification of project scoping in and out)				
ON-HUM-4.1	Cumulative schemes for transport assessment	07/01/19 - requested ERYC to advise on potential projects known to them for which should be included and/or considered within the Hornsea Four CEA.	07/01/19 - ERYC advised the proposed upgrade works to A164/Jocks Lodge scheme and that it should be included in the Hornsea Four CEA list of projects. Additional projects also identified and ERYC to provide a complete list for inclusion in the Hornsea Four CEA.	07/01/19 - agreed
ON-HUM-4.2	Approach to CEA for transport assessment	05/09/19 - agreement sought on whether a detailed CEA is required for the ES or could potential traffic impacts be managed through the co-ordination of activities within the respective CTMP once greater certainty regarding the timing of construction works and supply chains are known?	05/09/19 - Highways England confirmed that the approach presented is acceptable and that it would be appropriate to manage the potential for cumulative impacts through the respective CTMPs. Also agreed that both the HGV and employee traffic during construction can be detailed in the same CTMP.	05/09/19 - agreed
ON-HUM-4.3	Cumulative schemes for transport assessment	02/10/19 - it was discussed with ERYC that Jocks Lodge and Castle Street Improvement highway schemes should be included as CEA projects. Advised that meeting with Highways England had been held in relation to the Castle Street Improvement scheme where it had been agreed that no formal assessment will be required. Sought agreement from ERYC that this principle could also be applied for the Jocks Lodge Scheme.	02/10/19 - ERYC confirmed this approach would be acceptable.	02/10/19 - agreed

Human Environment

ID	Issue on which the Applicant seeks agreement	Applicant Comments	Technical Panel Member Comments	Agreed/Disagreed Actions
ON-HUM-4.3	Cumulative schemes for transport assessment	29/04/20 - applicant advised that following previous engagement the attenuation pond had been removed to facilitate the Hornsea Four access - however ongoing liaison would be undertaken to ensure the two accesses can coexist. Applicant also explained the DCO decision for the A63 Castle Street Improvement Scheme has been delayed but Hornsea Four has been in contact with Highways England to discuss the interaction between the two projects.	29/04/20 - all attendees confirmed acceptance of approach to CEA	29/04/20 - agreed
ON-HUM-4.4	Cumulative impacts from Jocks Lodge scheme and HOW04	07/10/2020 - Applicant provided ERYC highways information relating to the interaction of Hornsea Four and the proposed ERYC Jock's Lodge highways scheme. Information was subsequently discussed with ERYC in May 2021 to discuss the proposals and the approach to be taken for the Hornsea Four CEA.	27/05/2021 - ERYC agreed with proposals and approach being taken for the CEA.	27/05/2021 - agreed with ERYC

Appendix C – Evidence Plan Meeting Minutes

Appendix C1 – Steering Group Evidence Plan Meeting Minutes

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting #1	10 August 2018
Meeting Date	07/08/18	
Place	York & Bristol	
Participants	<div style="background-color: black; width: 100px; height: 100px; display: inline-block; vertical-align: middle;"></div> <ul style="list-style-type: none"> - East Riding of Yorkshire Council - The Planning Inspectorate - The Planning Inspectorate - The Planning Inspectorate - Marine Management Organisation - GoBe Consultants - Natural England - Ørsted - Ørsted 	Our ref. HOW04/EP_SG
Absent	None	
Copy	<div style="background-color: black; width: 100px; height: 15px; display: inline-block; vertical-align: middle;"></div> - Ørsted	
Next meeting	December 2018	

Agenda

1. Welcome and safety brief
2. Introductions
3. Aims and objectives of meeting
4. Introduction to Hornsea Project Four
5. Evidence Plan Terms of Reference summary and reflections/comments
6. Principles of the Evidence Plan process
7. Steering Group members' roles and responsibilities
8. Agreement and sign-off on Evidence Plan Terms of Reference
9. Discuss Logistics Plan and content of next Steering Group

Minutes

Introduction

DK welcomed attendees to the first Hornsea Four Evidence Plan Steering Group meeting and thanked members for finding the time to participate.

DK provided an opportunity for health and safety briefings. EB and GB provided fire evacuation instructions at each office location.

DK ran through the days agenda, aims and objectives, providing the opportunity for members to suggest any alterations or additions. Agreed aims were as follows:

1. Introduce Hornsea Project Four

2. Provide an overview of the Evidence Plan process
3. Discuss the Terms of Reference considering feedback
4. Agree roles and responsibilities
5. Sign-off on Terms of Reference
6. Discuss logistics, content and purpose of next meeting
7. Discuss Technical Panel meeting logistics, content and purpose

DK gave an overview of the Hornsea Project Four project (noting the Steering Group members have already received one-to-one kick-off meetings).

DK provided a summary of the key consenting programme dates. The primary dates included: April 2018: Stakeholder Engagement; June 2018: Route Planning Site Selection; July 2018: Scoping Project Description internal review; Oct 2018: Scoping submission; May 2019: PEIR submission; and Q1-Q2 2020: DCO application.

EB stated NE had concerns regarding the May 2019: PEIR submission date and anticipated lack of available survey time between now and then, meaning there is a real risk of data collection not being adequate at PEIR.

EB noted wording within the Evidence Plan Terms of Reference (ToR) document at Section 6.5 stating an assessment cut-off point. NE believe this cut-off was too early in the process. For ref. the ToR document states *“It is reasonable to have a ‘cut-off’ point within the assessment process, after which no more plans or projects will be included within the assessment and so that the assessment can be finalised for the application. The Applicant proposes that a reasonable ‘cut-off’ point would be the close of the Section 42 consultation following receipt of comments on the PEIR, unless new information presented subsequent to this that would be considered to be likely to significantly change the outcome of the assessment (e.g. a new designation).”*

DK acknowledged EBs concerns.

Overview of the Evidence Plan Process

LK provided an overview of the process, combining EIA and HRA in the Evidence Plan process, ensuring proportionality in the EIA, recording the evidence base and acting as a log for agreement.

Question 1. Do all parties agree with the aims of the Evidence Plan?

GB queried whether eight technical panels was an appropriate number.

LK clarified that the number of groups was based on the highest risk environmental receptors but is subject to change dependent on how initial discussions progress.

SZ confirmed it is highly possible some of the onshore technical panels will be dropped.

SH confirmed ERYC were happy with the aims of the Evidence Plan.

EB had concern with ToR page 5 section 1.1 text *“Evidence requirements should only change if new areas of concern are identified following initial assessment; if new relevant evidence or*

research comes to light that would affect what information is required; or there is a material change to the Project or new proposed nature conservation designations come to light prior to the agreed “cut-off” date”. Should new case law become available, NE’s advice is subject to change.

RW agreed that advice will always be based on best available evidence at the time, which is subject to change.

DK advised members were welcome to review these questions now and respond formally to Ørsted following the meeting, via the ‘Meeting One Questionnaire’ (issued separately).

Evidence Plan – Benefits of the Process

LK provided an overview of the benefits including the opportunity to discuss and resolve evidence-based disagreements, the basis for Statements of Common Ground, and providing The Planning Inspectorate a record of discussion and agreement/disagreement.

LK presented the proposed Evidence Plan structure, splitting the Technical Panels between onshore and offshore topic areas with four proposed Technical Panels each.

LK gave an overview of the general rules / guiding principles.

Question 2. Do all parties agree with the general rules identified or have any additional suggestions?

EB requested the third bullet point be revised.

GB stated that there needs to be flexibility around deadlines, considering this is non-statutory work for many organisations and will not always take priority. Ørsted were requested to provide documents at least two weeks in advance.

RW stated that Cefas have different response timescales so may require additional review time in advance of meetings.

EB noted the requirements for early provision of meeting materials differ between introductory/summary meetings and detailed meetings to discuss Position Papers.

SH, RW and EB agreed two weeks is preferable.

Evidence Plan Terms of Reference

LK stated feedback from members was welcomed prior to all signing-up to the ToR. Clarified this was a working document and updates would be provided as an addendum. Ran through the membership.

Question 3. Should any other parties be involved in the Evidence Plan Steering Group process?

GB confirmed that membership was largely at the request of the Applicant. Enquired whether merit in inviting Port Authorities.

LK clarified that Port Authority related issues, being very site and issue specific, would be dealt with on a one on one basis.

SH confirmed Hull Council need not be included.

EB suggested NE want input from the JNCC on offshore nature conservation site issues but was currently uncertain. Likely to be relevant to Technical Panel membership i.e. marine mammals and marine ecology.

Steering Group Roles & Responsibilities

LK informed members the Steering Group could facilitate issue resolution and escalation from the Technical Panel level, should that be required, and that feedback should be a two-way process between both membership levels.

LK confirmed the Planning Inspectorate future role in the Steering Group setup. PINS would not be expected to attend Technical Panels unless they specifically requested to do so.

LK ran through each of the organisations roles and responsibilities to the Steering Group function.

Question 4. Do all parties agree with their Steering Group roles and responsibilities?

GB agreed with the information presented and stated PINS were always looking for opportunities to better add value to the process.

Technical Panel Membership

LK provided an overview of the proposed Technical Panel membership and requested feedback from members.

Question 5. Should any other parties be involved in the Evidence Plan Technical Panel process?

RW requested the MMO/Cefas are included in the Marine Mammals Technical Panel. LK confirmed that the inclusion of the MMO and Cefas would be considered and confirmed.

SH requested Humber Archaeology Partnership and ERYC are included in the Onshore Archaeology Technical Panel. Enquired whether Network Rail need to be included. SZ stated that National Rail would be dealt with on a one-to-one basis.

EB requested that subject to a review of the pre-scoping boundary, JNCC may need to be included in the Marine Ecology & Process, and potentially the Marine Mammals Technical Panel.

Technical Panel Responsibilities

LK provided an overview of the Technical Panels roles and responsibilities. Clarified that engagement was likely to be flexible i.e. face-to-face might not always be possible or necessary.

Question 6. Do all parties agree with the Technical Panel roles and responsibilities?

SH and RW had no comments.

EB suggested better communication around worst-case scenario parameters - needs to be a way of ensuring all Technical Panels are consistently working with the same set of project parameters.

GB advised in relation to project parameters that flexibility is maintained throughout the assessment process.

SZ confirmed parameters must be aligned across the entire project internally for engineering design and EIA purposes. Ørsted can consider how best to present this information more clearly to Technical Panels.

ACTION: Ørsted to consider how project parameters are presented to Technical Panels and managed throughout the Evidence Plan process.

GB requested Ørsted consider PINS Advice Note 9 which has been recently updated.

Evidence Plan Working Arrangements & Log

LK detailed a range of working arrangements including minute taking and the Evidence Plan Log.

Question 7. Do all parties agree with the Principles described for reaching agreement?

EB had a question regarding when meeting minutes will be circulated, and requested that they are clearly labelled as draft and final once complete.

ACTION: Ørsted to ensure that all Evidence Plan meeting minutes are distributed as draft for comment and then final copies are distributed once all comments have been incorporated.

SH and RW had no comment.

Logistics of future Steering Group Meetings

LK gave an overview of anticipated future Steering Group meetings. Noting all dates subject to change but largely consent milestone based (error noted in PowerPoint slides).

RW requested a draft dML discussion prior to application and whether this could be fitted-in.

ACTION: Ørsted to ensure draft DCO discussions are occluded in Project programme.

Logistics of Technical Panel Meetings

LK set out the anticipated Technical Panel meeting dates. Noting all dates subject to change but largely consent milestone based.

GB requested the Applicant consider avoiding clashes with PINS statutory consultation i.e. the Scoping opinion is likely to be received mid-November 2018).

Question 8. Do all parties agree within the frequencies and the approximate timings of the proposed Steering Group and Technical Panel meetings?

EB stated that NE had significant concern with timings on PEIR submission when considering available survey opportunities in 2018/2019. Noted the very short time available between Scoping Opinion received and PEIR cut-off. Commented that the general approach to meetings appeared sensible.

Next Steps

LK informed members of the next steps including:

- Steering Group members to respond to questions 1-8 by 10/08/18;
- Ørsted to update ToR following discussions and responses to questionnaire;
- Steering Group members sign-off of ToR document;
- Ørsted to initiate first Technical Panel meetings pre-scoping; and
- Ørsted to organise second Steering Group meeting in December 2018.

Any Other Business

EB requested shapefile or pdf of pre-scoping boundary to confirm proposals position against designated sites.

SH similarly confirmed this would be helpful.

DK needed to confirm with project team what could be shared externally and ran through actions.

ACTION: Ørsted to share a shapefile and/or image of the pre-scoping boundary.

GB confirmed a note of this meeting will be published on the PINS website.

Summary of Actions

1. Ørsted to consider how project parameters are presented to Technical Panels and managed throughout the Evidence Plan process.
2. Ørsted to ensure that all Evidence Plan meeting minutes are distributed as draft for comment and then final copies are distributed once all comments have been incorporated.
3. Ørsted to ensure draft DCO discussions are occluded in Project programme.
4. Ørsted to share a shapefile and/or image of the pre-scoping boundary.

Post-Meeting Note

DK provided questionnaire in Word version for members to complete and send back, requested by 10/08/18.

DK issued invitations for Technical Panel meetings on 12 – 13th September 2018.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting 2	18 December 2018
Meeting Date	12/12/2018	
Place	Ørsted, 5 Howick Place, London	
Participants	<div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – The Planning Inspectorate <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> (G) - The Planning Inspectorate <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – East Riding of Yorkshire Council <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – Marine Management Organisation <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – Natural England <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – Ørsted <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – GoBe Consultants <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> - Royal Haskoning DHV <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – Ørsted <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> – Ørsted	Our ref. HOW04/EP_SG_2
Absent		
Copy	<div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div>	
Next meeting	Not planned	

Agenda

1. Welcome and safety brief
2. Introductions
3. Hornsea Four Update
4. Review of Actions of Previous Meeting
5. Aims and Objectives of Meeting
6. Evidence Plan Terms of Reference Sign-Off
7. Scoping Review
8. Next Steps
9. AOB

Introductions

Introductions were made for those who had not met previously.

Hornsea Four

DK noted that the Hornsea Four Scoping Report was submitted to the Secretary of State on 15 October 2018. This was a 782-page report which adopted a front-loaded, proportionate EIA approach. The associated 182-page Scoping Opinion was adopted by the Secretary of State on 23 November 2018.

SH highlighted that there has been a technical problem and ERYC had not received the consultation from PINS. SH confirmed that ERYC would be issuing a late scoping response.

DK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, offshore Export Cable Corridor (ECC), landfall, onshore ECC and onshore substation location refined and an internal design freeze set for 14 December. In relation to the preparation of the Preliminary Environmental Information Report (PEIR), the project parameters are being finalised, baseline data collection is underway, and the Scoping opinion has been evaluated.

Review of Actions from Previous Meeting

Ørsted to consider how project parameters are presented to Technical Panels and managed throughout the Evidence Plan process. **Ongoing**. DK confirmed that Ørsted are continuing to consider how best to manage this through the Evidence Plan process.

Ørsted to ensure that all Evidence Plan meeting minutes are distributed as draft for comment and then final copies are distributed once all comments have been incorporated. **Ongoing**. DK noted that this process has been followed to date for Hornsea Four and we will issue minutes in a timely fashion for comment, noting that the Christmas period is likely to cause delays to this process.

Ørsted to ensure draft DCO discussions are included in Project programme. **Ongoing**. DK confirmed that consultation will be undertaken with interested parties on the DCO and dMLs with specific wording of conditions discussed via the relevant Evidence Plan Technical Panels.

Ørsted to share a shapefile and/or image of the pre-scoping boundary. **Complete**. DK confirmed that this shapefile was submitted after the last meeting and PEIR shapefiles will be provided as soon as they are available.

Aims and Objectives

DK stated that the principal objective of this second Hornsea Four Evidence Plan Steering Group was to provide an update on Hornsea Four development activities, review responses received during the Scoping process, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the Preliminary Environmental Information Report and the Environmental Statement for Hornsea Four.

Evidence Plan Terms of Reference Sign-Off

LK requested that all Steering Group members provide written sign-off of the Hornsea Four Evidence Plan Terms of Reference document (via email), noting that it will remain a live document and any subsequent amendments will be made as an addendum, with all updates agreed by the Steering Group before being implemented.

ACTION: All Steering Group members to confirm acceptance of Terms of Reference document subsequent to the meeting (if not already done so).

Scoping Review

Offshore

LK went through all offshore slides, noting all key issues raised, and noting that scoping responses for all topics that have an associated Evidence Plan Technical Panel will be discussed in detail at these meetings in December and January.

LK noted that there has been a lack of engagement to date with Historic England although a meeting has been scheduled for next week. DK stated that a DAS agreement is now in place with Historic England which could have been the main stumbling block. EB noted that it is likely that Historic England, like Natural England, are involved in a lot of projects and several examinations so resourcing is likely to be the cause of this, highlighting that this has been the reason why Natural England hasn't been able to engage fully in the Hornsea Four Evidence Plan process to date. LK acknowledged these limitations and stated that Ørsted are keen to identify the best ways of working with consultees and to engage in the easiest way possible for those consultees.

DK noted that the commencement of the underwater noise modelling is very time-critical in the Hornsea Four programme and the methodology needs to be agreed as soon as possible with the Cefas and Natural England. DK stated that Cefas' underwater noise advisor is on a research cruise and will be not available until the end of January. It was agreed that a methodology note would be produced and provided to Cefas and Natural England for comments in writing since a meeting was not possible in the required timeframe.

ACTION: Ørsted to provide an underwater noise methodology note to members of the Marine Ecology and Marine Mammals Evidence Plan Technical Panels for consideration and comment.

Onshore

TW went through all onshore slides, noting all key issues raised, and noting that scoping responses for all topics that have an associated Evidence Plan Technical Panel will be discussed in detail at these meetings in January.

In relation to the PINS scoping opinion request that the transportation of offshore components is scoped in, GB acknowledged the significant complexities (notably supply chain and routing uncertainties) in undertaking an assessment of the transportation of offshore infrastructure on the highway network. GB stated that the Applicant should acknowledge the potential for effects to arise. TW stated that a response to the comment would be provided detailing the assessment uncertainties and applicable best practice mitigation measures.

In relation to onshore topics, GB noted that issues identified to be scoped in by PINS were the result of a specific process being applied when reviewing. The approach focusses on whether sufficient evidence has been provided to scope an assessment out of the EIA. If sufficient information was unavailable at the EIA scoping stage, but the evidence base is improved at PEIR, GB stated that PINS would be in the position to agree on certain matters being scoped out.

Summary

GB highlighted that Ørsted seem to have taken onboard the Scoping feedback in the spirit which it was intended and praised the Ørsted team for this approach. TW noted that the layout and presentation of the Scoping Opinion made this task easy. GB stated that this would be fed back to the PINS team.

Next Steps

LK noted that post-Scoping Evidence Plan Technical Panel meetings have been scheduled for December 2018 and January 2019 which will discuss scoping responses, baseline data, assessment methodology, and any relevant mitigation. LK highlighted that discussions and consultation outwith the Evidence Plan process is also taking place in relation to Commercial Fisheries, Aviation & Radar, Infrastructure & Other Users & Seascape and Visual Resources. Non-Evidence Plan consultation will include further liaison with ERYC and local parish councils to discuss OnSS location and access.

AOB

It was agreed that it would be preferable if the next Steering Group meeting could be in person and this could take place over two locations as per the first Steering Group in Bristol and York.

GB highlighted that the Flamborough SPA and SAC have been extended. DK confirmed that it is being taken into account by the Hornsea Four team.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting 3	28 June 2019
Meeting Date	25/06/2019	
Place	Skype	
Participants	[REDACTED] – The Planning Inspectorate (PINS) [REDACTED] – East Riding of Yorkshire Council (ERYC) [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – Natural England [REDACTED] – Ørsted [REDACTED] – Ørsted [REDACTED] – GoBe Consultants	Our ref. 03154630
Absent	[REDACTED] – Historic England [REDACTED] – Natural England [REDACTED] – MMO	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Welcome and safety brief
2. Introductions
3. Hornsea Project Four Update
4. Review of Actions of Previous Meeting
5. PEIR assessment updates
6. Next Steps
7. AOB

Introductions

Introductions were made for those who had not met previously. Mark Qureshi introduced himself to the panel as the new Case Manager from the MMO for Hornsea Four and conveyed the apologies from Adam Suliman who is the new Case Office for Hornsea Four from the MMO. Andy Wainwright introduced himself to the panel as the nominated contact from ERYC for Hornsea Four. DK noted that Historic England have now joined the Steering Group but had been unable to attend this meeting.

Review of Previous Actions

All Steering Group members to confirm acceptance of Terms of Reference document subsequent to the meeting (if not already done so). **Ongoing.**

- DK requested that if any Steering Group members had any comments on the Terms of Reference (Revision D), if these could be provided as soon as possible, noting that Hornsea Four are just waiting on Natural England to confirm acceptance. EB confirmed

that Natural England's comments would be provided shortly. DK noted that comments have been received from Historic England, so a Version E will be issued soon incorporating Historic England and Natural England's latest comments.

- EB noted that Natural England have an ongoing concern in relation to the Hornsea Four timetable and timescales (e.g. having enough time after PEIR to collect additional data and respond to queries). DK queried whether Natural England's concerns related to the overall project timescales rather than anything specific within the Terms of Reference document. EB confirmed that the concerns lie solely with the project timescales and not the Terms of Reference document.
- GB agreed with EB, noting that from PINS experience, it was important to allow adequate time to allow comments to be incorporated into the final ES so Hornsea Four should try and make this process as efficient as possible (e.g. seeking specific rather than generic comments).
- TW noted that the PEIR consultation period is being extended to 6 weeks and Hornsea Four have offered to meet with consultees to discuss the PEIR to aid the review process. TW also noted that a 'How to Read the PEIR' guide is going to be issued to consultees to aid the review process.

Ørsted to provide an underwater noise methodology note to Marine Ecology and Marine Mammals Evidence Plan Technical Panels for consideration and comment. [Complete.](#)

Hornsea Four Project Updates

DK stated that four local information events had been held in October/November 2019 which included poster sessions and the use of interactive mapping. DK noted that turnout at these events was very good with more than 80 feedback forms submitted. Key themes identified by members of the public included drainage, traffic, cables and feedback influenced project design. DK reported that questionnaire responses indicated that 73% of respondents agreed with Hornsea Four's proposals for the project and 90% agreed that offshore wind has the potential to contribute significantly towards the UK's low carbon transition. DK also stated that Hornsea Four have held informal local interest group presentation sessions.

DK noted that members of public had suggested commitments at the information events and those adopted by Hornsea Four will be presented in the Commitments Register. DK gave an overview of a couple of commitments that were suggested by the public that have been taken forward by Hornsea Four (e.g. avoidance of works around Barmston Main Drain to avoid village flooding and the commitment to underground cabling, avoiding the need for any overhead pylons). GB asked if there were new pylons proposed at the onshore substation. TW confirmed that no new pylons will be installed as part of Hornsea Four.

MQ asked if the Commitments Register is was a new thing for NSIPs or is this specific to Hornsea Four and would these commitments would be secured in the DCO and dMLs.? DK confirmed that this is a new concept and commitments would be secured, where possible in the DCO or dMLS, noting that the Commitments Register has a column which states how each commitment is secured. JC highlighted that there would be increased pressure on the local planning authority if all of the commitments were conditions but despite this, was happy to see these commitments.

DK stated that Hornsea Four are adopting a major site reduction from the Agreement for Lease (AfL) area that was presented at Scoping, with the full narrative behind this change captured

in the Site Selection and Consideration of Alternatives PEIR chapter. DK confirmed that all PEIR impact assessments will be concluded on the reduced PEIR boundary. MQ queried whether the bird hotspots in the figure would shift over time? EB noted that this is a current piece of work that Ørsted are undertaking to understand the underlying reasons why these hotspots are there. DK noted that the southern section is shallower water so the hotspots could be related to sand distribution and prey preferences to this area.

DK stated that the landfall area has been refined from Scoping boundary where a wide search area was considered, down to two landfall sites that are being considered for PEIR submission. This will be further refined down to one landfall for final application. DK confirmed that the export cable corridor has been refined down from 3 to 1.5 km with a widening to accommodate potential Dogger Bank Crekye Beck cable crossing and another at the HVAC booster station search area.

TW confirmed that the onshore ECC has been refined from 700m at Scoping to 80m in width with a funnel at landfall and the substation site, with further analysis and landowner consultation informing this process. TW stated that one onshore substation site has been selected for PEIR.

TW stated that early Section 42 consultation is going to start on 29 July until 12 August, with the formal Section 42 and Section 47 consultation taking place between 13th August and 23rd September. TW confirmed that PEIR consultation events will be taking place between 2 September and 7 September, with formal invites to be sent out to prescribed bodies, landowners, local communities and members of the public to comment on the Hornsea Four proposals.

MQ asked about consultation with the commercial fisheries industry. DK explained that engagement with the commercial fisheries has been positive and there are regular meetings with organisations such as the NFFO that have been taking place for the last year and will be ongoing.

TW gave an overview of 'Commonplace'¹, a new digital engagement tool with the aim of providing the local community an easy way of accessing project information online and encouraging people to review our plans in an interactive way, provide feedback and influence the design. TW gave a brief overview of the interactive mapping tool which has the ability to provide comments. TW asked GB if PINS had seen this being used before. GB said she hadn't but will speak to the project case team about this, stressing that responses need to be captured in a way that meets the requirements of the Act. TW noted that comments can be extracted into an Excel file and then the project can incorporate these into the Consultation Report. MQ and JC noted that the interactive maps looks like a useful too.

TW explained that a community liaison officer has been appointed for Hornsea Four who forms a crucial link between local communities and the project team TW noted that the Community Liaison Officer takes on the day to day engagement with local stakeholders, organising meetings and reporting directly to the project and ensuring that all relevant information is shared.

¹ <https://hornsea4feedback.commonplace.is/>

Update on Offshore Technical Panels

LK gave an overview of discussions that have taken place within the following Technical Panels:

- Offshore and Intertidal Ornithology Technical Panel
 - Discussions focussing on baseline data (specifically the digital aerial survey data and other data sources) and assessment methodologies (specifically collision risk modelling and displacement); and
 - Documents have been circulated in relation to the developable area work (hotspots), the ornithological digital aerial survey, and the precision of this survey data.
 - EB noted that Natural England consider that ornithology is the biggest risk to the project as it is the closest project to the coast and in particular the Flamborough and Filey Coast SPA. EB stated that Hornsea Four have been doing some good work to understand the ornithology risks and the developable area workstream has been really encouraging.
- Marine Mammals Technical Panel
 - Discussions focussing on baseline data (specifically the digital aerial survey data and other data sources), scopes of assessments (simple vs detailed) and the underwater noise modelling methodology; and
 - A noise modelling methodology note has been circulated and consultee comments addressed and discussed.
- Marine Processes & Ecology Technical Panel
 - Discussions focussing on baseline data (receptors to be assessed), scopes of assessments (simple vs detailed) and assessment methodologies (particularly underwater noise modelling); and
 - Several documents have been circulated in relation to an operational wave monitoring assessment, noise modelling methodology, benthic baseline strategy and the benthic survey strategy. Consultee comments on these documents have addressed and discussed.
 - LK stated that benthic surveys are currently taking place with the results of these surveys being reported in the final application. EB asked whether consultees would be able to see draft documents before final submission in these cases? LK confirmed that these would be submitted via the Evidence Plan to consultees who will be given the chance to comment before final submission.
- Marine Archaeology Technical Panel
 - After limited Evidence Plan engagement to date with Historic England (one initial meeting post-Scoping), a single reset meeting took place in early June (although not formally within the remit of the Evidence Plan process); and
 - Discussions have taken place in relation to the "*proportionate approach*", baseline data and geophysical surveys.

Update on Onshore Technical Panels

TW gave an overview of discussions that have taken place within the following Technical Panels:

- Human Environment Technical Panel
 - Discussions have focused on traffic and transport (primarily agreement of methodology and presentation of links/study area identified by Hornsea Four) and public rights of way (summary of affected receptors and overarching approach to assessment).

- Historic Environment Technical Panel
 - Recent technical panel meeting (supplemented by separate email correspondence with Historic England) was undertaken to agree on the final scope of assessment for PEIR and present the baseline survey results obtained to-date.
- Ecology Technical Panel
 - The next technical panel meeting will give a further update on the progress of the baseline surveys, the RIAA and what to expect in the PEIR. The meeting will also provide a first look at some of the findings from baseline surveys, for example, breeding birds and Great Crested Newts.
 - GB asked if the project was still requiring the Section 53 access? TW confirmed that all accesses have been consented.
 - EB stated that if the PEIR is going to be incomplete in relation to survey data, it would be useful to see the updated submissions prior to final ES submission. TW confirmed that all submissions would be consulted up [on through the Evidence Plan prior to final application.
- Hydrology Technical Panel
 - The next technical panel meeting will be used to agree the final scope of the PEIR, as well as providing a guide to reading the Impacts Register, the Commitments Register and the Crossing Schedule as the main tools for statutory consultees for this topic area.

Non-Evidence Plan Consultation Update

LK noted that Hornsea Four have been undertaking consultation on topics outwith the Evidence Plan process with statutory and non-statutory consultees. For offshore this has been consultation with the commercial fisheries industry, consultation with aviation and radar organisations (e.g. NATS), with shipping and navigation stakeholders and with those with oil and gas interests in the vicinity of Hornsea Four.

TW stated that in relation to onshore, working groups have been held with local stakeholders and with the onshore substations working group. Meetings have also been held with ERYC to discuss the Design Vision Statement and the PEIR submission.

AOB

DK stated that minutes would be drafted and circulated for comment. GB also noted that PINS would be publishing a summary meeting note on its website.

DK asked for any outstanding comments on the Terms of Reference document and these would be incorporated into the next update.

EB mentioned that some stakeholders may have some resource clashes with the Hornsea Four PEIR as Norfolk Boreas have just submitted an application and Sizewell-C have recently undertaken Stage 3 consultation.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting #4	16 December 2019
Meeting Date	06/11/2019	
Place	Ørsted, Howick Place, London	
Participants	<ul style="list-style-type: none"> ██████████ – Natural England – by phone ██████████ – Natural England ██████████ – Historic England ██████████ – The Planning Inspectorate (PINS) – by phone ██████████ – Ørsted ██████████ – Ørsted ██████████ – GoBe Consultants ██████████ – RHDHV – by phone 	Our ref. HOW04/EP_SG_4
Absent	<ul style="list-style-type: none"> ██████████ – PINS ██████████ – Marine Management Organisation (MMO) ██████████ – MMO 	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Aims and Objectives

DK stated that the principal objective of this fourth Hornsea Four Evidence Plan Steering Group was to provide an update on Hornsea Four activities. DK noted that specifically the aims were to provide an update on development activities; review responses received during the S42 consultation process and to discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in the Environmental Statement.

Hornsea Four Evidence Plan Terms of Reference Document

DK highlighted that upon Historic England joining the Hornsea Four Evidence Plan Steering Group, they provided some comments on the Evidence Plan Terms of Reference document previously approved by all other Steering Group members. DK noted that all updates have been made in tracked-changes to aid consultee review and this document was provided via email on 1st November. DK requested confirmation from all attendees that changes are accepted and then a finalised PDF version will be issued. EB noted that Natural England haven't had a chance to read through it yet but will try and review and confirm acceptance within the week. IG noted that Gail Boyle (PINS) had reviewed and had no comments.

ACTION: All attendees to confirm acceptance of the updated Evidence Plan Terms of Reference document (provided by email on 1st November).

Hornsea Four Update

DK noted that the southern landfall option (A4) had been selected with the rationale based on onshore access, reduced public use and lower cliff height. DK noted that the full rationale for the selection will be added to the Site Selection and Alternatives chapter. TW noted that the construction compound would only take up a proportion of the identified landfall area. PS noted that the indicative line of English coast path runs through the landfall site so the construction compound will be positioned to avoid requiring to divert the path if it is in place before construction works commence if on-site conditions allow. EB asked if the final Application will be made more specific (e.g. access and installation methods) now that the landfall location

has been refined? TW acknowledged that this is the case and this would be further discussed later in the meeting.

DK noted for offshore, the HVAC booster station search area has been reduced, with narrowing of the permanent works area on the eastern side of the search area.

TW gave an overview of the onshore design changes and noted that lots of small onshore cable route changes have been made to account for landowner comments and requests and S42 responses. TW stated that both permanent and temporary access for the onshore substation are now from the north with no access from the south (i.e. along Park Lane), at the request of landowners and S42 comments. TW noted that the landscape boundary and attenuation pond area were identified and that the access road been moved away from the Birkhill Wood ancient woodland based on the S42 response from Natural England. MM asked if this detail would be discussed at the Onshore Ecology Evidence Plan meeting? TW confirmed that would be case.

LK gave an overview of recent Hornsea Four activities, noting that additional survey data has been collected (e.g. offshore benthic and geophysical surveys, summer marine traffic survey, onshore geophysical surveys, phase 2 ecology surveys (e.g. bats, badgers). EB noted that Natural England's PEIR comments often focussed on the data gaps that were present in the baselines and highlighted concerns that the final Application could be the first time SNCBs would be able to review the complete baselines. EB queried whether the updated baselines could be shared through the Evidence Plan before submission? LK confirmed that these updates would be discussed at the individual topic specific Evidence Plan meetings. CP queried whether the offshore WSI would be updated with the latest geophysical data. LK confirmed that would be the case and this would be discussed at the Marine Archaeology Technical Panel meeting next week. TW also noted that an onshore WSI would be drafted for the final Application, the contents of which are to be discussed at the upcoming onshore Historic Environment Technical Panel.

Post-Meeting Note: *Since this EP meeting was held, the Hornsea Four programme has now changed, allowing more time for consultation on ES documents. This will be discussed in further detail at the next Evidence Plan meeting in early 2020.*

MM asked whether Hornsea Four were planning to issue a response to all S42 comments provided? DK noted that Hornsea Four intend to address all comments within the Consultation Report and the consultation sections in the Chapters with key comments discussed in the Evidence Plan Technical Panel meetings, but that Hornsea Four would consider providing a more focused detailed response. EB noted that a lot of the S42 comments relate to baseline evidence so it would aid the Statement of Common Ground (SoCG) process if these comments could be closed out before that point and leave fewer outstanding issues for the Examination.

ACTION: Hornsea Four to consider providing formal responses to S42 comments.

Programme to DCO

DK gave an overview of the Hornsea Four programme which includes Evidence Plan meetings in November and December 2019 and final application submission in Q1 2020, most likely the end of February 2020. DK noted that it would be good to have a discussion about the format and content of SoCGs prior to final Application so DK will request time from Natural England to discuss this.

TW stated that each Technical Panel will make the decision on whether additional EP meetings are required after the meetings in November. EB asked what the cut-off date for input into the final Application document would be?

ACTION: Hornsea Four to provide an update on these cut-off dates.

Impact Register Updates & Scope of the EIA at ES

DK gave an overview of the changes that will be made to the Impacts Register post-PEIR, noting that the Impacts Register will be presented as in the PEIR, with the addition of a few additional columns (e.g. sensitivities and magnitudes as considered at PEIR). DK stated that impacts would be moved from the Chapters to the Impacts Register where assessments have concluded no likely significant effect (in EIA terms) at PEIR and there is no change in project description affecting the assessment; baseline environment data affecting the assessment or no change in assessment methodology and there are no significant comments in stakeholders' S42 responses. DK noted that in these cases the Impacts Register will be updated to state that these impacts are *"Not considered in detail in the ES. No likely significant effect identified at PEIR."* EB noted that it would be useful to see the updated Impacts Registers at the Technical Panel meetings.

CP asked for an example of one of these impacts that is not considered further in the ES. TW gave an overview of the Impacts Register for the land use and agriculture example, looking at the impact of severance, temporary diversion or closure of Public Rights of Way (PRoW). TW noted that there has been no material change in the project details in relation to this impact, no new baseline data, and the mitigation measures haven't changed. TW confirmed that this impact has been removed from the ES Chapter with the justification provided in the Impacts Register, noting that this approach has been agreed with East Riding of Yorkshire Council (ERYC).

Offshore Topics

LK gave an overview of the key themes raised by consultees during the S42 consultation in relating to the four Evidence Plan Technical Panels.

Marine Ecology & Processes – LK noted that many comments were received requesting clarity on project description details that were provided in both the Project Description and the Marine Processes, Benthic Ecology, and Fish and Shellfish Chapters. LK noted that engineers have been addressing these comments and the updated Project Description and MDS tables should be clearer on these points. LK highlighted that concerns were raised by multiple consultees on the potential impacts on the Smithic Bank sandbank. LK noted that additional commitments have been added to the Commitments Register to address these concerns. As mentioned previously, LK noted that comments were received on the baseline data gaps which will be filled by the additional survey data that will be provided in the updated Chapters and Technical Reports. In relation to fish and shellfish, LK stated that comments have been received in relation to the impacts on spawning herring. LK noted that updated noise modelling has been undertaken as well as additional commitments added to the register to address these concerns. LK also noted that simultaneous piling will also be considered fully in the fish and shellfish noise assessment.

Marine Mammals – LK noted that comments largely focused on the presentation of the Maximum Design Scenario versus the Most Likely Scenario for piling noise, simultaneous pilings and the UXO assessment. LK noted that these topics would be addressed in full at the Marine Mammals Technical Panel meeting that was taking place later in the afternoon.

Offshore and Intertidal Ornithology – LK noted that comments were received requesting clarity on project description details that were provided in both the Project Description and the Maximum Design Scenarios. LK stated that discussions are ongoing about precision and 2 vs 4 cameras, noting that Hornsea Four have analysed a month of the additional 2 cameras and the Evidence Plan Technical Panel have agreed three further months that will be analysed. LK also noted that comments related largely to the CRM, displacement, disturbance and PVA assessments.

Marine Archaeology – LK noted that limited comments were received on the Chapter and Technical Report, with positive comments provided on both documents. LK highlighted that minor comments on the Outline WSI in relation to the programme of survey works were raised and will be discussed at next week's Evidence Plan Technical Panel meeting.

Onshore Topics

TW gave an overview of the key themes raised by consultees during the S42 consultation in relating to the four Evidence Plan Technical Panels.

Ecology & Nature Conservation – TW stated that comments focused on the consideration and assessment of SSSIs and ancient woodland and the baseline survey coverage, including the extended Phase I Survey and Phase II surveys, noting that additional surveys are now complete and the results of these surveys will be incorporated into the Chapter and Technical Reports and discussed in the upcoming Technical Panel.

Hydrology & Flood Risk – TW noted that input and recommendations for project commitments were provided by consultees during the S42 consultation, with comments raised in relation to the phraseology for the CoCP and Onshore Drainage Strategy. Comments also related to the onshore substation flood risk modelling and mitigation. TW recognised the constructive and informative S42 consultation response method provided by the Environment Agency, through the track changes of suggested commitments.

Traffic & Transport – TW noted that continuing engagement has been taking place with ERYC and Highways England in relation to potential overlap of highways improvement schemes (Jocks Lodge and A63 Castle Street) with Hornsea Four construction programme. TW also noted that a clarification meeting has been held with Highways England to discuss methodology and road links.

Air Quality – TW stated that Hornsea Four is now reviewing haul road traffic movements in respect of ecological receptors. TW noted that this is a relatively new consideration that was raised in the S42 consultation and Hornsea Four are currently looking into whether modelling is required. It is anticipated that traffic flows will be below the AADT thresholds for assessment. TW noted that queries regarding dust assessment on ecological receptors has been raised and there is disagreement from Natural England on IAQM thresholds. TW highlighted that discussions on this will be held at the Technical Panel meeting next week.

PS noted that there were also some S42 comments on land use with the potential scoping in of an assessment of agricultural land. PS also noted comments were received from Public Health England in respect of proposed methodology for assessing health impact and associated consultation.

CP noted that there has been no mention of visual impacts on designated and non-designated sites. TW noted that this relates to the setting assessment and that will be picked up at the Historic Environment Technical Panel meeting next week where they will consider how these impacts will be addressed in the final Application.

Commitments Register

DK noted that the Commitment Register is currently being updated in response to feedback from S42 consultation. The register will comprise either unamended commitments, existing commitments amended post-PEIR or new ones – a change log will be provided at DCO to document all amendments. All commitments will be linked to the DCO, DML or relevant outline plans where appropriate. DK talked through the new or edited commitments in the table below.

New/Amended Commitment	Commentary
Co187 - The installation of the offshore export cable at landfall will be undertaken by Horizontal Directional Drilling or other trenchless methods.	New commitment added in response to feedback from public during consultation and Local Information Events.
Co188 - No cable protection will be employed within 350m seaward of MLWS	New commitment added in response to comments raised by Natural England & MMO in relation to impacts on Smithic Bank.
Co189 - The Dogger Bank cable crossing will be positioned east of Smithic Bank and seaward of 20m depth contour.	New commitment added in response to comments raised by Natural England & MMO in relation to impacts on Smithic Bank.
Co190 - No impact piling within the HVAC area (DCO Works No. 3) will be undertaken between 1st September and 16th October unless otherwise agreed with the relevant stakeholders.	New commitment added in response to comments raised by Natural England & MMO re impacts on herring spawning.
Co110 - A piling Marine Mammal Mitigation Protocol (MMMP) will be developed in accordance with the Outline MMMP and will be implemented during construction. The piling MMMP will include measures to ensure the risk of permanent threshold shift (PTS) to marine mammals is negligible and will be in line with the latest relevant available guidance. The piling MMMP will include details of soft starts to be used during piling operations with lower hammer energies used at the beginning of the piling sequence before increasing energies to the higher levels.	Amended commitment to reflect comments from Natural England & TWT on the need to develop the protocol in line with the 'relevant available guidance'. Reference to JNCC 2010 guidance removed.

EB noted that Co187 was positive and TW noted that access to beach would only be needed in case of emergencies or unforeseen circumstances so Hornsea Four is not anticipating planned beach closure during the construction activities. EB noted that if there is still a need for coffer damming then the Marine Processes chapter will need to consider that. EB noted that the Smithic Bank commitments (Co188 & Co189) are really positive commitments and that it was good to see positive amendments as a result of the PEIR and formal consultation process.

DK summarised that many of these are significant commitments that will hopefully go a long way to addressing stakeholder concerns. TW noted that this is not an exhaustive list and doesn't cover a number of onshore matters but the update process is ongoing and relevant onshore commitments will be discussed at the Technical Panels where relevant.

Draft DCO and dMLs

DK noted that the draft DCO & dMLs are currently being updated based on feedback received from S42 consultation, updated commitments, and design changes. DK mentioned that Hornsea Four are seeking to further engage with stakeholders on the draft DCO prior to application and as such, DCO/dML workshops being planned for early December with stakeholders with an updated draft DCO & dMLs will be shared with stakeholders prior to workshop. DK noted that any feedback provided will be incorporated into the draft DCO & dMLs where possible for Application.

DK asked if HE want to be involved in this process. CP stated that HE have reviewed the DCO and provided comment and are usually involved in Examination discussions but noted that HE would be happy to be involved earlier in the process to avoid having to discuss it at Examination. CP noted that comments on the draft DCO/dML were provided in the PEIR response.

Next Steps

DK noted that post-S42 Evidence Plan Technical Panel meetings and calls scheduled for November and December 2019. DK also noted that non-Evidence Plan discussions and consultation is taking place in relation to commercial fisheries, shipping & navigation, aviation & radar, and infrastructure & other users. TW noted that further liaison is ongoing with ERYC and local parish councils to discuss onshore issues. TW highlighted that meetings have been taking place with the Onshore Substation Working Group and the Landfall Working Group as well as PRow meetings.

DK noted that other activities taking place are the continued review of S42 consultation responses; consultants updating chapters and technical reports based on S42 comments and any additional data collected; Impacts Register being updated based on design changes and the continuing proportionate approach, additional Commitments being added to the Commitments Register and existing Commitments refined based on S42 comments and a review of comments on the Report to Inform Appropriate Assessment

EB asked if contact had been made with the NEIFCA. LK confirmed contact had been made and NEIFCA have provided some data and PEIR comments. DK noted that they also attended the last Landfall Working Group.

AOB

MM stated that it would be good to get the dates for the November and December meetings into the diary. DK noted that these will be organised at the end of next Evidence Plan meetings.

CP queried whether foundation infrastructure has changed or if turbine capacity is going to be provided. DK confirmed that only floating turbines have been ruled out and that capacities will not be confirmed as the project are providing the maximum dimensions rather than capacities.

IG noted that PINS will be drafting a summary of the meeting to put on the website.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
All attendees to confirm acceptance of the updated Evidence Plan Terms of Reference document (provided by email on 1st November).	All attendees
Hornsea Four to consider providing formal responses to S42 comments.	Hornsea Four
Hornsea Four to provide an update on EP input cut-off dates.	Hornsea Four

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting #5	20 May 2020
Meeting Date	16/03/2020	
Place	Teleconference	
Participants	[REDACTED] – The Planning Inspectorate (PINS) [REDACTED] – East Riding of Yorkshire Council (ERYC) [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – Historic England [REDACTED] – Ørsted [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – RHDHV	Our ref. HOW04/EP_SG_5
Absent	[REDACTED] – PINS [REDACTED] – MMO	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Review of Actions from Last Meeting

ACTION: All attendees to confirm acceptance of the updated Evidence Plan Terms of Reference document (provided by email on 1st November).

- DK noted that the Evidence Plan process has been established for a while and is moving towards the end of the process so it is assumed that all Steering Group members have accepted the Terms Of Reference document.

ACTION: Hornsea Four to consider providing formal responses to S42 comments.

- DK stated that the Hornsea Four programme has been extended since last Evidence Plan Steering Group meeting and the project is now in the process of providing draft Environmental Statement (ES) documents to Evidence Plan members alongside a spreadsheet of comments that details all comments and how they have been addressed within the documents. DK noted that there will be an opportunity to discuss each document through the relevant Evidence Plan Technical Panel. EB confirmed that it sounded like a suitable process and noted that ultimately, Natural England would like to know what points have not been taken forward within the application documents so that these can be captured within the Statement of Common Ground (SoCG). TW noted that for onshore the process is slightly different with discussions taking place within each Technical Panel meeting, particularly for onshore ecology.

ACTION: Hornsea Four to provide an update on cut-off dates for Evidence Plan input.

- DK noted that the Hornsea Four programme has been extended for six months so this allows for extra consultation time. Rachel Hall will be in touch with Natural England with an overview of planned deliverables and engagement under their Service Level Agreement process. Other stakeholders would be contacted on an individual basis.

Project Updates

Draft ES Document Reviews

DK noted that draft ES documents have been issued to the relevant Evidence Plan Technical Panels for review (e.g. subsea noise technical report, marine mammal technical report, draft fish and shellfish ecology technical report, draft onshore ecological and archaeological reports, plus many more). DK stated that amendments made since PEIR have been completed in tracked changes and a spreadsheet has been provided with relevant S42 comments and how these have been addressed. DK noted that the documents do not require a full review, just a check that comments have been addressed adequately. EB asked when the Offshore and Intertidal Ornithology chapter would be available? LK confirmed that this would be later in the process, perhaps August but the individual Technical Reports would be available earlier. EB requested cut-off dates for input into final Application

ACTION: Hornsea Four to provide an update on cut-off dates for Evidence Plan input.

DK highlighted that due to an organisational shake-up, Whale and Dolphin Conservation (WDC) are withdrawing from the Evidence Plan process but can still respond on an informal basis if required.

DK noted that further draft ES documents are to be issued for review in the coming weeks (e.g. fish & shellfish chapter, benthic ecology technical report, benthic ecology chapter, marine processes technical report, marine processes chapter, draft marine mammals chapter, draft construction traffic management plan, draft health impact assessment, and outline marine written scheme of archaeological investigations).

TW noted that Public Health England might have an understandable delay in reviewing the draft health impact assessment (previously requested from them to review) due to the current coronavirus situation.

Shipping & Navigation Issues

DK noted that comments have been received from the Maritime and Coastguard Agency (MCA) and Trinity House on the draft Layout Principles and these comments are currently being considered. DK stated that there are competing demands on developable area within the array in relation to ornithology, third party cables and commercial shipping and confirmed that Hornsea Four are considering the viability of a separation between Hornsea Four and Hornsea Project Two. DK stated the engagement with the MCA, Trinity House and shipping operators is ongoing in order to find an appropriate solution for all parties.

DK noted that the DCO Application will consider the full array layout (no separation) as this is considered to be the worst case for shipping and navigation. GB asked that given the uncertainty around this would there be a likelihood of a change request being submitted during Examination. It was agreed that this would be discussed in more detail with Hornsea Four and PINS at the next project meeting.

ACTION: Hornsea Four and PINS to discuss at the next project meeting the process for any updates to the developable area.

Seabed Ground Investigations in 2020 and Beyond

DK provided an update on future seabed ground investigation surveys, clarifying that these surveys will not feed into the DCO Application but support pre-construction submissions.

Tables of surveys are provided below.

Scope	Survey year	List of Deliverables (data and reports)	Deliverable timing
Main Array and Export Cable Corridor (Geotech 1A)	2020	Offshore, deep and shallow sampling and testing: Datasets: Boreholes/vibrocores and CPTs Deliverables: Factual reports (Operational and Measured and Derived parameter reports, calibration with geological ground model.	Q3/Q4 2020
Main Array (Geotech 1B)	2021	Offshore, deep and shallow sampling and testing: Datasets: Boreholes/vibrocores and CPTs	Q3/Q4 2021
Main Array and Export Cable Corridor (Geophysical Seismic)	2021	Seismic survey of site border to refine geological ground model for pile placement: Datasets: MBES/Backscatter, SBP & UHRS.	Q3/Q4 2021
Main Array geophysical MBES (sand wave)	2021	Full coverage bathymetry survey of array site: Datasets: MBES/Backscatter	Q3/Q4 2021
Landfall geophysical and geotechnical	2021	Targeted landfall investigation: Datasets: CPT & BH and Geophysical (Seismic refraction / Resistivity profiles).	Q3/Q4 2021
Geotechnical 1B - Export Cable Corridor, Offshore Substations	2024	Offshore, deep and shallow sampling and testing: Datasets: Boreholes/vibrocores and CPT(s)	Q3/Q4 2024
Geotechnical 2 - Foundations	2024	Offshore, deep and shallow sampling and testing: Datasets: Boreholes/vibrocores and CPT(s)	Q3/Q4 2024
Geophysical - Export cable lines	2024	Full coverage geophysical survey of reduced cable route: Datasets: MBES/Backscatter, SSS, MAG, SBP.	Q3/Q4 2024
Geophysical - Array cable lines	2024	Full coverage geophysical survey of reduced cable route: Datasets: MBES/Backscatter, SSS, MAG, SBP.	Q3/Q4 2024
Geophysical 2A + 2B - UXO and export cable corridor	2025/2026	Full coverage geophysical UXO survey of construction cable corridor: Datasets: MBES/Backscatter, SSS, MAG, SBP.	Q4 2025/2026

CP noted that post-application, it is important that Hornsea Four continues to consult with Historic England on all the surveys in the table above in order to agree/set the objectives of these surveys and to ensure that they are undertaken in line with the WSI.

EB highlighted that survey data gaps were one of the main comments raised in relation to the PEIR which led to a very wide design envelope. EB noted that Natural England are pleased to hear that data gaps have been filled after PEIR and that a more refined can be presented within the DCO Application. GB agreed with this sentiment.

Onshore Formal Consultation

TW noted that formal consultation currently ongoing in relation to changes to the onshore cable route, with a response received from Historic England and awaiting other responses from relevant stakeholders on the call. This consultation is to enable the 'promoter' to comply with section 42(1) of the Planning Act 2008 during pre-application preparation of the DCO. TW stated that the consultation closes on Wednesday 18th March 2020. TW noted that the changes relate to an alternative Export Cable Corridor (ECC) route option and associated logistics compound on Dalton Estate Land by Lockington Carr Cross (both ECC options included); 36 proposed minor onshore route amendments (including amendments to the ECC (14), logistic compounds (6), access tracks (16); and inclusion of permanent access rights for 27 additional operation accesses.

GB queried whether this was a targeted consultation or open to all. TW confirmed that the consultation is targeted. AW noted that the consultation documents have been circulated internally and ERYC will formulate a response later in the week.

Design Vision and Enhancement

TW noted that the Hornsea Four Design Vision Statement is being updated based on guidance presented within the National Infrastructure Commission (NIC's) Design Principles for National Infrastructure document. TW highlighted that the Design Vision Statement is going to be supported by a new 'Outline Enhancement Strategy' and reformatted to be design-led. TW noted that some of the changes relate to recognition of the importance of making a clear distinction between mitigation and enhancement and how these are captured within the DCO and EIA.

TW noted that Hornsea Four are also looking to provide an 'Outline Design Plan' that will provide detailed design elements of project such as the application of colour and patterns on the substation and access a wayfinding. TW stated that an online based workshop on all associated documents would be taking place soon and greater detail will be available at the next meeting.

GB noted she was aware of the NIC's design principles document and had recalled Hornsea Project Four had previously described ambitions regarding this area of design which may align with the principles.

Programme to DCO

TW noted that Hornsea Four are targeting DCO submission in September 2020 with Evidence Plan Technical Panel and Statement of Common Ground meetings running between now and submission.

Impacts Register Updates

TW noted that Hornsea Four have been looking at the Impacts Register to make it more user-friendly and easier to navigate. TW highlighted that changes have been made to the register with it being divided into sections with headers at the top (e.g. Impact Background (including the Maximum Design Scenario (MDS)), EIA Scoping, PEIR and ES). TW noted that colours for EIA scoping outcomes have been added to match the colouring used for PEIR and ES. TW stated that new colours have been added to the ES section to relate to impacts that have been removed from ES chapter due to no significant effects being identified at PEIR and no changes to the baseline or assessment methodology. TW stated that Hornsea Four will issue the

updated Impacts Register to stakeholders once complete and these will form an important part of some SoCGs.

Commitments Register

DK explained that a number of new commitments have been added to the Commitments Register since PEIR with some existing commitments updated in response to S42 comments and design changes. DK noted that a commitment change log will be provided alongside the DCO Application. DK highlighted that the Commitment Register sets out how commitments are secured (e.g. within the DCO, dMLs or relevant outline plans). Some examples of new and amended commitments are provided in the table below:

New/Amended Commitment	Commentary
No cable protection will be employed within 350m seaward of MLWS	New commitment added in response to NE & MMO S42 comments which raised concerns with impacts on Smithic Bank. Commitment consistent with conditions on Dogger Bank Creyke Beck.
No impact piling within the HVAC area (DCO Works No. 3) will be undertaken between 1st September and 16th October unless otherwise agreed with the relevant stakeholders.	New commitments added in response to NE & MMO S42 comments which raised concerns with impacts on Herring spawning.
<p>A pre and post construction condition survey will be undertaken at each of the crossing location on primary and secondary watercourses where infrastructure (e.g. A Bailey bridge) is emplaced upon banks.</p> <p>A pre and post construction condition survey will also be undertaken at each EA Main river crossings, including any flood defences to be crossed. The scope and methodology of the survey will be agreed in advance with the Environment Agency. On completion of the project, details of the surveys under each Main River and flood defence will be submitted to the Environment Agency.</p>	Amended commitment in response to S42 comments from the Environment Agency.

EB asked if there will be signposting to where each commitment secured within the DCO or dMLs? DK confirmed that there will be clear links to how each commitment is secured. AW asked if a copy of the Commitments Register could be provided. DK confirmed a draft would be sent to stakeholders once it has been signed off internally.

ACTION: Hornsea Four to circulate an updated draft of the Commitments Register to stakeholders.

DK noted that some additional plans are being drafted for DCO Application that weren't included in the PEIR submissions, these include the In-Principle Monitoring Plan, Outline Fisheries Coexistence and Liaison Plan, Outline Onshore WSI, and Outline Site Integrity Plan.

Draft DCO and dML Updates

DK noted that the Draft DCO and dMLs have been updated following S42 comments and post-S42 workshops that have been held with the MMO and ERYC, noting that a DCO workshop has still to be arranged with Natural England. DK stated that Hornsea Four have sought to accommodate lessons learned on DCO implementation with the draft DCO

Next Steps

DK noted that the next steps in relation to the Evidence Plan process will be the review of draft ES documents and Section 42 responses (where provided) and the early drafting of SoCGs.

DK stated that outside of the Evidence Plan process, the next steps include the continued engagement with aviation and radar consultees, and oil & gas and shipping operators with the early drafting of Statements of Common Ground.

TW noted that additional onshore archaeological geophysical survey will now be undertaken on the additional route option at Dalton estate, subject to health advice regarding Coronavirus.

AOB

GB noted that PINS are keen to understand if the project can conclude no adverse effect on integrity, particularly in relation to in-combination ornithology impacts. DK stated that the project should know more after the Population Viability Analysis (PVA) is completed and reviewed by the Evidence Plan Technical Panel in June. EB stated that Hornsea Four had previously stated that the project wanted to wait until a decision was made on Hornsea Three and queried whether there was now sufficient time to take this into consideration given the delay? DK noted that Hornsea Four are trying to design/engineer away from significant impacts alongside commitments that are being made.

EB stated that the derogation case for the project should be put forward once Hornsea Four have explored mitigation and avoidance measures and that discussions about mitigation and avoidance should take place in parallel with the Evidence Plan process and the move on to discussing the derogation case if required. EB asked if PINS would expect the derogation case to be submitted alongside the DCO Application. GB confirmed that would be the case unless the Applicant is confident in their case that there is no Adverse Effects on Integrity (AEoI). In reaching their position, PINS advise applicants to make every effort to be made to agree matters with the relevant stakeholders prior to application, in order to avoid the submission of large amounts of new material during examination.

DK noted that Hornsea Four are going to be holding a piling workshop with internal specialists and external stakeholders in relation to how the project has developed their piling scenario based on the ground model and site-specific data and what the implications of that scenario are for underwater noise receptors. DK stated that he would be in touch with relevant parties to arrange.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to provide an update on cut-off dates for Evidence Plan input.	Hornsea Four
Hornsea Four and PINS to discuss the process for updating the array layout and the timing of this.	Hornsea Four and PINS
Hornsea Four to circulate an updated draft of the Commitments Register to stakeholders	Hornsea Four

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting #6	04 December 2020
Meeting Date	21/10/2020	
Place	Teleconference	
Participants	<p>██████████ – The Planning Inspectorate (PINS)</p> <p>██████████ – PINS</p> <p>██████████ – East Riding of Yorkshire Council (ERYC)</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Marine Management Organisation (MMO)</p> <p>██████████ - MMO</p> <p>██████████ – Historic England</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – RHDHV</p>	Our ref. HOW04/EP_SG_6
Absent	██████████ – MMO	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Agenda

1. Review previous actions
2. Updated programme to DCO
3. Draft ES document review progress
4. General project updates:
 - a) Statements of Common Ground
 - b) Project Seabird & derogation case preparations
5. Offshore specific updates
6. Onshore specific updates

GB noted that PINS drafted a high-level note of the discussions at the last Steering Group meeting and this has been agreed with attendees and will be published on the PINS website soon. GB confirmed a similar note will also be produced for this meeting and circulated for review before going on the website.

Review of Actions from Last Meeting

Action: Hornsea Four to provide an update on cut-off dates for Evidence Plan input. **Complete**

- DK noted that with the programme extension there is now time for further Evidence Plan discussions. DK stated that draft ES chapters and Technical Reports are being provided to the relevant Evidence Plan Technical Panels now and turnaround times will be agreed with individual stakeholders.

Action: Hornsea Four and PINS to discuss the process for updating the array layout and the timing of this. **Complete**

- DK confirmed that the project decision to update the Order Limits was made in June 2020.

Action: Hornsea Four to circulate an updated draft of the Commitments Register to stakeholders. **Complete**

- DK confirmed that the Commitments Register is still in draft form but will be provided pre-application for review to those Technical Panel members whom requested early sight of it. DK asked that stakeholders should request this from Orsted if they require it for their review of ES chapters or Technical Reports.

Updated Programme to DCO

DK gave an overview of the programme running from the last Steering Group meeting (meeting 5) which took place in March 2020, up until the planned DCO submission in Q1 2020.



CP asked if Hornsea Four could be more specific about the DCO submission date. TW confirmed that DCO submission is anticipated to be no earlier than mid-February and no later than the end of March 2021 and noted the considerations that have fed into the delay. TW noted that Eleni Antoniou (Hornsea Four) has been in touch with Historic England about arrangements for consultation going forwards, including the review of draft documentation and attendance at post-application meetings.

Draft ES Document Reviews

DK gave an overview of the programme for offshore ES document submission to Evidence Plan Technical panels as outlined in the table below.

Document to be shared	Date
Gannet & Razorbill Screening & PVA Note	22/09/2020
Marine Processes Technical Report & Chapter	02/10/2020
Benthic & Intertidal Ecology Technical Report & Chapter	02/10/2020
Fish & Shellfish Ecology Technical Report & Chapter	23/10/2020
Ornithology Baseline Technical Report & MRSea Report	23/10/2020
Marine Mammals Technical Report	30/10/2020
Marine Mammals Chapter	09/11/2020 (tbc)
In-Principle Monitoring Plan	20/11/2020 (tbc)
Offshore Ornithology Chapter	11/01/2021

MM noted that Natural England had reviewed several of the Technical Report several months ago. DK confirmed that those versions were before the Order Limits change so they have been updated in line with that change. LK also noted that spreadsheets have been provided alongside the documents containing stakeholders comments and how these have been

addressed within the document for both PEIR consultation and for the reviews undertaken a few months ago through the Evidence Plan process.

In relation to the proposed split submission of the marine mammals documents, RR highlighted that it might be easier to receive both the Technical Report and Chapter at the same time. MM agreed that this would be useful.

Action: Hornsea Four to submit the Marine Mammal Technical Report and ES Chapter at the same time.

TW gave an overview of the programme for onshore ES document submission to Evidence Plan Technical panels and stakeholders as outlined in the table below.

Document to be shared	Date
Onshore Written Scheme of Investigation	March 2020
Outline Construction Traffic Management Plan	April 2020
Multiple onshore ecology technical annexes and ES Chapter	Q3 2020
Outline Public Rights of Way Management Plan	Oct 2020
Air Quality ES Chapter	Oct/Nov 2020
Noise and Vibration ES Chapter	Oct/Nov 2020
Landscape and Visual ES Chapter	Oct/Nov 2020
Traffic and Transport ES Chapter	Nov 2020
Outline Code of Construction Practice	Nov 2020

TW noted that there are a number of onshore and offshore archaeological documents that will be submitted to Historic England over the next couple of months to aid the Statement of Common Ground (SoCG) process – these submissions have been agreed in principle with Historic England through updates to projected hours and costs.

Statements of Common Ground

TW noted that three SoCG documents (in template form) have been submitted to the relevant stakeholders (ERYC, Historic England and Environment Agency). TW confirmed that the templates have been approved by all three parties after comments received and accounted for, and the detail and agreements will be added over the coming month, facilitated by draft ES documents where necessary. TW further noted that templates are being drafted for the MMO and MCA and these will be submitted to the relevant stakeholders soon. TW confirmed that Rachel Hall (Hornsea Four) will be in contact with Natural England about onshore and offshore SoCGs for Hornsea Four.

Project Seabird & Derogation

DK gave an overview of the Project Seabird and Derogation workstream, noting that Project Seabird has been set up to focus on the derogation workstream and compensation measures for key species where there is potential for adverse effect on site integrity (AEoI) in relation to Flamborough and Filey Coast Special Protection Area (SPA). DK confirmed that Hornsea Four will be engaging with key stakeholders throughout the process (Natural England and RSPB), building on the work done by Hornsea Three.

DK highlighted that Hornsea Four are planning to hold a Project Seabird/Derogation workshop later this year and will be requesting Natural England's attendance. DK confirmed that Rachel Hall (Hornsea Four) will be in touch with Natural England to agree a date/time. DK noted that there will be a series of follow up meetings in early 2020. DK highlighted that further detail on Project Seabird is provided in the slides.

Offshore Update: Updated offshore Order Limits

DK gave an overview of the reasons behind the amendment to the offshore Order Limits for Hornsea Four, noting that in May 2020, in response to a number of concerned shipping stakeholders, Hornsea Four explored the possibility of reducing the array developable area to accommodate commercial shipping routes. DK highlighted that the Section 42 comments (MCA, DFDS Seaways, UK Major Ports Group, Chamber of Shipping) were very clear on the need for a route between Hornsea Four and Hornsea Project Two. DK noted that a second Navigation Risk Assessment was undertaken [online] in May 2020 to qualify stakeholder concerns and identify the level of support for a range of potential mitigation measures. DK confirmed that feedback to the proposed Structures Exclusion Zone of 2.2nm between Hornsea Project Two and Hornsea Four was positive and written responses were received from across the industry in support of the proposal. DK stated that in June 2020, the Hornsea Four Steering Committee approved the implementation of a Structures Exclusion Zone of 2.2nm which was ultimately implemented in the form of an Order Limits change. Slides were shown which illustrated the changes to the Order Limits from PEIR.

Offshore Update: Approach to new projects

DK confirmed that Hornsea Four will consider the impacts on other activities where we have the information available to do so – and the scope and detail of the assessment is governed by the level of detail that is available in the public domain – for example Scoping reports or EIAs. DK noted that in consultation with other developers, a number of new potential offshore infrastructure projects are coming forward (e.g. possible 'Endurance' Carbon Capture & Storage (CCS) site and an Alpha Petroleum possible pipeline). DK highlighted that there is currently no information available in the public domain on these projects so may not be considered within the EIA on the basis of lack of publicly available information. DK further noted that Hornsea Four do acknowledge that there is the potential for an interested party come forward with new information at Examination but for a proper evaluation by the Examining Authority, the interested party is going to have to provide reasonable detail to allow Hornsea Four to respond.

GB confirmed that PINS have been aware of these issues with Hornsea Four and noted that given that the information isn't available for these projects then it could be considered a defensible position to not consider them in detail at this stage. GB cautioned that this any limitations to the cumulative impact assessment should be set out clearly in the ES and acknowledged the Examination risk. DK confirmed that consultation is ongoing with the developers of these potential projects but these discussions and any information sharing comes under a Non-Disclosure Agreement (NDA). DK stated that Hornsea Four will have an Examination strategy in place and will try and prepare an assessment as soon as information becomes available. GB noted that it is common practice to have a cumulative cut-off date. LK confirmed that Hornsea Four have set a cumulative cut-off date of mid-November and this has been communicated to relevant parties, but due to the sensitive commercial nature of these

projects, all information provided to date has been under NDAs and it is unlikely that any information will be made public before this cut-off date.

Offshore Update: Landfall Surveys

DK gave an overview of the planned survey at the Hornsea Four landfall that will be taking place in November and December 2020, noting that this survey has been designed to provide information within the landfall area needed primarily for the HDD feasibility assessment, a geo-hazard assessment, and for the planning of future (2021) geotechnical investigations. DK noted that the main objectives of this survey will be to verify the assumptions made in the conceptual ground model, provide information on geo-hazards (hard layers, buried channels, peat, faults), and to inform a geotechnical campaign which will be performed along the survey grid in 2021. DK noted that the data from this survey won't be available in time to inform the EIA. DK confirmed that any new datasets will be assessed in relation to the historic environment and these assessments will feed into the post-application historic environment documents (e.g. WSIs). CP queried whether a method statement will be made available to Historic England in relation to this survey?

Action: Hornsea Four to confirm whether an archaeological method statement will be submitted to Historic England in relation to the landfall survey and provide further information to Historic England on this.

Onshore Update: Design Vision

TW gave an update on the ongoing discussions with ERYC regarding the redline boundary interaction between Hornsea Four and the A164/Jocks Lodge Highways Improvement Scheme. TW noted that a residential property will use the same layby to access their property as was proposed for construction and operation use for Hornsea Four. TW stated that Hornsea Four have been in close contact with ERYC to discuss the best way forward, whether this would be a joint access design or potentially looking at a late minor amendment to the redline boundary. TW highlighted that it is likely that the amendments would only require minor figure amendments within submission documents.

TW gave an overview of the Design Vision Statement which has been drafted and encompassed details secured in multiple DCO submission documents (e.g. Enhancement Measures, Biodiversity New Gain, Mitigation Measures, Detailed Design, DCO Parameters, and Options Not Selected). TW highlighted that biodiversity net gain is not a statutory requirement but Hornsea Four keen to pursue this in the identified areas.

TW noted that multiple landowner workshops have been taking place online with technical members from the Hornsea Four engineering team presenting information on construction methods and drainage. TW stated that this process has allowed questions and comments to come through from landowners and that a key focus of these discussions have been in relation to construction link boxes and drainage.

TW acknowledged that there have been several iterative delays to the DCO submission and as such, Hornsea Four have been undertaking a baseline evaluation of the desk-based onshore information to consider whether any data refreshes would be needed. DK confirmed that this process was also being undertaken on offshore data. DK noted that with the new submission date, the vessel traffic survey data will be a few weeks out of date based on guidance from

the MCA. DK confirmed that Hornsea Four have engaged with the MCA and have received confirmation that they are content with the existing data.

AOB

Resources and timelines

GB highlighted that there isn't much time until submission date and there has been significant changes to project, and draft documents still to submit to the Evidence Plan Technical Panels. GB asked stakeholders about whether they were comfortable with the time available to consider the information before the DCO submission is made. CP noted that Historic England are very conscious of the number of offshore wind farm projects currently at different stages and highlighted that it was important for Historic England to commit resources. CP requested clarity on what material is being provided when. CP suggested that an engagement plan could be appended to the Evidence Plan document. DK noted that Eleni Antoniou (Hornsea Four) would be in touch with Historic England regarding future engagement if it hasn't already been agreed. RR confirmed that the MMO have enough resource to review the documents within the timelines but would appreciate dates for document submissions. EB stated that Natural England are fairly comfortable with the timescales, acknowledging that the exception could be ornithology as discussions are still ongoing. EB highlighted that the ornithology ES chapter will be available in January 2021 at the same time as compensation discussions so this could be difficult. EB confirmed that Natural England were aware of this and will do their best in the available time.

Action: Hornsea Four to engage with the MMO and Historic England regarding future document submissions. **Complete**

Submission of other documents

CP queried whether there would be an updated Impacts Register provided. DK confirmed that updated Commitments and Impacts Registers will be provided pre-application, noting that these are still live documents and being used and updated throughout the internal review process.

Action: Draft Commitments and Impacts Registers to be provided to stakeholders (those who have requested these documents) as soon as possible prior to DCO application submission.

RR asked whether stakeholders would get a chance to review draft DCO before DCO application. DK confirmed that the draft DCO is currently being finalised and Rachel Hall (Hornsea Four) will be in touch to provide this.

Action: Hornsea Four to confirm timescales for the pre-application provision of the draft DCO.

Updated Design Envelope

MM highlighted that upon reviewing some of the latest chapters, it has become apparent that the design envelope hasn't reduced despite the reduction in the Order Limits – for example the reintroduction of gravity base foundations and the increase in cable installation tool width. DK confirmed that these changes have arisen as a result of an engineering review of the DCO application and a review of the viability of the project and any associated risks. DK noted that due to the smaller developable area, it was considered necessary to reintroduce gravity bases due to the uncertainty around the viability of monopiles across the entire site. EB highlighted that the inclusion of GBS is a big change and massively increases the seabed disturbance areas.

CP also voiced concerns about this large increase. DK acknowledged the increased MDS for foundations.

DK noted that the width of cable installation within the offshore ECC has increased from 30m to 40m but highlighted that the sandwave clearance width was at 40m already and therefore the MDS for seabed disturbance had not increased in this respect. MM and RR stated that it would be useful to understand the reasoning why design changes have been made since PEIR.

Action: Hornsea Four to consider how to present changes to the design envelope between PEIR and ES – this could be a stand-alone note or incorporated into the Project Description or relevant ES chapters.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to submit the Marine Mammal Technical Report and ES Chapter at the same time.	Hornsea Four
Hornsea Four to confirm whether an archaeological method statement will be submitted to Historic England in relation to the landfall survey and provide further information to Historic England on this.	Hornsea Four
Hornsea Four to engage with the MMO and Historic England regarding future document submissions.	Hornsea Four
Draft Commitments and Impacts Registers to be provided to stakeholders (those who have requested these documents) as soon as possible prior to DCO application submission.	Hornsea Four
Hornsea Four to confirm timescales for the pre-application provision of the draft DCO.	Hornsea Four
Hornsea Four to consider how to present changes to the design envelope between PEIR and ES – this could be a stand-alone note or incorporated into chapters.	Hornsea Four

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Steering Group Meeting #7	05 August 2021
Meeting Date	29/07/2021	
Place	Teleconference	
Participants	[REDACTED] – The Planning Inspectorate (PINS) [REDACTED] – East Riding of Yorkshire Council (ERYC) [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – MMO [REDACTED] – The Wildlife Trusts (TWT) [REDACTED] – Ørsted [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants	Our ref. HOW04/EP_SG_7
Absent	[REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – TWT [REDACTED] – Historic England	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Review previous actions
2. Updated programme to DCO
3. Draft ES document review progress
4. Statements of common ground updates
5. Compensation updates
6. Offshore specific updates
7. Onshore specific updates
8. Any other business

GB noted that PINS drafted a high-level note of the discussions at the last Steering Group meeting and this has been agreed with attendees and will be published on the PINS website soon. GB confirmed a similar note will also be produced for this meeting and circulated for review before going on the website.

DK stated that this was potentially the last Steering Group meeting prior to the DCO Application submission which has been delayed to 30th September to accommodate consultation on proposed ornithology compensation measures.

Review of Actions from Last Meeting

Action: Hornsea Four to submit the Marine Mammal Technical Report and ES Chapter at the same time. **Complete**

- DK stated that comments were currently being addressed and reports were being updated in preparation for the DCO application submission.

Action: Hornsea Four to confirm whether an archaeological method statement will be submitted to Historic England in relation to the landfall survey and provide further information to Historic England on this. **Complete**

- DK confirmed the archaeological method statement was consulted on and these surveys were now complete.

Action: Hornsea Four to engage with the MMO and Historic England regarding future document submissions. **Complete**

- DK noted that most if not all documents pre-application have been submitted. An upcoming meeting to discuss marine monitoring proposals had been scheduled.

Action: Draft Commitments and Impacts Registers to be provided to stakeholders (those who have requested these documents) as soon as possible prior to DCO application submission. **Complete**

Complete

- DK noted these were some of the final documents to be finalised, and as such will likely be submitted at the end of September.

Action: Hornsea Four to confirm timescales for the pre-application provision of the draft DCO. **Complete**

Complete

- DK confirmed the draft DCO had been provided to all those consultees whom requested it ahead of DCO application.

Action: Hornsea Four to consider how to present changes to the design envelope between PEIR and ES – this could be a stand-alone note or incorporate into chapter. **In progress**

- DK noted the importance of this item, but recognised Ørsted have yet to tackle this and highlighted that Orsted has provided documents in draft versions throughout the ES process. DK wondered what the best solution would be to transfer this method into the DCO Application and asked the group whether anyone had any ideas or useful lessons learned from previous projects. No responses were provided.

Updated Programme to DCO

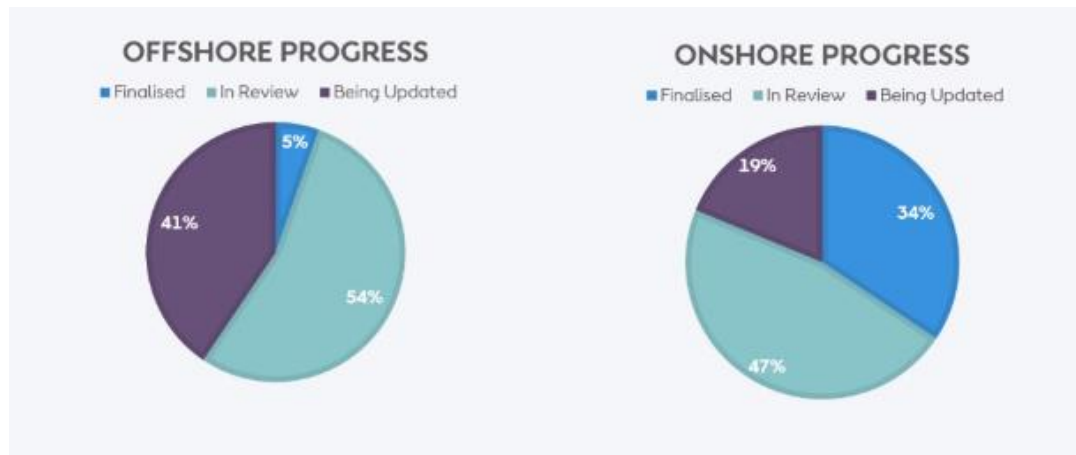
DK gave an overview of the programme running from the last Steering Group meeting (#6) which took place in October 2020, up until the planned DCO submission in Q3 2021.



DK stated that all compensation consultation materials were currently undergoing their final checks and that these would be issued alongside the start of the consultation process on 4th

August. DK noted that the DCO Application submission will now be 30th September as per the email communication that was issued to all key stakeholders. This small delay is to allow more time for the consultation on potential compensation measures.

Draft ES Document Review Progress



With reference to the above figure, DK explained that the previous extension to the DCO was based on a change to the Order Limits in the offshore array area, which in turn has required remodelling for various offshore topics and has created a longer lag time for document finalisation compared to onshore efforts.

TW stated that onshore only had a minor red line boundary change which caused multiple figures to be updated however, most of the written material for these topics were not affected and as such, it has been relatively quick to progress a number of documents to sign-off procedures.

Statements of Common Grounds Update

DK stated Ørsted are aiming to have drafted Statements of Common Grounds (SoCGs) signed-off and submitted alongside the DCO Application in late September for a number of consultees.

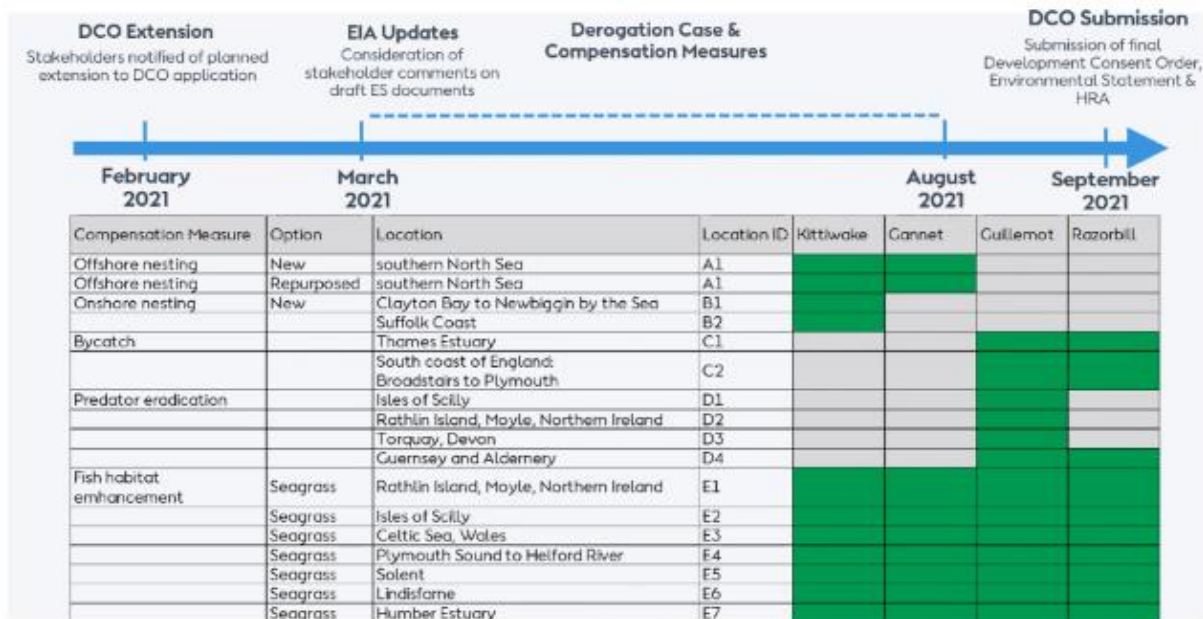
Statements of Common Ground	Letters of Comfort
<ol style="list-style-type: none"> 1. East Riding Yorkshire Council – structure agreed, draft documents reviewed (including ES chapters and technical reports) and positions agreed for a number of topics. 2. Historic England – Format and structure of SoCG agreed, though no positions to be identified until post-application after Historic England request. 3. Environment Agency – Template and structure agreed, next steps to populate once draft documents have been reviewed. 4. Marine Management Organisation – draft issued and introductory meeting held. Next steps are to commence populating document and arrange follow-up meeting. 5. Maritime & Coastguard Agency – as above. 6. Trinity House – as above. 7. Chamber of Shipping – as above. 8. Natural England Onshore – positions agreed for a number of topics after review of draft documents. 	<ol style="list-style-type: none"> 1. Shipping operators: <ul style="list-style-type: none"> – DFDS Seaways – Oil & gas operators: <ul style="list-style-type: none"> – Alpha Petroleum agreed but not yet signed – Shell agreed, awaiting return of signed copy – Position statements being prepared with NEO & Perenco 2. Interconnector cable developers: <ul style="list-style-type: none"> – Viking Link – Eastern Link – Continental Link

TW confirmed that Hornsea Four had input from Natural England during the design of the onshore ecology SoCG template and had progressed agreements based on draft submission documents; however, it is unclear whether this would be submitted with the DCO application.

DK highlighted that the SoCG was not the best process for dealing with commercial issues and Letters of Comfort were considered more appropriate, particularly for the oil and gas industry. DK noted that a similar approach will also be proposed for interconnectors and the shipping industry.

Compensation Consultation Update

DK explained that there are five primary candidate compensation measures being pursued by Hornsea Four: Offshore Nesting, Onshore Nesting, Predator Eradication, Bycatch and Fish Habitat Enhancement (i.e. seagrass restoration). The planned consultation period is scheduled to last for 28 days (5th August – 6th September) and will primarily be done electronically. However, all consultation documents have been designed to allow for printing and postage for stakeholders and areas in which electronic viewing is not feasible. This consultation timeline will allow enough time for Hornsea Four to consolidate responses and submit these alongside the DCO Application in late September.



DK displayed the compensation measures consultation webpage¹ and provided a brief overview of the planned documentation and supplementary information available. DK noted that if Hornsea Four are unable to contact an individual or stakeholder, then printed versions of consultation materials could be posted.

- Non-statutory Targeted consultation - Electronic
- Cover letter and targeted consultation pack
- Directed to Hornsea Four website
- 05 August to 06 September

Landing Page

- Cover letter, Consultation materials, Project Description and Location Plan overview with hyperlinks to each search area (e.g. Rathlin Island)

Search Area Hyperlink

- Search area-Compensation Measure(s) Project Description(s), detailed Location Plan(s) and Impact Register(s) provided high-level assessment upon which we are seeking comments

DCO Application

- EIA Annex and HRA Plan

¹ <https://hornseaprojects.co.uk/hornsea-project-four/compensation-measures-consultation>

GB questioned whether there was enough time between the end of this consultation period and the submission of the DCO application. DK acknowledged the unknowns when considering how much feedback will be received during consultation, especially when factoring in summer and school holidays, but believed the current timeline of events was possible.

GB stated that the array of compensation options available was wide reaching and could easily result in substantial amounts of feedback submitted. DK agreed this was possible and explained that the measures proposed were considered appropriate, based on initial consultee feedback.

GB wondered how much flexibility there was in the DCO Application date and if Hornsea Four envisioned any subsequent impacts on this. DK stated that the current DCO Application date has already been postponed allowing for compilation of consultation results and that team believe this is an achievable, although undoubtedly tight, timeframe dependent on the scale of feedback received. DK acknowledged that further delays to DCO submission would not be ruled out, dependent on consultee availability and range of feedback offered.

Offshore Updates

Offshore Surveys

DK stated full coverage surveys of the offshore ECC, array area and a nearshore geotechnical campaign were successfully completed in the Spring – Summer 2021. Data collected from these surveys provides crucial information for design and engineering, plus supports the ongoing marine archaeological review and development of the ground model. DK mentioned that the scoping of next year's geotechnical campaign was progressing well. This campaign will provide full site geotechnical coverage within the array area and specifically targets foundation areas for proposed turbine and substation locations.

Meetings

DK explained that a suite of Evidence Plan meetings were held in May 2021 which discussed comments received on draft ES documents for Marine Processes, Fish and Shellfish Ecology, Benthic and Intertidal Ecology and Marine Mammals. An upcoming meeting scheduled later in August will discuss the Outline Marine Monitoring Plan and subsequent comments received from stakeholders. The key objective of this meeting will be to agree a plan and carry this forward into Examination.

Onshore Updates

TW stated that both beach and landfall site investigation works were now complete. An archaeological watching brief was prepared and agreed with the Humber Archaeological Partnership and information has been incorporated into the DCO application submission via an addendum to the Geoarchaeological Desk Based Assessment. Additionally, site investigation works are planned at the onshore substation site; however information will not be ready to inform the DCO application submission and instead will be presented during Examination, if required. Ecology in-fill surveys were completed to infill gaps due to previous landowner constraints. Final meetings were held with Parish Councils to discuss landfall, onshore ECC and Onshore Substation. Baseline validity position papers were issued to stakeholders to agree on proposed minor updates to the environmental baseline due to delays in the DCO Application submission. Lastly, a final targeted consultation was undertaken to cover a construction access change located off the A164, one of the main A roads in East Riding. This resulted in a red line boundary change and the junction has moved further south to a non-motorised area to be incorporated as part of a consented highways improvement scheme, which suits all parties involved.

DK asked if there were any questions relating to these offshore and onshore updates. No comments.

DK highlighted there were 48 working days remaining until submission of the DCO Application and that there were no other major updates other than the bird compensation measures already discussed.

LW enquired about the SoCGs and highlighted the fact that the MMO have yet to see one of these and subsequently require an update. DK admitted that this was an oversight as the SoCG had been drafted but the kick-off meeting did not take place. DK would like to arrange a meeting between now and September to finalise this SoCG and will be in touch shortly with potential dates. LW stated that there was nothing further from the MMO.

Action: Hornsea Four to issue SoCG drafts to the MMO and schedule a meeting to discuss before DCO submission.

AOB

Next Steps

DK stated that Hornsea Four would proceed with the compensation and SoCG workstreams as well as continue documentation finalisation and sign-offs in preparation for the DCO submission, currently anticipated late September. There is no future Evidence Plan meetings scheduled however TW would like to schedule another meeting with Natural England (outwith the EP process).

Action: Hornsea Four to schedule a meeting with Natural England to discuss final onshore ecology matters, to close out agreements prior to DCO application submission.

GW would like to add a meeting note to be issued alongside these minutes.

Action: PINS to submit a meeting note to Hornsea Four for review prior to publication on the PINS website.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to issue SoCG draft to the MMO and schedule a meeting to discuss before DCO application.	Hornsea Four
Hornsea Four's Onshore Team to arrange a meeting with Natural England to discuss final onshore ecology matters, to close out agreements prior to DCO application submission..	Hornsea Four
PINS to submit a meeting note to Hornsea Four.	The Planning Inspectorate

Appendix C2 – Offshore Evidence Plan Meeting Minutes

Minutes of Meeting

Meeting	Hornsea Four Marine Processes & Ecology Technical Panel Meeting One (Pre-Scoping)	
Meeting Date	12 September 2018	24 October 2018
Place	Ørsted, 5 Howick Place, London	
Participants	██████████ (Ørsted) ██████████ ██████████ (GoBe Consultants) ██████████ ██████████ (GoBe Consultants) ██████████ ██████████ (Cooper Marine Advisors) ██████████ ██████████ (GoBe Consultants) ██████████ ██████████ (Marine Management Organisation) ██████████ (Marine Management Organisation) ██████████ ██████████ (Cefas) ██████████ ██████████ (Cefas) ██████████ ██████████ (Cefas) ██████████ ██████████ (Natural England) ██████████ ██████████ (Natural England)	Our ref. 00307483_A
Absent	None	
Copy	██████████ (Ørsted)	
Next meeting	November 2018	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim

Initial meeting to discuss the approach to the scoping report, the scope of any proposed surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

Introduction

DK provided a Health and Safety Briefing, facilitated general introductions, and outlined the aims and objectives of the meeting – with the main aim of this meeting to be the establishment of the Marine Ecology & Processes Evidence Plan Technical Panel to discuss the data and information to be included in the Hornsea Four Environmental Statement in relation to Marine Processes, Benthic Ecology, and Fish & Shellfish Ecology. DK presented an overview of Hornsea Four, the consenting programme, route planning and site selection undertaken to date.

Evidence Plan Process

LK presented an overview of the Evidence Plan process. EB: enquired whether the Evidence Plan would lead to Statements of Common Ground (SoCG). LK confirmed the Evidence Plan provides the basis for SoCG in the subsequent examination process and aims to reduce resource requirements during examination by reducing evidence-related disagreement.

Proportionate EIA

LK presented an overview of the proportionate approach to EIA, outlining the five methods being used to achieve this proportionate approach: Impacts & Effects Registers, Commitments Register, the Evidence Plan Process, innovative ways of presenting data, and directed questions in Scoping.

JR queried what a 'simple assessment' comprised of. LK stated that 'simple assessments' would be defined at each topic level and outlined in the scoping documents but largely relied on existing datasets / modelling relevant to the current scheme.

JR commented that the issue of bloated EIA largely stemmed from a young industry, where impacts were unknown, and precaution was built-in. LK stated that many of the impacts are now better understood, which allowed a more proportionate approach to be developed for Hornsea Four.

EB requested that additional clarification be added to the impacts and effects register to make clear that the term "likely significant effects" used in the Impacts and Effects Register, is being used in an EIA context and a distinction should therefore be made to the term "likely significant effects" already in use in Habitats Regulations Assessments (HRAs), albeit with another meaning. The use of the same terminology will be confusing since conclusions drawn on the EIA regarding "likely significant effects" will not necessarily translate across to the HRA assessment. JC and JP confirmed.

Action – LK to ensure that all future reference includes "the likely significant effects (applicable to the 2017 EIA Regulations)"

Marine Processes

BC presented the marine processes position paper as the basis for discussion, stating that the industry benefits today from almost 20 years of research and knowledge. BC highlighted that the key issues are likely to be turbidity effects during construction and potential for wave and tidal barriers during operations. BC confirmed that Ørsted are advocating the evidence-based approach, utilising the extensive knowledge base from across the former Hornsea zone.

BC queried whether anyone could identify gaps in the current literature list. JR stated that the approach appeared reasonable, in principle but would need time to review the evidence list before commenting on its sufficiency.

JR recommended that UKHO Medin (on the CARIS website) was reviewed in relation to seabed data.

BC stated that temperature had not normally been a marine processes topic but was being considered across the Hornsea zone due to the proximity of the project to the Flamborough Front. JR suggested that Hornsea Four consider the published work by Liam Fernand (Cefas) characterising the frontal system.

Action: JR to provide brief advice note to MMO on review of evidence list and environmental topics for consideration.

BC concluded that the available baseline evidence for marine processes is sufficient for the purposes of Hornsea Four assessment and no further baseline survey were proposed beyond the geophysical survey. There are comparable conditions across the zone, it's a comparable project and is likely to have comparable effects. No further detailed modelling is anticipated as existing modelling evidence is considered sufficient and will offer a basis of validating comparable effects for Hornsea Four described on a simple basis, consistent with the proportionate approach.

JR stated that Cefas would need evidence that the baseline conditions are comparable across the entire zone, but that the approach, in principle, appears acceptable.

EB commented that comparable data was important, but that testing the modelling with post-construction data (from operational wave monitoring) was also important. RW suggested that HOW01 and HOW02 post-construction survey data should be available to feed-in to the Hornsea Four assessment. JR highlighted that should there be a gradient in wave height from HOW01 and HOW02, the Dowsing wave buoys could be a useful source of data.

BC stated that whilst post-construction monitoring data (from wave buoys at operational Hornsea wind farms) might be made available in time for Hornsea Four, the use of this data is not being committed to at this stage as it's applicability to Hornsea Four EIA needs to be established. Before committing to use this data, the suggestion was made that the potential value of the operational wave monitoring needed to be considered first, since the design of the deployment configuration was never intended for the purpose of monitoring post-construction wave effects and deployments would need to be in close proximity to structures to pick up any effect.

BC described the committed embedded mitigation and topics proposed to be scoped in and out of future assessment. JR confirmed that Cefas would need to review the existing evidence base before they could accept scoping out potential impacts. JR highlighted that seabed clearance, especially for gravity base foundations should be scoped-in. Consideration of cable laying, rock-armouring and sandwave clearance / disposal is also very important.

RW highlighted the case of Thanet offshore wind farm where post-consent rock dumping was required to protect the export cable and went well beyond what was expected and considered in the EIA. RW stated the Hornsea Four need to demonstrate proper consideration to achieving depth of burial and assurances that a similar situation would not occur on Hornsea Four, else this could lead to further marine process interactions that could be disruptive to sediment pathways and negate this issue from being scoped out.

EB confirmed that altering longshore sediment transport would have implications for HRA and that the implications of any rock armouring required that could interfere with this process should be considered.

Action: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.

Marine Ecology

FM presented the marine ecology position paper as the basis for discussion, highlighting the full benthic data coverage of the array area from pre-existing surveys including zonal characterisation and infill surveys at adjacent projects. Nearshore data from Creyke Beck OWF project overlaps with the inshore section of the Hornsea Four Export Cable Corridor (ECC). FM noted that Hornsea Four ground investigation data is currently being collected but will not be available until post-scoping.

FM noted that similarly, fish and shellfish ecology baseline will be utilising the existing data sources available from across the Hornsea zone. FM summarised the approach to scoping and preliminary scoping determinations for both benthic and intertidal ecology, and fish and shellfish ecology.

FMY enquired whether charts of data points / coverage could be provided because it was currently not provided in position paper. FM confirmed that sampling locations of all surveys would be plotted in the Scoping Report. FMY suggested that the Eastern IFCA are approached for nearshore fish survey data, and that the Cefas shellfish advisor should also be approached for input. FMY noted that sediment disposal sites might need to be scoped-in.

JE suggested that activities including cleaning turbines during operations and maintenance were starting to be considered by the regulator and should be considered within the Hornsea Four assessment. JE also noted that Cefas were aware of high levels of arsenic within the muds across the Hornsea zone and therefore this may need consideration.

JE highlighted that there are instances where EUSeaMap predictions have been inaccurate and would prefer to see site specific survey data. FM noted that where possible, other data would be used to attempt to 'ground-truth' the EUSeaMap predictions.

JE noted that justification would need to be presented to support scoping determinations.

Action: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.

HRA Screening

SK provided a summary of the approach being taken for the HRA Screening at Hornsea Four: EB confirmed that a 16km buffer seemed appropriate for benthic and intertidal ecology and agreed that the terrestrial elements of Flamborough Head SAC could be screened out.

EB clarified Natural England's interpretation of the Sweetman ruling: all potential impacts are initially screened in to determine if there are Likely Significant Effects (LSE) and therefore an appropriate assessment (AA) is needed. This is done irrespective of mitigation measures in place, which will then be considered at the AA stage to assess if there is an Adverse Effect on Integrity (AEOI). In practice this means that if any mitigation or avoidance measures needs to be applied, we cannot say that there is no LSE. This would need to be considered in the AA stage, and it would need to be demonstrated that these measures were sufficient to rule out AEOI.

EB suggested impacts on lamprey should be considered in combination with other activities like abstraction and fishing licences – the EA would hold these records.

EB concluded that based on the high-level description of the approach to HRA Screening that it seemed appropriate.

AOB

LK/DK: Thanked all participants for joining the Technical Panel meeting. Meeting minutes and a slide-pack would be circulated by Ørsted within the next few days for comment / sign-off within the next two weeks.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Ecology & Processes Technical Panel Meeting 2	29 January 2019
Meeting Date	12/12/2018	
Place	Ørsted, 5 Howick Place, London	
Participants	<p>██████████ – Cooper Marine Advisors</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p> <p>██████████ - Cefas</p> <p>██████████ – Cefas</p> <p>██████████ – Cefas</p> <p>██████████ - Cefas</p> <p>██████████ – Marine Management Organisation (MMO)</p>	Our ref. HOW04/EP_TPMEP_2
Absent	<p>██████████ – MMO</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ - Cefas</p>	
Copy	██████████	
Next meeting	Not planned	

Agenda

1. Welcome and safety brief
2. Introductions
3. Hornsea Project Four Update
4. Aims and Objectives of Meeting
5. Marine Processes
 - a) Review of Actions of Previous Meeting
 - b) Scoping Review
 - c) Next Steps
6. Benthic & Intertidal Ecology
 - a) Review of Actions of Previous Meeting
 - b) Scoping Review
 - c) Next Steps
7. Fish & Shellfish Ecology
 - a) Review of Actions of Previous Meeting
 - b) Scoping Review
 - c) Next Steps

8. AOB

Introductions

Introductions were made for those who had not met previously.

Hornsea Four Update

DK noted that the Hornsea Four Scoping Report was submitted to the Secretary of State on 15 October 2018. This was a 782-page report which adopted a front-loaded, proportionate EIA approach. The associated 182-page Scoping Opinion was adopted by the Secretary of State on 23 November 2018.

DK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, offshore Export Cable Corridor (ECC), landfall, onshore ECC and onshore substation location refined and an internal design freeze set for 14 December. In relation to the preparation of the Preliminary Environmental Information Report (PEIR), the project parameters are being finalised, baseline data collection is underway, and the Scoping opinion has been evaluated.

Aims and Objectives

DK stated that the principal objective of this second Hornsea Four Evidence Plan Marine Ecology & Processes Technical Panel meeting was to provide an update on Hornsea Four development activities, review responses received during the Scoping process and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the PEIR and the Environmental Statement for Hornsea Four.

Marine Processes

a) Review of Actions from Previous Meeting

Action: JR to provide brief advice note to MMO on review of evidence list and environmental topics for consideration. **Completed.** Letter of 26th September from Cefas, including response to questions posed by MMO

Action: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper. **Completed.** Response included from Jon Rees in letter of 26th September from Cefas.

Follow Up from Discussions at Previous Meeting: JR request to develop baseline description to demonstrate comparable conditions across Hornsea to substantiate use of HOW01, 02 and 03 evidence – **Ongoing.** Planned in PEIR baseline activities

Follow Up from Discussions at Previous Meeting: Consider HOW01 operational wave data for evidence of wave effects from as-built structures. **Ongoing.** Drafting Technical Note to share views with Evidence Plan process

b) Scoping Review

BC gave an overview of the key issues raised in the scoping responses:

- Assessment of scour, if rock placement does not precede foundation installation (Planning Inspectorate)
- Potential effect of cable during O&M phase on sediment pathways from Smithic Bank to MHWS

- Temporary increase in SSC across array, ECC and nearshore areas during installation and removal (decommissioning), subject to justification of old (benthic) survey data (from Benthic and Intertidal Ecology comments)
- Nearshore processes, given active coastline / cable burial and protection, especially in the active nearshore
- Potential removal (decommissioning) of cable protect and scour protection
- Seabed preparation activities, including levelling, boulder and sandwave clearance

c) Next Steps

BC gave an overview of an initial review of using HOW01 operational wave data for evidence of wave effects from as-built structures, noting that this was an initial review and all comments were provisional, without prejudice and subject to further review. BC noted that the initial review covered the following points:

- Determine what foundations have been installed, when and where
- Determine what waves have been measured, when and where
- Establish what period of data represents the pre-installation baseline and which may have an influence from any installations, type and scale of influence and over what period
- Determine fair basis for comparison between equivalent wave conditions pre- and post-installation
- Plan to develop Technical Note to report to Evidence Plan Technical Panel

BC gave an overview of the wave modelling that supported the Hornsea Project One ES as a context for predicted changes in waves based on a more conservative layout. The contrast with the as-built layout was shown, which is presently around 75% installed foundations at 18 November 2018. The timeline of operational wave monitoring at sites north and south of the array was referred to pre-construction, construction (of middle section between the two wave buoys), construction pause and further construction periods (with the latter two phases taken together to represent a post-construction period). An initial comparison of the operational wave data covering pre-construction (baseline) and post-construction periods was offered which indicated a high degree of comparable wave conditions between the two locations, this contrasts with the slight net reduction of waves shown in the EIA for a range of representative directions and return periods.

BC suggested that a Technical Note could be prepared to provide a fuller explanation of the comparison of measured wave conditions with the intention of sharing this note with the Evidence Plan Working Group. This note would also respond, in part, to the comment made by Natural England regarding consideration of using actual data in the Scoping Opinion; *"we would like to further justification of the applicability of these models to the Hornsea Project 4 area and to see these models testing using actual data that is increasingly becoming available from the Hornsea zone"*.

JR stated that this was a fantastic data set and suggested a two-pronged approach to the analysis, looking at sectoral wave directions as well as peak events. JR also suggested that it would be interesting to pair up comparable storm events and directions in the pre-construction and post-construction periods.

Action: Ørsted to develop a Technical Note on the operational wave data to report to Technical Panel.

Benthic & Intertidal Ecology

a) Review of Actions from Previous Meeting

None

b) Scoping Review

FM noted that the following impacts have been scoped out of EIA:

- Impacts on benthic ecology from subsea noise arising from foundation installation
- Indirect disturbance to benthic habitats from electromagnetic fields (EMFs) generated by inter-array and export cables
- Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology during construction.

FM gave an overview of key issues raised in the Scoping Opinion which included:

- Insufficient site-specific information on habitats and species to provide confidence in the assessments;
- Inadequacy of EUSeaMap for project characterisation; and
- Insufficient coverage of contaminants analysis from benthic samples.
- Natural England also noted that the level of detail presented in the Scoping in relation to cable installation, cable protection and decommissioning is limited and a realistic worst case scenario must be developed.

c) Next Steps

FM discussed the current data coverage of the Hornsea Four area, noting data from the former Hornsea zone and Creyke Beck data. FM explained the benthic data availability heat mapping process that has been undertaken by Ørsted, with green areas representing areas within 2 km of 2018 geophysical ground truthing sampling location and recent (5 years) desktop information within 5 km of 2018 geophysical ground truthing sampling location. Yellow areas represent areas within 5 km of geophysical ground truthing sampling location; or within 2 km of recent (5 years) desktop information. Red areas represent areas greater than 5 km from geophysical ground truthing sampling location; or informed by historical data older than 5 years.

FM stated that in order to gain the best understanding of the baseline benthic environment available site specific data will be incorporated into a predictive habitat model to identify the likelihood of presence of specific biotopes within the Array Area and Export Cable Corridor using a number of physical environmental parameters, Hornsea Four propose to undertake predictive habitat modelling and gave examples of its application on various projects such as the Humber Regional Environmental Characterisation and at East Anglia ONE.. FM gave an overview of the predictive habitat modelling process (detail on slides) which will look at the following factors:

- Sediment, depth, light attenuation, wavebase, seabed energy, water body type, seabed temperature, seabed salinity
- Extracts biotope preference to each parameter
- Preference 'envelope' created from statistical analysis and expert judgement
- Predictors weighted, e.g. sediment most important
- 'Likelihood' of each biotope provided
- Biotopes may overlap due to opportunistic and successional characteristics

- Overlaps may be removed if biotopes significantly different this process makes assumptions and is by trial

JE noted that predictive habitat modelling is often used at Cefas and they agree with the Hornsea Four approach in principle but would need to see more detail on the methodology.

Action: Ørsted to provide a Technical Note on the predictive habitat modelling methodology and to include information on the data availability heat mapping.

LK noted that the MMO have stated that the number of sediment samples will be influenced by the amount of material to be disturbed. LK asked if further clarity could be provided on this comment.

RW noted that this comment came from Cefas. JE stated that there is no set number of samples required but the samples should be representative of all sediment types present in the area with a focus on muddy sediments as these are where contaminants are typically found.

Fish & Shellfish Ecology

a) Review of Actions from Previous Meeting

None

b) Scoping Review

LK noted that noise impacts on fish and shellfish ecology were not being discussed at this meeting due to the noise specialist from Cefas not being present.

PN noted that the following impacts have been scoped out of EIA:

- Direct damage (e.g. crushing) and disturbance to mobile demersal and pelagic fish and shellfish species arising from construction activities;
- Accidental pollution events during the construction phase resulting in potential effects on fish and shellfish receptors;
- Electromagnetic fields (EMF) effects arising from cables;
- Direct disturbance resulting from maintenance during operation;
- Indirect disturbance resulting from the accidental release of pollutants.

PN gave an overview of key issues raised in the Scoping Opinion which included:

- Insufficient site-specific information on habitats and species to provide confidence in the assessments;
- Insufficient data on the operational noise from larger turbines; and
- Insufficient coverage of contaminants analysis from benthic samples.
- MMO and Natural England noted in their responses that PSA data should be used to inform habitat suitability for herring and sandeel within the array and export cable corridor.

c) Next Steps

PN gave an overview of the IHLS heat mapping that GoBe Consultants have undertaken as part of the 'ORJIP Impacts from Piling on Fish at Offshore Wind Sites: Gap Analysis and Appraisal of Mitigation Options (June 2018)' project. PN noted that the analysis shifts the focus of studies from abandoned spawning sites and highlights those regions that have shown recent

spawning activity. PN further noted that the techniques and methodology of heat mapping demonstrated the final report study provides clearer information of the areas of active spawning and their proximity to offshore wind developments, when compared to the predictive spawning habitat mapping. PN also identified that the IHLS data was the main predictor (had the highest confidence score) within the predictive habitat mapping process and as such the IHLS data in combination with historical spawning ground data will provide sufficient information on suitable spawning habitat locations without the need to undertake the habitat mapping. PN suggested that Hornsea Four should rely on the IHLS data as opposed to the spawning habitat mapping suggested by Cefas. It was agreed that a Technical Note setting out the data sources proposed would be produced for the Evidence Plan Technical Panel.

Action: Ørsted to provide a Technical Note on the proposed reliance on IHLS herring spawning data and other data to be used for the fish and shellfish assessment.

AOB

LK and DK thanked all participants for joining the Technical Panel meeting. Meeting minutes would be circulated by Ørsted within the next few days for comment / sign-off in the New Year.

It was agreed that the proposed technical notes would be submitted to Technical Panel members in mid-January with the next meeting to be held in February/March 2019 to discuss these notes.

Minutes of Meeting

Meeting Hornsea Four Evidence Plan Marine Ecology & Processes
Technical Panel Meeting 3

10 June 2019

Meeting Date 30/04/2019

Place Ørsted, 5 Howick Place, Westminster, London SW1P 1WG

Participants [REDACTED] – Ørsted
[REDACTED] – GoBe Consultants
[REDACTED] – Cooper Marine Advisors (by phone)
[REDACTED] – GoBe Consultants
[REDACTED] – GoBe Consultants
[REDACTED] – GoBe Consultants
[REDACTED] – Natural England
[REDACTED] – Natural England
[REDACTED] – Marine Management Organisation
(MMO)
[REDACTED] - MMO
[REDACTED] - Cefas
[REDACTED] - Cefas
[REDACTED] - Cefas
[REDACTED] – Cefas (by phone)

Our ref. 02931741_A

Absent None

Copy [REDACTED] – Ørsted

Next meeting TBC

Agenda

1. Welcome and Safety Briefing (David, Ørsted)
2. Introductions (David, Ørsted)
3. Aims and Objectives of the Meeting (David, Ørsted)
4. Hornsea Four General Update (David, Ørsted)
5. Proportionate Approach (Lauren, GoBe Consultants)
6. Marine Processes
 - a) Review of Actions from Previous Meeting (Bill, Cooper Marine Advisors)
 - b) Scoping Review (Bill, Cooper Marine Advisors)
 - c) Impacts & Effects Register (Bill, Cooper Marine Advisors)
 - d) Operational Wave Monitoring Note and Responses (Bill, Cooper Marine Advisors)
 - e) Approach to PEIR Assessment - Baseline and Assessment Methodology (Bill, Cooper Marine Advisors)
7. Benthic Ecology

- a) Review of Actions from Previous Meeting (Angie, GoBe Consultants)
- b) Scoping Review (Angie, GoBe Consultants)
- c) Impacts & Effects Register (Angie, GoBe Consultants)
- d) Benthic Baseline Strategy Note and Responses (Angie, GoBe Consultants)
- e) Benthic Survey Strategy and Responses (Angie, GoBe Consultants)
- f) Approach to PEIR Assessment - Baseline and Assessment Methodology (Angie, GoBe Consultants)
8. Fish & Shellfish Ecology
 - a) Review of Actions from Previous Meeting (Phil, GoBe Consultants)
 - b) Scoping Review (Phil, GoBe Consultants)
 - c) Impacts & Effects Register (Phil, GoBe Consultants)
 - d) Fish Baseline Note and Responses (Phil, GoBe Consultants)
 - e) Approach to PEIR Assessment - Baseline and Assessment Methodology (Phil, GoBe Consultants)
9. Report to Inform Appropriate Assessment (Sally, GoBe Consultants)
10. Net Gain (David, Ørsted)
11. PEIR Submission and Distribution (Ørsted/GoBe Consultants)
12. Next Steps (Ørsted/GoBe Consultants)
13. AOB (Ørsted/GoBe Consultants)

Introductions

Introductions were made for those who had not met previously.

Aims and Objectives

DK stated that the principal objective of this third Hornsea Four Evidence Plan Marine Ecology & Processes Technical Panel meeting was to provide an update on Hornsea Four development activities, discuss the proportionate approach that is being implemented by Hornsea Four, review responses received during both the Scoping process and the Habitats Regulations Assessment (HRA) Screening Report consultation, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES) for Hornsea Four.

Hornsea Four Update

DK noted that the Hornsea Four Scoping Report was submitted to the Secretary of State (SoS) on 15 October 2018. The associated Scoping Opinion was adopted by the SoS on 23 November 2018. DK stated that PEIR submission will be in Q3 2019 with the submission of the final ES in Q1/Q2 2020.

DK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, and offshore 2/9

Export Cable Corridor (ECC) (reduced from 3000m to 1500m width), landfall (with northern area of scoping boundary the most likely location), onshore ECC and onshore substation locations and the developable area refined. In relation to the preparation of the PEIR, the project parameters have been finalised, baseline data collection is underway, the Scoping Opinion evaluated and the drafting of technical baseline reports and PEIR assessments is underway.

Developable Area Process

DK noted that the Hornsea Four Agreement for Lease (AfL) area was 848 km² at Scoping, and that in the spirit of proportionate Environmental Impact Assessment (EIA), the project is currently giving due consideration to the size and location (within the existing AfL area) of the final project. DK highlighted this process will be detailed in the Site Selection Chapter of the PEIR.

Proportionate Approach

LK noted that all technical panel members had attended meetings earlier in the month in relation to Hornsea Four's proportionate approach. As such, only a brief overview of the proportionate approach was presented. LK stated that the proportionate approach is supported by five approaches: the Impacts and Effects Register which will be updated as Hornsea Four progress through PEIR to final ES; the Commitments Register which has been added to with commitments suggested by the public; the Evidence Plan process; innovative presentation of data, and directed questions. LK gave an overview of the characteristics of both simple and detailed assessments and noted that updated Impacts and Effects Registers would be circulated to consultees before PEIR submission with more detail provided at that point.

Marine Processes

Review of Actions from Previous Meeting

Action: Ørsted to develop a Technical Note on the operational wave data (related to HOW01 construction periods) to report to Technical Panel.

Completed: BC noted that the Technical Note was sent to MMO and Natural England on 25th February 2019. BC stated that feedback was received from MMO on 28th March 2019 and discussions are ongoing with Cefas in order to reach a consensus on the main conclusions of the note.

Scoping Review

BC gave an overview of the key issues that were raised in the Scoping opinion, noting that the PEIR Project Description Chapter is currently being developed and will give a clearer idea of what is being installed and how. BC noted that this PD will allow the project to consider potential impacts such as scour and the effects of cable protection (particularly in the nearshore area)

Operational Wave Monitoring Note & Responses

BC suggested that the operational wave monitoring note is discussed separately with JR. JR confirmed that he was happy with this approach as long as the MMO are kept informed. JW asked if any other reports, documentation etc that arises from this discussion can be sent through MMO who will disseminate this to Cefas. Natural England asked to be kept informed of discussions and outcomes.

Action: JR to provide BC with dates to arrange a Skype meeting with MMO to be copied in to all correspondence and Natural England to be kept in the loop.

BC highlighted that the response from Cefas noted the methodology was appropriate and agreed but noted that the findings of the note are subject to further discussions to achieve consensus. JR requested that the study was extended to incorporate further afield sites. BC stated that it would not be possible to extend the analysis to these sites, highlighting that correlations would weaken with distance from Hornsea Project One, greater uncertainty would be introduced, and data would require further manipulation. JR noted that Cefas were keen to utilise the dataset as much as possible but conceded that there could be valid arguments why this was not possible. It was agreed by all to discuss the finer points of this note separately and report back to the Evidence Plan Technical Panel

Action: Ørsted to provide an update on operational wave monitoring discussions at the next Evidence Plan Technical Panel meeting.

Approach to PEIR Assessment

BC gave an overview of the proposed approach to PEIR assessment for marine processes, noting that simplistic assessments would be applied to describe impacts and effects aligned to issues identified from scoping responses. BC noted that the assessment will draw on existing evidence from comparable projects and settings, justified within the technical reporting. BC highlighted that as requested by JR at previous meetings, comparable projects with comparable effects will be documented and auditable with the approach justified appropriately. JR noted that the source-pathway-receptor model is important and if the relevant receptor is closer for Hornsea Four and the pathway is more demonstratable, then Hornsea Project One may not be the right project to reflect the findings from. BC noted this advice and stated other projects will be considered alongside Hornsea Project One.

BC noted that the maximum design scenarios will be clearly defined within the PEIR assessment and all assumptions and uncertainties discussed. BC stated that in terms of blockage, a large gravity-base box-type of foundation is within the envelope for the HVAC booster area closer to shore (approx. 34 km east from coastline). JR queried whether the profile would be rectangular or circular. DK confirmed that the foundation would be rectangular. BC highlighted that the project details are being continually refined and more details would be provided within the PEIR, noting that this structure was in the envelope for other Hornsea projects (most recently Hornsea Three). JR noted that he didn't recall this type of structure in previous Hornsea design envelopes.

EB asked how blockage from cable protection at and outwith cable crossings would be considered. BC stated that the locations of these crossings are known, and the assessment will look at the scale of these crossing and protections and the potential impacts of these.

Benthic & Intertidal Ecology

Review of Actions from Previous Meeting

Action: Ørsted to provide a Technical Note on the predictive habitat modelling methodology and to include information on the data availability heat mapping. **Completed.**

Scoping Review

AdB gave a summary of the impacts that have been agreed (through the Scoping Opinion) to be scoped out of the assessment. AdB noted that all other impacts identified at Scoping will be scoped in as it is acknowledged that there was insufficient characterisation data at that stage to scope out.

Benthic Baseline Strategy Note & Responses

AdB gave a summary of all responses received from Natural England and the MMO in relation to the Benthic Baseline Strategy Note and provided a Hornsea Four response to each:

Natural England:

- Natural England stated that areas of potential reef on the array and Export Cable Corridor (ECC) areas should be identified. AdB noted that no biogenic or geogenic reef has been identified through the survey across the array and the results of ECC analysis are pending. MM asked if this absence of reef has been confirmed by Drop Down Video (DDV). AdB confirmed the array results have been confirmed with DDV and stated that the 2019 ECC grab survey will include DDV – this data will be available for the ES, with the predicted habitat model user for the PEIR.
- Natural England raised concerns about the Scoping boundary apparent overlap with the Holderness Inshore MCZ and Holderness Offshore rMCZ. AdB confirmed that the refined red line boundary that will be presented at PEIR does not overlap with the MCZ or any other designated sites besides the southern North Sea SAC.

MMO

- MMO requested recent geophysical data prioritised in the model. AdB noted that the predictive habitat modelling method is based on point data that would be modified using the geophysical substrate / feature map. If geophysical survey data conflicts with grab point data, it will be forced to override if the grab data is > e.g. 5 years (e.g. BGS) or if the geophysical interpretation is 100% certain.
- MMO noted that the extensive data integration and mapping by Cefas was not referenced. AdB confirmed that Cefas model data will be incorporated into model.
- MMO requested that consultants consolidate all available datasets and map density of the key parameters to establish if a consistent full coverage dataset is sufficient for a EUNIS Level 4 characterisation, i.e. at 1km. AdB confirmed that GoBe are updating the UKSeaMap2018 EUNIS Level 4 model through application of a project specific EUNIS substrate map. This was planned at 1km which reflects the resolution of UKSeaMap2018, though accept that this is a finer resolution of the Cefas sediment model (~500m). As such, we may alter to the 500m resolution depending on model outputs / further assessment. AdB also noted that all input layers to the model are full coverage as all layers are modelled. The only point data used in the model is the biotope grab locations (plus sediment PSA from surveys, though this will be incorporated into a full coverage predictive layer).
- MMO queried how the faunal assemblage data will be used in the biotope prediction model? AdB confirmed that faunal data have been classified according to the JNCC biotope classification system and this data will be incorporated into the model.
- MMO mentioned in their response that the Cefas Southern North Sea Synthesis study data could be provided to Ørsted.

- **Action:** Cefas to provide GoBe (Caroline Chambers: [REDACTED]@gobeconsultants.com) with the Cefas synthesis data.

Benthic Survey Strategy & Responses

AdB gave a summary of all responses received from the MMO in relation to the Benthic Survey Strategy Note and provided a Hornsea Four response to each:

- MMO recommend using EUSeaMap with caution and prioritise the collection of site-specific data to ensure robust characterisation of the Array area and ECC. AdB confirmed that site-specific data will be prioritised.
- MMO noted that no information has been provided on the location of proposed physical sample stations. AdB confirmed that the 2019 survey strategy will be included in PEIR and the locations of the grab sample locations have been selected to cover all habitat types present.
- MMO noted that the geophysical survey does not appear to be 100% coverage and asked for confirmation on whether the geophysical survey corridors within the array area correspond with the proposed array design. AdB confirmed that the geophysical survey lines were designed specifically to align with array design. JE queried whether a survey with 100% coverage of the site will be obtained for application. AdB confirmed that a 100% coverage geophysical survey will be undertaken pre-construction but will not be available to feed into the PEIR or ES. JE queried why 100% was not being obtained, noting that it is usually required to characterise the environment. DK noted that lessons have been learned from Hornsea Three where vast surveys were done across a large area, a large proportion of which was dropped from the application red line boundary. DK highlighted that this survey approach is in line with the proportionate approach for Hornsea Four and that lighter coverage is planned early on and more focussed surveys will be undertaken later on once the design has been further defined. JE noted that if 100% coverage is not obtained then you can't have full confidence that there is no biogenic reef. DK noted that Hornsea Four have a commitment to microsite infrastructure based on full-coverage surveys that will be undertaken prior to construction.
- The MMO noted that there appears to be large gaps in the data coverage for the North West part of the array area and recommended that geophysical data was analysed prior to the 2019 survey. AdB noted that geophysical and benthic data has already been collected within the array and analysed.
- The MMO queried whether there was further geophysical data collection planned within the fan area where the array meets the ECC. AdB confirmed that extra data is to be collected in this area which has been reduced in size allowing the data collection to be more focussed.

Approach to PEIR Assessment

AdB gave an overview to the approach to PEIR assessment for benthic and intertidal ecology, noting that all impacts that will be scoped in to the assessment will be simple assessments as defined by the proportionate approach. AdB stated that the sensitivity of biotopes will be classified using the MarLIN Marine Evidence Based Sensitivity Assessment.

Fish & Shellfish Ecology

Review of Actions from Previous Meeting

Action: Ørsted to provide a Technical Note on the proposed reliance on IHLS herring spawning data and other data to be used for the fish and shellfish assessment. **Completed.**

Scoping Review

PN noted that Hornsea Four are proposing to undertake a “proportionate assessment” for the PEIR and ES and as such have proposed scoping out impacts where these are understood, from previous wind farms and other knowledge sources, to have non-significant effects. PN stated that within the Scoping Opinion, the MMO disagreed with scoping out temporary localised increases in SSC and smothering; direct and indirect seabed disturbances leading to the release of sediment contaminants; long term loss of habitat; and increased hard substrate and structural complexity.

PN stated that Hornsea Four propose to limit the fish and shellfish assessment to impacts on sandeel and herring as these species have spawning grounds in the area and are sensitive to the impacts above and asked if the MMO, Natural England and Cefas agreed with this approach? GE stated that Cefas consider that it would be appropriate to focus only on these two species in the Hornsea Four EIA.

Post-meeting note: Sea Lamprey may also need consideration given they are a feature of the Humber Estuary SAC.

Fish Baseline Note & Responses

PN gave a summary of all responses received from the MMO in relation to the Fish Baseline Note and provided a Hornsea Four response to each:

- The MMO noted that there are three key potential impacts that should be considered in relation to spawning herring: a. noise and vibration; b. disturbance to herring spawning habitat from construction activities; and c. loss of spawning habitat from placement of infrastructure. PN confirmed that these potential impacts will be assessed individually within the PEIR chapter, with the relevant maximum design scenario provided.
- The MMO noted that they support the use of IBTS data to inform the characterisation of spawning herring habitat. The MMO has assumed that it will be used to provide data on herring functional maturity analysis. The MMO recommends that complete datasets for the North Sea are utilized. PN confirmed that Hornsea Four agree with this approach and that the complete datasets will be used and that the analysis will be used to provide data on the presence of functionally mature herring.
- The MMO recommended that maturity class 62 is included in the functionally mature group along with class 63 (actively spawning fish) and 64 (recently spawned fish). PN confirmed that maturity classes 62, 63 and 64 will all be considered functionally mature for the purposes of the Hornsea Four assessment.
- The MMO stated that to delineate the spawning grounds, the specific substrate requirements of herring required for them to spawn need to be

considered. PN confirmed that the specific substrate requirements of herring will be informed by the PSA data that has been collected in 2018 within the array area and which will be collected in 2019 within the ECC.

- The MMO noted that the PSA sampling locations have not been provided. PN confirmed that maps showing the location of the PSA samples will be presented within the Fish and Shellfish Ecology Technical Report which will accompany the PEIR.
- The MMO requested further detail on the methodology for PSA interpretation. PN stated that the PSA data has been analysed in line with the Reach *et al* methodology, but not following the exact methodology. As such, the same sediment classes of 'Preferred', 'Marginal' and 'Unsuitable' will be used, with the classification being based on the Folk classification of the sample. This will be done conservatively, e.g. where a sample is classed as 'slight gravelly sand' this will be considered to be 'marginal' habitat, whereas, strictly speaking only Folk classes of 'part gravelly sand' or with a higher gravel content should be classed as 'marginal' under Reach *et al*.
- The MMO noted that sufficient coverage of PSA data is required to accurately characterise and assess impacts to spawning herring. PN noted that the PSA data collected in 2018 and scheduled for 2019 will provide sufficient coverage to characterise the array and ECC. Maps showing the extent of the surveys will be presented in the Technical Report and PEIR chapter.

GE confirmed that the responses provided by PN in relation to the fish baseline note answer all queries raised by Cefas.

Noise Modelling Methodology Note & Responses

PN noted that the noise methodology note is being discussed in detail with Cefas noise experts at the Marine Mammals EP meeting this afternoon. Hornsea Four will further discuss the noise modelling methodology for fish and shellfish with Cefas and the MMO following this meeting.

Post-meeting note: Fish specific queries were raised at the Marine Mammals EP meeting, so a call was arranged to discuss fish noise modelling queries. Notes from this call are captured at the end of this document

Action: Ørsted to arrange a call with PN and Cefas (GE & RF) with MMO to be copied in to all correspondence and Natural England to be kept in the loop.
Complete

Action: Ørsted to provide an update on fish noise modelling discussion at the next Evidence Plan Technical Panel meeting

Approach to PEIR Assessment

PN gave an overview to the approach to PEIR assessment for fish and shellfish ecology, noting that all impacts that will be scoped in to the assessment will be simple assessments as defined by the proportionate approach.

Report to Inform Appropriate Assessment

SK noted that GoBe Consultants are leading on the RIAA, with APEM responsible for offshore ornithology, RHDHV responsible for onshore ecology, and GoBe addressing all other receptors.

SK noted that no response to the HRA Screening Report has been provided by Natural England. EB confirmed that Natural England will provide a response by the end of the week (03/05/19).

Post-meeting note: Natural England HRA Screening response received 01/05/19.

SK noted that Hornsea Four will not be issuing an updated HRA Screening Report but there will be a screening section with the main RIAA. SK stated that cross-references will be made as far as possible to avoid repetition of information.

SK highlighted that a lot of information on designated sites has been updated recently. EB noted that there are two windows for updating advice (March and September) and noted that draft advice for Flamborough and Filey Coast SPA has now been published.

SK noted that topic baselines aren't going to be included in the RIAA as these are included within the Technical Report for the topic-specific chapters. EB confirmed that that approach would be appropriate so long as it is clearly signposted in the document.

SK went through the assessment criteria for all topics, noting that onshore ecology has been screened out but Hornsea will await comments from Natural England on that. EB noted that it might be useful to have a call to discuss Natural England's comments on the HRA Screening Report. SK confirmed that it would be useful.

Action: Ørsted to arrange a call with SK and Natural England once HRA Screening response received.

Net Gain

DK asked attendees about their experiences with Net Gain. DK stated that there is appetite within Ørsted to consider potential offshore Net Gain initiatives, so any proposals would be welcomed. DK noted that any offshore Net Gain initiatives are unlikely to be linked to the Development Consent Order (DCO) application due to timescales. DK highlighted that the project is aware that there is potential to confuse mitigation with Net Gain so are keen to avoid this.

PEIR Submission and Distribution

DK noted that the Hornsea Four PEIR will be published in early Q3 2019 and will be available electronically, with hard copies available upon request.

Post-meeting note: DK noted that Hornsea Four are aiming for a PEIR submission date of 29th July (subject to change) with documents available to consultees on Ørsted's website as part of an early S42 consultation. Hard copies of the PEIR will be delivered to local information points on 12th August, with the official start of the formal Section 42 and 47 consultation on 13th August. DK noted that local information events will be held in the first week of September.

AOB

DK noted that the project is always happy to discuss any issues so Technical Panel members should feel free to get in touch with Ørsted via the normal channels.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
JR to provide BC with dates to arrange a Skype meeting with MMO to be copied in to all correspondence and Natural England to be kept in the loop.	JR/BC
Ørsted to provide an update on operational wave monitoring discussions at the next Evidence Plan Technical Panel meeting.	BC
Cefas to provide GoBe (Caroline Chambers: caroline@gobeconsultants.com) with the Cefas synthesis data.	Cefas
Ørsted to arrange a call with PN and Cefas (GE & RF) with MMO to be copied in to all correspondence and Natural England to be kept in the loop. Complete – meeting notes provided within these minutes.	PN/GE/RF
Ørsted to provide an update on fish noise modelling discussion at the next Evidence Plan Technical Panel meeting	PN
Ørsted to arrange a call with SK and Natural England once HRA Screening response received. Complete – call arranged for 16th May.	SK/EB
RF to provide Ørsted with a list of literature that will be used to compare noise levels at spawning grounds.	RF

Noise Modelling Methodology Note & Responses

PN noted that the main issue raised in the Cefas response was in relation to the stationary and fleeing fish responses to piling noise. RF stated that the onus is on the developer to provide evidence to support the use of fleeing fish swimming speeds. PN noted that there is evidence from several different papers in relation to fish fleeing responses but acknowledged that these papers mainly relate to shipping noise. RF stated that there was no evidence to suggest fleeing over these large distances and over those timescales. RF noted that the current Cefas advice is to present both the fleeing and stationary modelling. RF confirmed that eggs and larvae are definitely stationary receptors and should be modelled as such. PN confirmed that eggs and larvae will be treated as a stationary receptor but queried if Cefas would consider it acceptable to present stationary modelling for certain fish species and fleeing modelling for other fish species? RF stated that it would be preferable to see both the stationary and fleeing models presented so a range of impact ranges are shown - it would be likely that the actual impact range would fall within the two ranges whilst being appropriately conservative.

PN queried whether Cefas were comfortable with presenting both the impulsive and impulsive/non-impulsive scenarios in the same way as the marine mammal assessment. RF confirmed that it would be acceptable as long as both impulsive and the impulsive/non-impulsive scenarios are presented.

PN asked Cefas if they have any preferences as to how they would like to see behavioural noise impacts on fish assessed. RF noted that the Popper methodology is a bit vague but Cefas would like to see presented the received levels of single strike SEL at the spawning grounds - that would allow Cefas to compare those noise levels to the literature. RF confirmed that the noise levels could be overlaid on the IHLS data. PN asked if Cefas

could provide a list of the literature that would be used for that comparison on noise levels.

Action: RF to provide Ørsted with a list of literature that will be used to compare noise levels at spawning grounds.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Ecology & Processes Meeting #4	12 February 2020
Meeting Date	13/11/2019	
Place	Natural England, York	
Participants	<ul style="list-style-type: none"> ██████████ – Natural England ██████████ – Natural England ██████████ – MMO ██████████ – MMO ██████████ – Cefas (Skype) ██████████ – Cefas (Shellfish Ecology) (Skype) ██████████ – Cefas (Marine Processes) (Skype) ██████████ – Cefas (Benthic Ecology) (Skype) ██████████ – Cooper Marine Advisors (Skype) ██████████ – GoBe Consultants (Skype) ██████████ (AdB) – GoBe Consultants (Skype) ██████████ – GoBe Consultants (Skype) ██████████ – Ørsted ██████████ – GoBe Consultants Skype 	Our ref. HOW04/EP_ME&P_4
Absent	None	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Aims and Objectives

DK noted that the aims and objectives of this fourth Hornsea Four Evidence Plan Marine Ecology & Processes Technical Panel meeting were to discuss and confirm positions on the list of topics/questions provided in advance of the meeting.

Hornsea Four Update

DK noted that the southern landfall option (A4) had been selected with the rationale based on onshore access, reduced public use and lower cliff height. DK noted that the full rationale for the selection will be added to the Site Selection and Alternatives chapter. DK noted offshore, that the HVAC booster station search area has been reduced, with narrowing of the permanent works area on the eastern side of the search area. DK also noted the reintroduction of WTG gravity base foundations into the project envelope. These updates would be described in the Route Planning & Site Selection Chapter and Project Description.

Programme to DCO

DK gave an overview of the Hornsea Four programme which includes Evidence Plan meetings in November and December 2019 and final application submission in Q1 2020, most likely the end of February 2020.

Impact Register Updates & Scope of the EIA at ES

DK gave an overview of the changes that will be made to the Impacts Register post-PEIR, noting the addition of columns. DK stated that impacts would be moved from the Chapters to the Impacts Register where assessments have concluded no likely significant effect (in EIA terms) at PEIR and there is no change in project description affecting the assessment; baseline environment data affecting the assessment or no change in assessment methodology and there

are no significant comments in stakeholders' S42 responses. DK noted that in these cases the Impacts Register will be updated to state that these impacts are "Not considered in detail in the ES. No likely significant effect identified at PEIR."

Marine Processes

New Commitment

BC gave an overview of some new commitments that have been added to the Commitments Register as a result of the S42 responses and feedback from the public. These are:

- Co187 - The installation of the offshore export cable at landfall will be undertaken by Horizontal Directional Drilling or other trenchless methods.
- Co188 - No cable protection will be employed within 350m seaward of MLWS
- Co189 - The Dogger Bank cable crossing will be positioned east of Smithic Bank and seaward of 20m depth contour.

DK noted that Co188 has been copied from the Dogger Bank Creyke Beck dML conditions, as suggested by consultees.

Aims and Objectives

BC noted that the aims and objectives of this sections were to seek clarification on specific S42 responses to marine processes PEIR chapter and technical report, and to provide an update on relevant data, information and assessment methodologies for EIA phase. Further detail on the list of topics/questions was provided in advance of the meeting.

Data Collection & Description of Baseline Environment – S42 Responses

Spoil Ground HU015: BC noted that S42 comments and requested details of relevant conditions on dredge disposal at this site. EB noted that the text inferred that it had a certain capacity but in fact it is an old disposal ground not frequently used and if to be used, would require a HRA. EB stated that there will be marine licence conditions that the disposal would need to adhere to and the MMO should be able to provide details of these conditions. BC clarified that the project was not proposing to use HU015 for any spoil disposal, but this new spoil site was in fact in regular use by Bridlington Harbour and was only referred to as part of baseline understanding. EB stated that the assessment need to identify where any sediment will be disposed of and make sure the impacts of that activity are fully assessed.

ACTION: MMO to provide details of licence conditions for the Spoil Ground HU015 site.
Complete

Post meeting note: EB highlighted that there appears to be a misunderstanding of Natural England's PEIR comment. In the PEIR/RIAA it was implied that increases in suspended sediment where unlikely to be LSE on the basis that there was a disposal site which could support a relatively large amount of sediment located much closer to the SAC/SPA. The point that Natural England were making was that whilst this is true, that disposal site is not used to capacity and any materials deposited there are subject to HRA and licences include specific conditions to mitigate impacts. Consequently, increases in suspended sediment arising from this project should be considered in their own right and not presumed to be insignificant on the basis that this disposal location exists.

Geophysical survey: BC noted that S42 comments requested information on the geophysical surveys. EB noted general concern that new data has been collected and everything will need to be reassessed and asked if there would be an opportunity to review and comment before final submission.

ACTION: Hornsea Four to provide an early draft of the updated baseline sections of the Technical Report. Hornsea Four to confirm the programme on this.

Flamborough Front: BC noted S42 comments in relation to the Flamborough Front and stated that the project intends to use the Peter Miller report. JR confirmed that would be appropriate.

Assessment of waves from Hornsea One: BC noted that the updated wave note¹ would be submitted to the Technical Panel soon. BC stated that the note will use an additional correlation statistic established from the LINEST function and will report Standard Error on Y variable, SE(Y). JD to confirm this approach is appropriate after consultation with a statistician.

ACTION: JR to confirm in writing that standard error on Y is acceptable for the updated wave note.

Impact Assessment Methodology – S42 Responses

Project Description: BC confirmed that a review of the updated Project Description is currently underway to confirm the Maximum Design Scenario (MDS) as a “source” of effect relevant to associated pathways and receptor(s). BC highlighted the MDS for WTG foundations now includes consideration of GBS option which will be the same dimensions as Hornsea 3 (53m). JR noted that the GBS seabed preparation area is quite small at 69m with a 53m diameter foundation.

ACTION: Hornsea Four to confirm that the seabed preparation area for WTG GBS is correct.

Smithic Bank: BC reiterated the commitments detailed earlier in the meeting in relation to Smithic Bank. BC highlighted that the importance of feature was recognised in PEIR and the relationship with local sediment sources and pathways summarised. BC stated that the commitments have been added to lesson potential localised impacts. BC noted that the Natural England S42 response stated that “given the connectivity with designated sites (such as the Humber Estuary SAC/SPA/SSSI/ Ramsar), Hornsea Four will need to have *certainty beyond reasonable scientific doubt* in their conclusions”. BC highlighted that this may prove problematic given the limited amount of historic data available for Smithic Sands. EB confirmed that the phrase is more in relation to the HRA as this is the standard that those assessments need to meet.

Effects of large foundations on waves and tides / sediment plumes: BC stated that marine processes modelling is now being undertaken to support the EIA phase and will include assessment of nearshore cable crossing, HVAC booster stations and offshore array. BC noted that the modelling tools and approach will aim to remain as consistent as possible with the Hornsea Three (wave) modelling. JR asked if the modelling would be looking at bedform pathways. BC stated that the primary scope for modelling was waves, tides and sediment plumes. Interpretation of modified waves and flows could be extended to look at changes in

¹ HOW04 Marine Processes Operational Wave Evidence Plan Technical Note (01493919_A).docx originally submitted 25th February 2019.

sediment transport rates using point based analysis. JR noted that approach sounds appropriate. BC presented a few figures to demonstrate how Smithic Bank is represented in the model, noting it was well-resolved showing all the key features.

Cumulative Assessment – S42 Responses

BC initiated discussions about the adoption of as-built (Hornsea One) and final design (Hornsea Two) in the baseline assumption of cumulative / in-combination impacts. BC noted Natural England's S42 response *"It is not currently clear at which point the revised designs of consented projects become legally secured in order to be considered the baseline assumption of cumulative/in combination assessment within an ES or HRA. Guidance should be sought from the regulators on this point"*.

BC confirmed that the marine processes cumulative assessment is working with final design based information from both Hornsea Project One and Two. EB noted that it would be logical to use the final design but there is a question about at what point that final design becomes legally secured so that there aren't any final changes. EB noted that other projects have got projects/developers to provide a written commitment that the build isn't going to change – easier if both projects are owned by the same developer. AS stated that if final design isn't secured then assessments have to be made on 'as consented' MDS.

BC confirmed that the modelling is using operational wave data from the as built HOW01 so it would not be realistic to consider the worst-case for HOW01 alongside this. BC said could look at the cumulative modelling for HOW03 using worst cases and suggested presenting both for the EIA, as appropriate. EB confirmed that the HRA has to be assessed on the projects that has been consented.

ACTION: MMO to consider how this 'as built' design is captured and legally secured. **Complete**

Next Steps

BC noted that the next steps for marine processes will be to use the modelling outputs to support completion of Hornsea One wave review technical note which will be recirculated for final comments; confirm MDS from updated PD, review geophysical survey information; and develop the ES chapter and technical reports, drawing on modelling outputs as relevant.

Benthic and Intertidal Ecology

Aims and Objectives

AdB noted that the aims and objectives of this sections were to seek clarification on specific S42 responses to marine processes PEIR chapter and technical report; to request a template for OSPAR returns, and to discuss nitrogen deposition in the Humber estuary, a sediment management plan and marine invasive species. Further details on the list of topics/questions was provided in advance of the meeting.

Data Collection & Description of Baseline Environment – S42 Responses

AdB provided an update on the 2019 geophysical and benthic data that was collected across ECC, noting that the habitat model has been updated with this data as will the Technical Report and Chapter.

AdB noted the queries raised in the S42 responses in relation to the MDS' and how these were calculated and confirmed that improved detail will be provided within the ES, in addition to a check on any discrepancies that were noted in the responses.

AdB noted that S42 responses requested locations for Particle Size Analysis (PSA) samples within the ECC. AdB clarified that PSA samples had not been collected across the ECC in time for inclusion into the PEIR and that the ECC PSA samples have since been collected and figures within the ES will be updated to reflect this.

AdB noted the MMO's request for contaminant assessment results to be submitted in the MMO template to allow for easy submission for the annual returns for OSPAR and London Convention/London Protocol which is an obligation on the MMO. AdB asked if the MMO could provide the template for this.

ACTION: MMO to provide the latest contaminant assessment results template. **Complete**

Impact Assessment Methodology – S42 Responses

AdB noted that within the Natural England S42 response, it was raised that full justification was often not provided when a range of significance of effect were presented and one ultimately chosen. AdB acknowledged this comment and confirmed that further justification will be provided within the ES.

AdB highlighted Natural England's S42 response stated that biotopes outwith the boundaries of Hornsea Four need to be considered in relation to temporary increases in SSC and sediment deposition. AdB noted that the majority of habitats within the SIZ are also located within our PIZ and have therefore been assessed, and that habitats within the boundaries and those specific to the Holderness Marine Conservation Zone (MCZ) and Flamborough Head Special Area of Conservation (SAC) have been considered. AdB stated that a further review of the habitats within the SIZ will be undertaken to ensure we have picked up all biotopes and that clarity will be added to the text.

Cumulative Assessment – S42 Responses

AdB noted S42 responses in relation to projects that should be included within the cumulative benthic assessment (Viking Link, Dogger Bank Creyke Beck A and B Export Cables and Hornsea Project Two Export Cables). AdB confirmed that these projects will be added to the updated cumulative assessment for benthic ecology. AdB also confirmed that cumulative impacts such as temporary habitat disturbance (Construction phase) or direct disturbance to seabed from jack-up vessels and cable maintenance activities (Operation and maintenance phase) will be added to the benthic ecology cumulative assessment due to the physical overlap between some of these projects and Hornsea Four.

AdB highlighted that an assessment on impacts on the Humber Estuary as a result of nitrogen deposition will be included within the RIAA but noted that no impacts on intertidal receptors are included in this assessment as they considered low vulnerability to this impact. EB stated that this should be added to the Impacts Register and then it should be decided whether this warrants a simple or detailed assessment. AdB confirmed that the assessment will consider this impact on intertidal receptors and will align with the onshore approach.

Other S42 Responses

AdB noted Natural England's request for a sediment management plan in line with the Environment Agency's recommendation. AdB stated that a sediment management plan will not be put into place, because monitoring will allow the project to identify impacts associated with smothering and compliance with the results of the ES. Furthermore, the CMS will audit that what is being proposed will be the same as that assessed within the ES. AdB highlighted that EA's request for this plan wasn't within the EA PEIR response. MM noted that the EA comment came from the consultation table within the Benthic Ecology PEIR chapter and stated that a sediment management plan could detail how impacts will be minimised. DK asked what the grounds would be for this plan – surely only if a significant impact was predicted? MM noted that responsible developers should be looking to reduce all impacts. EB noted that the Natural England comment related to the mention of it in the chapter and it not being fully addressed and justified.

AdM noted that the MMO requested (within their S42 response) that foundation monitoring should be undertaken in relation to marine invasive non-native species (MINNS). AdB agreed that there is a lack of certainty around the spread of MINNS, however the spread of MINNS have not been attributed to any existing OWF and therefore it is not considered necessary to include foundation monitoring at Hornsea Four and mitigation is considered more appropriate. As will be discussed within the ES, provisions have been put into place to prevent the spread of MINNS. PN noted that there could be a provision with the Operation and Maintenance plan to provide for monitoring of foundation in the future if there is found to be evidence of MINNS during the O&M phase. PM stated that approach would be appropriate.

AdB noted that the MMO confirmed within their S42 that they are satisfied that no benthic monitoring is required of the wider area but stated that localised monitoring of the habitats around selected turbines and cable crossings would be beneficial. AdB confirmed that Hornsea Four agree that a targeted post-construction monitoring is the most appropriate way to test the predictions made within the ES and that a high-level targeted monitoring approach will be included within the ES.

Fish & Shellfish Ecology

Aims and Objectives

PN noted that the aims and objectives of this sections were to seek clarification on specific S42 responses to marine processes PEIR chapter and technical report; discuss PSA and baseline shellfish data, and to discuss the noise assessment, herring spawning, and increased SSC. Further details on the list of topics/questions was provided in advance of the meeting.

Data Collection & Description of Baseline Environment – S42 Responses

PN noted the S42 comments in relation to the ECC sediment data. PN confirmed that the ECC PSA data has now been analysed and will be incorporated in the assessment. PN asked if this will be sufficient to inform the assessment of direct and indirect sediment effects on herring and sandeel? GE stated that this would depend on the coverage of the PSA data and asked to see a figure showing the sample locations. AdB stated that it was important to note we have a lot of other PSA points that we have used in the PEIR assessment so that can be added to the figure provided.

ACTION: Hornsea Four to provide a figure showing the PSA sample locations.

PN stated that the S42 comments noted that the baseline for shellfish was minimal and Cefas provided additional information in their S42 response for scallops, crab, lobster and *Nephrops*. PN asked if consideration was required for any further species. CB confirmed that those are the four most valuable species in the area CB noted that he was happy with the inclusion of those species in the Technical Report and then considered alongside the other species in the impact assessment.

Impact Assessment Methodology – S42 Responses

PN noted the S42 comment in relation to the MDS and inclusion of simultaneous piling. PN confirmed that further noise modelling has been undertaken with an amended soft-start procedure, maximum hammer energy of 3000kJ for pin piles and the inclusion of simultaneous piling.

PN noted the S42 comments in relation to the inclusion of direct disturbance impacts during maintenance activities. PN confirmed that this would be included in the ES assessment.

PN highlighted that comments were received in relation to the screening distances for the fish and shellfish assessment (discrepancies between array and ECC screening activities). PN confirmed that as mentioned earlier in the meeting, marine process modelling is currently underway so these screening distances will be updated based on the outputs of the modelling. MM asked if this would also be the case for the benthic assessment? AdB confirmed that benthic screening distances would also be updated and aligned with the fish screening distances.

PN noted S42 comments in relation to impacts from SSC and confirmed that the results from the updated physical processes modelling will be used to inform the assessment. PN asked if this approach would be sufficient to address these concerns. GE confirmed that it sounds appropriate.

In relation to the herring spawning season, PN noted that there is a need to agree the timing of the herring spawning season to be used in the assessment. PN confirmed that the NE Banks stock has a spawning period of August to October and as you go south, the spawning season gets later in the year. PN highlighted that piling restrictions for other projects within range of the Banks stock run from 1st September to 16th October and that this is in line with the timings of the IHLS data. PN confirmed that he is happy to consider a general spawning season of August to October but base the assessment on the peak spawning periods. GE confirmed that an assessment of the peak spawning would be appropriate but noted that she would need to consult with Louise Cox from Cefas.

ACTION: GE to confirm (with Louise Cox) that an assessment of the peak spawning would be appropriate.

PN stated that a result of the S42 comments in relation to impacts on spawning herring, the project have committed to a seasonal piling restriction for the HVAC booster station to cover the peak herring spawning season.

Outcome of EIA – S42 Responses

PN noted that similar to as has been discussed for benthic ecology earlier in the meeting, comments were provided in relation to conclusions of minor significance when the outcome

could be either minor or moderate. PN confirmed that the project will be providing updated assessment based on new data and modelling and will include further justification for these situations.

Cumulative Assessment – S42 Responses

PN noted comments on the inclusion of the Dogger Bank projects in the cumulative assessment and asked if any attendees could provide any updates on the construction timetables of these projects. EB confirmed that the MMO or Natural England would share any information as soon as it became publicly available. It was noted that some information was available from the CfD process but as per previous discussions it is not certain if the assessment can be based on this.

ACTION: MMO or Natural England to provide Dogger Bank construction timetables as soon as they become publicly available. **Complete**

Report to Inform Appropriate Assessment

SK gave an overview of the current actions in relation to Marine Ecology & Processes RIAA topics. SK noted that for physical processes, screening ranges will be reviewed and confirmed/updated as relevant based on the new modelling. JR stated that the background 19 year climatology SSC data should give some information on when levels will return to background levels.

SK noted the comments in relation to intertidal habitats in the Humber Estuary and confirmed that further air modelling work is being carried out. EB noted that the saltmarsh nitrogen comments were more about the process rather than the information. EB stated that the comments came from a terrestrial colleague so any queries need to go to Liam O'Reilly. It was agreed that SK would dial into the onshore ecology EP Technical Panel this afternoon to discuss the air quality issue.

In relation to the fish and benthic ecology RIAA comments, SK noted that assessment of impacts on prey species of harbour porpoise within the SNS SAC and impacts on herring and sandeel will draw on the updated fish and shellfish chapter and the assessment of impacts from cable protection on benthic ecology and prey species is being looked at within the RIAA as a prey resource issue.

AOB

It was agreed that an invitation would be sent out for a further call on 17th December between 2pm - 4pm. GE to confirm availability. PN noted that a separate call could be arranged with GE if required.

ACTION: GE to confirm availability for call on 17th December. **Complete – call cancelled.**

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
MMO to provide details of licence conditions for the Spoil Ground HU015 site. Complete	MMO

Action	Responsible
Hornsea Four to provide an early draft of the Marine Processes Technical Report. Hornsea Four to confirm the programme on this.	Hornsea Four
JR to confirm in writing that standard error on Y is acceptable for the updated wave note.	JR
Hornsea Four to confirm that the seabed preparation area for WTG GBS is correct.	Hornsea Four
MMO to consider how this 'as built' design is captured and legally secured. Complete	MMO
MMO to provide the latest contaminant assessment results template. Complete	MMO
Hornsea Four to provide a figure showing the PSA sample locations.	Hornsea Four
GE to confirm (with Louise Cox) that an assessment of the peak spawning would be appropriate.	GE
MMO or Natural England to provide Dogger Bank construction timetables as soon as they become publicly available. Complete	MMO/NE
GE to confirm availability for call on 17 th December. Complete – call cancelled.	GE

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Ecology & Processes Meeting #4A – Marine Processes	02 July 2021
Meeting Date	13/05/2021	
Place	Teleconference	
Participants	[REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – MMO [REDACTED] – Cefas [REDACTED] – Cooper Marine Advisors [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants [REDACTED] – Ørsted	Our ref. HOW04/EP_ME&P_4A
Absent		
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Hornsea Four Update
2. Programme to DCO Submission
3. Review of Comments on Draft ES chapter / Key Issues
4. Updates to Modelling
5. Next Steps
6. Any Other Business

Hornsea Four Update / Programme to DCO Submission

DK provided an overview of all Hornsea Four site reductions to date. DK explained that the blue area presented on slide 4 was the array area currently showcased in all Environmental Statement (ES) documentation which has been previously reviewed by this technical panel. DK announced that there may be one more site reduction (i.e. DAA Part 3) made due to ornithology mitigation measures. DK stated that the months of May to August will be spent updating draft ES documents in preparation for the DCO application submission date which is now scheduled for September 17th 2021. DK noted that technical panel members were unlikely to receive further chapter and technical report drafts relating to this topic prior to the DCO application submission.

Review of Comments on Draft ES Chapter / Key Issues:

BC thanked everyone for providing feedback and review comments on the Technical Report and the Chapter. BC explained that he would like to use this meeting to discuss some key issues and ensure we understand the correct interpretation of your comments.

Geophysical Evidence

BC stated that the geophysical evidence utilised presents a collective body of pre-existing datasets and offshore surveys. BC noted that the nearshore has been surveyed to the highest level of detail as close to 100% of infilling has been completed in this area. BC stated that at

this time there is no plan to incorporate more geophysical data and that he has adopted a conservative assessment for the datasets currently incorporated.

JR stated that he would like to see maps of areas where 100% coverage exists and other remaining areas with decreasing steps of coverage represented. This will assist Cefas in applying levels of confidence to the datasets. BC said this could be incorporated into one of the appendices. BC asked DK whether he could provide the geophysical survey reports. DK stated that this could be done, or a separate workshop could be arranged to discuss this in further detail. LK stated that the geophysical survey reports are provided as appendices to the Benthic and Intertidal Ecology Technical Report and these would be provided to attendees.

Action: Hornsea Four to circulate geophysical survey reports currently presented as appendices to the Benthic and Intertidal Ecology Technical Report.

JR stated that a direct comparison of the geophysical survey data across multiple years would be quite difficult and used recent storm events (e.g. the Beast from the East) as a recent example of modelling this complexity. BC noted this.

Sandwave Clearance / Trenching / Nearshore Release (West of Smithic Sands)

BC explained that this topic involved the entire cable route. Sandwave clearance allowances included initial preparation to remove a potential mobile surface layer of sediments with trenching below this level. BC stated that the preparation phase includes clearance of unfavourable sandwaves. DK acknowledged that there were questions surrounding how Hornsea Four has achieved the maximum design scenario calculations and identified that the engineering design team was currently working on providing further details to this effect. DK also noted that Hornsea Four were considering a meeting with Natural England and the MMO to discuss sandwave clearance and how the calculations have been informed by the survey data however, this meeting may not take place until the Examination phase. BC highlighted the fact that the figures presented represent the worst-case scenario volumes of how much material could be removed to install the undersea cables. In reality, some areas will require more sediment to be removed than others. AM asked if the volumes would be reduced prior to DCO application? DK confirmed that there would be no reduction prior to DCO application and that the values represent the worst-case scenario.

Action: Hornsea Four to arrange a meeting to discuss sandwave clearance volume calculations.

BC noted additional sediment release locations were requested to be modelled. JR highlighted an area between Smithic Bank and the coastline as being very complex and understanding the fate of materials within this area would be useful. JR explained that daily dispersion is what we are interested in. BC stated he will select a representative location for sediment plume modelling. JR said this would be appreciated.

Smithic Sands / Dogger Bank A&B

BC stated that the level of detail currently provided by Hornsea Four on Smithic Sands is more than any other project to date, and asked what else could be included to describe this feature. JR stated that he was concerned about the cumulative impacts from all the cables on this bank due to both Dogger Bank A & B and Hornsea Four utilising the same location and the potential for rock armour to be required as a remediation measure which then may impact the bank's overall form and function. As such, Hornsea Four is being asked to provide more detailed

evidence on the degree and magnitude of cable protection in this area. EB noted that Dogger Bank A&B has consent for a certain volume of cable protection but does not know where this rock protection will be located. BC asked if JR could assist Hornsea Four in ascertaining more details on what Dogger Bank A&B were planning to do. JR said he could try however; this issue has become a generic issue across multiple offshore wind farm projects. JR noted that there has been an interesting development within Telemac, a new module called Gaya and Cefas is considering submitting a proposal to The Crown Estate Enabling Actions to look at impact of scour protection in an area. The group acknowledged any such research would be sometime in the future and after the consenting phase of Hornsea Four.

Action: Hornsea Four to liaise with JR (via the MMO) to agree an approach to the Smithic Bank/Dogger Bank A & B cable protection assessment.

DK explained that Hornsea Four is undertaking an internal assessment on the need for cable protection in Smithic Sands. DK noted that Hornsea Three undertook a light version of a CBRA for protected sites, noting that Smithic Sands is not a protected feature but is a sensitive one, to ensure everyone had the necessary information prior to the commencement of the Examination phase. YF asked about Hornsea Four's understanding of the processes along this bank. BC responded saying that the present studies have exhausted existing data and information and there was insufficient historic data to help establish the long-term morphology of the bank. YF explained that in that case we need to consider the worst-case impacts of the proposed cable protection for both Dogger Bank A&B and Hornsea Four projects on Smithic Sands. BC suggested that the integrity of cable burial across the bank would likely be part of operational monitoring to ensure the cables stayed buried over time. BC indicated that this discussion has been helpful in providing further clarity and determining the motivation behind some of the comments provided by this group.

HDD Exit Pit Cofferdams / Bentonite

BC explained that an HDD exit pit can exist without a cofferdam and that cofferdams represented the worst-case scenario. Currently there is a provision for up to 8 exit pits as a contingency. Only 3 exit pits will be open at any one time. DK noted that cofferdams are not ideal from an engineering and installation perspective as they are more intrusive, expensive and require further HSE assessment. Although these are not a preferred solution, they have been included as the worst-case scenario for a marine processes assessment. A comment about the use of bentonite will be added to the chapter.

BC confirmed that no extra material will be taken from the surrounding seabed to infill, however this was still subject to an internal clarification.

Cliff Stability / Recession

BC confirmed that more details would be provided in relation to stability and beach access to the chapter and project description.

BC explained that some assets may be left behind during decommissioning such as cables and that the TJB will be around 300 m back from the cliff line. BC asked for clarification on whether the group were concerned about the consequence of cliff recession approaching the TJB and leaving these cables exposed. YF responded yes and asked what the chances were for the infrastructure to be left *in-situ* upon decommissioning. JR said his main concern was about the cables themselves. YF asked what the protocol would be if this were to happen. BC asked if this

question was regarding whether the developer would assume responsibility if this were to happen. YF responded yes. EB said she would like to understand the likelihood of infrastructure becoming exposed, a potential timeline for if it were to become exposed and how it would be subsequently handled? BC asked DK if the answers to these queries would be covered within the Decommissioning Plan? DK explained that traditionally the Decommissioning Plan would be provided a lot later in the timeline than the DCO application submission date. DK noted these questions were more related to a PD clarification rather than MP and suggested that this information should be provided within the PD instead. AL explained that these queries were linked to coastal processes and the fact that this potential has not been addressed within the Chapter.

AM appreciated the clarification regarding the location of TJBs being positioned 300 m back from the cliff as this information was not provided in the comments log and subsequently asked if it would be added to the MP Chapter or PD. DK explained the cliff retreat rates were calculated through the ERYC dataset so the consideration of TJB would remove the risk of the infrastructure failing onto the beach during the operational phase. DK highlighted the fact that buried cable infrastructure will be cut and left in place. EB explained that this area is subject to a lot of erosion and subsequently infrastructure can easily become exposed. Therefore, it would be good to see a commitment in the DP or elsewhere explaining the protocols for decommissioning of these cables. DK stated he would take this under advisement and determine whether this would fit better within the MP Chapter, as a commitment or as an update the PD. BC noted that the content relating to cliff recession in the report currently does not consider this context. EB explained that the report currently focused on the lifetime and operation of the wind farm and not about the decommissioning phase and beyond. YF highlighted some examples where some of the climate changes impacts have been incorporated (e.g. sea level rise). YF asked whether the infrastructure calculations that have been included in the design could be included. BC noted that data is available to map out of future estimated shorelines. JR indicated that data is available in the Shoreline Management Plans. YF advised that would be important to think about the entire lifetime of the project and provide further detail to this regard. BC stated that he would add this extra context into the Chapter.

Action: Hornsea Four to provide further context to Chapter on cliff recession and decommissioning plans.

GBSs for WTCs

BC explained that the PEIR did not have GBS incorporated within the design envelope (although the Scoping Report did) and this triggered further modelling for the ES. DK noted that when Hornsea Four investigated the MDS for GBS it considered the ground model to determine whether a reduction in the number of GBS was possible based on the comments raised around this issue. This analysis process is still ongoing however, the project is unlikely to make a drastic reduction in GBS or spatially define where some GBS may be located. However, the project does hope to commit to using less GBS than that of the full 180 for WTCs. JR explained that the main cause for concern regarding this plan was based on the amount of seabed preparation that is required for GBS installation. JR considered it to be a tight margin between the edge of GBS and the edge of the seabed preparation area. JR indicated that Hornsea Four may be confident that that the parameters illustrated are achievable. BC noted that waves would not have an influence on the seabed across the array, or on scour protection, due to the relatively deep locations.

Flamborough Front

BC noted that comments from MMO/Cefas had suggested the possibility of incorporating satellite imagery data of Flamborough Front to help assess changes in mixing conditions. JR responded by stating that satellite imagery could form monitoring as part of the mitigation process. BC noted that existing high resolution thermal sensors may not be sufficiently detailed to detect cold plumes uprising. YF asked if learning outcomes from Hornsea One and Hornsea Two projects would provide insight on the question of whether the scale of turbine installations could create mixing by the turbulent wake and cause changes in stratification in the immediate vicinity. If this were to happen would this have a knock-on effect on the area's biological productivity? BC confirmed the need to demonstrate that this wake effect would not reach and array scale effect to the detriment of Flamborough Front. YF suggested reviewing the findings from a German Bight study and BC acknowledged he had considered this work and would review further for the final document update. JR asked if anything could be learned from the O&G industry and turbulence affects from platforms. BC confirmed he had considered this in the existing data but not determined any discernible influence from relevant platforms.

HVAC Booster Stations / Seabed Preparation

Bill outlined how the HVAC booster stations have been incorporated in the modelling for both an assessment of sediment plumes from seabed preparation in this area and as an influence on reducing wave energy transmission towards the coast. No further comments were raised by attendees.

Mitigation / Monitoring

BC explained that mitigation is reserved for significant effects and no significant effects were indicated for MP therefore, no further mitigation above the commitments already present are proposed at this time. JR would like to ensure a link is made where cable integrity surveys are undertaken for the routes and this data is also utilised to investigate potential impacts on coastal processes and sediment transport. BC indicated he expected there will be asset-based monitoring to ensure cables remained buried. BC explained that this monitoring is undertaken by the engineering team, but data collected could be used to further understand MP. JR stated that multi-use of these datasets, which are expensive to collect, is necessary. LK confirmed that a separate call would be scheduled to discuss the In-Principle Monitoring Plan and in preparation for this meeting Hornsea Four would consider how this data could be collected. DK confirmed a meeting would be arranged but indicated he was less keen on linking the bathymetric surveys to MP just for the sake of doing so as there are currently no mitigation purposes for MP. DK explained that there is still a cost associated for data analysis and therefore, we must consider the purpose and value this data investigation would provide.

Action: Hornsea Four to arrange a meeting in relation to comments received on the In-Principle Monitoring Plan.

EB stated that it would be beneficial for this evidence panel to be informed of what monitoring efforts will be completed across the entire Hornsea Four project as this information would provide further context and aide in understanding for these discussions. LK confirmed there was a section on engineering and design related surveys within the Monitoring Plan, but this information will be reconsidered, and more detail will be added where required. EB noted that this would be useful in determining whether additional interpretation could be added on to existing modelling rather than new data being required to be collected.

AOB

EB highlighted that there were a few items discussed during this meeting where answers and further information may not be available at the time of the DCO application submission and instead be submitted during Examination. EB indicated that it would be useful to have this information (e.g. refinement of cable protection in the nearshore) ahead of providing our list of relevant representations for the Examination phase as this will enable the discussions to move forward easier rather than creating new debates and discussions of topics already closed out. DK agreed with this approach as he also does not want to go over old territory in the early phase of Examination. DK said he would try to get these clarification notes (e.g. nearshore, MDS justification, sandwave clearance requirements, etc.) submitted to everyone as soon as possible. DK explained that some of these investigation works have recently commenced however, he will strive to provide timescales relating to these outstanding issues as soon as possible. EB suggested aiming for this information to be submitted within the six weeks between DCO application submission and the Examination start date.

Action: Hornsea Four to provide clarification / technical notes prior to Examination.

Next Steps

BC stated that the Chapter and Technical Report would be updated where necessary in line with SNCB comments and Hornsea Four responses. Updates to modelling would be completed. BC explained that there was a new cumulative cut-off date for the end of May after which the long list of projects will be updated, and the CEA updated as required.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to circulate geophysical survey reports currently presented as appendices to the Benthic and Intertidal Ecology Technical Report. Complete	Hornsea Four
Hornsea Four to arrange a meeting to discuss sandwave clearance volume calculations.	Hornsea Four
Hornsea Four to liaise with JR (via the MMO) to agree an approach to the Smithic Bank/Dogger Bank A & B cable protection assessment. Complete	Hornsea Four
Hornsea Four to provide further context to Chapter on cliff recession and decommissioning plans.	Hornsea Four
Hornsea Four to arrange a meeting in relation to comments received on the In-Principle Monitoring Plan.	Hornsea Four
Hornsea Four to provide clarification / technical notes prior to Examination.	Hornsea Four

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Ecology & Processes Meeting #4B – Benthic Ecology	02 July 2021
Meeting Date	13/05/2021	
Place	Teleconference	
Participants	[REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – Cefas [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants [REDACTED] – Ørsted	Our ref. HOW04/EP_BE_4B
Absent	[REDACTED] – MMO	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Hornsea Four Update / Programme to DCO Submission
2. General Agreements from SNCB Comments
3. Increase in MDS from PEIR to ES
4. Gravity Base Structure and the MDS
5. Permanent Habitat Loss
6. Cumulative Assessment
7. Monitoring
8. Next Steps
9. Any Other Business

Hornsea Four Update / Programme to DCO Submission

DK provided an overview of all Hornsea Four site reductions to date. DK explained that the blue area presented on slide 4 was the array area currently showcased in all Environmental Statement (ES) documentation which has been previously reviewed by this technical panel. DK announced that there may be one more site reduction (i.e. DAA Part 3) made due to ornithology mitigation measures. DK stated that the months of May to August will be spent updating draft ES documents in preparation for the DCO application submission date which is now scheduled for September 17th 2021. DK noted that technical panel members were unlikely to receive further chapter and technical report drafts relating to this topic prior to the DCO application submission.

General Agreements from SNCB Comments

LK thanked everyone for their comments on the Benthic Ecology Chapter and Technical Report. LK explained that she has pulled out the key themes that arose from the comments received to clarify understanding and discuss matters whilst we are in the process of drafting responses. LK clarified that more detail will be added to the Benthic Chapter for drill arisings; more explanation will be included for Maximum Design Scenarios (MDS) calculations in the final ES, and discrepancies will be rectified for the final ES. LK stated that overall Natural England were fairly satisfied with the baseline characterisation and impact identified. LK asked if the MMO had any comments on this. RR asked JE to comment. JE responded stating she did not have anything

specific to raise and that she was generally happy. RR stated her main concerns were with the GBS and protected species.

Increase in MDS from PEIR to ES

LK stated that the reintroduction of GBS foundations is required in response to increasing understanding of the geological complexities. Without the GBS presented in the design envelope significant portion of the array site could become sterilised to development due to challenging ground conditions. LK explained Hornsea Four are in the process of reinvestigating their ground model to see if any reductions in the number of GBS can be made. LK confirmed that there was no change to sandwave clearance volumes between PEIR and ES as the width of this corridor presented within the PEIR was incorrect.

EB stated that from a Natural England perspective the width of 40 m for these clearance corridors seems to be significantly wider than other projects and would like to understand why this might be. LK responded saying she will take this query to the technical team and provide an update later. EB said it would be useful to understand why these corridors have increased and why this estimate is larger than other projects.

Action: Hornsea Four to provide an explanation for the large width of clearance corridors.

Gravity Base Structure and the MDS

LK highlighted that in terms of benthic ecology, GBS represent the MDS for temporary habitat loss due to having the largest seabed footprint. For other receptors, such as marine mammals, pile-driving activities during the installation of pin pile or monopile foundations represent the MDS due to their impact on underwater noise. LK explained that assessments were performed on a case-by-case basis to determine their representative MDS to ensure the assessment was valid. RR confirmed that this explanation answered her queries.

JE agreed that GBS represented MDS for benthic ecology but queried whether their installation would not result in permanent habitat loss. LK explained that the plan is to remove these structures during the decommissioning phase and Hornsea Four's assumptions were listed in the decommissioning impact assessment. EB explained that a layer of scour and gravel would be laid as a base in preparation for GBS installation on top of this and therefore, this bottom layer would most likely not be able to be decommissioned. DK responded with all surface structures would be removed at decommissioning but did not believe there would be an issue to remove this base layer. EB stated she had concerns regarding rock protection and would like to know whether this base layer could be removed and if so, that it can be done without causing further impacts to the benthic environment. LK responded saying she will take this query to the technical team and provide an update on whether this layer could be removed or not. LK explained that current assessments are based on information presented within the Project Description. RR indicated that if there was any uncertainty then a feasibility study would need to be undertaken which is a similar approach adopted by other projects. DK requested clarification on Cefas's concerns. EB responded stating that the decommissioning plan would need to include this base layer and would need to be removed in such a way as to not cause further impact to the surrounding environment. EB explained that if a GBS is sitting directly on top of this layer than the likelihood of colonisation of this benthic environment is quite low but did believe that colonisation may occur around the edges of this structure.

Action: Hornsea Four to confirm whether installed base layers for GBS foundations can be successfully decommissioned without causing further harm to the benthic environment.

Permanent Habitat Loss

LK stated that in the final ES assessment the habitat loss magnitude will be upgraded to minor. LK explained that the footprint of affected area is highly localised, and the affected benthic habitats are both common and widespread across the region. As the habitat loss has been assessed as a long-term or permanent impact, the discussion regarding the reversibility of the impact within the assessment has been removed.

JE stated she was happy with the magnitude level being upgraded to minor however, Hornsea Four are still saying it will cause permanent habitat loss. LK ensured her that this assessment is based on the operational impact in which there would be permanent habitat loss during this period. JE was happy with this further clarification.

Cumulative Assessment

LK explained that it was not always possible to quantify some impacts from other projects by their percentage of overlap with the Hornsea Four study area. Therefore, the percentage overlaps presented for this topic contextualise the precautionary nature of the MDS. LK indicated that Hornsea Four has followed Natural England's advice on incorporating a precautionary approach to the 'consented vs. as-built' situation using consented values (e.g. ornithology). This approach means assessments will always be considered by worst-case in terms of their cumulative impacts.

EB agreed that the percentage of overlap approach described above was acceptable. EB stated that Natural England would need to go back to their comments on the 'consented vs. as-built' query before they could provide a response. EB stated that Natural England will provide Hornsea Four with a response at a later time. AM believed the comment was in relation to WCS and realistic approaches. JE said that it was Cefas who made this comment originally.

Action: Natural England to consult comments on 'consented vs. as-built' and provide a response to Hornsea Four. **Complete**

Post-meeting note: Natural England's response - Natural England's advice would be that the consented parameters should be used unless it can be demonstrated that a constructed project is not legally able to change (this is particularly the case for projects with consent for phased builds etc). We would usually look to the regulator for confirmation of this.

Monitoring – Annex I Habitats & Climate Change

LK stated that following a request from Natural England, Hornsea Four has updated the text to state, *"In the event that any Annex I and/or conservation features of interest are identified in the pre-construction survey, post-construction monitoring will also be carried out with the focus on these identified features."* EB confirmed Natural England were happy with these changes.

LK asked the MMO for clarification on whether their comment related to the request for climate change monitoring or simply more robust OWF monitoring. JE confirmed that this comment was not requesting climate change monitoring and instead was addressing planned OWF monitoring.

Non-Native Invasive Species Monitoring

LK explained that Hornsea Four were committed to preparing a Marine Biosecurity Plan which details how the risk of introduction and spread of invasive non-native species will be minimised and its contractors are committed to applying best practice techniques including appropriate vessel maintenance as outlined in MARPOL. However, Hornsea Four are currently not committing to non-native invasive species monitoring.

JE thanked LK for information about the biosecurity plan in place for Hornsea Four. However, she queried whether the point about "*Hornsea Four considers the relatively large distances between individual wind turbines and scour infrastructure would not represent any form of linked reef-link feature.*" was true. JE explained that this statement was not correct as many species breed in the plankton and can thus travel large distances which could result in the colonisation of other turbines. Therefore, this method could provide a stepping-stone for non-invasive species. JE asked if Hornsea Four were aware of the post 2020 CPD framework in which one of the targets (target 5) considers non-invasive species management by 2030. This topic is due to be discussed during the COP15 in October. RR stated that from the MMO perspective this query will remain open and will be discussed during Examination.

Action: Cefas to supply information relating to non-invasive species management¹ to Hornsea Four. **Complete**

Thornton Bank OWF GBS Monitoring

LK presented slides relating to this topic which discussed findings from Coates *et al.*, 2014 in relation to GBS foundation impacts on sediment transport and tidal water flows.

EB asked how comparable the scale of GBS is between Hornsea Four and Thornton Bank foundations? EB assumed that Hornsea Four will be bigger than Blyth. LK stated she will take this away as an action for direct comparison between the OWFs and we can continue this discussion over the next couple of months. EB asked if Hornsea Four were proposing to do something similar to what was done at Thornton Bank? LK clarified that Hornsea Four are not proposing the monitoring of GBS, but are wanting to draw a comparison to demonstrate the potential applicability of the Thornton Bank study to Hornsea Four. EB stated that Natural England would like to discuss this during the upcoming monitoring call. AM echoed the comments raised above and would like to continue the discussion during the monitoring call.

Post-meeting note: The GBS at Thornton Bank are 21.5m in diameter, whilst the Hornsea Four GBS are 53m in diameter.

Next Steps

LK stated the Chapter and Technical Report would be updated where required to align with SNCB comments and Hornsea Four responses. LK highlighted there was a new cumulative cut-off date for the end of May and that there will a separate discussion to be arrange in relation to comments received on the In-Principle Monitoring Plan.

RR asked when meeting minutes from this week will be provided. LK said she anticipates all minutes will be distributed next week as this week will be spent reviewing these internally. EB asked for more time to review the minutes and for Hornsea Four to provide a priority list to

¹ <https://www.cbd.int/conferences/post2020>

inform Natural England's reviewing order. LK responded saying this is not a problem and would provide a prioritised list for comments and minutes to be signed-off.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to provide an explanation for the large width of clearance corridors.	Hornsea Four
Hornsea Four to confirm whether base layer installation for GBS foundations can be successfully decommissioned without causing harm to benthic environment.	Hornsea Four
Natural England to consult comments on 'consented vs. as-built' and provide a response to Hornsea Four. Complete	Natural England
Cefas to supply information relating to non-invasive species management to Hornsea Four. Complete	Cefas

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Ecology & Processes Meeting #4C – Fish & Shellfish Ecology	15 July 2021
Meeting Date	11/05/2021	
Place	Teleconference	
Participants	[REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – MMO [REDACTED] – MMO [REDACTED] – Cefas [REDACTED] – Cefas [REDACTED] – Cefas [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants [REDACTED] – Ørsted	Our ref. HOW04/EP_ME&P_4C
Absent	None	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Hornsea Four Update
2. Programme to DCO Submission
3. Spawning Timings for Banks Herring
4. EIA Conclusions
5. Next Steps
6. Any Other Business

Hornsea Four Update

DK provided an overview of all Hornsea Four site reductions to date. DK explained that the blue area presented on slide 4 was the array area currently showcased in all Environmental Statement (ES) documentation which has been previously reviewed by this technical panel. DK announced that there may be one more site reduction (i.e. DAA Part 3) made due to ornithology mitigation measures. DK stated that the months of May to August will be spent updating draft ES documents in preparation for the DCO application submission date which is now scheduled for September 17th 2021. DK noted that technical panel members were unlikely to receive further chapter and technical report drafts relating to this topic prior to the DCO application submission.

Banks Stocks Spawning Timing

PN thanked everyone for comments on the Fish and Shellfish Chapter and Technical Report noting that most comments were straight-forward, and updates will be made accordingly. PN wanted to discuss the request for further information regarding the suggested herring spawning period identified within the assessment. PN explained how back-calculations were made based on IHLS data and subsequently provided the earliest spawning date to likely occur in September. PN noted that this analysis would be presented in a position paper or technical note prior to DCO submission.

GE asked if multiple years had been considered. PN confirmed they were but only 2008 was shown in the presentation for brevity. GE said it would be useful to see all the years to ensure enough years were considered especially years in which there was extended spawning further south. PN confirmed that all years would be presented in the position paper. GE asked if the temperature data was based on the IHLS dataset. PN replied yes. GE asked if the temperature was exactly 10.0 C? PN stated that no decimal points were utilised in the initial analysis however, this could be included in the position paper or as an appendix. He considered 8 C was too conservative based on the temperature data provided in the IHLS dataset. GE indicated that an egg development time of 10-12 days for 10 C was reasonable. However, decimal places within the temperature range would affect the yolk absorption period as temperature dependent yolk absorption from the Russell paper is sensitive to small temperature fluctuations. However, GE noted that based on an absorption period of 20 days (is at 10.3 C) possible development time for larvae of 32 days and queried whether this had been considered in the calculations. PN stated that the IHLS records did not differentiate between larvae with and without a yolk sac and so it had not been possible to include specific consideration of this, with an assumption being made that the IHLS records included yolk sac larvae. GE said she would ask colleagues involved in the IHLS programme and confirm if any knew whether this information is captured during surveys.

Action: GE to request further information from colleagues about whether data on yolk sac larvae is available within the IHLS data. **Complete**

Post-Meeting Note: GE provided the following response: *Herring larvae with yolk sacs attached remain on the seabed during their early developmental stages until the yolk sac has been fully absorbed. The IHLS survey uses a Gulf 7 plankton sampler which is towed through the water column in a V-shaped profile but does not collect samples from the seabed. Accordingly, the Gulf 7 will not capture larvae with yolk sacs, hence no details of yolk sac stages are captured within the IHLS data. Therefore, a conservative approach to yolk sac absorption periods (based on Russell, F.S. (1976). The eggs and planktonic stages of British marine fishes, London: Academic Press. 524 pp.) will need to be taken for the IHLS back calculation period. It should also be noted that surface and bottom temperatures are recorded during each haul on the IHLS surveys. Temperatures are shown to one decimal place on the IHLS data and are available to download from [ICES](#). The MMO recommends that a conservative average bottom temperature is used for the purpose of estimating the egg development and yolk absorption periods.*

GE stated that in terms of the survey date the September 26th sounds about right. GE suggested that while we can obtain a conservative spawning date, no flexibility has been incorporated for fish coming from north to south for spawning in relation to noise. Is it not something that can be answered straight away but should be considered when setting restrictions.

Action: Hornsea Four to produce Technical Note providing full details of the IHLS back-calculation methodology and considerations.

EIA Conclusions

PN presented conclusions based on specific comments received during the latest round of feedback. The first slide for this section addressed PSA sampling, impacts from SSC and sediment deposition, and impacts to sandeels.

RR asked if Cefas had any concerns regarding the post-construction monitoring. GE asked for clarification as to whether Hornsea Four would undertake pre- and post-construction PSA for herring and sandeel? PN responded yes. GE stated that Cefas would be happy with in principle PSA as this is standard practice for OWF projects and is a less invasive approach. AM stated that Natural England agreed with these points, noting that Natural England are pleased to see these included and are happy with the proposed approach. No other comments were raised.

The second slide for this section addressed long-term habitat loss and direct disturbance from maintenance during operation. EB asked if the numerous assumptions listed here will be reflected in the new ES Chapter. PN confirmed that this would be the case. EB stated that it would be good for Natural England to review this in the full context rather than a slide. EB accepted that maintenance is not anticipated but this still needs to be incorporated into the DCO to provide a realistic worst-case scenario assessment. Natural England would like this to be acknowledged within the ES that there might be a need for maintenance work, and this could have an impact on different receptors. PN asked if Natural England would prefer a more qualitative or quantitative analysis? EB stated that this decision should be whatever provides a realistic worst case of what maintenance may entail, number of days required, areas being disturbed, etc. This additional information would provide clarity on what has already been assessed within the ES stage and assist Natural England when it comes to the O&M post-consent planning stage. RR stated that the MMO agrees with Natural England in regards the need for this additional information.

GE understood the points about the IHLS hotspot. GE suggested to provide the same justification for maintenance. GE noted that she had been unable to review all responses to comments prior to the meeting and so would wish to review the spreadsheet of responses alongside the presentation prior to providing further thoughts on the conclusions of the EIA with the additional information.

Action: GE to review response in spreadsheet in relation to direct damage and disturbance and provide further thoughts. **Complete**

The third slide for this section addressed the conclusion that the magnitude of effect on herring from piling noise will be minor. PN noted that the comment from MMO specifically referenced need for inclusion of the Popper *et al.* (2014) guidance for behavioural impacts but queried whether this was what had been intended as that guidance had been followed in the assessment, with the qualitative assessment approach presented. RF agreed that this was confusing and identified that this was intended to refer to the 135dB SELss sound level identified in the Hawkins *et al.* (2014) paper which Cefas would like to have presented. PN noted that this sound level had been stated within the paper as not appropriate for use in assessments of impacts. RF agreed that there are limitations with the sound level but wished to see it presented as a highly conservative indicator.

The fourth slide for this section addressed the recommendation that construction works associated with the ECC (i.e. non-piling activities) should not take place between mid-August and mid-October in line with previous projects (i.e. Dogger Bank B). PN asked if the Dogger Bank B restriction was in the DCO or this was new advice provided? GE stated Dogger Bank B was provided as an example as this is project dependent. GE explained that her response was a recommendation in relation to cable laying. PN noted that the cable route for Dogger Bank B passed directly through the core of the Banks stock spawning ground, whereas Hornsea Four

passes to the south, within areas of relatively low importance for spawning so they should not be considered equivalent. LK asked for clarity on whether this was just a restriction that was proposed for Dogger Bank B (by Cefas) that was not included in the final dML? RR said she would investigate this.

Action: RR to confirm if there are any cable installation seasonal restrictions within Dogger Bank A & B deemed Marine Licenses. **Complete**

Post-Meeting Note: Response received from the MMO: *The MMO provides advice on a case by case basis and there is a potential that a seasonal restriction on Hornsea Four will be required. The MMO did request a seasonal restriction within the Dogger Bank Examination, please see points 5.136 onwards of the Examiner's Recommendation¹. The MMO notes some licences contain seasonal restrictions due to noisy activities, and that although smothering is of lower magnitude the precautionary principle still needs to be used. The MMO will continue to engage in discussions on these matters.*

AOB

RR asked if the technical note / position paper would be submitted prior to application. LK confirmed that this is our intention as Hornsea Four are keen to obtain an agreement on the peak spawning period prior to DCO application submission.

Action: Hornsea Four to confirm submission date for IHLS Back-Calculation Note. **Complete**

Post-Meeting Note: Hornsea Four are planning to submit the IHLS Back Calculation Note to the Fish & Shellfish Evidence Plan Technical Panel at the end of August 2021.

RR asked if the Chapter and Technical Report would be available for review prior to submission. LK confirmed these may be available a few weeks prior to submission however, there would be no time for meaningful consultation and comments. RR stated she will collate any outstanding queries and response to the comments log and send these over as soon as possible.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
GE to request further information from colleagues about whether data on yolk sac larvae is available within the IHLS data. Complete	Cefas
Hornsea Four to produce Technical Note providing full details of the IHLS back-calculation methodology and considerations. In Progress	Hornsea Four
GE to review response in spreadsheet in relation to direct damage and disturbance and provide further thoughts. Complete	Cefas
RR to confirm if there are any cable installation seasonal restrictions within Dogger Bank A & B deemed Marine Licenses. Complete	MMO
Hornsea Four to confirm submission date for IHLS Back-Calculation Note. Complete	Hornsea Four

¹ [Paragraph 5.1.36 onwards on page 64.](#)

Minutes of Meeting

Meeting	Hornsea Four Marine Mammals Technical Panel Meeting One and Two (Pre-Scoping)	
Meeting Date	Meeting One: 13 September 2018 Meeting Two: 03 October 2018	08 November 2018
Place	Ørsted, 5 Howick Place, London	
Participants	██████████ (Ørsted) ██████████ ██████████ (GoBe Consultants) ██████████ ██████████ (GoBe Consultants) ██████████ ██████████ (SMRUC) ██████████ ██████████ (SMRUC) ██████████ ██████████ (Marine Management Organisation) ██████████ (Marine Management Organisation) ██████████ ██████████ (Natural England) ██████████ ██████████ (Natural England) ██████████ ██████████ (Natural England) ██████████ ██████████ (Cefas) ██████████ ██████████ (TWT) ██████████	Our ref. 00349700_B
Absent	None	
Copy	██████████ (Ørsted)	
Next meeting	November 2018	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim

Initial meeting(s) to discuss the approach to the scoping report, the scope of any proposed surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to

scoping and to help form their opinions by providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

Introduction

DK provided a Health and Safety Briefing, facilitated general introductions, and outlined the aims and objectives of the meeting – with the main aim of this meeting to be the establishment of the Marine Mammals Technical Panel to discuss the data and information to be included in the Hornsea Four Environmental Statement in relation to Marine Mammals. DK presented an overview of Hornsea Four, the consenting programme, route planning and site selection undertaken to date.

Evidence Plan Process

LK presented an overview of the Evidence Plan process.

Proportionate EIA

LK presented an overview of the proportionate approach to EIA, outlining the five methods being used to achieve this proportionate approach: Impacts & Effects Registers, Commitments Register, the Evidence Plan Process, innovative ways of presenting data, and directed questions in Scoping.

EB requested that additional clarification be added to the impacts and effects register to make it clear that the “likely significance of effect” is not the same as the term “likely significant effects” used in HRA assessments, and that this proportionate approach (and associated tools) are for the EIA and not applicable to the HRA. JC and JP confirmed.

Action – LK to ensure that all future reference includes “the likely significant effects (applicable to the 2017 EIA Regulations)”

Position Paper – Marine Mammals

RP presented the marine mammals position paper as the basis for discussion.

Data Sources

RP outlined the baseline data sources for Hornsea Four. TD noted that there have been sightings of humpback whales off the Yorkshire coast and asked if these sightings would be considered. CS noted that no humpback whales had been seen in the HiDef surveys but Ørsted will look into getting the relevant data from SeaWatch.

Action – SMRUC to obtain humpback whale data from Seawatch.

RP noted that the HiDef data still has to be analysed to derive sightings per unit effort, highlighting that this would be done after Scoping.

RW stated that for PEIR it would be useful to assess if analysing 10% of the data is sufficient for white-beaked dolphin and minke whale. RP clarified that the surveys provide 10% coverage of entire array area rather than 10% of data analysed. RW also queried whether SMRUC are confident that 10% coverage is enough for a rare species such as white-beaked dolphin? CS stated that this degree of coverage is reasonable and noted that it would be impossible to cover that area in a boat-based survey over a short timescale and as a sampling fraction it is comparable with other sampling methods. RW asked whether the data from the additional two cameras during the aerial survey could be analysed? CS noted that there was uncertainty on whether that would improve the robustness of

the analysis and that it would be great to have the funding to investigate the relationship between survey coverage and precision of density estimates for both common and rare species.

CS stated that in previous projects, the harbour porpoise densities were taken forward from the aerial surveys to inform the quantitative impact assessment and that other data sources have been used for density estimates of the rarer species, noting that aerial survey data is still useful in these species for showing seasonal patterns and inter-annual variation.

CS noted the variations in population estimates for pinnipeds based on pup counts or summer haul out counts, highlighting that the area doesn't have a resident population that is stable the whole year round – it fluctuates. CS noted that given that the seal usage maps are based on the scaled haul out counts it might be more appropriate to use the summer haul out counts as the basis for the reference population size. RW stated that various different counts of cetaceans (using different data sources) are often presented for context and asked if this could be done for pinnipeds? CS stated that this could be done for PEIR.

Mitigation

RP presented the embedded mitigation measures committed to by Hornsea Four in relation to marine mammals. TD stated that it would be preferable if mitigation measures were discussed earlier in the Evidence Plan process compared to other projects where it is often discussed too late. EB agreed on this point.

Impacts Scoped In

RP presented the impacts that Hornsea Four is proposing to scope in to the EIA in relation to marine mammals.

In relation to impacts from UXO clearance, CS noted that UXO clearance would form part of a separate Marine Licence (ML) application nearer the time of construction, but a simple assessment would be included in the PEIR and ES. TD stated that TWT consider that a detailed assessment should be required for UXO impacts. CS stated that a detailed assessment would not be possible as the information will not be available at the PEIR/ES stage, and that the UXO assessment situation should have more certainty by the time of application for the separate ML.

TD noted that a detailed assessment of UXO impacts is necessary within the PEIR so that the cumulative impacts can be considered. TD asked if there would be a possibility of doing surveys to collect information on potential UXO in the area before submission of the PEIR. CS stated that Hornsea Four can look at what Hornsea Project One and East Anglia One have found and make the assumption that this will be something similar. All accepted that there would be uncertainties with this approach and that these uncertainties would be compounded at the cumulative assessment level, leading to potentially quite an inaccurate and over-precautionary assessment. CS highlighted that this was a general problem with developer led cumulative assessments and TD highlighted that TWT believe that CIA should be strategically led. DK noted that the detailed UXO surveys are usually undertaken once cable routes, foundations locations etc are finalised. LK also noted that there is a certain responsibility on the developer to deal with any UXO found so if this was done too early then there could be implications. DK stated that the project will investigate this further and see if an early survey could be factored in. EB noted that there are other checks and balances in place in relation to UXO such as EPS Licences, HRAs. LK noted that a Marine Licence application will provide an updated assessment once further details are known.

Impacts Scoped Out

RP presented the impacts that Hornsea Four is proposing to scope out of the EIA in relation to marine mammals.

In relation to TTS, RF stated that it would be useful to have TTS ranges presented in an appendix – as was done for Hornsea Three. CS asked for feedback on what these TTS ranges were used to inform and how they helped Cefas provide advice. RF agreed to provide a statement on this by 12th October. RW stated that TTS will be discussed at the NOAA meeting next week and parties will hopefully come to an agreed position on this. RF stated it would be sufficient to have TTS ranges presented in an Appendix rather than in the ES Chapter.

Post-meeting note: NOAA thresholds were not resolved, and Natural England's view remains that TTS ranges should be retained for context – as per Hornsea Project Three.

RP stated that in relation to operational noise, evidence from a number of studies indicate that marine mammals are not affected by operational noise. CS stated that the recent Race Bank telemetry data collected in a collaboration with Orsted shows no differences in seal usage of the area with operational wind farms in the Wash. RW confirmed that Natural England are generally happy with that. CS noted that the justification has used a combination of evidence and conclusions of similar assessments on similar projects.

Post-meeting note: Natural England don't expect issues from operational turbines from the larger R3 wind farms, but don't have the evidence. They think it has not been an issue from the R1 and 2 smaller wind farms. However, some additional work may be being funded under the offshore SEA to answer this question.

In relation to impacts on grey seal foraging availability, RW stated that Natural England would be happy with that scoped out as long as that considered the effect of piling noise on transiting animals (as telemetry data shows a potential foraging area to the NW of the site). CS confirmed that this would be covered in the piling and other construction noise impact assessments.

All agreed that there were no issues with scoping out toxic contamination and EMF.

EB confirmed that as long as there is sufficient justification presented in the Scoping Report then the scoping out of these impacts should be acceptable.

Approach to Assessment

RP presented the proposed approach to assessment in relation to marine mammals for Hornsea Four.

TD stated that fishing activity should be included in the cumulative baseline.

TD requested that modelling is undertaken to understand the implications of mitigation methods such as bubble curtains. CS stated that there needs to be proper empirical data on noise attenuation in order for Hornsea Four to be able to do this effectively. CS confirmed that Hornsea Four will assess the design envelope without mitigation and if the outcome is not of EIA significance then there is no requirement for mitigation. If a significant impact is predicted, then this will be considered.

In relation to auditory injury thresholds, it was agreed that this would be discussed at the NOAA meeting next week.

Post meeting note: At the NOAA meeting on 9th October 2018, it was agreed that NOAA thresholds should be adopted.

CS noted that in relation to marine mammal sensitivity to PTS, this will be based on recent PTS expert elicitation results. RW noted that the report doesn't cover minke whales. CS confirmed that the elicitation didn't have enough time to cover that in elicitation but that SMRUC are considering this internally.

TD stated that she would provide some questions on the approach to assessment in writing for SMRUC to respond to.

Action: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.

Action: SMRUC to distribute copy of Booth & Heinis (2018) PTS expert elicitation report to Technical Panel.

HRA Screening

SK provided a summary of the approach being taken for the HRA Screening at Hornsea Four:

EB clarified Natural England's interpretation of the 'People Over Wind Ruling', ensuring all potential impacts are initially screened in for assessment and that mitigation is considered within the Appropriate Assessment.

AOB

LK/DK: Thanked all participants for joining the Technical Panel meeting. Meeting minutes and a slide-pack would be circulated by Ørsted for comment / sign-off within the next two weeks.

Summary of Actions

Action – LK to ensure that all future reference includes "the likely significant effects (applicable to the 2017 EIA Regulations)"

Action – SMRUC to obtain humpback whale data from Seawatch.

Action: All participants agreed that feedback would be provided on the Scoping Report and not the Position Paper.

Action: SMRUC to distribute copy of Booth & Heinis (2018) PTS expert elicitation report to Technical Panel.

Minutes of Meeting

Meeting	Hornsea Four Marine Mammals Technical Panel Meeting Three (Post-Scoping)	
Meeting Date	14 January 2019	
Place	Teleconference	
Participants	[REDACTED] (Ørsted) [REDACTED] [REDACTED] (GoBe Consultants) [REDACTED] [REDACTED] (SMRUC) [REDACTED] [REDACTED] (SMRUC) [REDACTED] [REDACTED] (Marine Management Organisation) [REDACTED] (Natural England) [REDACTED] [REDACTED] (Natural England) [REDACTED] [REDACTED] (Natural England) [REDACTED] [REDACTED] (TWT) [REDACTED]	08 March 2019
Absent	[REDACTED] (Marine Management Organisation) [REDACTED] (Cefas)	Our ref. 01256286_A
Copy	[REDACTED] (Ørsted)	
Next meeting	TBC	

Agenda

1. Welcome and Safety Brief
2. Aims and Objectives
3. Project Updates
4. Review of Actions from Previous Meeting
5. Scoping Review
6. Noise Impact Assessment Methodology
7. Next Steps
8. AOB

Aims and Objectives

DK stated that the principal objective of this third Hornsea Four Evidence Plan Marine Mammals Technical Panel meeting was to provide an update on Hornsea Four development activities, review responses received during both the Scoping process, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the Preliminary Environmental Information Report and the Environmental Statement for Hornsea Four.

Project Updates

DK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, offshore Export Cable Corridor (ECC), landfall, onshore ECC and onshore substation location refined, and an internal design freeze set for 14 December. In relation to the preparation of the Preliminary

Environmental Information Report (PEIR), the project parameters are being finalised, baseline data collection is underway, and the Scoping opinion has been evaluated.

Review of Actions from Previous Meeting

Action: LK to ensure that all future reference includes “the likely significant effects (applicable to the 2017 EIA Regulations). **Complete.** LK confirmed that the change of wording has been applied throughout Scoping and going forwards in all documentation in order to reduce any confusion.

Action: SMRUC to obtain humpback whale data from Seawatch. **In Progress.** SMRUC have contacted the regional coordinator for East England but no response has been received as yet.

Action: All agreed that detailed feedback would only be provided on the Scoping Report and not the Position Paper. **Complete.** Scoping Opinion received Case Reference: EN010098 November 2018.

Action: SMRUC to distribute Booth & Heinis 2018 PTS EE report. **In Progress.** To be sent to Laura Opel (MMO).

Scoping Review

RS presented a summary of the impacts that had been agreed to scope out of the Hornsea Four EIA which were toxic contamination, Electromagnetic Fields (EMF), and haul out disturbance.

RS provided a summary of the key issues raised by the Planning Inspectorate and consultees in their response to the Scoping Report:

- **TTS:** *The ES should assess impacts to marine mammal from TTS during all phases of development where likely significant effects could occur.*
 - CS confirmed that as discussed in the previous meeting and has been agreed on Hornsea Three, it is proposed that the TTS assessment will present ranges but not take a view on the significance of the impact – quantifying the number of animals at risk will not be undertaken. RW confirmed that NE were happy with this approach. LO confirmed that if NE are happy with the approach then the MMO are content. LO will check with Rebecca Faulkner (Cefas) once she’s is back from research cruise, but it is unlikely to be an issue.
 - **Action:** LO to confirm RF content with proposed approach for TTS assessment.
- **Operational Noise:** *The Inspectorate considers that significant effects could occur during operation of the wind farm array and the substations and advises that these matters must be assessed in the ES.*
 - RS stated that empirical data will be used and extrapolated to provide an assessment of operational noise from turbines. CS noted that the Scoping Report didn’t consider operational noise in relation to the offshore substations and that any consideration in the ES would be in relation to vessel-related noise rather than any noise generated by the offshore substations themselves. EB noted that the comment could be in relation to birds, but NE would clarify this, and all attendees would advise if there are anything the assessment should be considering in relation to operational impacts of substations other than vessel movements around substations.
 - **Action:** All attendees to provide comment if they consider that the operational noise assessment needs to consider anything other than noise related to vessel traffic.
- **Prey availability:** *The ES must ensure that inter-relationships between assessments are fully explored and that all relevant data are used to inform the assessment of significant effects.*

- RS stated that this assessment is dependent on the Benthic and Intertidal Ecology and Fish and Shellfish Ecology chapters and any significant impact on benthic ecology, fish and shellfish will be considered.
- Foraging ability: *The ES should assess the extent to which increases in suspended sediment may affect foraging ability of relevant marine mammal species where significant effects are likely to occur.*
 - RS stated that as for prey availability, this assessment is dependent on the marine processes chapter and any significant impact on marine processes will be considered. RW noted that the grey seal hotspot to northwest of the Hornsea Four site should be considered.
- Study Area: *The ES should clearly present and explain the study area used to inform the assessment.*
 - CS noted the marine mammal study areas will be defined as far as possible, noting that that the study area may look different for different species due to the spatial extent of the impact footprints and the management units for each species.
- Marine Mammal Sensitivity to PTS: *The Inspectorate considers that the ES should provide an assessment of low frequency noise on relevant receptors where significant effects are likely. Advice should be sought from the relevant consultees regarding potential receptors and their sensitivity.*
 - RS noted that the assessment will consider the most recent expert elicitation results and use the hearing ranges for the appropriate receptors. RW stated that the main concern is low-frequency cetaceans (minke whales).

Noise Impact Assessment Methodology

LK stated that a technical note outlining the proposed underwater noise modelling methodology for Hornsea Four would be issued to all Technical Panel members for comment by COB Tuesday 15th January.

Action: All attendees to provide comments on the underwater noise modelling methodology technical note.

Post meeting note: Technical Note issued to Technical Panel members on Tuesday 15th January 2019.

Model and modelling locations

RS gave an overview of the noise model that will be used for the noise impact assessment modelling, noting that Subacoustech will be using the INSPIRE model which has recently been updated to version 4 which includes Hornsea Project One noise monitoring data (2018 campaign). RS stated that the INSPIRE models considers the critical elements of underwater noise transmission: bathymetry, sound speed and source frequency content and meets the requirements of the NPL Good Practice Guide 133 for Underwater Noise (Robinson et al, 2004). CS noted that there is a difference in the frequency spectrum of the model when compared to the previous version that was used on Hornsea Three. The difference between the spectrum for pin piles and monopiles is less pronounced in version 4, still a difference but less of a difference between the two pile types as used in the assessment at Hornsea Three.

RS noted that modelling is proposed to be undertaken at four representative locations: three locations covering the Hornsea Four array area and one location covering the accompanying HVAC Booster Station search area. The northwest and eastern locations give a wide spatial coverage of the Hornsea Four array area along the deeper water to the north and east, with the other locations

selected according to their proximity to sensitive receptors (both marine mammals and fish and shellfish). CS noted that modelling will be undertaken at all locations for each species.

PTS and TTS

RS notes that the impact ranges will be predicted on the basis of thresholds from NOAA (2018) guidance; dual criteria unweighted SPL_{peak} and weighted SEL_{cum}, and that the fleeing animal model for SEL_{cum} will be used, with a swim speed of 1.5 m.s⁻¹ for all marine mammals except minke whale (3.5 m.s⁻¹). RS stated that as discussed earlier, only ranges for TTS will be presented (quantification of numbers of animals at risk and assessment of significance only for PTS). RS noted that in relation to behavioural responses, dose response curves will be used, using unweighted single strike SEL – taking contours from modelling and overlaying on density surface and assigning the dose response to work out how many animals are likely to be impacted. RS stated that the Graham *et al.* (2017) dose response curve will be used for all cetaceans, and the Russell *et al.* (2016) curve will be used for seals. CS noted that Hornsea Four propose to include assessment of most likely as well as worst case piling parameters informed by operational experience, in line with the approach for Hornsea Three.

CS stated that Hornsea Four propose to consider range dependent loss of pulse characteristics in the prediction of PTS and TTS ranges as the propagating sound wave produced by a pile strike will spread over distance and time, from a sharp pulse to a more distributed, less injurious nature. CS noted that at long ranges, the impulsive thresholds will overestimate the risk of PTS and TTS. In a recent workshop organised by the Offshore Wind Programme Board, Brendan Southall emphasised the importance of this. A paper led by Gordon Hastie from SMRU in collaboration with Nathan Merchant at Cefas is likely to be published soon providing data on this change in pulse like characteristics with range. CS highlighted that there is currently no definitive description of the range at which pulses transition to non-pulses but Southall suggested that for piling it might be in the region of 2-5 km; a draft of the NOAA guidance suggested 3 km, whilst the Hastie *et al* paper suggests around 4-6km. CS stated that for the Hornsea Four assessment, it is proposed that contours are initially predicted using impulsive thresholds, but non-impulsive thresholds will be considered beyond 5 km. CS noted that if the aforementioned papers are published in time and provide definitive distance guidance then we will feed that in to this assessment.

RW stated that this was considered an interesting scenario to investigate but in the absence of any definitive evidence, this should be done in addition to the typical scenarios impulsive thresholds. CS stated that there may not be many (if any) impact ranges for PTS beyond 5km so everything might be modelled using impulsive thresholds. Although this may affect TTS ranges. CS noted that it would be useful to get some feedback from Cefas on this given Nathan Merchant's involvement in the paper. LO stated that this detail should be presented in the briefing note so Cefas can provide comment.

Density estimates and management units

RS noted that the assessment will consider a range of density estimates from a number of sources for each marine mammal species as outlined below:

Harbour porpoise:

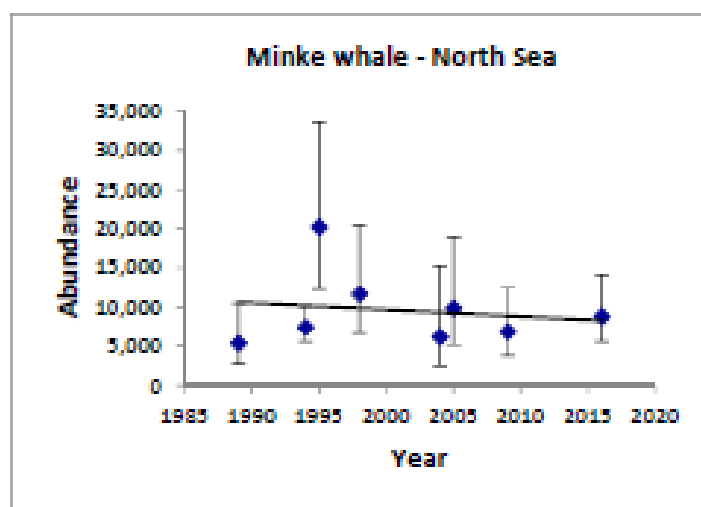
- Density estimates from 2 years of site-specific aerial surveys
- Previous boat based visual and acoustic density estimates of the Hornsea Zone
- JCP III densities (Paxton *et al.*, 2016)
- SCANS III model-based density estimates (if available – If not, block specific design based estimates will be used (Hammond *et al.*, 2017)).
- MANAGEMENT UNIT: North Sea based on SCANS III design-based abundance estimate of 345,373

Minke whale

- Previous boat based visual density estimates of the Hornsea Zone
- JCP III densities (Paxton *et al.*, 2016)
- SCANS III model-based density estimates (if available – If not, block specific designed based estimates will be used (Hammond *et al.*, 2017)).
- MANAGEMENT UNIT: If OBSERVE data available then revised CGNS MU based on combined SCANS III and OBSERVE data
- In absence of OBSERVE use SCANS III design-based abundance estimate of 13,101 (for the North Sea) or revised SCANS II CGNS MU abundance of 26,800 (Hammond *et al.* 2017).

CS noted that Hammond *et al.* (2017) concluded that there was no significant change in minke whale population size in the North Sea, so it could be possible to conclude that there hasn't been a change in the Management Unit. RW stated that the proposed approach to the management unit choice seems a sensible way forward but that it is important to note that the Hammond *et al.* (2017) assumption (of no change in minke whale population size) is only based on two SCANS surveys.

Post meeting note: RS confirmed that the North Sea minke whale population assessment of stable was based on a range of estimates from SCANS I, SCANS II, SCANS III and the Norwegian Independent Line Transect Surveys (Bøthun *et al.*, 2009; Schweder, 1997; Skaug *et al.*, 2004; Solvang *et al.*, 2015). Full details available in the SCANS III design-based estimates report (Hammond *et al.*, 2017).



White beaked dolphin

- Previous boat based visual density estimates of the Hornsea Zone
- JCP III densities (Paxton *et al.*, 2016)
- SCANS III model-based density estimates (if available – If not, block specific designed based estimates will be used (Hammond *et al.*, 2017)).
- MANAGEMENT UNIT: If OBSERVE data available then revised CGNS MU based on combined SCANS III and OBSERVE data
- In absence of OBSERVE use SCANS III design-based abundance estimate of 36,287 (for the SCANS III area) or revised SCANS II CGNS MU abundance of 37,700 (Hammond *et al.* 2017)

CS highlighted that the SCANS III and whole MU density estimate are quite similar, so the choice of data source is unlikely to result in a change to the assessment outcomes. CS noted that the

minke whale abundance estimates are quite different so will get different results depending on which data source is used.

Seals

- Seal density will be taken from maps of harbour and grey seal at-sea density at a 5 km by 5 km grid scale generated for the whole of the UK based on seal telemetry data and annual haul out counts (described in Russell *et al.*, 2017).
- MANAGEMENT UNIT:
 - Harbour seals: South East England Seal Management Area: 5,792 (2017 scaled August haul out counts)
 - Grey seals: combined North and South East England Seal Management Area: 45,894 (2017 scaled August haul out counts)

On a general point concerning all marine mammal species, CS highlighted that the data sources discussed above will be used in the quantitative assessment but noted that all relevant data sources will be used to characterise the baseline environment, including the site-specific aerial survey data.

Next Steps

RS noted that the next steps for Hornsea Four are the production of marine mammal baseline technical report and agreement from EP Group on marine mammal population sizes and density estimates against which to assess impacts. Additionally, the pile driving parameters will be finalised and noise modelling and associated impact assessment undertaken.

As discussed earlier, CS noted that the underwater noise modelling methodology technical note would be issued to consultees shortly. CS suggested that signposting to specific sections for specific consultees would be provided to aid the review process, as well as indicative response cut-off dates. LO noted that the MMO would require 3-4 weeks to get comments back from Cefas. More generally, EB stated that NE would welcome an indication of deadlines for all technical panel responses.

Post meeting note: Technical Note issued to Technical Panel members on Tuesday 15th January 2019 with signposting and timescales in the covering email.

Post meeting note: Going forward, the Whale & Dolphin Conservation (WDC) will be participating in Hornsea Four Marine Mammals Technical Panel meetings.

AOB

RW stated that she would be on leave between 24 January and 20 February.

DK thanked all participants for joining the Technical Panel meeting. Meeting minutes would be circulated by Ørsted for comment / sign-off within the next two weeks.

Summary of Actions

Action: SMRUC to obtain humpback whale data from Seawatch.

Action: SMRUC to distribute copy of Booth & Heinis (2018) PTS expert elicitation report to LO.

Action: LO to confirm RF content with proposed approach for TTS assessment.

Action: All attendees to provide comment if they consider that the operational assessment needs to consider anything specific to substations other than noise related to vessel traffic.

Action: All attendees to provide comments on the underwater noise modelling methodology technical note.

Minutes of Meeting

Meeting Hornsea Four Marine Mammals Technical Panel Meeting
Four

Meeting Date 30 April 2019

Place Ørsted, 5 Howick Place, Westminster, London SW1P 1WG

Participants [REDACTED] – Ørsted
[REDACTED] – GoBe Consultants
[REDACTED] – GoBe Consultants
[REDACTED] – SMRU Consulting
[REDACTED] – Natural England
[REDACTED] – Natural England
[REDACTED] – Natural England
[REDACTED] – Marine Management Organisation
(MMO)
[REDACTED] - MMO
[REDACTED] - Cefas
[REDACTED] – Whale & Dolphin Conservation (WDC)
[REDACTED] – The Wildlife Trusts
[REDACTED] - Subacoustech
[REDACTED] - Subacoustech
[REDACTED] – SMRU Consulting

Absent [REDACTED]

Copy [REDACTED] – Ørsted

Next meeting 26 June 2019

10 June 2019

Our ref. 02927955_A

Agenda

1. Welcome and Safety Briefing (David, Ørsted)
2. Introductions (David, Ørsted)
3. Aims and Objectives of the Meeting (David, Ørsted)
4. Hornsea Four General Update (David, Ørsted)
5. Proportionate Approach (Lauren, GoBe Consultants)
6. Review of Actions from Previous Meeting (SMRUC)
7. Scoping Review (SMRU Consulting)
8. Impacts & Effects Register
9. Noise Modelling Methodology Note and Responses (SMRU Consulting)
10. Approach to PEIR Assessment - Baseline and Assessment Methodology (SMRU Consulting)
11. Report to Inform Appropriate Assessment (Sally, GoBe Consultants)
12. Net Gain (David, Ørsted)
13. PEIR Submission and Distribution (Ørsted/GoBe Consultants)
14. Next Steps (Ørsted/GoBe Consultants)
15. AOB (Ørsted/GoBe Consultants)

Introductions

Introductions were made for those who had not met previously.

Aims and Objectives

DK stated that the principal objective of this fourth Hornsea Four Evidence Plan Marine Mammals Technical Panel meeting was to provide an update on Hornsea Four development activities, discuss the proportionate approach that is being implemented by Hornsea Four, review responses received during both the Scoping process and the HRA Screening Report consultation, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES) for Hornsea Four.

Hornsea Four Update

DK noted that the Hornsea Four Scoping Report was submitted to the Secretary of State (SoS) on 15 October 2018. The associated Scoping Opinion was adopted by the SoS on 23 November 2018. DK stated that PEIR submission will be in Q3 2019 with the submission of the final ES in Q1/Q2 2020.

DK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, and offshore Export Cable Corridor (ECC) (reduced from 3000m to 1500m width), landfall (with northern area of scoping boundary the most likely location), onshore ECC and onshore substation locations and the developable area refined. In relation to the preparation of the PEIR, the project parameters have been finalised, baseline data collection is underway, the Scoping Opinion evaluated and the drafting of technical baseline reports and PEIR assessments is underway.

Developable Area Process

DK noted that the Hornsea Four Agreement for Lease (AfL) area was 848 km² at Scoping, and that in the spirit of proportionate Environmental Impact Assessment (EIA), the project is currently giving due consideration to the size and location (within the existing AfL area) of the final project. DK highlighted this process will be detailed in the Site Selection Chapter of the PEIR.

Proportionate Approach

LK noted that all technical panel members had attended meetings earlier in the month in relation to Hornsea Four's proportionate approach. As such, only a brief overview of the proportionate approach was presented. LK stated that the proportionate approach is supported by five approaches: the Impacts and Effects Register which will be updated as Hornsea Four progress through PEIR to final ES; the Commitments Register which has been added to with commitments suggested by the public; the Evidence Plan process; innovative presentation of data and directed questions. LK noted that updated Impacts and Effects Registers would be circulated to consultees before PEIR submission with more detail provided at that point.

Review of Actions from Previous Meeting

SMRUC to obtain humpback whale data from Seawatch. **Ongoing.** CS stated that SMRUC have emailed Seawatch a few times but no response. CS noted that the technical baseline report currently states that humpback whales have been recorded in the east England area

but that they are not considered a regular visitor and neither the former Hornsea Zone or site-specific Hornsea Four surveys have recorded any.

Action: CS asked if any technical panel members had a contact within Seawatch or could provide contact details. **Complete**

Post-meeting note: TD provided Seawatch contact on 01/05/19.

SMRUC to distribute Booth & Heinis 2018 PTS EE report – **Complete**

MMO to confirm RF content with proposed approach for TTS assessment (ranges presented in chapter but not being carried through to qualitative assessment.). **Complete:** RF provided confirmation that Cefas were content with this approach in December. RF verbally confirmed in the meeting that this approach was appropriate.

All attendees to provide comment if they consider that the operational assessment needs to consider anything specific to substations other than noise related to vessel traffic. **Ongoing.** All consultees confirmed that this issue wasn't raised by the Technical panel members.

Action: Ørsted to contact PINS for some clarity on this comment.

All attendees to provide comments on the underwater noise modelling methodology technical note – **Complete.**

Scoping Review

CS gave an overview of any outstanding matters arising from the Scoping Opinion.

- TTS - Agreement that we will present ranges only but not an assessment of # animals or significance of impact;
- Operational noise – Clarity required from PINS (see action in 'Review of Previous Actions' section above); and
- Prey availability – CS asked for agreement that should the assessments conclude no significant impacts on prey species or habitats, then they would not need to be considered further in the PEIR/ES. CS suggested that the following statement would be added to the assessment to cross-reference the benthic and fish and shellfish assessment *"because neither the fish and shellfish chapter or the benthic ecology chapter concluded that the project would result in any significant effects on prey species or habitats, they have not been assessed further in this chapter"*. EB stated that there needs to be a more specific connection made between prey and marine mammals so an additional step is required which links the prey species and habitats directly to marine mammals in terms of their importance. CS agreed that this will be provided in the PEIR assessment.

Noise Modelling Methodology Note & Responses

CS noted that modelling is being undertaken without consideration of mitigation and the results will be presented in the PEIR. CS stated that if the results suggest a significant impact (in EIA or HRA terms) then mitigation will then be considered, and if appropriate, be incorporated into the modelling. EB agreed that it was a sensible approach to consider it in this way and noted that the SIP would consider mitigation options. VJ clarified that this was likely a misunderstanding as the note seemed to imply that modelling was going to include

mitigation. CS highlighted that SMRU Consulting were involved in an assessment in Scotland that modelled mitigation but then had to backtrack as the mitigation was then found to be not appropriate.

TM gave an overview on how the noise model had changed since the Hornsea Project One monitoring results had been collected with the first hammer strikes slightly louder than previously anticipated based on hammer energy. TM summarised that the noise levels at the start will be louder so this has been taken into account. RW queried whether there was an instantaneous PTS risk from the first few hammer blows. TM noted that this depends on specifics of installation situation – not as generic of adding 2dB. RB noted this was on more of a sliding scale dependent on energies. TM noted that the differences were more than a fraction of a decibel so it does make a difference. TM stated that the ranges calculated from this model is resulting in larger impacts, particularly SELcum.

CS highlighted that once results have been received then we can have that discussion in more detail. DK noted that Ørsted are proactively challenging hammer suppliers to engineer more agreeable ramp ups.

Action: - Hornsea Four to present the instantaneous PTS ranges from first strike.

CS gave an overview of the latest Gordon Hastie paper that has been published in relation to the changes in the pulse characteristics of noise with increasing range from the source.

Action: Ørsted to distribute this Hastie paper ([Complete](#)) and RF to provide some Cefas advice on how the findings should be incorporated into assessments of piling noise.

Baseline characterisation

CS gave a summary of the main data sources for the marine mammal assessment:

- Harbour porpoise: CS gave an overview of the baseline characterisation for harbour porpoise using SCANS III North Sea MU estimate. CS noted that a range of density estimates will be presented, and the assessment will be based on the worst-case.
- CS noted that concerns had been raised in relation to the limitations of aerial surveys in higher sea states and confirmed that limited survey effort took place above sea state 4. CS confirmed that the PEIR will only use data from sea states 4 and below to calculate density so SMRUC are confident that any biases in the higher sea states have been minimised. Additionally, CS confirmed that corrections for availability have only been applied to sightings of animals breaking the surface to reduce bias. VJ noted that using data only from surveys in sea states in 4 or below would be acceptable. CS noted that this is considered in detail within the baseline technical report.
- Minke whale and white-beaked dolphins: CS noted that a range of data sources and density estimates will be used although there were not enough sightings during the site-specific aerial surveys to generate density estimates.
- Harbour seals: CS noted the updated management unit count for harbour seals and note that predicted at sea densities are quite low with the array area. CS stated that European data shows no connectivity with the site.
- Grey seals: CS noted that the reference population abundance estimate combines the Southeast and Northeast England Seal Management Units and there has been some connectivity observed between European sites from telemetry studies.

- RW queried why the JCP data was not being used. CS noted that SMRU are in discussion with JNCC and CREEM on this – there have been concerns raised by the lead author of the Phase III analysis about that the code that was issued by JNCC to extract abundances and densities from the database. CS stated that until this is resolved, SMRU don't feel comfortable with incorporating the density estimate extracted using that code into the quantitative impact assessment. The JCP III density estimate will be reported in the baseline technical report, however. CS noted that density surfaces from the Heinanen and Skov 2015 report have not been made public, so data can't be extracted.

Approach to PEIR Assessment

CS provided an overview of the approach for PEIR assessment, noting that this is largely covered by noise modelling methodology note, scoping report and previous meetings. CS stated that a detailed quantitative assessment for PTS & disturbance from piling construction noise will be undertaken, presenting both absolute "worst case" scenario and "most likely" scenario at four modelling locations (3 in array area, 1 HVAC). CS noted that all other impacts will be covered with a 'simple' assessment that will not involve any quantitative modelling of the magnitude of impact.

CS stated that the UXO assessment will consider 86 targets with detonations on 150 - 324 days (depending on rate), with the potential to consider "low-order" detonations. CS noted that SMRU and RW had attended a JNCC meeting about low order detonations and that the company presenting has been asked to provide more evidence on these techniques. RW confirmed she hasn't had any follow up on that since the meeting. CS noted that the detonation company were trying to link up with BEIS SEA group to do some research.

Action: CS and RW to share any publicly-available information about these low-order detonations. [Complete](#)

TD queried whether the number of UXO were based on site-specific data or other projects? LK confirmed that the numbers have been based on experience on previous projects. TD noted that a more realistic assessment of UXOs would be preferred to create an accurate cumulative and in-combination assessment. DK confirmed that Hornsea Four are in a fortunate position that it can use data from other projects in the direct vicinity of Hornsea Four. TD stated that it would be useful for the assessment to provide some detail on how that 86 target value has been reached and a confidence estimate based on that number.

Action: PEIR Project Description to describe the justification on how that number has been reached.

Report to Inform Appropriate Assessment

SK noted that GoBe Consultants are leading on the RIAA, with APEM responsible for offshore ornithology, RHDHV responsible for onshore ecology, and GoBe addressing all other receptors.

SK noted that no response to the HRA Screening Report has been provided by Natural England. EB confirmed that Natural England will provide a response by the end of the week (03/05/19).

Post-meeting note: Natural England HRA Screening response received 01/05/19.

SK noted that Hornsea Four will not be issuing an updated HRA Screening Report but there will be a screening section with the main RIAA. SK stated that cross-references will be made as far as possible to avoid repetition of information.

SK noted that topic baselines aren't going to be included in the RIAA as these are included within the Technical Report for the topic-specific chapters. EB confirmed that that approach would be appropriate provided there is signposting to the appropriate information in the technical report.

SK went through the assessment criteria for all topics, noting that onshore ecology has been screened out but Hornsea will await comments from Natural England on that. EB noted that it might be useful to have a call to discuss Natural England's comments on the HRA Screening Report. SK confirmed that it would be useful. As a general comment, EB noted that the HRA Screening Report goes a bit further than would normally be expected so comments have been provided on the first half with the second half sitting better within the RIAA.

Action: Ørsted to arrange a call with SK and Natural England in relation to the HRA Screening Report response.

Net Gain

DK asked attendees about their experiences with Net Gain. DK stated that there is appetite within Ørsted to consider potential offshore Net Gain initiatives, so any proposals would be welcomed. DK noted that any offshore Net Gain initiatives are unlikely to be linked to the Development Consent Order (DCO) application due to timescales. DK highlighted that the project is aware that there is potential to confuse mitigation with Net Gain so are keen to avoid this.

PEIR Submission and Distribution

DK noted that Hornsea Four are aiming for a PEIR submission date of 29th July (subject to change) with an early S42 consultation period of 29th July to 12th August - documents available to consultees on Ørsted's website during this time. Hard copies of the PEIR will be delivered to local information points on 12th August, with the formal S42 and S47 consultation running from 13th August to 20th September. DK noted that local information events will be held between 2nd and 7th September.

AOB

DK noted that the project is always happy to discuss any issues so Technical Panel members should feel free to get in touch with Ørsted via the normal channels.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
CS asked if any technical panel members had a contact within Seawatch or could provide contact details. Complete	All
Ørsted to contact PINS for some clarity on the operational noise from substations comment.	Ørsted
Hornsea Four to present the instantaneous PTS ranges from first strike in the PEIR.	Ørsted

Action	Responsible
Ørsted to distribute this Hastie paper (Complete) and RF to provide some Cefas advice on its use.	Ørsted RF (Cefas)
CS and RW to share any publicly-available information about the detonations. Complete	CS/RW
Project description will describe the justification on how UXO number has been reached.	Ørsted
Ørsted to arrange a call with SK and Natural England in relation to the HRA Screening Report response – Complete – arranged for 16 th May.	Ørsted

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Mammals Technical Panel Meeting Five	23 July 2019
Meeting Date	26/06/2019	
Place	Teleconference	
Participants	[REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – SMRU Consulting [REDACTED] – SMRU Consulting [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] - Cefas [REDACTED] – Whale & Dolphin Conservation (WDC) [REDACTED] – The Wildlife Trusts	Our ref. 03155028_A
Absent	[REDACTED] – MMO	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Introductions

AS introduced himself to the panel as the new Case Officer for Hornsea Four from the MMO and conveyed the apologies from Mark Qureshi who is now the Case Manager from the MMO for Hornsea Four.

Aims and Objectives

DK stated that the principal objective of this fifth Hornsea Four Evidence Plan Marine Mammals Technical Panel meeting was to provide an update on Hornsea Four activities, discuss the scope of the Preliminary Environmental Information Report (PEIR), review the Impacts & Effects Register, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the PEIR and the Environmental Statement (ES) for Hornsea Four.

Hornsea Four Update

DK noted that in relation to the preparation of the PEIR, the technical baseline reports and PEIR assessments are currently being reviewed with the formal S42 and S47 consultation on the Hornsea Four PEIR running from 13th August to 23rd September. DK noted that local information events will be held between 2nd and 7th September.

In relation to the Hornsea Four site selection process, DK summarised that ongoing appraisal and refinement has been taking place of the landfall sites, onshore substation sites, offshore export cable corridor and onshore export cable corridor, with refinement of the developable area (reduced PEIR array area from larger Agreement for Lease (AfL) boundary presented at Scoping). TD asked if the Marine Mammals assessment is using the PEIR boundary or has that

been based on the AfL boundary? DK confirmed that the PEIR boundary is being used for all assessments, but that data collected from the wider AfL survey area is being used in the marine mammal assessment. EB noted that for ornithology, the reduction in the developable area has led to a reduction in the amount of data from the aerial surveys used in the assessment and asked if this was the case for marine mammals? RS confirmed that this was not the case for marine mammals as the impacts are more wide-ranging than collision risk for birds to all data from the entire aerial survey area is being used in the marine mammal assessment.

Review of Actions from Previous Meeting

Ørsted to contact the Planning Inspectorate (PINS) for some clarity on the operational noise from substations comment. **Ongoing**. DK confirmed that this query is going to be raised with PINS at a regular meeting taking place on 27th June.

Hornsea Four to present the instantaneous PTS ranges from first strike in the PEIR. **Complete**. RS confirmed that these ranges will be presented in the PEIR assessment.

Ørsted to distribute this Hastie paper (**Complete**) and RF to provide some Cefas advice on its use. **Ongoing**. RF noted that Cefas consider it too premature to incorporate the findings of this paper into the Hornsea Four PEIR and that the assessment should continue based on current noise exposure criteria (NOAA, 2018) for impulsive sources until more definitive guidance becomes available.

Action: RF to confirm Cefas guidance on Hastie paper in writing following the meeting.

Post-meeting note: Cefas guidance distributed to all Technical Panel members on 26th June.

Project description will describe the justification on how UXO number has been reached. **Complete**.

Baseline characterisation

RS gave a summary of the main data sources for the marine mammal assessment that have been presented at previous Evidence Plan meetings. RS noted that no new data sources have been considered since the presentation of these sources at the last meeting so all attendees should be familiar with the list.

RW asked if SMRUC had obtained data for harbour porpoise in relation to the JCP Phase III study? RS confirmed that data had been extracted from the JCP Phase III analysis tool for harbour porpoise, and noted that there is going to be another review of the paper and a subsequent update but SMRUC are not sure when that is going to be made available.

TD asked if any data was ever received from SeaWatch in relation to humpback whales. RS confirmed that numerous attempts have been made to get the data, with SeaWatch querying in the latest communication why Hornsea Four were contacting them about humpback whales when these are not the main species in the area. RS highlighted that no humpback whales were sighted in the HOWO4 surveys or any other surveys in the former Hornsea Zone.

Action: TD to make some further enquiries and provide any updates to the Technical Panel.

RS stated that Hornsea Four are keen to get a firm position from all consultees on the following question: Do consultees agree/disagree that data collected, and the sources being used to

define the baseline characterising marine mammals in the vicinity of Hornsea Four are fit for the purpose of the Hornsea Four impact assessment? RW confirmed that Natural England are happy with the data collected and the data sources. AS noted that the MMO would defer to the judgement of other stakeholders. TD confirmed that she (on behalf of The Wildlife Trusts) considered the baseline data was adequate but noted it would be good to add the humpback whale data. RF confirmed that if Natural England are content then Cefas would also consider it adequate.

Approach to PEIR Assessment

RS gave an overview of the Impacts & Effects Register for Marine Mammals, noting that detailed assessments have been carried out for PTS and disturbance from piling noise but for all other impacts, simple assessments have been undertaken. TD stated that UXO clearance should be more than a simple assessment. RS confirmed that the assessment presented in the PEIR has taken quantitative information from previous studies in relation to PTS and disturbance impact ranges but specific modelling for Hornsea Four has not been carried out at this stage.

EB highlighted that it was difficult to comment on the simple versus detailed assessments as Technical Panel members don't know what these definitions means in practice. RS confirmed that there is more detail in the PEIR chapter for simple assessments than is shown in the Impacts & Effects Register. LK also confirmed that definitions of the simple and detailed assessments is presented in the "How to Read This PEIR" guide that was submitted to all members prior to this meeting.

DK gave an overview of the Commitments Register and RW asked if consultees would get a copy of the Commitments Register to cross-refer. DK confirmed that this would be provided at PEIR submission, if not before.

EB noted that it would be helpful to have (within the Impacts & Effects Register) some justification of why particular impacts have been scoped out. DK stated that perhaps some of this justification could be provided in column Z, stating that these impacts have been agreed with PINS to be scoped out with some reasoning behind this.

Action: Ørsted to consider adding justification for scoping out of impacts into the Impacts & Effects Register.

RW suggested that Technical Panel members should review this and provide comments.

Action: All Technical Panel members to provide comments on the Impacts & Effects Register during the PEIR review process.

Report to Inform Appropriate Assessment

LK noted that following the receipt of Natural England's comments on the HRA Screening for Hornsea Four, these comments have been taken on board and the screening process updated with new sites screened in. LK confirmed that an updated Benthic Ecology, Onshore Ecology, Migratory Fish & Marine Mammals Screening was submitted to Natural England 28th May, with the updated Ornithology Screening submitted to Natural England 18th June. LK asked if Natural England could give an indication on when they expect to be able to respond to these documents? MM stated that comments are due back from Martin Kerby on 4th July (in relation

to ornithology) so comments on both documents will be compiled after that date and issued soon thereafter.

Action: Natural England to provide comments on the updated RIAA Screening.

How to Read This PEIR

LK gave an overview of how the PEIR is going to be presented and how it should be read by consultees – a step-wise process:

- Step 1: Impacts & Effects Register
- Step 2: Commitment Register
- Step 3: DCO Application Register
- Step 4: PEIR Chapters and Technical Reports

LK noted that the above points are covered in the “How To Read This PEIR” note that was provided prior to this meeting and highlighted that Hornsea Four are happy to set up meetings with stakeholders after the PEIR documents have been received to talk them through the process and answer any queries that might arise.

Next Steps

DK confirmed that the statutory consultation on the PEIR will commence on Tuesday 13th August 2019 and closes on Saturday 21st September 2019. DK stated that a post-PEIR Technical Panel meeting will be scheduled for October 2019 to discuss consultation responses received as part of formal consultation and the purpose of this meeting will be to discuss concerns raised and changes/updates to assessments required for final submission. DK confirmed that a final pre-application meeting will be held in Q4 2019/Q1 2020 to discuss any significant changes following PEIR consultation and what will be presented in the final ES.

Any Other Business?

Impulsive vs non-impulsive noise

CS noted that SMRUC are working with Gordon Hastie (author of the recent impulsive vs non-impulsive noise paper) to determine the best approach to incorporate those findings into PTS assessments generally with a view to then incorporating them into the assessment for Hornsea Four. CS noted that SMRUC have access to the data used in recent publication and are trying to explore the possibility of analysing additional data from other windfarm projects. CS noted that the paper took a probabilistic approach to fit a curve to data to establish the probability of a strike being impulsive or non-impulsive at different ranges but that decisions would be required about levels of certainty in order to define specific ‘transition points’. CS commented on the variation between the two sites in the study with the data from the Moray Firth and the Wash showing very different ranges for the transition. CS commented that it is likely that depth plays a large factor in this. CS stated that the Hornsea Four environment is more similar to the Moray Firth than the Wash in terms of depth but SMRUC are looking into all parameters that can affect the transition range. CS noted that SMRUC are trying to work out how to include these ranges in the assessment, stating that it won’t be fully included but the PEIR will include SMRUC’s thoughts on this topic.

RW stated that it would be good if SMRUC included Nathan Merchant (Cefas, and co-author of the paper) in these discussions. CS stated that SMRUC would speak to Gordon Hastie to bring in Nathan to discussions about how best to feed this evidence into assessments in the absence of definitive guidance.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
RF to confirm Cefas guidance on Hastie paper in writing following the meeting. Complete.	RF
TD to make some further enquiries about the SeaWatch humpback whale data and provide any updates to the Technical Panel.	TD
Ørsted to consider adding justification for scoping out of impacts into the Impacts & Effects Register.	Ørsted
All Technical Panel members to provide comments on the Impacts & Effects Register either before PEIR or during the PEIR review process.	All
Natural England to provide comments on the updated RIAA Screening.	Natural England

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Mammals Meeting #6	15 January 2020
Meeting Date	06/11/2019	
Place	Ørsted, Howick Place, London	
Participants	[REDACTED] – Natural England – by phone [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – MMO [REDACTED] – SMRU Consulting [REDACTED] – SMRU Consulting [REDACTED] - The Wildlife Trusts [REDACTED] – Whale & Dolphin Conservation – by phone [REDACTED] – Cefas - by phone [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants	Our ref. 04352058_A
Absent	None	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Aims and Objectives

DK noted that the aims and objectives of this sixth Hornsea Four Evidence Plan Marine Mammals Technical Panel meeting were to discuss and confirm positions on the list of topics/questions provided in advance of the meeting, as per below:

Points for discussion

1. Data Collection & Description of Baseline Environment - Section 42 Responses
 - a) Bottlenose dolphin data: TWT highlighted that dolphin sightings have increased – can data be provided?
 - i. Discuss inclusion of bottlenose dolphins
 - b) Baseline methodologies: WDC raised concerns
 - i. Discuss data sources and limitations

2. Impact Assessment Methodology – Section 42 Responses
 - a) Comments regarding WCS and simultaneous piling
 - b) Discussion of MDS for piling (ramp up, hammer energies and durations)
 - c) UXO assessment
 - d) Cetacean sensitivity to PTS – scored as medium
 - i. Discuss and agree sensitivity score
 - e) Use of expert elicitation results to inform sensitivity scores
 - i. Discuss and agree use of EE results
 - f) Use of dose-response curve for behavioural disturbance
 - i. Discuss use of DR curve and agree approach
 - g) Range dependent characteristics of noise
 - i. Discuss range dependent data and the development of methods

3. Cumulative Assessment – Section 42 Responses
 - a) Projects included in each Tier
 - b) Timelines assessed
4. Report to Inform Appropriate Assessment
 - c) Anything specific that consultees want to ensure is included in the Site Integrity Plan?

Hornsea Four Update

DK noted that the southern landfall option (A4) had been selected with the rationale based on onshore access, reduced public use and lower cliff height. DK noted that the full rationale for the selection will be added to the Site Selection and Alternatives chapter. DK noted offshore, that the HVAC booster station search area has been reduced, with refinement of the permanent works area on the eastern side of the search area.

Programme to DCO

DK gave an overview of the Hornsea Four programme which includes Evidence Plan meetings in November and December 2019 and final application submission in Q1 2020, most likely the end of February 2020. DK noted that a date for the next Marine Mammal Technical Panel meeting in December would be agreed at the end of this session. DK acknowledged that some consultees have significant concerns about the timescales but highlighted that this is out of the projects control and defined by The Crown Estate's Agreement for Lease. EB noted that the comments from Natural England were not requesting further data collection or evidence, with more focus on the assessment so significant progress is possible in the given timescales. CS requested confirmation that there are no consultee concerns with the 24 months of aerial data for the baseline. RW noted that NE have no concerns with the 24 months of aerial data. All agreed that the baseline data was adequate.

Impact Register Updates & Scope of the EIA at ES

DK gave an overview of the changes that will be made to the Impacts Register post-PEIR, noting the addition of columns. DK stated that impacts would be moved from the Chapters to the Impacts Register where assessments have concluded no likely significant effect (in EIA terms) at PEIR and there is no change in project description affecting the assessment; baseline environment data affecting the assessment or no change in assessment methodology and there are no significant comments in stakeholders' S42 responses. DK noted that in these cases the Impacts Register will be updated to state that these impacts are *"Not considered in detail in the ES. No likely significant effect identified at PEIR."*

CS noted that for marine mammals, there are a few impacts that were not commented on during the S42 consultation and that concluded no likely significant effects so was assumed these impacts are agreed and moved from the Chapter to the Impacts Register. RW noted Natural England's concerns about linkages with the Report to Inform Appropriate Assessment (RIAA), stating that if impacts are lost from the Chapter then these can't be relied on for the RIAA. TD noted a concern that details on impacts that may need to be included in other projects' cumulative assessments might be lost. CS confirmed that care will be taken to ensure that any information normally required for CEA will not be removed.

CS noted that piling noise would still be assessed within the Chapter as there were significant comments in the PEIR response and additional modelling has been undertaken. CS noted that there were no S42 comments on the marine mammal operational noise assessment which

concluded no LSE so therefore this is an example of an impact that will be moved to the Impacts Register. CS stated that in relation to the impact of vessel collision, there were some comments on the significances used in the assessment but these changes would not alter the significance of the overall assessment. CS suggested that the change in sensitivity could be captured in the Impacts Register.

MQ asked if JP had any comments on this approach; JP noted that it sounded like a reasonable approach overall. EB stated that there is a need for the ES to be a standalone document, particularly important for post-consent activities and noted that other projects will be relying on the Hornsea Four assessment to feed into their own cumulative assessments and RIAAs.

DK presented the onshore example of the Impacts Register noting that something similar would be prepared for Marine Mammals and presented pre DCO application. RW suggested some of that commentary is added within the Chapter. LK noted that this commentary would be provided in the scoped out table within the Chapter, as presented at PEIR.

ACTION: Hornsea Four to provide an updated Impacts Register for consultees to comment on the *'Not considered further in the ES'* approach and justification. **Complete**

Data Collection & Description of Baseline Environment – Section 42 Responses

RS noted that Natural England's S42 comments stated that the baseline characterisation and methodology adequate for marine mammals.

RS stated that TWT's comments noted that recent sighting data had shown an increase in bottlenose dolphin activity along the Yorkshire coast. RS confirmed that no dolphins were seen in the site-specific survey and asked if this data was available? TD stated that the bottlenose dolphin data has been given to Sea Watch and TD will pass on the contact details of the relevant staff member. CS acknowledged that this information would be required by early December in order to feed into the ES deliverables.

ACTION: TD to provide Hornsea Four with contact details for Sea Watch staff member for bottlenose dolphin data. **Complete**

RS noted that WDC had raised concerns regarding the age of the vessel and PAM data used to calculate density surfaces, the 4 km buffer for aerial surveys, and the use of SCANS data. RS agreed that the Hornsea Zone data is dated now, but these data were supplemented by recent site-specific survey data and that there is no significant difference in density estimates between the datasets. VJ noted that the baseline data is not a concern for this project as two years of aerial data has been collected.

RS confirmed that the bottlenose dolphin data will be added to the baseline (if available) but otherwise all consultees are happy the baseline was appropriate for DCO application. All parties agreed this was the case.

Impact Assessment Methodology – Section 42 Responses

Maximum Design Scenario vs Most Likely Scenario

RS noted that S42 comments focussed on how the Maximum Design Scenario (MDS) and the most likely scenario for piling was presented and confirmed that a full and quantitative assessment of the MDS will be provided at ES.

TD queried whether the final conclusions of the assessment will be based on the MDS or most likely scenario. CS stated that 100% of the piling at the MDS is not realistic so both scenarios will be expressed in the overall conclusions, noting the fact that if all assessments were based on a MDS then this would be massively over-precautionary and would cause problems for cumulative assessments in the future. RW noted that the way for the industry to solve this problem is to do the detailed geophysical work upfront, although DK noted that HOW03 collected a vast amount of ground data that was ultimately no longer required so Ørsted has learned some lessons from that. EB stated that if projects don't have enough information on ground conditions to support a most likely scenario then they have to rely on a MDS. CS noted that the MDS has to be assessed but that the most likely scenario is important for context.

TD noted concerns about how the MDS vs most likely is captured in the DCO. RW confirmed that the maximum hammer energy is captured in the DCO. AS noted, that a DCO condition (e.g. 20% of MDS, 80% of most likely) would need some thought. TD queried whether this could be tied to the Site Integrity Plan (SIP) with key milestones. SK highlighted that SIPs have previously been used to manage disturbance in-combination but there is no reason why the remit of the SIP couldn't be expanded (noting that the overriding purpose of a SIP is to ensure Site Integrity, with a SIP currently expected for the SNS SAC). SK added that the SIP can contain milestones where certain validations are required and revisited and that the MDS and most likely scenarios could be refined in the SIP at a certain stage. SK noted that the SIP covers disturbance and the Marine Mammal Mitigation Protocol (MMMP) covers PTS risk. CS stated that an appendix to both the MMMP and SIP to address the MDS and ongoing refinement of the most likely scenarios could be an option. All agreed that it would be useful for the MMO to provide a template for a SIP.

ACTION: MMO to provide a template for a SIP. **Complete**

MQ noted that the SIP focuses on harbour porpoise and queried if other species would be impacted. CS stated that harbour porpoise are the most common cetacean in the area and most potentially impacted so if the process is driven by the need to reduce impacts on harbour porpoise then it should be effective for other species. RW highlighted that minke whales are also important and sometimes missed out. CS agreed that minke whales were a key consideration for the MMMP.

RS noted that the MDS ramp up has been amended for the ES noise modelling (to match the most likely ramp up considered at PEIR) so SELcum PTS ranges are lower than presented at PEIR. RS also noted that the maximum hammer energy for pin piles has increased for ES so SPLpeak & disturbance impacts are slightly higher for pin piles. RS clarified that for the final ES modelling, the MDS for monopiles will be 4.4hours piling time and for pin piles will be 2.1 hours (both including a 52.5min ramp up). RS stated that project engineers have confirmed 5,000 kJ hammer energy is sufficient to install a 1.5m monopile. RS confirmed that consideration of simultaneous piling will be included in the ES.

UXO assessment

RS confirmed that Hornsea Four is not applying to licence UXO within the DCO Application and that current/recent UXO noise monitoring data are unlikely to be available for use in the Hornsea Four assessment. RS noted that the majority of UXO charge sizes found at HOW02 were <250 kg NEQ and that the Hornsea Four PEIR presented impacts based on a range of data including: 263 kg charge weight (von Benda Beckman et al 2015); and 260 kg & 227 kg charge weights (HOW01 modelling using NOAA PTS thresholds). RW highlighted that Hornsea Project Two modelled UXO up to 800 kg so suggested that this information could be used in the Hornsea Four assessment. CS confirmed that this information would be incorporated into the Hornsea Four assessment.

TD stated that as the MDS is not conditioned within the DCO so any UXO larger than assessed in the DCO Application would then be assessed within the Marine Licence application making the project RIAA no longer valid. SK confirmed that the SIP will include provision, along a timetable with trigger points requiring the developer to revisit the site alone and in combination parameters and confirm that they would remain correct – and that the conclusion of no Adverse Effect On Integrity (AEol) remained valid.

TD stated that TWT position is that to ensure site integrity for the Southern North Sea SAC and EPS, mitigation for UXO clearance and therefore the UXO clearance licence should be included within the DCO. TD noted that some projects are having a separate UXO and piling SIP. RW said that regulators should ensure that there is only one SIP for each project. TD confirmed that these objections are part of a wider industry conversation and are not project-specific.

Cetacean medium sensitivity to PTS

RS noted that the Hornsea Four PEIR assessment used medium sensitivity to PTS, noting that animals can recover from the impact of PTS as they are able to modify behaviour so that reproduction and survival is not likely to be affected. RW understood this concept but noted that it doesn't match with the definitions of the sensitivities – they are not getting that notch in hearing back. CS confirmed that the proposed approach is to alter the definition of sensitivity levels to take that into account. TD asked what evidence there was to support this argument? CS confirmed that the evidence base is the same evidence that the expert elicitation considered. CS noted that evidence is building to support the fact that PTS as a result of exposure to piling noise is not necessarily going to cause a significant negative effect (e.g. work conducted by Ron Kastelein on both seals and porpoise). CS highlighted that there is nothing specific in the EPS legislation that directly defines reductions in hearing sensitivity as injury – that link was made by JNCC as it wasn't known at that point what the impact of PTS would be on an individual and that the industry is only just starting to understand how piling noise causes threshold shifts. VJ noted WDC's concerns about this approach, stating that currently PTS is interpreted as injury in EPS terms. CS noted that at the expert elicitation there wasn't a big concern about the magnitude of PTS predicted from piling noise for most species although it is important to note that minke whales weren't included in this workshop – less is known. TD asked if this evidence is based on monopiles or pin piles?

ACTION: CS to check the source of the PTS sensitivity evidence – pin piles or monopiles.

All agreed, with the exception of VJ (WDC) and TD (TWT) that the assessment will consider the impact of the PTS change rather than the PTS itself. TD stated that before TWT agree, they request to see the evidence to support this approach and noted that the TWT current position

is that this can be used for illustrative purposes only and until strong evidence is available, it should not be used as part of the assessment. CS confirmed that the definitions for sensitivity will be changed. VJ noted that WDC strongly disagree with this approach to the PTS assessment.

Use of expert elicitation results to inform sensitivity scores

RS noted that the sensitivity scores used in the PEIR weren't based purely on the expert elicitation results – SMRUC have investigated the evidence behind the expert elicitation. RS noted a Natural England PEIR comment that stated, *"It is unclear why it would take >300 days of repeated disturbance to have an impact on fertility of harbour porpoises (assessed as having a medium sensitivity), but only ~185 days of disturbance to impact fertility of grey seals (assessed as low sensitivity)"*. RS confirmed that the key difference between porpoise and seals was the impact of disturbance on calf/pup survival. RW stated that she didn't appreciate that when she read the PEIR and noted that it was a very low risk comment. RS confirmed that the ES will be made clearer.

Use of dose response curve

RS confirmed that the use of a dose-response curve is no longer a new approach and is based on good empirical data (for some species) from German and Scottish windfarms. RS stated that there is also a new paper (Tyack & Thomas, 2019) that uses dose-response functions to improve calculations of the impact of anthropogenic noise. CS noted this is the best approach as a fixed threshold can massively underestimate the number of animals affected. TD asked if that paper could be circulated.

ACTION: SMRUC to distribute the Tyack & Thomas paper. **Complete**

RW noted that Natural England have no issue with the use of the dose response curves but would have expected to see behavioural modelling. CS noted that this would be added to the Subsea Noise Report.

Range dependent characteristics of noise

RS noted that at a previous Evidence Plan meeting it was agreed to use a 5km PTS limit but the Natural England PEIR comments advised the use of a 10km PTS limit. RS stated that Gordon Hastie has confirmed that the peak pressure/duration and rise time are the most important factors in establishing a limit. CS noted that the distance of 2-5 km suggested as the PTS limit was based on the probability of a sound being impulsive, the probability threshold chosen was 20% (i.e. only 20% of the sounds would still be considered as impulsive, 80% of the sounds would be considered non-impulsive). CS stated that Hastie et al (2019) suggested a 50% probability so highlighted that the value suggested by SMRUC is more conservative, noting that 20% is similar to what Southall based the TTS/PTS onset data on (i.e. Only 18-19% of animals are predicted to actually experience PTS at the PTS onset threshold level). CS indicated that more data is being analysed and might be ready for Examination. RW stated that given that there isn't enough data, the ES assessment needs to be precautionary and use the maximum number given in the paper (10km). CS confirmed that the text will be updated to be more descriptive, noting that the value is not relied on for the actual assessment.

Cumulative Assessment – Section 42 Responses

RS confirmed that the projects included in each Tier of the cumulative assessment will be updated based on latest information. RS noted that the scale on the figure axis made it appear that some project timelines were incorrect whereas it was just that there were such low numbers of grey seals that it made it hard to see. RS confirmed that tables will be added to the chapter to clarify this. All content with that approach.

Report to Inform Appropriate Assessment

SK acknowledged that the grey seal assessment was not complete for the PEIR but confirmed that additional work is being carried out by SMRUC to provide the evidence base for the assessment. RW noted that it was good to hear further work was being undertaken on this.

SK confirmed that where comments on the RIAA mirror those comments on the PEIR (e.g. the MDS vs most-likely), the RIAA will be updated in line with the ES chapter. SK also noted that the updates will be accompanied by cross-checking of referencing to ES chapters and technical reports throughout the RIAA.

SK stated that the comment on cable protection is noted and is being addressed in combination. RW confirmed that there is a project summarising all the cable protection assumptions made across all projects but it is unlikely to be available before Application. RW confirmed that the concern regarding cable protection relates to prey availability and not directly to harbour porpoise. TD queried whether this means that this needs to be taken through to cumulative assessment?

SK confirmed that a draft Site Integrity Plan will be issued as part of the Application to address any risk around disturbance (20%/10%) in relation to the SNS SAC and it will include measures to enable the assessment parameters alone and in combination to be confirmed and/or updated as relevant; suite of mitigation measures if required; and a timeframe for updates and re issue, with 'trigger points' requiring the draft SIP to be re-visited in consultation with relevant bodies. AS asked if the SIP would consider the location of noisy activities. SK noted that locations as known would be provided when the SIP is revisited. SK confirmed this would be considered within the RIAA also.

TD asked how much detail on the mitigation measures would be provided in the draft SIP. SK noted that the SIP would identify a range of mitigation measures, including an overview of the efficacy of each, but which measure is relevant would be dependent on what mitigation would be required to meet the thresholds.

SK confirmed that the in-combination assessment for harbour porpoise, harbour seal and grey seal requires updates, in light of a number of projects progressing in the interim and providing additional information. SK noted that the projects included in combination will therefore be checked and revised if necessary (including noting Natural England's comment 2.13 on Dogger Bank projects in combination for grey seal at the Humber). SK confirmed that the updates will also revisit the calculations presented for harbour porpoise. SK suggested that to avoid double-counting for the in-combination assessment, overlaps will be deleted from the circles. RW asked to see that in a pictorial format.

ACTION: In-combination assessment to provide maps showing the overlaps and areas removed.

SK stated that text highlighting the potential for further noisy activities will be included in the RIAA at a later date (if/when such activities appear in planning) with the SIP representing the forum through which such activities can be included. RW confirmed that approach seemed appropriate.

SK stated that the comments on fish are noted and the RIAA will continue to draw on the topic specific assessment of fish ecology (and benthic) as relevant.

MM noted that most comments have been provided on the PEIR so as long as those comments are addressed within the PEIR then this should draw across to the RIAA. EB noted that RIAA assessments are on a different scale than then EIA so more than a simple copy across is required. Commentary is required.

Next Steps

RS confirmed that the next steps for the Marine Mammal documents are to update the Chapter with results from revised MDS modelling; the inclusion of simultaneous piling; the ES to be updated with any points agreed at this meeting and to agree the approach in relation to impacts not considered further at ES.

AOB

RW queried whether Hornsea Four are going to issue a formal response to each comment provided during the PEIR consultation. DK stated that the intended approach to is provide this commentary in the Consultation Report and the Chapter but the project will consider the provision of responses before the next Evidence Plan meeting.

ACTION: Ørsted to confirm if this response can be provided in advance of next Evidence Plan meeting.

Next Marine Mammals Evidence Plan meeting arranged for December 17th (10.00 – 12.00). DK confirmed that prior to this meeting, Hornsea Four will issue updated Impacts Register and a response to S42 comments where feasible. After receipt of these, a decision will be made as to whether this meeting is required.

EB noted that it was really useful to have slides and topics/questions in advance of the meeting so that attendees could prepare.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to provide an updated Impacts Register for consultees to comment on the <i>'Not considered further in the ES'</i> approach and justification. Complete	Ørsted
TD to provide Hornsea Four with contact details for Sea Watch staff member for bottlenose dolphin data. Complete	TD
MMO to provide a template for a SIP. Complete	MMO
CS to check the source of the PTS sensitivity evidence – pin piles or monopiles	CS
SMRUC to distribute the Tyack & Thomas paper. Complete	SMRUC

Action	Responsible
RIAA In-combination assessment to show figures showing the overlaps and areas removed.	SK
Ørsted to confirm if this response can be provided in advance of next Evidence Plan meeting.	Ørsted

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Mammals Meeting #7	13 February 2020
Meeting Date	17/12/2019	
Place	Teleconference	
Participants	[REDACTED] – Natural England – by phone [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – SMRU Consulting [REDACTED] - The Wildlife Trusts [REDACTED] – Cefas [REDACTED] – Ørsted [REDACTED] – GoBe Consultants	Our ref. 05086857_A
Absent	[REDACTED] – Natural England [REDACTED] – MMO [REDACTED] – Whale & Dolphin Conservation [REDACTED] – SMRU Consulting [REDACTED] – GoBe Consultants	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Programme

DK noted that the Hornsea Four DCO submission date has been extended from Q1 2020 to Q3 2020, allowing a six month extension. EB stated that it was very positive for the project to have the extra time and it is a good opportunity to work together to submit a well-considered, strong application.

DK highlighted that there will now be time for additional Evidence Plan meetings and stakeholder-specific meetings to develop the Statements of Common Ground (SoCG). DK noted that Hornsea Four will give stakeholders opportunity, where they see benefit, to review draft Technical Reports, Annexes and potentially Chapters prior to DCO submission. TD stated that TWT are happy to receive the documents but response times will depend on workloads. EB confirmed this was also the case for Natural England but it is a good idea to review the documents in advance of DCO submission.

DK noted that Hornsea Four are currently pulling together an engagement strategy so will be in touch in January to get some dates in the diaries.

Impacts Register

RS ran through the marine mammal impacts that Hornsea Four are proposing to 'not consider in detail in the ES' as no likely significant effect was identified at PEIR. RS highlighted that this only applies to a few impacts as most impacts are still being considered in the ES due to changes to the maximum design scenarios (MDS) between PEIR and ES.

RS noted that the impacts proposed to be 'not considered in detail in the ES are as follows:

- Construction
 - Non-piling noise (e.g. cable laying, dredging);
- Operation
 - Operational noise;

- Vessel collision risk;
 - Disturbance from vessels;
- Decommissioning
 - PTS from underwater noise;
 - Disturbance from underwater noise;
 - TTS from underwater noise;
 - Vessel collision risk; and
 - Disturbance from vessels.

RW noted that Natural England are content with not considering these impacts in detail in the ES but noted that it was really important to have a clear audit trail within the ES chapters stating where these impacts have been considered (e.g. PEIR chapter), why they are not considered further and links to the Impacts Register. RW noted that this also has to be clear within the SoCG. RS confirmed that there is a table within the chapter that details what impacts are not considered in the ES and that this table will link back to the Impacts Register. EB also generally agreed with the approach and agreed that the audit trail was really important.

EB asked where the MDS for each of these impacts not considered in detail in the ES would be detailed, as this is important in the post-consent phase? RS noted that the MDS for these impacts is presented in the Impacts Register even if the impact is not fully assessed in the ES chapter. LK noted that a statement could be added to the table in the ES chapter, stating that the MDS for these impacts are detailed in the Impacts Register.

TD confirmed that it would be useful if a document was created that provided information on how the application was set up and how it should be read (e.g. a 'How to Read this ES' guide) and this could link to where all the information is presented. DK noted that this kind of document was produced at PEIR and will be updated for the ES. EB noted that it would be useful to see this ES guide in advance of DCO submission to see if it contains the right information and links to assessments.

Action: Hornsea Four to produce a 'How to Read the Hornsea Four ES' document and share a draft with technical panel.

RS asked whether attendees were in agreement with the proposed impacts that were not being considered further in the ES. RW and EB stated that Natural England are happy with the approach, as long as the audit trail is provided. RF reiterated Natural England's points and confirmed that an official Cefas response would be provided via email. TD also agreed to respond via email on whether TWT agree with this approach.

Action: RF and TD to confirm if this approach to ES is acceptable via email.

Post-meeting note: Cefas would like to see adequate justification provided in the ES as to why certain impacts have not been considered further. Provided that the evidence to support any justification is appropriate, then Cefas are satisfied with this approach on this occasion.

RW queried whether cumulative impacts will be added to the Impacts Register. LK confirmed that cumulative impacts are not detailed in the Impacts Register but will be considered in the standard way within the text of the ES chapter.

TD queried whether there are any impacts not being considered further in the ES in relation to the cumulative assessment. RS confirmed that some impacts will be not considered further in the ES but will remain in the cumulative assessment, but with links added to sensitivities defined within the PEIR. RS noted that the cumulative impacts considered in the chapter will be clearly set out in the introductory cumulative text.

AOB

RW queried whether Hornsea Four are going to issue a formal response to each comment provided during the PEIR consultation. DK stated that Hornsea Four will not be issuing formal response to comments but with the extra time for Evidence Plan discussions then we will discuss all comments. DK noted that there is a spreadsheet with all comments and responses but a lot of the responses are signposting to sections of the ES and TRs so it won't make sense without the documents. RW noted that it would be fine to receive these responses at the time of application so consultees can go through and check that all comments have been addressed. DK confirmed the Consultation Report will contain all Section 42 comments and how they've been addressed in the DCO Application.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to produce a 'How to Read the Hornsea Four ES' document.	Ørsted
RF and TD to confirm if this approach to not considering impacts further in the ES is acceptable (via email). Complete	RF & TD

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Mammals Meeting #8	25 August 2020
Meeting Date	04/06/2020	
Place	Teleconference	
Participants	[REDACTED] – Natural England – by phone [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – MMO [REDACTED] – Cefas [REDACTED] – SMRU Consulting [REDACTED] – SMRU Consulting [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants	Our ref. 06229702_A
Absent	[REDACTED] - The Wildlife Trusts	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Welcome
2. Aims and objectives
3. Hornsea Four update
4. Draft ES Marine Mammal Technical Report
5. Draft ES Outline Marine Mammal Mitigation Protocol (MMMP)
6. Update on UXO assessment
7. Draft Outline Site Integrity Plan (SIP)
8. HRA Screening
9. Grey seal Report to Inform Appropriate Assessment (RIAA)
10. Any other business

MQ asked to add the recent MMO advice on the Subsea Noise Technical Report to the agenda.

Aims and Objectives

DK outlined the aims and objectives of the meeting which were to discuss the feedback from Natural England on the Marine Mammals Technical Report, provide an update on the UXO assessment, and discuss the material set out in the Position Paper (provided to the Technical Panel on 21st May 2020 feedback from Natural England), namely in relation to the Outline MMMP, Outline SIP, HRA Screening and the RIAA assessment of grey seals .

Project Update

DK noted that Hornsea Four are still on track for a September 2020 DCO application submission, noting that current activities are focused on reviewing and finalising DCO documentation and having stakeholder and Evidence Plan meetings.

Draft ES Marine Mammal Technical Report

RS thanked Natural England for comments on the Marine Mammal Technical Report, noting that most comments are straight-forward and updates will be made accordingly. RS wanted to

discuss one comment in relation to use of JCP data. In their comments, Natural England stated that *"it would be useful to have a range of harbour porpoise densities for context, taking SCANS III as the lowest (0.888), the site specific density as the middle value (1.74) and JCP as the highest value (3.12)."* RS outlined the reasons why the JCP data isn't being taken forward to the marine mammal assessment namely, that the JCP Phase III report authors state that the JCP database provides relatively poor spatial and temporal coverage; that the results should be considered indicative rather than an accurate representation of species distribution; that due to the patchy distribution of data, the estimates are less reliable than those obtained from SCANS surveys; and that outputs cannot be used to infer abundance at a finer scale than 1000 km². RS also noted that the data are between 10 and 26 years old, and that the JCP summer density estimate (3.12) is similar to the HOW4 aerial summer estimate (3.8), with the summer density not representative of other times of the year and therefore inappropriate to use in quantitative EIA – as it would lead to large over-estimations.

RW noted that the limitations of the JCP data were understood and highlighted that Natural England are happy for the site-specific data to be used in the assessment. RW stated that more text on the context of the density estimates and the variability between different datasets is required. RW noted that context should be provided in the ES Chapter as well as the Technical Report. It was agreed by all to include this extra commentary.

CS noted the variability in porpoise occurrence on a day-to-day and even hour-to-hour basis and highlighted that the average density of the year is used to smooth out the seasonal variation as this is the most appropriate way to characterise the disturbance risk. EB queried how this approach worked in relation to the HRA? CS noted that the HRA is undertaken on an area basis.

Draft ES Outline Marine Mammal Mitigation Protocol (MMMP)

RS noted that at PEIR, the MMMP mitigation was for SPL_{peak} PTS-onset only and highlighted that no Section 42 comments were received in relation to this approach. RS wanted to highlight this and have a discussion on the proposed approach. RS gave an overview of the proposed approach to the MMMP that was detailed within the Position Paper, noting that the MMMP will focus on mitigating the "instantaneous" SPL_{peak} PTS-onset. RS stated that SEL_{cum} PTS-onset impact ranges are highly over-precautionary and unrealistic and there is growing empirical evidence that the equal energy hypothesis assumption behind the SEL_{cum} threshold is not valid. RS further noted that impulsive noise thresholds overestimate the risk of PTS-onset as impulsiveness reduces over distance; that the fleeing swim speed modelled were precautionary; and that SEL_{ss} levels are lower at the surface so depth averaged models can overpredict exposure at the surface.

CS stated that it was important to note that this approach to mitigation mirrors the approach agreed and used in Scotland and it would be useful to align the approach across the industry.

RW stated that she agreed with the evidence presented and has been trying to talk to SNH about this approach but had been able to get in touch with Caroline Carter as yet. RW noted that she would like to take this away to consider before responding but this was an important conversation to have.

RW asked when Katherine Whyte's data that highlights much lower noise levels near the surface compared to that modelled would be available? CS confirmed that the publication of

Katherine's work is imminent and has been accepted for publication so will be available soon to feed into the process.

RW noted that SEL models could be improved by including data from Katherine's work and by using increased fleeing speeds. RW stated that if the models can be made more realistic then that would allow for a better understanding of SEL cumulative and the potential risk to animals. CS acknowledged the need to improve the way cumulative exposure is modelled but highlighted that firm regulatory decisions are being made on mitigation distances but not taking into account the body of evidence and uncertainty. CS noted that this is where Scotland is taking a more pragmatic view on this from a licensing perspective. CS encouraged RW to speak to Caroline Carter (SNH) on her position and why she feels comfortable with this approach. CS stated that Scotland is focussing on collecting data to try and inform the uncertainty in terms of monitoring around piling and UXO noise to try and understand the impulsive noise change and porpoise behaviour around piling to see if they can understand how individuals are responding. CS noted that SNH appear to acknowledge uncertainty but are make licensing decisions based on the more certain predictions whilst investing in collecting more evidence around the other uncertainties.

CS stressed that the assessment will consider cumulative SEL ranges, it is just the MMMP that is focussed on mitigating instantaneous PTS.

It was agreed that Natural England and Cefas would provide a formal response on the approach to the MMMP by the start of July. RF stated that Cefas will discuss this inhouse but their initial thoughts are that the MMMP should be based on both SPL_{peak} and SEL_{cum} . CS stated that if there was anything about this approach that consultees would like to discuss before forming their response then they should please get in touch.

Action: Natural England and Cefas would provide a formal response on the approach to the MMMP by the start of July.

DK confirmed that Tania Davey from TWT is going to provide comments on the Position Paper via email.

MMO and Cefas Advice on Modelling and Mitigation

MQ noted that the MMO provided Hornsea Four with advice in March in relation to the Subsea Noise Technical Report which took into account advice from Cefas. MQ stated that Ørsted had queried elements of that advice, specifically the comments in relation to mitigation. MQ stated that the MMO had an internal discussion on this and agreed to review that advice to ensure that it was focussed on the modelling rather than the mitigation. DK clarified that the project were requesting comments on the Subsea Noise Technical Report and some of the comments did not appear to be relevant to the report submitted. DK stressed that Hornsea Four is keen to understand if the advice on mitigation is in line with advice from Cefas/Natural England/JNCC. MQ stated that this is being discussed internally and Nathan Merchant has provided some input on this. MQ stressed that the MMO encourage advice from Cefas on noise and that advice would normally be incorporated into the MMO's advice to Hornsea Four. MQ noted that the MMO are in favour of the use of ADDS and asked if that was Cefas' view? RF stated that this was Cefas' view but they consider it better to reduce the noise at source. MQ confirmed that the MMO are going to consider the advice and the ADD discussion but are not going to ask Cefas to revise their advice.

DK asked if the noise abatement measures that the MMO are advocating are in line with the view of Natural England and the impacts presented in the ES? EB noted that Natural England hadn't seen the MMO advice so couldn't comment.

Action: MQ to share advice on Subsea Noise Technical Report with Natural England and ensure they are aligned on the advice.

DK thanked the group for the discussion and stressed that Hornsea Four are just asking for consistent advice on noise abatement at source.

Update on UXO Assessment

RS noted that at the Marine Mammals Evidence Plan Meeting Six (06/11/2019), RW highlighted that Hornsea Project Two modelled UXO up to 800 kg so suggested that this information could be used in the Hornsea Four assessment. RS confirmed that the Hornsea Four UXO assessment now uses the Hornsea Project Two predicted ranges for charges up to 800 kg.

RS noted that Natural England's Section 42 comments requested that the UXO assessment is undertaken using aerial or acoustic plus SCANS III densities, not just SCANS III densities. RS confirmed that the Hornsea Four UXO assessment now uses the density surfaces to calculate the number impacted. RS also noted that the location of the UXOs is unknown at present so the assessment assumes that the UXO is at centre of array area.

RW thanked RS for the update.

Draft Outline Site Integrity Plan (SIP)

SK noted that the Outline SIP (provided as an appendix to the Position Paper) is going to be included as part of the DCO application. SK stated that the purpose of the SIP is to address uncertainty for SNS SAC disturbance in combination. SK gave an overview of detail contained within the Outline SIP, noting that it follows the Advice on Activities for the site in relation to mitigation options. SK asked for feedback from the Technical Panel on the content of the Outline SIP.

RW stated that Natural England have no comments on the Outline SIP – it is a high level document as it has to be at this stage. RF echoed RW's comments. MQ confirmed no comments from the MMO on this. EB noted that TWT might want to comment on this document. DK confirmed that Tania Davey will be providing comments via email on the Position Paper.

Marine Mammals HRA Screening

SK noted that a summary of the changes that have been made to HRA Screening in relation to marine mammals are presented within the Position Paper. SK stressed that most changes are more precautionary, noting that accidental pollution is no longer considered to have 'Potential for LSE' in line with what was presented within the RIAA at PEIR. EB asked why accidental pollution has been screened out. SK confirmed that this was as a result of the publication of the 'Guidance on the use of Habitats Regulations Assessment'¹ by the Ministry of Housing, Communities and Local Government which considers the implications from the People over Wind judgement for HRA.

¹ <https://www.gov.uk/guidance/appropriate-assessment>

Action: SK to provide a link to the new guidance. **Complete** (see footnote)

EB queried whether it would be easier to screen accidental pollution in and then address it by stating that there is mitigation in place, noting that this would avoid getting stuck in a discussion about why it was screened out. EB to review the link and consider this.

Action: EB to consider the 'Guidance on the use of Habitats Regulations Assessment' and provide feedback to the Technical Panel (via email). **Complete via email on 31/07.20**

All other consultees confirmed that there were no further comments on the updated HRA Screening in relation to marine mammals.

Grey seal assessment for RIAA

RS noted that the draft RIAA at PEIR required further consideration of grey seals and this additional work has been undertaken by SMRUC looking at site connectivity. RS gave an overview of the work presented within the Position Paper, noting that the assessment uses data on tagged seals within an area around the Hornsea Four array (21km buffer around Hornsea Four boundary) which represents the approximate maximum disturbance impact area (informed by the maximum design scenario impact contours for a monopile at 5,000 kJ at the northwest modelling location). RS stated that the work considers connectivity between those seals and SACs/haulout sites (Humber & Berwick NNC) and therefore how predicted impact at the site can be 'apportioned' among the various SAC/haulout sites. RS stated that the work also considers the relative level of grey seal disturbance across the array and how this varies depending on location to consider a realistic construction scenario. RS stated that estimates of the grey seal population of the Humber SAC were made, taking account of increasing numbers in both August haul out counts and pup counts. The RIAA will then apply the work to determine the potential for effect at site level.

CS highlighted that taking into account the current population is very important as the at sea densities used in the assessment are scaled to the current population rather than historical population, so this approach aligns both the ES and RIAA assessments.

EB stated that when considering implications against the designated site, the target population from the conservation advice needs to be used. SK noted that the current population is considerably higher than the citation population and continuing to grow. EB stated it might depend on the wording of the Conservation Objective which states that target is to maintain the population within the site. EB confirmed that for the Humber SAC, the current population size could be used in the assessment. SK confirmed that the RIAA assessment will present the citation population, the current population, the target to maintain the population, and will note that the population is exceeding the target and that the assessment is based on current population. EB agreed with this approach.

EB further noted that the RIAA assessment should be based on the worst case scenario rather than a realistic scenario. SK clarified that the assessment is based on the worst case disturbance impact area for a single pile location and that the impact range for every other pile location will be less so a weighted average across the site is used. CS noted that the wording could be confusing things here. The assessment has a worst case location and the worst case piling parameter scenario. The assessment presented in the RIAA uses the worst case piling parameter scenario but takes into account spatial variability in the level of disturbance predicted from

WTG across the array area. EB concluded that the definitions of these terms needs to be made clear in the assessment.

Natural England agreed this is a useful first step in assessing impacts on SAC seals at sea. CS agreed, stating that there is a lot of telemetry data that can be used to inform the management and assessment of the population units. RW agreed with this sentiment.

AOB

In relation to next steps for marine mammals, LK noted that the marine mammals chapter will be available at the end of July, noting that there would not be enough time to incorporate any comments on this chapter into the final submission. EB stated that it would be useful to be provided with the chapter at that stage to inform the Statement of Common Ground (SoCG) process. MQ agreed that it would be useful to see the chapter. LK confirmed that an updated MMMP will also be provided for information but that will be finalised after responses received from Natural England and Cefas in relation to the approach discussed at this meeting.

DK confirmed that invitations for SoCG meetings will be sent out soon, noting that draft SoCGs documents are ready and will be provided for discussion.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Natural England and Cefas would provide a formal response on the approach to the MMMP by the start of July. Complete	Natural England (RW) & Cefas (RF)
MQ to share advice on Subsea Noise Technical Report with Natural England and ensure they are aligned on the advice.	MQ
SK to provide a link to the new guidance. Complete	SK
EB to consider the 'Guidance on the use of Habitats Regulations Assessment' and provide feedback to the Technical Panel (via email). Complete	EB

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Mammals Meeting #9	15 July 2021
Meeting Date	10/05/2021	
Place	Teleconference	
Participants	[REDACTED] - The Wildlife Trusts (TWT) [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Marine Management Organisation (MMO) [REDACTED] – MMO [REDACTED] – Cefas [REDACTED] – SMRU Consulting [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants	Our ref. HOW04/EP_Mammals_9
Absent	None	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Agenda

1. Hornsea Four Update
2. Programme to DCO Submission
3. Bottlenose Dolphin Management Unit and Assessments
4. Marine Mammal Cumulative Impact Assessment
5. Next Steps
6. Any Other Business

Project Update

DK provided an overview of all Hornsea Four site reductions to date. DK explained that the blue area presented on slide 4 was the array area currently showcased in all Environmental Statement (ES) documentation which has been previously reviewed by this technical panel. DK announced that there may be one more site reduction (i.e. DAA Part 3) made due to ornithology mitigation measures. DK stated that the months of May to August will be spent updating draft ES documents in preparation for the DCO application submission date which is now scheduled for September 17th 2021. DK noted that technical panel members were unlikely to receive further chapter and technical report drafts relating to this topic prior to the DCO application submission.

Bottlenose Dolphin Management Unit and Assessments

RS thanked attendees for comments on the Marine Mammal Chapter and Technical Report, noting that most comments were straight-forward, and updates will be made accordingly. RS wanted to discuss the recommendation of *assessing bottlenose dolphins as part of the Coastal East Scotland Management Unit (MU)*. RS proposed to utilise the abundance estimates published for the Greater North Sea MU within the Inter-Agency Marine Mammal Working Group (IAMMWG) 2021 report instead. However, both populations MUs could be included within the report if this is deemed more acceptable. It was noted that the bottlenose dolphin density

estimate approach is currently a qualitative assessment although the ambition is to create a quantitative assessment if more supporting evidence could be found.

OH stated that Natural England have not seen the IAMMWG 2021 report so they cannot agree to this approach yet, noting that this document is expected to be released by the JNCC very soon. Natural England are still reviewing the evidence.

TD raised the issue of the lack of published papers within the public domain but said there was data from volunteer surveys. TD stated Seawatch surveys have matched sightings of bottlenose dolphins from the east coast of England and the Moray Firth through photo-ID. TD suggested to explore this dataset as much as possible to create a more quantitative assessment for this project.

RS said Seawatch data from land-based sightings has been included in the baseline report. RS said she could incorporate this photo-ID data which has displayed connectivity with the East Scotland MU. RS stated the current limitations were the lack of effort related *in-situ* data and density estimates. RS asked if there were any other datasets the group were aware of that could be included in the density estimate analysis.

TD said she was not aware of anything other than the Seawatch citizen science data collection. TD appreciated where RS was coming from regarding data limitation and asked for this to be made clear within the Examination phase. TD asked to be kept up to date with progress and data collection. TD would also appreciate to be informed of RS's decision prior to the DCO submission and Examination.

RS agreed to incorporate the connectivity between east England and Scotland into the Chapter and HRA. RS suggested that she could try and establish density estimates from the IAMMWG population and will reach out to the Seawatch foundation to see if any further information is available.

TD asked if RS was aware of the Citizen Fins work with photo-ID. RS was aware. TD asked if this could be referenced within the documents. RS agreed.

RS will keep everyone up to date as to whether SMRUC are able to create a quantitative assessment rather than just qualitative for UXO as well.

Action: SMRUC to incorporate the East Scotland MU population into Chapter and HRA as well as provide updates on approach and likelihood of obtaining quantitative assessment.

Marine Mammal Cumulative Impact Assessment

RS proposed an approach for seismic surveys from BEIS (2020) which will assume an Effective Deterrent Radius (EDR) of 12 km and utilise average density of porpoise populations.

OH stated that from a Natural England perspective she agreed that this is the best approach available at the EIA level. OH requested the inclusion of the caveats for this approach and references utilised to be included within the technical report. LW stated the MMO did not have anything else to add to Natural England's comments.

TD requested time to think about this approach and stated the TWT would get in touch if they had any questions.

RS raised the concern from consultees that disturbance impacts may have been underestimated and will require updates to show the Maximum Design Scenario (MDS) of simultaneous piling at Hornsea Four. RS proposed two approaches: 1) to assess both single and concurrent piling events at each development and 2) to assess developments using 26 km EDR and values presented in the ES Chapter.

OH understood both approaches outlined and believed it would be useful to see the range of the level of impacts. OH said it might be worth looking at other projects to better ascertain a realistic scenario for Hornsea Four. OH stated that from a Natural England perspective she would advise to just use EDRs to base the assessment on but had no issues to include both approaches as it would provide an array of estimates to utilise.

RS stated there were limitations on what could be included from other projects due to limited information present within the public domain (i.e. legally bound information). RS suggested that they could potentially contact different developers in hopes of ascertaining more information relating to single or concurrent piling approaches and timeline updates to ensure Hornsea Four has assessed all piling activities to the best of its ability. OH said this approach seemed sensible. No comments were raised by TWT or the MMO.

RS stated comments were received relating to the lack of clarity in visual data representations (e.g. graphs and tables) within the CEA. RS presented a new table layout to allow the assessment and additive effects to be more easily followed for CIA. Within this illustrative table blue represented periods of pre-construction UXO clearance, orange presented periods considered for pile driving activities for individual OWF projects, and green presented the periods considered for seismic surveys. RS asked for feedback on the formatting of this table and overall data presentation. RS stated that the aim was to include a series of these types of table to cover various piling activities within the Impacts Chapter.

OH stated this table does provide clarity. OH asked what the assumption that UXO will happen in the quarter prior to the piling event was based on. RS replied that OWF projects to date conducted UXO clearance activities immediately prior to the commencement of piling operations. RS was unsure how far in advance of piling UXO clearance typically occurred, but highlighted that given recent experience that it was unlikely to have UXO detonation operating concurrently with piling activities. OH replied with the belief that projects were applying more in advance than a single quarter based on UXO licences. RS stated that any information the MMO could provide would be greatly appreciated.

Action: MMO to confirm information on timescales for UXO clearance activities or seek further information from developers.

RS noted that some OWF projects have quite a long offshore construction phase (e.g. Sofia is 3 years) however, piling activities are not expected to take place during this entire timeline. The majority of projects intend to pile within a year and not throughout the entire offshore construction window. RS stated that the current data analysis approach assumes piling activities could occur at any time. RS plans to discuss typical timelines for UXO clearance activities with other developers in hopes of being able to refine the current approach as much

as possible. OH agrees with RS regarding piling activities not occurring throughout the long offshore construction phase and the need to include new, up-to-date information wherever possible.

TD stated that UXO clearance could take place a year in advance to piling commencement and this activity could cross over multiple quarters. Therefore, it is important to consider uncertainties and slippages of timelines to ensure the approach covers all potential scenarios. TD said it would be useful to hear from other developers particularly Hornsea Two. TD indicated that the EIA approach outlined today could also be transferred across to the HRA and asked if similar tables could be incorporated within the HRA chapter.

RR concurred with comments raised by both Natural England and TWT. RR stated that UXO clearance takes more than just one quarter for instance, Hornsea Two extended their UXO license across the entire offshore construction period.

TD highlighted why it would be useful for OWF projects to include the UXO license within the DCO application. This information would help other projects incorporate data within the CEA and plans to raise this point again during Examination.

RR stated that from a MMO perspective it would be prefer the UXO license to be issued separately. However, EA1N and EA2 have included it within their DCO application so it will be up to the SoS to decide.

OH stated that the Natural England do not consider piling to be a short-term impact. However, given the justifications presented by RS in the xls comments log the Natural England would be happy for Hornsea Four to assess it as a short-term impact.

Next Steps

RS confirmed that the bottlenose dolphin MU and CIA assessment approaches have been agreed and the documents and assessments will be updated accordingly. Subacoustech will complete a revised underwater noise modelling for the north-west location. SMRUC will update the baseline and impact assessment.

No comments were raised.

AOB

TD stated that the current In-Principle Monitoring Plan was not fit for purpose especially in terms of harbour porpoise. LK replied that she is currently going through the IPMP and this will need to be discussed separately once all other topics have been updated using the issued feedback.

DK noted the next meeting might focus more on monitoring and HRA. Statement of Common Ground meetings will be run in parallel to this. DK stated that the door was always open and to please get in touch if anything comes up after this meeting.

RR asked to see update chapters as soon as they become available prior to DCO submission so that the MMO can commence their Section 36 responses. RR asked if the potential changes to the array boundary will likely be to the NW. DK confirmed this and hoped to know Ørsted's final decision within the next week.

DK thanked everyone for their time and input over the last few months / years on this topic.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Incorporate both the east of England and Moray Firth BND populations into the Chapter and HRA.	SMRUC
Provide updates on approach and likelihood of obtaining a quantitative assessment.	SMRUC
Confirm information on timescales for UXO clearance activities or seek further information from developers	MMO

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Offshore & Intertidal Ornithology Technical Panel Meeting 1 - Pre-scoping	13 September 2018
Meeting Date	13 September 2018	
Place	Ørsted Office (Room 05.17), Howick Place, London.	
Participants	[REDACTED] – Ørsted [REDACTED] – APEM Ltd [REDACTED] – APEM Ltd [REDACTED] – RPSB [REDACTED] - RSPB [REDACTED] – Natural England (NE) [REDACTED] – NE [REDACTED] – NE	Our ref. Hornsea Four EP Ornithology TP Meeting #1
Absent	N/A	
Copy	[REDACTED]	
Next meeting	TBC (November 2018)	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim:

Initial meeting to discuss the approach to the scoping report, the methods and scope of data collection and surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by providing a detailed

overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

Introduction to Hornsea Four

JC presented an overview of Hornsea Four, the consenting programme, route planning and site selection, proportionate EIA and tools used i.e. commitments register and impacts/effects register. He explained that the application would be based on a set of technical parameters for the array and sought to move away from setting a power capacity in MW.

JC explained that the PEIR was likely to be submitted in mid-2019.

JC presented that Hornsea Four has committed to avoiding the Inshore and Offshore Holderness MCZ and this was the key driver for cable routing.

EB noted that whilst the Holderness MCZ was avoided by the ECC, NE was keen to understand whether or not the implications for other sites (e.g. Flamborough & Filey Coast (FFC) pSPA and the Greater Wash SPA) had been considered or if avoiding Holderness Inshore was the main driver.

EB requested that additional clarification be added to the impacts and effects register to make it clear that the “likely significance of effect” is not the same as the legal term “likely significant effects” used in HRA assessments, and that this proportionate approach (and associated tools) are for the EIA and not applicable to the HRA. JC confirmed. EB suggested either using different terms within the EIA and HRA, or ensuring that the definition of “Likely Significant Effects” is the same across both assessments.

Action – JC to ensure that all future reference in EIA documents includes the more specific phrase “the likely significant effects (applicable to the 2017 EIA Regulations)”. JC to circulate a copy of Ørsted’s Proportionate Approach Position Paper.

Offshore & intertidal Ornithology Evidence Plan Position Paper

SS presented the Offshore & Intertidal Ornithology Evidence Plan Position Paper as the basis of discussion for the first meeting, with summary slides.

SS presented broad methodology to consider colonies and designated sites for seabirds recorded within the Array Area. Mean max foraging ranges from Thaxter *et al* (2012) would form the core for this when considering seabird species during the breeding season. Additional recent tracking studies would be sought where appropriate, including (but not limited to) the most recent tracking data from birds tagged at the FFC pSPA.

MK and AJ requested that the latest tracking studies and data be used in order to provide for the most robust assessment of connectivity of seabirds from colonies to the Array Area during the breeding season.

Action – JC to provide APEM with latest RSPB tracking data from FFC pSPA once available (2017 report is finished and available; 2018 in draft).

MK raised a query with respect to how non-breeding species and seasons (for seabirds and non-seabirds) would be considered.

SS explained that standard methods to consider species recorded outside of the breeding season would be taken. Methods used in Hornsea P3 and Norfolk Vanguard would form the basis of that put forward for Hornsea Four. Additional explanation was provided with reference to the Impact / Effects Register in order to explain why migrant non-seabirds would be scoped out of assessment. This proposal was based upon previous Hornsea projects predicting negligible mortality rates alone or in-combination when assessed against regional, national or wider BDMPS populations.

MK requested that further data be provided on migrant non-seabird assessments before agreement could be reached on scoping out of future assessment.

[Note: this issue was further discussed under “Potential Operational Impacts”]

Action – SS to provide details of previous migrant non-seabird impact assessments from all three Hornsea OWF environmental statements.

SS provided information on the data sources proposed to characterise the intertidal area for assessment purposes. Details of surveys from previous projects undertaken within the proposed landfall area and along the Holderness Coast and from the BTO’s national survey programmes were listed. These data sources are deemed to provide sufficient data to characterise the baseline without requiring further field surveys.

RB explained that non-seabirds within the intertidal habitat within the cable landfall area are not connected directly with any designated sites, as they are too distant from them. The nearest designated site for waders and wildfowl within intertidal areas is the Humber Estuary SPA, with evidence from studies related to that SPA showing that waders and wildfowl feeding and roosting locations do not include the proposed cable landfall area. In addition the non-breeding interest features of that SPA are associated with estuarine muds whereas the Holderness coast is sand, supporting a small number of a different range of species.

SS presented a slide of the aerial digital video surveys undertaken by HiDef for Hornsea Four covering the Array Area and a 4 km buffer surrounding. An explanation was provided as to the transect line spacing (2.5 km), coverage (10%), period of surveys completed over (24 months between Apr 16 and Mar 18), which follow previously agreed survey methods for other UK OWFs using this technology. SS put forward the proposal that these surveys provide sufficient data to characterise the baseline offshore ornithology for upcoming impact assessments.

MK agreed that 24 months was standard and was pleased that the project had this ahead of Scoping. However, MK asked if 20% coverage was collected and if so why had all not been analysed for use in upcoming baseline characterisation. MK also queried the data collected, with reference to Hornsea P3, requesting further detail as to the level of precision achieved.

JC and SS provided clarity that the survey provider collected 20% coverage, but standard practice is to assess 10%, as the additional coverage is collected as a back up in case of systems failure.

SS asked what level of precision is considered the standard requirement for data from such sources. MK replied that typically NE would wish to see data achieve a level of precision such that the coefficient of variation of the population estimate is less than 16%. Such precision in the population estimate allows, should there be future post-consent surveys, the detection a halving or doubling of numbers between surveys with a power of 0.8 or higher. NE had made representations over precision of population estimates in its inputs to the examination of Hornsea Project 3.

MK requested that Ørsted present all population estimates with information on precision to allow NE to judge what reliance can be placed on the population estimate.

Action – Ørsted to present information on precision of density and abundance estimates generated from the analysis of the baseline survey data.

JC and SS provided an overview of the maximum design scenario that offshore and intertidal ornithology assessments would be based upon. This included those which would provide for the focus of assessments such as a construction of up to 180 WTGs with a maximum rotor diameter of 305 m. Key commitments for embedded mitigation include for a limited number of foundations and / or WTGs being constructed simultaneously, MCZs to be avoided along the offshore ECC and a raised minimum air draft of WTGs to 35 m (instead of standard 22 m). MK requested that detail of all the parameters required for CRM was included in the relevant report. SS confirmed that such information would be in the CRM documentation.

SS then ran through the Impact Effects Register and how the project intended to apply the proportionate approach to the EIA. This included providing an overview of topics that would be scoped out where deemed negligible at an EIA level.

SS explained that standard BDMPs populations from Furness (2015) would be used to assess against during the non-breeding seasons. Data from a variety of sources would be sought for assessing against during the breeding season depending on the level (regional, national, international). MK and AM agreed in principle to this approach.

SS explained that at this stage the use of Furness (2015) would be used as the starting point for compiling different biological seasons. On completion of the analysis of the 24 months of site-specific data it is possible that there may be amendments to the seasonal definitions used in the assessment for individual species, colonies or populations in order to provide a more evidence led approach to individual species-specific bio-seasons. MK and AM agreed in principle to this approach.

Potential Construction Impacts – SS provided an explanation of why indirect impacts would be scoped out if marine and fish ecology chapters provide evidence of no significant impacts. Simple assessments would be provided for impacts with expected

magnitude of low and negligible such as disturbance and displacement associated with the foundation and WTG construction activities, the laying of the export cable and any trenching through the intertidal zone.

MK and EB requested that they wish to see a clear evidence trail in order to rule out the requirement to provide details on any such potential impacts from the ES Chapter.

Potential Operational Impacts – SS again emphasised the preference to scope out indirect impacts from further assessment if marine and fish ecology chapters provide evidence of no significant impacts. SS also described reasons for wishing to scope out disturbance and displacement associated with any ad-hoc maintenance of the export cable in the offshore or intertidal zones due to being limited temporally and spatially so as to not pose any risk to birds.

SS and RB provided an explanation as to why simple assessment only would be provided for collision risk to non-seabird migrants and barrier effects associated with seabirds. The former due to previous Hornsea projects providing evidence that both alone and in combination with each other the level of effect from such potential impacts is deemed negligible. The barrier effect is widely acknowledged to be incorporated into the assessment of disturbance and displacement due to uncertainty on estimating any level of effect associated with a barrier.

JD said that the RSPB had expressed concern about the qualitative statements on non-seabird migrants provided for Hornsea Project 3 and sought a quantitative approach. SS suggested an example approach, providing quantitative information on 2-3 species from previous Hornsea OWF development applications.

MK and EB requested that they wish to see a clear evidence trail in order to rule out the requirement to provide details on any such potential impacts from the ES Chapter. MK was also concerned that if a potential effect was scoped out then it may be missed off the list of matters that would be addressed by binding requirements in the DCO e.g. controlling pollution risk during construction and maintenance. JC responded that such matters would be noted in the effects register and they would be recorded as a commitment that feeds in to the DCO.

SS raised a number of topics with respect to collision risk modelling (CRM), which are bulleted below to provide a clearer record of discussion points;

- SS asked if the Marine Scotland Science R-implementation of the Band Model with stochastic outputs (MSS, 2018) had been tested and is it the preferred method for future assessments. MK, who had been a steering group member for the MSS project, said that the functioning of the MSS programme could not be guaranteed and suggested that the standard MSEXcel implementation of the Band (2012) model should be run with variations in input parameters and if the developer wished to run CRM using MSS (2018) the results of this could be presented alongside the outputs from the Band (2012) MS Excel implementation. That way the stochastic CRM outputs could be cross-checked against standard methods;

- SS stated that the intention was to use the latest peer reviewed paper on avoidance rates in the CRM from Cook *et al* (2018). MK and AM suggested that this would not be acceptable, as SNCB guidance had not changed since the UK SNCB response to Cook *et al*'s previous paper in 2014 (UK SNCBs, 2014).
- SS stated that the intention was to use the latest peer reviewed levels for nocturnal activity in the CRM from Furness (2018) for gannet (and potentially for kittiwake subject to a further paper being issued). MK and AM suggested that this would not be acceptable on its own and variation of multiple parameters would be more acceptable. MK suggested reference to Hornsea P3 and Norfolk Vanguard (pending) relevant representations from NE in order to see their formal advice on this topic.
- SS put forward proposed cumulative (and in-combination) assessment methods to include an update to the TCE spreadsheet to work out overall numbers for collision mortality. MK did not agree that this spreadsheet should be used and said that NE do not agree with the ratios, assumptions and outputs from this or the associated report from MacArthur Green (TCE, 2017).

SS raised a number of topics with respect to disturbance and displacement, which are bulleted below to provide a clearer record of discussion points;

- Similar levels of displacement for gannet, guillemot, puffin and razorbill would be used in the initial assessments. MK and AM agreed in principle to using the same starting point for initial assessments of displacement.
- SS described a new method for calculating cumulative displacement totals for species assessed for displacement in UK waters. This is based on amending data for individual OWFs to account for any changes in the footprint between planned / assessed and as-built. MK and AM agreed in principle to preparing data in this manner, if the original data source for OWF abundances is agreed upon and those projects included are legally not able to develop out into areas being removed. MK requested that further details of the methods would be required before agreement could be reached on this being a suitable approach.

SS and JC requested consideration of three potential solutions to engineer a viable project that would reduce risk to birds. These include;

- Do NE and RSPB consider that by raising the minimum aircraft higher than proposed it may be possible to reduce collision risk to within negligible levels for all species?;
- Do NE and RSPB consider that by reducing the scale of the project spatially a site can be located within an area that reduces the risk of displacement to within negligible levels for auks?; and
- Do NE and RSPB consider that reducing the number of Wind Turbine Generators (WTGs) from the maximum can further aid the reduction of risk from both collision and displacement to within negligible levels for all species?

JD considered that these proposals were welcome from RSPB's perspective and that it may be possible to engineer a project following consideration of the best available evidence. RSPB and NE's view was that they still have concerns about this project alone and especially in combination with previous Hornsea projects. In summary, MK and AM

explained that their concerns about Hornsea Four were that it was closer to the FFC pSPA than other Hornsea projects and that it was adding to the Hornsea Project 3. The in combination impacts on kittiwake and gannet are getting to a level that is possibly becoming significant and this is a main concern.

MK suggested that it would help discussion if the detail of the survey data used in the baseline were provided early in the process i.e. at scoping since it has already been collected; that it is provided as data and not as a pdf document; and that a senior engineer be available at meetings to answer questions about parameters and 'what if' changes to them.

The HRA screening report will be available for comment 8th October.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting 2	25 January 2019
Meeting Date	17/12/2018	
Place	Teleconference	
Participants	<p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – RSPB</p> <p>██████████ – APEM</p> <p>██████████ - APEM</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p>	Our ref. HOW04/EP_TPOrnith_2
Absent	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p>	
Copy		
Next meeting	Not planned	

Agenda

1. Welcome and safety brief
2. Introductions
3. Aims and Objectives of Meeting
4. Hornsea Four Update
5. Review of Actions of Previous Meeting
6. Scoping Review
7. Next Steps
8. AOB

Introductions

Introductions were made for those who had not met previously.

JD queried the reasons why Natural England weren't present at the meeting. EA explained that Natural England are particularly resource-constrained at the moment, with several projects going through the Examination process and due to the time of year. EA noted that Natural England are keen to engage in the New Year in relation to Hornsea Four so they are likely to attend the next meeting.

Aims and Objectives

EA stated that the principal objective of this second Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel meeting was to provide an update on Hornsea Four development activities, review responses received during both the Scoping process and the HRA Screening Report consultation, and discuss the next steps in relation to seeking agreement with key stakeholders on the data and information to be included in both the Preliminary Environmental Information Report and the Environmental Statement for Hornsea Four.

SS noted that the RSPB submitted a response to the HRA Screening Report but did not submit a response to PINS on the Scoping Report and suggested that discussion could revolve around the Natural England's response to the Scoping Report including the in the Scoping Opinion. JD stated that they hadn't read any of the Scoping Opinion, including the Natural England response. SS recognised that RSPB had not read the Scoping Opinion and that the meeting would be structured around the key points of the Natural England scoping response as well as the RSPB's HRA Screening response.

Hornsea Four Update

EA noted that the Hornsea Four Scoping Report was submitted to the Secretary of State on 15 October 2018. This was a 782-page report which adopted a front-loaded, proportionate EIA approach. The associated 182-page Scoping Opinion was adopted by the Secretary of State on 23 November 2018.

EA noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, offshore Export Cable Corridor (ECC), landfall, onshore ECC and onshore substation location refined and an internal design freeze set for 14 December. In relation to the preparation of the Preliminary Environmental Information Report (PEIR), the project parameters are being finalised, baseline data collection is underway, and the Scoping opinion has been evaluated.

Review of Actions from Previous Meeting

Action: EB requested that additional clarification be added to the impacts and effects register to make it clear that the 'likely significance of effect' is not the same as the term 'likely significant effects' used in HRA assessments. **Complete.** JC confirmed that the change of wording would be applied throughout in order to reduce any confusion.

Action: Natural England (and not RSPB) agreed that detailed feedback would only be provided on the Scoping Report and not the Position Paper. **Complete.** SS noted that the Natural England's comments on the Scoping Report were received on 13th November 2018.

Action: MK & AJ requested the latest tracking studies be used to provide most robust assessment of connectivity of seabirds to the Array Area in breeding season. JC confirmed that APEM would be provided with the latest RSPB tracking data / report from FFC SPA once available. **Complete.** RSPB provided report (Seabird tracking at the Flamborough & Filey Coast: Assessing the impacts of offshore wind turbines) and associated data to Ørsted.

AM gave an overview of the results from the tracking study, noting that 2018 data has not yet been analysed. In relation to the 2017 study, tracking was undertaken using novel tags with accelerometer and altimeter to get fine scale behavioural movements of birds. Remote

downloading of data meant it wasn't required to recapture birds and retrieve tags and tags stay on for approximately 22 days. AM noted that the breeding year in 2017 was fairly poor because of weather with an unusually high rate of nest failure unrelated to tagging. The birds with the greatest foraging trips were successful breeders – this situation gave researchers the chance to study unsuccessful birds and their behaviour.

AM highlighted that the study considers, at a fine scale, three-dimensional behaviour of birds which helps the understanding of vulnerability to collision risk, and also allows for the collection of good flight height data. AM stated that he was unsure when the initial 2018 report would be available to Ørsted (as funders) but this could be early Spring.

SS queried if there were any plans to provide an update to the Thaxter paper as a result of this study. AM stated that the Crown Estate are looking into this and considering whether to commission something. AM noted that the RSPB have data that could update the Thaxter paper but their main focus has been writing up the Wakefield paper (for four species). AM agreed that there is a real need for Thaxter to be revisited with all the new data, noting that other data is available from BTO (large gulls) and Dr Keith Hamer (gannets), though these studies provide further evidence relating to importance of recognising colony-specific behaviour.

AM highlighted that the key lesson from tracking data was the importance of colony specific data, looking at variability in foraging ranges from across colonies. AM provided a brief overview of the latest tracking studies that include mostly kittiwake, but also small numbers of gannet. The most recent tags attached to birds stay on for a considerably longer period than previous version (up to 29 days), with data that can be remotely downloaded via a novel new system. It is hoped that the latest tags attached in 2018 (data pending analysis with report potentially drafted by spring 2019) to kittiwake and gannet may provide additional data on flight altitude.

Action: MK requested further data on migrant non-seabird assessments before agreement could be reached on scoping out of EIA. **Ongoing.** SS agreed to provide previous impact assessments from Hornsea 1, 2 and 3 ES Chapters. To be discussed at next evidence plan meeting (when Natural England present).

Action: MK agreed 24 months of data collection was standard / accepted coverage. MK requested additional 10% of survey data could be analysed. MK also queried if the survey data reached the level of precision Natural England would typically wish to see data achieve - a level of precision such that the coefficient of variation of the pop estimate is less than 16% (0.16). **Ongoing.** SS confirmed that this action is currently being undertaken by survey provider and precision detail will be shared with Natural England and the RSPB.

Action: MK requested all future abundance estimates be presented with information on level of precision. **Ongoing.** SS confirmed that this will be provided in the baseline technical report at PEIR.

Other issues raised at previous meeting

Use of Furness (2015) as source for BDMPs populations/bio-seasons & additional evidence from site-specific data - SS asked the RSPB if they have any information about the phenology of nesting birds at Bempton/Flamborough. AM stated that they have details on when they turn

up at breeding sites, first laying dates etc which is similar to what was described in Furness (2015).

Action: JD to provide summary from site to Ørsted. **Complete.**

Simple assessment for intertidal birds. Natural England had requested clear evidence trail for this in order to rule out requirement for ES - SS confirmed more detailed assessment for sanderling, noting no requirement for other species for more detailed assessment

SS requested RSPB's opinion on the new Marine Scotland R-implemented CRM model, noting that Natural England suggested this would be the preferred option for CRM. SS highlighted that it is not clear if any projects have tested it, run it, and submitted it. AM confirmed that the RSPB have high confidence on the new model (through their involvement in the compilation and review process of the new model) which has been subject to more testing than the original Band model, noting that Natural England's current position is presenting both the new model and the older Band model. AM agreed with this approach. SS noted the resource constraint in using the Band models as well as the Marine Scotland model.

Scoping Review

SS presented a summary of key ornithological points detailed within the Hornsea Four Scoping Report:

- Multiple data sources for offshore birds including 24 months site-specific data for Array Area & 4 km buffer, which suggests key species; fulmar, gannet, kittiwake, great black-backed gull, guillemot, razorbill & puffin;
- Initial findings suggest higher concentrations of key species in south of Array Area & buffer;
- Multiple data sources for intertidal suggest low overall abundances. Very few species of interest other than sanderling;
- Initial findings suggest only sanderling found in greater numbers on coast with cable landfall. Very mobile species but very unlikely to be a significant effect;
- Key sites for consideration at EIA and HRA level include Flamborough & Filey SPA (recently designated), Hornsea Mere SSSI & SPA and the Greater Wash SPA;
- Following the proportionate approach that Hornsea Four are following, potential impacts scoped out include indirect impacts and disturbance/displacement during operation and maintenance within the intertidal and offshore ECC areas;
- Potential impacts to be assessed in PEIR include disturbance/displacement during construction & operational phases and collision risk;

SS provided a summary of the key issues raised by Natural England in their response to the Scoping Report:

- *Assessment of impacts of proposal on FFC SPA and the species associated with that site are of highest priority.*
 - RSPB agreed.
- *Request to consider migrant seabirds (including little gull) and waterbirds in greater depth.*
 - SS proposed simple assessment of migrant seabirds. AM stated that the RSPB would have to check back at the proposals but would defer to Natural England on this.
- *Request further analysis of sanderling data in relation to potential impacts from cable landfall.*

- SS proposed that a more detailed analysis would be conducted for sanderling, but not any other intertidal species and the Hornsea Four team were hoping to speak to Natural England about this. JD noted that he was inclined to agree but would have to check with a colleague and will confirm.
- **Action:** JD to confirm that RSPB happy for intertidal section to consider sanderling alone.
- **Post meeting note:** JD confirmed that RSPB happy for intertidal section to consider sanderling alone.
- *Data collection: precision on site-specific digital aerial survey (DAS) data and reference to Hornsea 3 Relevant and Written Representations on methods of data collection;*
 - JC noted that the issues raised by Natural England in relation to HOW03 are not entirely applicable to HOW04, with Hornsea Four having 24 months of data compared to Hornsea Three's 20 months of data. JC highlighted that the current advice is a minimum of 24 months which Hornsea Four has followed.
 - AM agreed that 24 months of data is sufficient, with the data of good quality and suitable for assessment. JC highlighted that RSPB noted that they weren't party to methodology for data collection for HOW03 but stated that it followed the protocol for HOW03 that was agreed through the Evidence Plan process for HOW03. AM stated that if the survey has been carried out in the same way as for Hornsea Three then there shouldn't be an issue.
 - **Action:** Hornsea Four to provide a DAS aerial survey methodology note.
 - AM stated that DAS coverage only outstanding RSPB issue with data (10% vs 20% coverage), noting that this was a prominent issue for Hornsea Three as they didn't have the full 24 months of data and that Natural England and the RSPB felt that getting the additional data from the further 2 cameras would provide contextual information that would overcome the discomfort with the lack of the full 24 months data. AM noted that the situation is different for Hornsea Four.
 - AM stated that the 20% coverage is more of a 'nice to have' but noted that the RSPB understand implications in terms of costs and timescales. JC agreed on the substantial financial implications for the project and noted that the analysis of this extra data does not seem to be in line with the Hornsea Four proportionate approach unless it could be demonstrated that the additional analysis would change the outcome of the assessment. JC highlighted that Hornsea Four would much rather spend money on something that could better inform the knowledge base. AM agreed that it is likely that this money could be better spent elsewhere.
 - JC noted that Hornsea Four want to be confident that we have the level of precision that is sufficient for us to do a robust assessment. Precision analyses and MRSea density modelling is being undertaken and will be peer reviewed and shared with the technical panel.
 - JD suggested that the project could do the hotspot analysis and then analyse those hotspots with the extra data. JC noted that as discussed with RSPB previously, the project is undertaking work on the developable area and is considering committing to not put turbines in some of those hotspot areas.
 - JD confirmed that if the project is confident in the 10% coverage then RSPB are happy.
- *Reiteration of evidence to support dropping indirect impacts being assessed in PEIR;*
 - SS noted that in the Scoping Report it was stated that if no significant impacts were predicted on benthic or fish populations, then there would be no possible indirect

impacts on ornithology receptors, highlighting that this was part of the proportionate approach which only considered 'likely significant effects' from an EIA perspective. JD stated that he agreed with this proportionate approach but that an audit trail is required, suggesting the briefest possible statement or signposting required. JC noted that the Impacts Register would provide this audit trail and JD confirmed that this would be acceptable.

- *Consideration of red-throated diver in Greater Wash SPA with respect to ECC corridor.*
 - SS highlighted that no offshore wind farms have predicted significant impacts on diver populations. JD noted that the concern is in relation to surface traffic passing through the SPA as part of the ongoing maintenance work. JC confirmed that operations and maintenance activity will consider vessels from Hull as a worst case.

- *Use of appropriate nocturnal activity and avoidance rates post-ORJIP evidence to be reviewed.*
 - SS confirmed that Natural England have recently come out in support of ORJIP evidence. AM noted that the RSPB weren't aware that Natural England had put out new advice about avoidance rates. SS confirmed that this had been discussed in relation to another project so there is nothing in the public domain. AM noted that the RSPB haven't changed their position on avoidance rates as they are waiting for SNCB's responses.
 - AM confirmed that the BTO report would be published soon which outlines how important site-specific information is, particularly flight speed and flight height.
 - In relation to nocturnal activity, AM noted that the gannet paper has been published and peer reviewed and highlights there is a differential spread of activity throughout the day. AM noted that this highlight concerns if surveys are only carried out at one phase of the day. AM noted that in relation to gannet, the RSPB accept use of nocturnal activity as defined in the Furness paper, but would want to see it in the context of provision of details of timings of surveys. AM stated that the scores in the Furness paper can be used directly in new stochastic model as the paper provides confidence intervals around those estimates for use, noting that the Band model can't handle a range as Natural England as requesting.
 - SS stated that the project would seek to engage further with both Natural England and RSPB ahead of any CRM so as to consider which are the most appropriate parameters to use in the modelling.

HRA Screening

JD noted that in relation to the HRA Screening, the RSPB are looking to be constructive and engage so if Hornsea Four have any queries on their comments then RSPB can clarify.

Next Steps

SS and JC noted that the RSPB should feel free to contact Ørsted if they any queries or comments upon reading the Scoping Report and associated Scoping Opinion.

AOB

None

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting 3	06 June 2019
Meeting Date	10/04/2019	
Place	Ørsted, 5 Howick Place, Westminster, London SW1P 1WG	
Participants	<p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – RSPB (by phone)</p> <p>██████████ – GoBe Consultants (by phone)</p>	Our ref. HOW04/EP_TPOrnith_3
Absent	None	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Introductions

Introductions were made for those who had not met previously.

Aims and Objectives

EA stated that the principal objectives of this third Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel meeting were to provide;

- An update on Hornsea Four development activities;
- Discuss the proportionate approach that is being implemented by Hornsea Four;
- Review responses received through the Scoping Opinion and the HRA Screening Report consultation;
- Discuss the next steps in relation to seeking agreement with key stakeholders on the source of data and / or information sources to define the baseline characterisation of offshore and intertidal ornithology;
- Agree the most appropriate methods for estimating potential impacts and how these are defined for use in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES) for Hornsea Four.

Hornsea Four Update

EA noted that the Hornsea Four Scoping Report was submitted to the Secretary of State (SoS) on 15 October 2018. The associated Scoping Opinion was adopted by the SoS on 23

November 2018. EA stated that PEIR submission will be in Q3 2019 (July/August) with the submission of the final ES currently forecast to be in Q1/Q2 2020.

EA noted that since the submission of the Scoping Report, further route planning and site selection work has taken place, with appraisals and refinement undertaken for the offshore Export Cable Corridor (ECC) (reduced from 3000m to 1500m width), landfall (with northern area of scoping boundary the most likely location), onshore ECC, onshore substation locations and an overall refinement of the developable area (of the array area). In relation to the preparation of the PEIR, the project parameters were finalised in Q1 2019, baseline data analysis is underway, the Scoping Opinion evaluated, the drafting of technical baseline reports commenced and PEIR methods being prepared ahead of the impacts being calculated and assessed.

Proportionate Approach

LK noted that Natural England had attended a meeting earlier in the day (10th April 2019), hosted by Ørsted, in relation to Hornsea Four's proportionate approach and that a date is to be arranged with the RSPB for a similar workshop. As such, only a brief overview of the proportionate approach was presented. LK stated that the proportionate approach is supported by five approaches:

1. The Impacts and Effects Register, which will be updated as Hornsea Four progress through PEIR to final ES;
2. The Commitments Register, which has been updated with commitments suggested by the public;
3. The Evidence Plan process;
4. Innovative presentation of data; and
5. Directed questions.

RH mentioned that if any specialists within Natural England or RSPB would like Ørsted to come and discuss the proportionate approach then that could be easily arranged, even after PEIR submission.

Action: Ørsted to arrange Proportionate Approach Workshop with RSPB.

Review of previous meeting

SS gave an overview of the previous meeting (17 December 2018) to attendees, as Natural England were not able to attend. Discussions focussed on a review of the Scoping Opinion submitted by NE and the RSPB's comments on the HRA Screening Report. SS noted that at the last meeting, AM gave an overview of the tracking data from 2018 and separately on the 2017 tracking data report, of which the data from the 2017 programme was influenced by a poor breeding success rate at the colony. AM confirmed that the 2018 report is due for submission to Ørsted by late April / early May. AM also noted that despite the 2017 breeding failures at the colony in 2017 the furthest foraging range of 324km was attributed to a successful breeding kittiwake. RH noted that Ørsted had requested the data from RSPB.

Review of Actions from Previous Meeting

Action: APEM to provide data / references to previous migrant seabird and non-seabird assessments from Hornsea projects for discussion at next Evidence Plan Meeting: **Ongoing:** Consideration will be given to whether these species will be assessed (simple assessment / proportionate approach) within PEIR assessment or in the final ES.

Action: APEM to provide Natural England with DAS Methodology Note; **Complete:** Hi-Def provided a note which has been submitted to Natural England and the RSPB.

Action: Request for abundance estimates to be presented with associated precision in baseline technical report: **Ongoing:** SS confirmed that the baseline technical report is currently in preparation and will contain precision for data within the appendices, which will be provided to all Technical Panel members.

Action: For intertidal ornithology detailed assessment require for Sanderling only, but additional data to be provided for other intertidal bird species before agreement to scope out: **Ongoing:** SS noted that the landfall zone is now markedly smaller than what was presented within the Scoping Report and that Sanderling were the only species recorded in reasonable numbers (of national importance). SS noted that Hornsea Four construction activities in the intertidal area would cover a period of up to two winter seasons.

AB queried whether the baseline technical report will be submitted as part of PEIR. SS confirmed it would be an annex to the PEIR. RH noted that Ørsted will make available the list of all documents that will be available at PEIR. This will be issued at the same time as confirming PEIR submission date. The register will also state which additional documents will be produced for final ES.

Action: Ørsted to provide Technical Panel members with list of documents that will be submitted as part of the PEIR.

Scoping Review

MK gave an overview of Natural England's comments on the Scoping Report:

- MK confirmed that 24 months of data is acceptable and advised that information from tracking and sensitivity analysis could also be used to provide longer-term characterisation of the site.
- MK noted that the Scoping Report did not consider potential impacts during migratory periods as a whole (seabirds and non-breeding water birds).
- MK noted that Sanderling is the only intertidal bird found in nationally important numbers. MK confirmed that Natural England is content that all other intertidal birds can be scoped out of the assessment. MK stated that it would be useful to utilise data from the British trust for Ornithology's (BTO) Wetland Bird Survey (WeBS).
- MK noted that Ørsted will provide a paper on precision to Natural England for further comment. MK noted that this was an area that was never resolved to satisfaction for Hornsea Three.
- MK highlighted that indirect impacts have been proposed to be scoped out based on assessments that have not yet been undertaken. MK requested that these issues could be scoped out at a later date once the other assessments have been made. EB stated that a process has to be followed whereby a narrative is given on why impacts on prey species are relevant to ornithology receptors. EB provided an example of linking the assessments from other chapters back to ornithology to strengthen the conclusion and provide clear explanation of why it is scoped out. SS noted that no significant indirect impacts have been identified for any offshore wind farms in the UK to date and based on this and expert judgement it was deemed that indirect impacts would not be significant. SS stated that consideration would be given to indirect effects within the Impacts & Effects Register and

should any other chapters highlight significant impacts that are connected indirectly to bird species then further consideration would be given to incorporating these into the PEIR.

- MK noted that a simple displacement assessment is not appropriate. SS noted that the simple assessment of displacement is in relation to potential construction impacts (not operational), which are limited both temporally and spatially. The assessment of operational displacement would be more detailed.
- MK suggested that reference should be made to the OSPAR lighting guidelines. EB noted that mitigation is often presented which are generally health and safety and construction plans rather than environmental. SS confirmed that consideration would be given to this, but that to date no offshore wind farm had concluded significant potential impacts for this and it would likely be a simple assessment (or potentially scoped out) at PEIR.
- MK noted that consideration should be given to inter-related effects such as marine processes impacts on the Flamborough Front and ornithological receptors.
- MK stated that the Furness report should be used to define breeding seasons unless there is clear evidence from surveys. SS confirmed that the assessments for collision risk and displacement would be based on the Furness bio-seasons (including those defined as return migration, migration-free breeding, post-breeding migration and non-migratory wintering bio-seasons) with additional evidence from site-specific surveys and wider bio-season to be considered where appropriate. AB noted that the conservation advice for Flamborough and Filey Coast has been published (in draft form) which includes seasonality for key seabirds.
- MK noted that it would be their preference for little gull to be considered further. SS noted that there is very limited information on little gull, due to being recorded on a limited number of occasions within migratory bio-seasons only, but they would be considered for assessment in either the PEIR and / or the ES. MK noted that previous Hornsea projects (P1-3) assessed little gull using estimated / modelled / apportioned migratory abundances through the migratory CRM to estimate potential collision risk, which may be appropriate for Hornsea Four.
- MK noted that Natural England were pleased to see barrier effects scoped in. MK suggested that flightless adults with dependents are probably most impacted by this and recommended that Hornsea Four look at work completed by the Centre for Ecology and Hydrology (CEH) as a potential method. SS confirmed this would be reviewed for consideration at PEIR but may not be completed until the ES.
- MK noted that Natural England have a set of best practice measures in relation to red-throated diver disturbance from vessels transiting SPAs during the O&M phase. Regarding considering impacts from the ECC on red-throated diver, MK suggested looking at a range of data sources in relation to the Greater Wash SPA, though the most appropriate was agreed to be that within the SeaMast dataset (Bradbury, 2014) and for consideration of potential displacement out to 2 km surrounding the ECC laying vessels during the non-breeding bio-season. SS agreed that the SeaMast data as being the most appropriate for such an assessment and confirmed that displacement would be considered out to 2 km from the ECC laying vessel for the non-breeding bio-season for red-throated diver.
- MK noted that Natural England are asking Norfolk Vanguard to consider seasonal restrictions to address impacts on Greater Wash SPA red-throated diver from cable installation, so this may be the best way forward to avoid impacts. SS thanked Natural England for this information but suggested that due to likely low densities of divers within this region it would be unlikely that this would be required for this project but would reserve judgement until after any potential impacts have been estimated and assessed accordingly.

- With respect to Collision Risk Modelling (CRM) MK noted that discussions are ongoing in relation to nocturnal activity rates, but currently Natural England advocate the use of the nocturnal activity rates for gannet, kittiwake and large gulls based on a 1 to 5 scoring index for each species in Garthe and Hüppop (2004) or King et al., (2009). SS confirmed that this more precautionary approach to CRM would be undertaken alongside scenarios considering other nocturnal activity rates from more recent evidence in the literature.
- With respect to Collision Risk Modelling (CRM) MK noted that currently Natural England advocate the use of the avoidance rates for gannet, kittiwake and large gulls based on the JNCC *et al.*, (2014) paper in response to Cook *et al.*, (2014), and that discussions regarding the recent Bowgen & Cook paper are ongoing amongst the SNCBs. SS confirmed that this more precautionary approach to CRM would be undertaken alongside scenarios considering other avoidance rates from more recent evidence in the literature.
- MK requested outputs from both the MSS stochastic model and deterministic Band CRM models be presented at PEIR.
- MK stated that any species-specific PVAs need to run for the entire duration of the proposed O&M phase of Hornsea Four in order to be valid.

In summary, MK noted that by the time Natural England is due to respond to the PEIR, Natural England should have resolved or at least provide guidance and /or responses to issues relating to all three projects currently nearing the end of their PINS application process (Hornsea Three, Thanet Extension and Norfolk Vanguard). SS confirmed that a 'lessons learned' workshop would be held with the Hornsea Three team prior to PEIR submission and that the team would follow the aforementioned three projects in order to inform the Hornsea Four PEIR, where possible.

Digital Aerial Survey Methodology (DAS) Note

SS noted that the DAS methodology note had been issued to consultees prior to the meeting. AB stated that the methodology was pretty standard but queried how birds with no ID have been apportioned. SS confirmed that the standard apportionment approach was being used, splitting unidentified birds by the proportion of identified species on a monthly, bio-season and / or annual basis as per standard practice agreed through consultation on other offshore wind farm projects. AB confirmed that this approach was acceptable if the methodology was clearly demonstrated in the baseline technical report. SS confirmed that the methods for apportioning would be provided at PEIR.

AB queried whether it had been considered to split the transect into smaller sections to increase the sample size. SS noted that this approach had been considered, but it would result in a loss of some of the coverage if done using a design-based approach to abundance estimates. AB noted that the samples wouldn't be independent, but there might be ways to account for that and this would increase the precision. AB requested that this is considered in the precision note. SS confirmed that this approach would be considered and recognised that the use of the Marine Scotland MRSea Power package uses this method, but that there are limitations relating to its applicability to data sets for species with lower abundances.

Action: SS to consult with APEM statisticians to see if it would be possible to increase the number of replicates.

AB asked if consultees would be provided with the survey reports for the surveys. EA confirmed that the reports would be issued with the precision note. SS highlighted that the baseline

technical report would present slightly different information to that within the Scoping Report and any survey reports, as a revised array area differs from the original survey area that was based on the Agreement for Lease (AfL) area.

AB noted that the section in the report on availability bias is not clear and requested to see additional details. SS confirmed that Hi-Def's derivation of correction factors is based on the work they have done on other projects and details would be provided with appropriate references in the baseline technical report.

Approach to PEIR Assessment

SS noted that the construction and decommissioning impact assessments would be proportionate as much as possible, and as agreed earlier in the meeting, the intertidal assessment would only consider Sanderling.

SS requested an open discussion about the methodology for the operational impact assessment:

- SS noted that there were not enough red-throated divers within the array area to undertake a displacement analysis, so this species would only be assessed for potential impacts during the construction phase of Hornsea Four as the ECC runs close to the Greater Wash SPA. The project team would also review Natural England's submissions in relation to displacement of divers within the ECC at Hornsea Three and Vanguard using SeaMast data (Bradbury, 2014).
- SS asked for confirmation of the seabirds set out for assessment of potential impacts from displacement within the array and an appropriate buffer in the Scoping Report, these being gannet (array and out to 2 km), guillemot (array and out to 1-2 km), razorbill (array and out to 1-2 km) and puffin (array and out to 1-2 km). MK confirmed that these species follow the SNCBs interim displacement guidance note and that these four species only would be expected to be assessed for potential displacement impacts during the operational phase of Hornsea Four.
Action: Natural England to check the list of birds within the displacement guidance note.
- SS asked if Natural England are aware of any additional papers on mortality rates. MK confirmed that Natural England were not aware of any new papers and referred to the JNCC red-throated diver works.
- AM noted that consultants working on Vanguard had encountered problems with the MSS stochastic model, but these have been resolved.
Action: AM to send a link to the website that details the glitches that have been resolved. Link here: <https://github.com/dmpstats/stochCRM/issues>
- AM highlighted that the interface allows for the presentation of both deterministic and stochastic model at the same time, and that RSPB would advise presenting both outputs. MK confirmed that this corresponds with the Natural England advice. MK advised to use the MSS "R" code, and not create our own, as this will minimise issues. The preference would be to run the CRM through the MSS 'ShinyApp' feature on the online platform. SS noted that Hornsea Four would use the Marine Scotland Science stochastic CRM model through the preferred use of the 'ShinyApp' online interface.
- MK confirmed that Natural England have not shifted from the use of the avoidance rates set out in the SNCB guidance. MK detailed that Natural England advocate the use of the avoidance rates for gannet, kittiwake and large gulls based on the JNCC et al., (2014) paper in response to Cook et al., (2014). SS confirmed that this more precautionary

approach to CRM would be undertaken alongside scenarios considering other avoidance rates from more recent evidence in the literature.

- SS asked attendees about the use of flight height distribution data in the CRM with respect to the 'extended' Band Model. MK stated that Natural England would take this away and consider.
- AM stated that the conclusions of the Cook *et al.* (2014) report and 2018 paper and the SNCB guidance were that there wasn't sufficient evidence to have an avoidance rate for kittiwake and gannet for use in extended model but it was good for large gulls. AM noted that the RSPB position is to follow SNCB guidance for 2014, and that Option 3 is not suitable for kittiwake and gannet.
- MK noted that more than one nocturnal activity factor should be used, using a range drawn from Garthe and Hüppop (2004) or King *et al.*, (2009). AM highlighted that it would be best to present a range and it would also be helpful to present the timing of surveys. SS confirmed that dates and timings of surveys would be presented in the baseline technical report.
- SS noted that there were very low densities of great black-backed gull and herring gulls, which may be so low as to not warrant running CRM for these species. SS also noted that migratory birds such as little gull would be considered in the CRM. MK queried the implications of no CRM for these species in Report to Inform Appropriate Assessment (RIAA), given herring gull is part of the Flamborough SPA seabird assemblage, noting that collision risk would be an impact but could not be considered if no CRM had been undertaken. SS stated that Hornsea Four would consider the potential risk all three of the aforementioned gull species and whether to undertake CRM for them or not if they are to be screened out of the RIAA.
- EB requested that a CRM was undertaken on these species to detail their contribution to the overarching CRM report, noting that it is important for cumulative and in-combination assessments.

Report to Inform Appropriate Assessment

SS noted that Hornsea Four had received a HRA screening response from the RSPB but had received no response from Natural England. EB confirmed that Natural England are currently reviewing the HRA Screening Report and will provide a response in due course.

Action: Natural England to provide a HRA Screening response.

EB noted that on initial review, the first few tables were clear, but it then wasn't clear how that list got narrowed down further. MK stated that in relation to gannet and kittiwake at the Flamborough and Filey Coast SPA, displacement and barrier effect should also be considered. AM noted that the seabird assemblage is a feature of the site so the RIAA would have to show the assemblage was not affected rather than just species alone.

EB highlighted that it is important to consider screening in the impacts alone and in-combination, noting that if there is an impact pathway then it should be screened in to the impact assessment.

SS asked if Natural England would be commenting on Scottish sites. EB noted that Marine Scotland Science (MSS) would have to comment on those. LK noted that the HRA Screening had been provided to MSS who had declined to comment. AM noted that RSPB have a remit in Scotland so would be looking at it from a Scottish perspective.

Net Gain

EA asked attendees about their experiences with Net Gain. RH noted that RSPB have provided an official statement on their thoughts on Net Gain. JD stated that is unlikely that Net Gain will become mandatory for Nationally Significant Infrastructure Projects (NSIPs) within the timescales for Hornsea Four in relation to offshore.

Action: JD to discuss offshore Net Gain with RSPB colleagues and report back in a formal response to the questions raised in the presentation.

MK noted that there hasn't been a lot of progress in relation to offshore Net Gain and there has been more of a focus on removing sources of negative impacts such as removing redundant infrastructure. MK stated that Natural England do not consider rock armouring as net gain and EB noted that there was limited evidence for this.

PEIR Submission and Distribution

EA noted that the Hornsea Four PEIR will be published in early Q3 2019 and will be available electronically. RH noted that USB sticks could be provided with all the documentation if required.

AOB

MK noted that there is a need to discuss apportioning at the next Evidence Plan Technical Panel meeting. EA noted that another Evidence Plan meeting would be scheduled prior to PEIR submission.

EB asked if a position paper could be provided in advance of the next meeting and meeting dates in the diary as soon as possible.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
1. Arrange Proportionate Approach Workshop with RSPB. Complete	Ørsted
2. Precision note and survey reports to be provided to Technical Panel members (to also consider increasing number of replicates). Complete	Ørsted
3. Technical Panel members to be provided with list of documents that will be submitted as part of the PEIR.	Ørsted
4. Natural England to confirm the list of birds Hornsea Four have identified as requiring assessment of potential operational impacts from displacement.	Natural England
5. Natural England to confirm the set of CRM parameters (nocturnal activity rates and avoidance rates) that they consider to be appropriate for assessment of potential impacts from collision.	Natural England
6. Send a link to the website that details the MSS CRM glitches that have been resolved. Complete	AM (RSPB)
7. Natural England to consider the use of flight height distribution data and what species may be appropriate for use in Band CRM Option 3.	Natural England
8. Natural England to provide an HRA Screening response. Complete	Natural England

Action	Responsible
9. RSPB to discuss offshore Net Gain with RSPB colleagues and report back in a formal response to the questions raised in the presentation.	JD (RSPB)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting 4	08 October 2019
Meeting Date	11/06/2019	
Place	Teleconference	
Participants	[REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Natural England [REDACTED] – Royal Society for the Protection of Birds (RSPB) [REDACTED] – RSPB [REDACTED] – APEM Ltd [REDACTED] – Ørsted [REDACTED] – GoBe Consultants [REDACTED] – GoBe Consultants	Our ref. HOW04/EP_TPOrnith_4
Absent	None	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Aims and Objectives

EA stated that the principal objectives of this fourth Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel meeting were to provide an update on Hornsea Four activities; to review actions from the previous meeting(s); to discuss the scope of PEIR / ES; and to discuss and agree on use of data and information to be included in both the PEIR / ES for Hornsea Four (specifically in relation to baseline characterisation, assessment methodology, and the Impacts Register).

Hornsea Four Update

EA noted that statutory consultation on the Hornsea Four PEIR will commence on Tuesday 13th August 2019 and will close on Saturday 23rd September 2019 – *please note that since this meeting the closure of our consultation period has now been extended until Monday 23rd September*. The project team are currently drafting chapters and preparing for submission of documents. EA noted that the DCO application will be made in early 2020.

EA noted that since the submission of the Scoping Report, further route planning and site selection work has taken place, with appraisals and refinement undertaken for the offshore Export Cable Corridor (ECC), landfall, onshore ECC, onshore substation locations and an overall refinement of the developable area (of the array area). EA noted that ornithology has been a key focus in the refinement of the array area with stakeholder feedback taken into consideration. EA stated that consultees should have all received an email on 11 June showing the confirmed PEIR boundary which has been the outcome of developable area workstream.

Review of previous meeting

SS gave an overview of the previous meeting (10th April 2019), noting the following agreements were minuted:

- 24 months of survey data was appropriate;
- Scope of intertidal assessment to focus on sanderling only; and
- Simple assessment of construction phase impacts.

SS noted that it was planned to seek agreement with stakeholders at this meeting regarding the topics outlined in the agenda, to get final positions from all stakeholders prior to PEIR submission.

SS noted that a stand-alone HRA Screening call was held on 16th May 2019 to discuss Natural England's comments on the HRA Screening Report. Minutes have been issued to attendees.

Review of Actions from Previous Meeting

Action: Ørsted to arrange Proportionate Approach Workshop with RSPB. **Complete.**

Action: Precision note and survey reports to be provided to Technical Panel members (to also consider increasing number of replicates). **Complete.**

Action: Technical Panel members to be provided with list of documents that will be submitted as part of the PEIR. **EA confirmed that this would be submitted shortly. – this has now been shared with NE and RSPB.**

Action: NE to confirm list of birds Hornsea Four have identified as requiring assessment of potential displacement operational impacts. **To be discussed later in this meeting.** MK noted that any comments made will have to be updated based on the PEIR review.

Action: NE to confirm the set of CRM parameters (nocturnal activity rates and avoidance rates) that they wish to advocate for impact assessment. **To be discussed later in this meeting.**

Action: RSPB to send a link to the website that details the MSS CRM glitches that have been resolved. **Complete.**

Action: Natural England to consider the use of flight height distribution data and what species may be appropriate for use in Band CRM Option 3. **MK stated that it would only be the large gulls that it would be appropriate to use Band CRM Option 3 for. MK confirmed that for lesser black-backed gull & great black-backed gull a 98.9% avoidance rate should be used and 99% for herring gull. SS also made it clear that for the PEIR BO3 would not form the basis of the assessment, but may be used in the final EIA Report.**

Action: Natural England to provide an HRA Screening response. **Complete.**

Action: RSPB to discuss offshore Net Gain with RSPB colleagues and report back in a formal response to the questions raised in the presentation. **EA confirmed that feedback had been received from Natural England. EA queried if JD had spoken to his colleagues about this. JD confirmed that he will get some feedback over to Ørsted as soon as possible.**

DAS Methodology/Final Survey Report & Precision Notes

EA noted that several documents have been submitted to Technical Panel members over the last few months (DAS Methodology Note, Final Survey Report & Precision Note). EA and SS asked both consultees in turn for their comments on the documents.

Natural England:

- AB noted that all documents relate to a larger project area (Afl area) than is going to be considered at PEIR therefore it is difficult to make judgements on this basis.
- AB stated that observations would be lost by reducing the area, which carries the risk of reducing the analytical power through a shortfall of data.
- EA asked if Natural England have a position on the methodology that was used to conduct the survey. AB agreed with:
 - 24 months of survey data collection;
 - the resolution of imagery;
 - the frequency of surveying; and
 - the overall methodology.

AB highlighted that the only query is about the amount of data that is being used.

- EA asked if the precision note helped to alleviate your concerns about the data? EB stated that it was difficult to comment without having seen data for PEIR boundary. EB stated that Natural England are not necessarily concerned by the reduction of the developable area but that the project needs to look at opportunities make the most of the reduced observations – that could be analysing the data (from additional 2 cameras) that have been collected but not analysed.
- AB stated that it would be good to clarify how the precision (CV values) has been calculated and asked if the data is going to be used to generate abundance estimates by the design-based approach and would that be the MRSea approach or bootstrapping? AB noted that the two approaches can be quite different in the precision of the estimates that they give you, with MRSea estimates tending to be more precise. SS added that MRSea is difficult to use on species with low abundances.
- SS confirmed that the note is based on standard design-based abundance estimates and asked whether Natural England are happy with that approach being used for the baseline? AB stated that Hornsea Four is the most sensitive offshore wind farm they have been asked to assess due to its location and the cumulative effects. Therefore, Natural England need to have the greatest confidence in the data used so anything that can be done to improve that confidence has to be seen as a good thing – the more data analysed, the better the estimates are likely to be.
- **Action:** Hornsea Four to look into exactly how the CV values in the HiDef report have been calculated and provide more information regarding this and how it relates to the levels of precision. *Since receipt of the baseline technical report at PEIR, this action is likely to have now been superseded, but will review at next technical panel meeting.*

RSPB:

- AM stated that the RSPB agree with everything that Natural England have said above and that they are content with methodology for data collection.
- AM stated that the RSPB share concerns with Natural England that the project is not analysing all the data available and stated that we need to be more creative when considering how to increase precision.

- AM stated that in relation to the precision note, this needs to be replicated for the PEIR boundary before RSPB can properly comment.

EA summarised that all attendees were in agreement that the data collection methodology is appropriate.

Baseline Characterisation

SS noted that in the last meeting, all agreed that the data from 24 months of DAS is fit for the purpose of characterising the baseline and for use in EIA / HRA assessments for Hornsea Four.

SS stated that migratory seabirds and non-seabirds would be considered following a review of previous projects within the Southern North Sea. JD recommended that the project consider the migratory non-seabird CRM examination responses for Norfolk Vanguard¹. SS highlighted that the PEIR baseline for such species would be determined from HOW01, HOW02, HOW03 and Norfolk Vanguard in order to present evidence to why further quantification may / may not be required for HOW04. SS asked for feedback on the baseline summary.

MK queried how large gulls are going to be assessed, as there was a suggestion in previous meetings that they may not be assessed for collision risk. SS confirmed that all three large gull species would be presented in the baseline and would be assessed for collision risk in the PEIR.

AB asked if the project could commit to analysing the 2 additional cameras? EA confirmed that this isn't something that Ørsted is going to commit to on the call. The precision note sets out that these additional 2 cameras won't be analysed. Based on attendee feedback, we will consider this again and confirm if the project's position has changed.

Action: Ørsted to consider analysing the additional cameras for a discrete time period to test the hypothesis that this will improve the precision.

SS asked what RSPB's view was on the MRSea methodology. AM stated that the RSPB agree with the statistical robustness of the method but noted that it does need a lot of data. AM stated that the RSPB would want to be given sufficient comfort that they don't need to object to the project, noting that this is unlikely in relation to cumulative impacts on kittiwake. AM suggested that if the project could provide sufficient statistical comfort by looking at the additional data then they could be more relaxed.

EA noted that there might be a better way to spend the money than analysing the data but highlighted that no alternatives have been suggested. AM could not think of any alternatives. MK suggested that the project could look at a few months and analyse the data and see if it makes a difference to the precision. AB agreed that it would be important to look at some of the data to decide whether there is value in analysing the full 24 months of additional data.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002567-DL3%20-%20Norfolk%20Vanguard%20Limited%20-%20Migrant%20Non-Seabird%20Collision%20Risk%20Modelling.pdf>
<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002637-DL4%20-%20Natural%20England%20-%20Deadline%20Submission.pdf>
https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002765-ExA;%20AS;%2010.D6.18_Norfolk%20Vanguard_Migrant%20non-seabird%20CRM%20Revision%20of%20REP3-038.pdf

SS highlighted that it would be an extremely costly process to analyse that additional data which may not make a difference to the precision. AB stated that Natural England are not suggesting analysing all the data – just the additional data for the PEIR boundary. In the first instance, AB suggested analysing 2 species (gannet and kittiwake) for 3 months on the reduced AfL area and if this is shown to be effective, to carry out the same exercise for the full 24 months. AB stated that this would be proportionate given the sensitivity of this area and its proximity to Flamborough Head and the potential cumulative impacts. JD noted that if this work is not done then it is likely that this point will be argued about in the examination phase so it would be better to resolve this now before the DCO submission. SS noted Natural England's comments, but also reminded those present that it is not possible to isolate and run abundance estimates for single species, as data could only be analysed on a monthly basis for all species.

EA asked if attendees could give positions on the baseline data. EB noted that Natural England will comment on the baseline in the PEIR review.

Use of SeaMast density maps for RTD in ECC

AB noted that the SeaMast mapping and sensitivity tool was never devised to provide absolute densities and these shouldn't be lifted directly off the tool – additional work is required.

Action: SS to look at the different data sources that feed into the Bradbury *et al.* (2014) SeaMast data / report / maps and to investigate which data source and species densities are most appropriate for our assessment of red-throated diver within the Hornsea Four ECC

SS noted that the SeaMast data provides the evidence to suggest that there are very few red-throated divers present in the Hornsea Four ECC. The SeaMast maps provide evidence that there are low to medium densities within a limited nearshore area and that therefore they are unlikely to be significantly affected by potential displacement impacts. MK queried whether the ECC will be within 2km of the SPA? SK confirmed that the ECC does not overlap with the SPA but that it is within 2km. MK stated that in that case the data from the Greater Wash surveys would be a useful additional data source. AB stated that it also might be useful to use the Lawson *et al.* (2016) report that sets out densities, noting that Norfolk Vanguard used that in their assessments and were able to put that through the matrix approach. SS noted this, but reiterated that Norfolk Vanguard undertook that assessment as their cable route went through the Greater Wash SPA, whilst Hornsea Four's planned ECC does not run directly through the Greater Wash SPA and is closest to an area of that SPA with the lowest densities of red-throated diver in it in comparison to the remainder of the SPA. MK noted that the northern boundary of the SPA is defined by survey extent rather than diver density, and that shore-based sightings indicate the waters to the north of the SPA support good numbers of red-throated diver.

EA asked whether attendees were all in agreement that use of SeaMast data is fit for purpose for baseline? AB stated yes, but as discussed there are a few items that require thought. AM stated that it would be useful to sense-check the Sea Mast data in Bradbury *et al.* (2014) to ensure the correct range of densities were used in the PEIR assessments of displacement of red-throated diver within the ECC.

Scope of PEIR Assessment (Impacts & Effects Register)

EA shared the latest version of the ornithology Impacts & Effects Register spreadsheet. SS gave an overview of the purpose of the Impacts & Effects Register. It was agreed that Ørsted would submit a summary of the Impacts & Effects Register to all attendees for comment as part of the PEIR.

Collision Risk Modelling (Species & Methods)

SS summarised that Hornsea Four are going to base the CRM input parameters on the latest evidence from the Industry. SS stated that the more precautionary approach using input parameters advocated by Natural England for recent OWF development applications (HOW03, NV and TE OWFs) would also be modelled using the parameters summarised in the table below:

Species	Nocturnal	Avoidance Rate
Gannet	2	98.9%
Kittiwake	3	98.9%
Lesser black-backed gull	3	99.5%
Herring gull	3	99.5%
Great black-backed gull	3	99.5%

SS asked if attendees have any comments on the values in the table. MK confirmed that the values are those that Natural England are advocating. MK stated that in terms of the nocturnal activity factor, the position Natural England got to with Norfolk Vanguard was the presentation of a range (gannet 1-2, other species 2-3).

AM queried whether both deterministic and stochastic CRM modelling is going to be presented at PEIR? AB indicated that NE's current advice is to present outputs from both deterministic and stochastic models. SS confirmed that for the PEIR only the stochastic CRM would be used, as this is the only official method able to be run through the ShinyApp, but that a separate call would be set up between AM and APEM to discuss how to work data through the ShinyApp to generate deterministic outputs.

Action: SS to confirm what is being presented. SS and AM to arrange call to discuss use of ShinyApp for deterministic CRM outputs.

SS noted that the project has utilised site specific data from boat based zonal surveys to allow the use of Band option 1. SS confirmed that SOSS is being used for Band Option 2 (and that Band Option 3 would be run for appropriate species, but not be part of the assessments at PEIR). SS asked for further comments on the Band options. MK stated that Natural England have ongoing concerns about flight height data based on boat-based surveys so are likely to raise this concern and continue to recommend focussing on Option 2, noting that it all depends what the project is resting their assessment on.

AM stated that in relation to flight heights, additional data from recent tagging projects from Bempton for kittiwake and gannets may become available in the near future that could be quite interesting. AM confirmed that as soon as RSPB are able to share this information they will do so. AM confirmed that ORJIP flight speeds were specific to a certain area and that the

RSPB are not entirely confident about incorporating ORJIP data. AM stated that the BTO review noted the data were very site-specific. AM confirmed that the RSPB are not in a position to say ORJIP flight speeds are acceptable - these can be presented but need to be caveated.

Displacement (Species, Bio-seasons and Methods)

SS stated that a simple assessment for the construction phase would be carried out for auk species associated within the array area. SS also described the proposed method for assessing red throated diver within the ECC (construction phase) considering a single extended non-breeding bio season spanning months of September to April. SS asked if Natural England and RSPB were in agreement with this approach for the construction phase assessment? MK asked if there were no common scoter in the inshore waters? SS confirmed that there were none, only red throated diver. MK stated that Natural England were content with that, but it would be useful to capture that narrative in the report.

SS stated that a more complex assessment for operational phase would be carried out for gannet and auk species associated with array area, with quantification to be based on gannet and auk species standard non-migratory breeding bio seasons and extended non-breeding bio seasons according to Furness (2015). SS noted that the assessments would present ranges of mortality rates for different species / bio-seasons, with full matrices presented in the displacement appendix. MK stated that the assessment needs to consider the full breeding season – not just the non-migratory ones, and this is the advice Natural England would provide to examiners, especially given the proximity to the colony. MK highlighted that the Natural England Displacement Note sets out the matrices that they expect. SS asked if Natural England have a current stance on the mortality rates that the project should be using. MK confirmed that there was no stance – hence the reason a range is requested.

RIAA

SK provided an update on the RIAA screening, stating that Hornsea Four provided updated screening tables for all topics except for ornithology on 28th May 2019. SK noted that the updated ornithology screening tables will be issued shortly. SK asked Natural England to confirm their timeframes for responding. EB stated that response dates will be confirmed once the ornithology screening tables received. LK noted that the response deadline given on the initial email (non-ornithology receptors) was the 24th June.

EB highlighted that the updated conservation objectives for the Flamborough and Filey Coast SPA will be updated shortly. SK noted that any advance notice of this publication would be much appreciated.

How to Read the PEIR

EA gave an overview of how the PEIR is going to be presented and how it should be read by consultees – a step-wise process:

- Step 1: Impacts & Effects Register
- Step 2: Commitment Register
- Step 3: DCO Application Register
- Step 4: PEIR Chapters and Technical Reports

JD stated that it would be a good idea to talk through this process further once PEIR is submitted. EB noted that Natural England will look at the PEIR once it arrives and see if a

discussion about the process is necessary, noting that it might be a good idea to put a date in the diary after PEIR submission to have that discussion if required.

Next Steps

EA confirmed that the statutory consultation on the PEIR will commence on Tuesday 13th August 2019 and closes on Saturday 21st September 2019 – *please note, following this meeting, the close of the statutory consultation period has been modified to Monday 23rd September 2019.* EA stated that a post-PEIR Technical Panel meeting will be scheduled for October 2019 to discuss consultation responses received as part of formal consultation and the purpose of this meeting will be to discuss concerns raised and changes/updates to assessments required for final submission.

EA confirmed that a final pre-application meeting will be held in Q4 2019/Q1 2020 to discuss any significant changes following PEIR consultation and what will be presented in the final ES.

AOB

AB queried whether attendees could get PEIR documents as soon as they are made available to PINS? EA to confirm if that would be possible.

Action: EA to confirm if PEIR documentation can be made available to attendees at the same time as submission to PINS. **Response: PEIR documentation cannot be made available any earlier, and the consultation period will follow the dates detailed above.**

SS asked if Natural England could send a link to the latest Flamborough and Filey Coast SPA conservation objectives. EB confirmed that the designated site page will be the most up-to-date but would send through links to confirm that.

Action: Natural England to send link to latest Flamborough and Filey Coast SPA conservation objectives.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
1. Ørsted to consider analysing the additional cameras for a discrete period to test the hypothesis that this will improve the precision.	Ørsted
2. SS to look at the different data sources that feed into the SeaMast mapping and sensitivity tool (Bradbury <i>et al.</i> , 2014).	SS
3. SS to set up call with AM to discuss deterministic CRM modelling within the ShinyApp.	SS
4. EA to confirm if PEIR documentation can be made available to attendees at the same time as submission to PINS.	EA
5. Natural England to send link to latest Flamborough and Filey Coast SPA conservation objectives.	EB

Summary of Areas of Agreement and Disagreement

A summary of the areas of agreement and disagreement are provided in the table below.

Ørsted Position	Stakeholder Position
24 months of survey data is appropriate	NE – Agree RSPB - Agree
Scope of intertidal assessment is to focus on sanderling only	NE – Agree RSPB - Agree
Simple assessment will be carried out for construction phase impacts.	NE – Agree RSPB - Agree
Digital aerial survey methods are fit for the purpose of baseline characterisation	NE – Agree RSPB - Agree
Two cameras worth of data collected to define the baseline characterisation of seabirds within the Hornsea Four array area and 4 km buffer are fit for the purpose of impact assessment	NE – disagree RSPB - disagree
For PEIR the principle of the use of SeaMast density map (Bradbury <i>et al.</i> , 2014) for red-throated diver is fit for the purpose of baseline characterisation and impact assessment for displacement within the ECC. The nature of the assessment would need further discussion	NE – Agree in principle RSPB - Agree
<p>The scope of EIA and PEIR as laid out in the Impacts & Effects register. Including:</p> <ul style="list-style-type: none"> • Impacts that have been scoped in and scoped out of the assessment • Species to be assessed for CRM, displacement from the array area (Construction & Operational phases) and displacement from the ECC during cable laying (Construction only) 	TBC following issue of Impacts & Effects register to stakeholders at PEIR submission
Use of Marine Scotland Science (McGregor, 2018) sCRM stochastic outputs only for PEIR, due to uncertainty surrounding the use of the ShinyApp for deterministic outputs.	NE’s current advice is to pre from both deterministic and models.
Confirm “Natural England’s Advocated Precautionary CRM input parameters for Nocturnal Activity rates and Avoidance rates” in order to provide range of CRM outputs at PEIR	NE - Agree
Detailed assessment of any migratory non-seabirds and seabirds for other Southern North Sea OWF EIAs will be used to determine if assessment required for Hornsea Four	NE’s advice to developers is to consider impacts on migratory seabirds and waterbirds using the tools available, though we will consider any review findings.
Detailed assessment of barrier effects would not form part of the PEIR, as species most at risk not likely to forage as far as Hornsea Four.	NE - disagree

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting Five	15 December 2019
Meeting Date	29/10/2019	
Place	Ørsted, Howick Place, London	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – RSPB – by phone</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd – by phone (CRM session onwards)</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants – by phone</p>	Our ref. HOW04/EP_TPOrnith_5
Absent	██████████ – Natural England	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Aims and Objectives

EA stated that the principal objectives of this fifth Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel meeting were to present a project update and programme to DCO; review Section 42 Responses; discuss and agree on progression of the proportionate approach; agree on appropriate species and methods to assess for construction disturbance and displacement; agree on appropriate species and methods to assess for O&M disturbance and displacement; to provide the RSPB with opportunity to present update on use of the sCRM Shiny App; to agree on NE / RSPB's 'worst case' for sCRM; to agree on appropriate species / methods for assessing collision risk to migratory seabirds / non seabirds; to provide NE with the opportunity to present the new PVA Tool and merits of use; and to set up further discussions for the RIAA and any other outstanding items.

Hornsea Four Update

EA gave an overview of recent Hornsea Four activities which have consisted of the review of S42 consultation responses; the updating of assessments and technical reports, where required, site selection works including updates to the onshore and offshore Export Cable Corridor and the refinement of the landfall and onshore substation sites.

Programme to DCO

EA gave an overview of the Hornsea Four programme which includes Evidence Plan meetings in November and December 2019 and final application submission in Q1 2020, most likely the end of February. JD noted the HOW03 decision wouldn't be available prior to the submission of the ES. EA and RH noted that the submission dates are constrained by the Crown Estate in relation to the terms of the Agreement for Lease. JD noted for HOW03 the RSPB considered that it was at the threshold and that will be the same case for HOW04. JD noted meetings taking place with the HOW03 in advance of the further submissions.

Impact Register Updates & Scope of the EIA at ES

EA gave an overview of the changes that will be made to the Impacts Register post-PEIR, noting that the Impacts Register will be presented as in the PEIR, with the addition of a minimum of 3 additional columns. EA stated that impacts would be moved from the Chapters to the Impacts Register where assessments have concluded no likely significant effect (in EIA terms) at PEIR and there is no change in project description affecting the assessment; baseline environment data affecting the assessment or no change in assessment methodology and there are no significant comments in stakeholders' S42 responses. EA noted that in these cases the Impacts Register will be updated to state that these impacts are *"Not considered in detail in the ES. No likely significant effect identified at PEIR."*

Precision: 4 cameras vs 2 cameras

EA noted that during the Offshore Ornithology Evidence Plan Meeting Four (11 June 2019), Natural England suggested Hornsea Four could analyse 3 months of data on the reduced AfL area to see if it makes a difference to precision¹, before deciding whether there is value in analysing the full 24 months. EA confirmed that Hornsea Four have started by analysing the additional cameras for 1 month (June 2017). AB commented that it was great to see that Hornsea Four had made a start on this analysis and positive they had taken previous comments onboard.

SS gave an overview of the results of the analysis of the additional 2 cameras for this extra month. SS noted that there was a slight improvement in the precision in flying, sitting and total abundance estimates for three of the four species summarised (gannet, kittiwake, guillemot and razorbill). SS noted that abundances for three of the four species summarised reduced in abundance when using the 4 camera dataset. SS noted when comparing the 2 vs 4 cameras, the 2 camera is a more precautionary dataset (particularly for gannet, kittiwake and guillemot) and confirmed that the 2 camera dataset is being used for assessment purposes with the Hornsea Four application. EA asked attendees whether these results increased their confidence in the data used to support the baseline?

AM asked how the precision figures had been derived. SS confirmed that it had been calculated in the same way as was presented in the PEIR. AB asked if that was based on standard error or standard deviation (both over mean), noting that standard error is sensitive to increases in sample size.

ACTION: SS to clarify how precision has been calculated and consider presenting the precision figures calculated from both standard error and standard deviation.

¹ Since Meeting 4, this has now been extended to four months.

AB noted that it would be interesting to see what happens to the confidence intervals with the increase of data. If the confidence limits get tighter around the estimates then we can have more confidence in the data. AB also noted that this work could have implications for the CRM as there could be more confidence in the range that is being assessed. AB noted there is likely to be a point where analysing more data makes little difference and agreed that the changes in precision are fairly small. AB stated that if the locations of individuals were clumped rather than evenly spaced in the survey data then it would be beneficial to look at more data.

EA stated that Hornsea Four will analyse three additional months of data within the breeding season and suggested April, May and July 2017. AB noted it would be more useful to have the same month across years, and that the key month seemed to be August as there were large post-breeding abundances, particularly of guillemot. AB therefore recommended June 2016 is analysed to match up with the June 2017 data already analysed and also August 2016 and August 2017.

EA asked if attendees would you be comfortable with the baseline once these precision issues are addressed? AB stated that this additional analysis would go a long way to addressing NE's concerns although it cannot be prejudged what tests will show and it will enable Hornsea Four and consultees to make much firmer conclusions. AB confirmed that Natural England's baseline concerns are largely focussed on precision, but that it has to be clear how the precision values have been derived. AB stated that if the further three months of analysis show that precision and confidence intervals have not improved significantly, then the analysis of further months does not need to take place and it would be Hornsea Four's prerogative to go with that data already contained within the PEIR. EA questioned what NE and RSPB would recommend if an increase in precision is not found after 4 months analysis. EB stated that if there is no improvement in precision and you still have large confidence intervals then the narrative that accompanies the assessments should reflect that. MK noted that the results could differ for different species.

AM stated that the additional analysis is welcomed but it would be good to see the full suite of the analysis to understand the variability. AM also agreed with the additional months selections of June 2016, June 2017, August 2016 and August 2017 suggested by AB and stated that getting an indication of precision and variability has a big influence on how all would view the need for precaution.

AB noted that it was unfortunate that the model based approach (MRSea) wasn't carried through to PEIR and the assessments and asked if there was any more of the model based approach planned for the ES. SS stated that Hornsea Four are not intending to follow the MRSea route for the assessment and instead the additional camera analysis has been prioritised. SM noted that the confidence intervals for the model based approach are better than design based but that MRSea doesn't give you a precision value for every survey – precision isn't calculated and confidence intervals are used.

Displacement Rates

SS noted that in the NE PEIR response (comment 6.14) it was stated that there was not enough evidence to make distinction in sensitivity for gannet, guillemot, razorbill and puffin between construction and operation. SS noted that they have tried to follow a similar approach to other projects that recognise different response levels of seabirds from construction and operational activities. MK acknowledged that SNCB's have provided varying advice on the

best way to address this issue, but noted that there isn't a clear line between construction and operation in practice and that the current advice is in line with the Dogger Bank Creyke Beck (DBCB) approach, which took a pragmatic stance. SS noted that Hornsea Four would consider this further. MK stated that the DBCB approach made an assumption of displacement of 50% during the construction phase, thereby assessing the activity on site ramping up rather than differentiating between construction and operation. SS noted NE's S42 responses recommended a 2km buffer to auks during operation phase and asked if this would be the same for the construction phase for puffin, guillemot and razorbill? SS also raised the assumption that gannets were not displaced beyond the array area from mots recent evidence base, whilst during the construction it is likely that gannets may only be displaced from those areas where WTCs were part or fully constructed. MK stated that NE would confirm. SS asked what mortality rates should be considered for this? MK recommended that rates should be kept the same for construction and operation as evidence not sufficiently robust to draw distinctions.

ACTION: NE to review the DBCB displacement approach and report back, mainly in relation to the species considered during the construction phase.

SS gave an overview of the operational phase disturbance and displacement assessment. MK stated that NE do not recommend varying mortality rates between season and to keep rates the same in construction and operation (PEIR comment 6.27). SS to consider presenting a matrix with shading with a scaled back approach for construction.

SS queried why NE consider a 10% displacement mortality rate for auks and gannets as appropriate, noting studies based around long term monitoring of seabirds (in particular red-throated divers) within German waters in response to offshore wind farms provides evidence to suggest overall distribution may have shifted, but that total abundance has not changed. MK stated that there is no evidence on actual mortality rates hence the recommendation that a range of values are used for project assessments. However, MK would check what mortality rates are used in in-combination/cumulative assessments this and confirm.

ACTION: NE to confirm the mortality rates for auks and gannets to use in in-combination/cumulative assessments.

AB noted that the advice on the conservation objectives for the Flamborough and Filey Coast (FFC) SPA will be formalised by March 2020, but that there would be limited technical changes to the draft ones currently available online. AB stated that the advice now is about distribution as well as abundance.

In relation to buffers, AB confirmed that whatever is in the SNCBs guidance note on displacement is what NE advise.

SS confirmed that flight direction has been considered in reviewing the biological seasons for seabirds recorded within the Hornsea Four array area and a 4 km buffer, which will define the final baseline. SS confirmed that For the use in impact assessments, for instance for guillemot, two seasons may be useful, but for defining the actual baseline it makes more biological sense to provide more detailed breakdown of individual seasons. SS also confirmed that when assessing potential impacts, it makes more biological sense to consider assessments seasonally rather than annually, but consideration may be given to wider bio-seasons for

certain species if appropriate. AB referred to the SNCB guidance note on displacement which says: "Breeding season assessment to be done against an appropriate regional population scale, as agreed with SNCBs (but likely to cover total colony counts within mean-max foraging range). Non-breeding season assessment done against appropriate population scale (e.g. Furness 2015), as agreed with SNCBs.". SS to consider this and provide a method statement in relation to how to consider this annually, but raised issues with adding up potential seasonal impacts into an annual one, due to overlap and suggested additional thought would be provided in response to NE's comments on this topic to ensure any potential impacts are considered proportionately to the correct scale. MK noted that it is easier to compare results from different projects if the methodology is the same. SS asked if RSPB had similar views on BDMPS. AM stated that the RSPB's position is in agreement with NE's and noted that so little is known about displacement so the NE advocated approach is the best way to capture that uncertainty. AB highlighted that all the advice is in the note and that if Hornsea Four disagree with the SNCBs guidance note on disturbance and displacement and have evidence to base assumptions on then that narrative has to be provided in the report.

SS noted NE's disagreement with the consideration of only RTD displacement in the Export Cable Corridor (ECC) (s42 response comment 6.21 & 6.22). MK also noted that NE do not agree with the baseline data for RTD applied within the PEIR (SeaMast data) as the basis to undertake an impact assessment. AB highlighted that this is not a change in advice as NE have previously noted at the Evidence Plan Meeting that the SeaMast data wasn't designed to predict absolute densities of birds (just relative densities). AB stated that it was possible to use alternate data sources to 'benchmark' the relative densities to abundance estimates from elsewhere in the North Sea, and thus provide scaled density estimates for the cable corridor MK also stated that benchmarking of those SeaMast densities against some known figures would be useful. EB noted that this advice is how NE recommend the use of the data to make it more defensible and that the project can choose to use another approach.

ACTION: AB to provide an illustrative example of how to 'benchmark' the use of the SeaMast data and go through with SS.

SS stated that data on red-throated diver used to define the boundary of the Greater Wash SPA showed a drop off to very low densities to the northern end of the SPA. MK noted that the northern boundary of the SPA was defined by the northern extent of the surveys, so the drop off in diver density was due to a lack of data outside of the SPA boundary and not due to empirical data. MK noted that the PEIR states that the cable route itself does not cross the SPA but queried whether the 2km buffer for displacement effects crosses the SPA boundary?

ACTION: Hornsea Four to provide a map with distances from the SPA boundary.

SS suggested that the impacts could be defined as birds south of the cable laying vessel being potential SPA birds and those to the north would not be SPA birds. MK stated that this approach could work.

MK noted that it seemed like common scoter was not considered within the Report to Inform Appropriate Assessment (RIAA) and that an evidence base is required for the conclusions. AB again noted that conservation advice is related to abundance, distribution and other factors. MK noted that RTD is an EIA and RIAA issue but that common scoter is essentially a RIAA issue as it is a designated feature of the SPA.

CRM Parameters & Collision Estimates

AM provided some commentary on the issues raised in the PEIR responses in relation to the sCRM ShinyApp. AM noted that there are unresolved issues with the sCRM ShinyApp but that the implications of these errors on magnitude of the predictions is currently unknown. AM confirmed that unless these issues are resolved, and even if they are, RSPB wishes to see Band 2012 Excel spreadsheets as well as the sCRM. AM stated that it would also be useful to see the sCRM with standard deviations set at zero to provide deterministic outputs for comparison. AM confirmed the RSPB would like to see three options:

1. Band 2012 Excel Spreadsheets
2. Shinyapp – deterministic
3. Shinyapp – stochastic

EA noted that it seems disproportionate to undertake all these different CRM scenarios. EB stated that ornithology is one of the largest risks for Hornsea Four so it would be more proportionate to focus on resolving this issue and potentially avoiding a situation in Examination where the sCRM might be proven to be erroneous and not having another CRM to fall back on. JD agreed on this point.

AM noted that the current issue in the sCRM ShinyApp is with Band Option 2 but there have been other issues raised in the online forum. SS confirmed that the project would look into this – maybe look at one scenario across the three approaches. AM stated that it may be more useful to check flight heights are correct for all species and keep the same other parameters (e.g. nocturnal activity rates). AM suggested one set of three CRM runs for each five species.

SS asked if Band Option 3 is suitable to use for large gulls? AB noted that the NE advice is to focus on Band Option 2 which assumes an equal probability of collision across the rotor face, but would provide clarification on if Band Option 3 is appropriate for use in estimating collision risk for any of the large gull species.

SS noted that the PCH bands have been calculated from the boat based survey data. MK noted that the PCH figures for Hornsea Four are a lot lower than for other Hornsea projects. SS confirmed that the same approach was used for the other Hornsea projects. MK stated that NE's position is well known about the process by which boat-based observers collect data on flight height and the subsequent processing of the data for the purposes of CRM. MK emphasised the risk of calculating flight height from boat based data and having these discussions in front of the examiner – NE's preference is to not bring forward Option 1 values as their position will remain unchanged. MK noted that providing Option 2 values is probably the best way forward. MK queried how many zonal survey transects actually exist within the ES boundary now that it has been reduced? SS confirmed that this narrative would be captured within the CRM annex. MK stated that the NE advice is to present Option 2 if testing the CRM methods and to target the risk which would be kittiwake and gannet.

MK noted that the standard deviations in Table 1 did not match those from Bowden & Cook (comment 6.82). SM confirmed that the Bowden & Cook confidence intervals were converted from a range using a rule of thumb to a standard deviation to get input parameters for the sCRM ShinyApp. MK stated that needs further explanation and confirmed that there is likely to be a SNCB response to the Bowden & Cook report before the Hornsea Four submission.

ACTION: APEM to provide a note to explain the calculation of the standard deviations in Table 1.

ACTION: AM to check on where the pre-populated standard deviations in the sCRM came from for bird length and wind span (comment 6.83).

SM queried what the preferred approach is for each species in relation to flight speeds (comment 6.84)? MK stated that the advice would be to use kittiwake speeds in Cook *et al.* noting that this approach was used for other species and that no clear rationale was given as to why kittiwake was different. AM confirmed that Cook *et al.* should be used for consistency.

SS asked what source should be used for establishing flight speeds for all species? MK to confirm.

ACTION: NE to confirm what source should be used for establishing flight speeds for all species.

SS noted that fixed nocturnal activity rates have been used in both the Applicant's and SNCB's version of sCRM and that NE consider that the sCRM should be run twice, once for each NAF. MK asked if anyone had an update on the timescale for the new Furness paper in relation to kittiwake? AM noted that the paper had stalled due to ongoing discussions on the data. AM noted that there will be nocturnal activity factors available from the FAME data soon but this is restricted in time period due to the methodology.

SS noted that in relation to comment 6.86 about different units that each parameter had been converted to the correct height (e.g. MSL, LAT, HAT) so additional text will be provided in the annex to make that clear. JD asked what sea level unit is used in the DCO and noted that this unit should be used across all assessments. EA confirmed that this would be a good approach and this would be investigated.

MK noted that NE have concerns about the accuracy of assigning bands to flight heights within boat-based survey data, but that this would not be a big deal if focussing on Band Option 2. MK noted that bringing the next flight height band below the swept area into the CRM would be the best approach but that will not address the more fundamental issues with Band Option 1.

MK noted that it should be possible to derive the standard deviation for site specific flight height data but would have to confirm that.

ACTION: MK to confirm if it is possible to derive the standard deviation for site specific flight height data.

SM asked what approach should be used for the calculation for the standard deviations of density used in the CRM (comment 6.87)? SM noted that they have been calculated from the mean of the two density estimates from Year 1 and Year 2. AB suggested that you could do some nested bootstrapping and select randomly from each year to get a double bootstrapped estimate for the month? SM not sure that would be the best approach but there could be other options. SM to consider.

SS noted that the number of turbines was not provided in the annex (comment 6.88). SS stated that this was an error and it would be added to the ES document. MK asked how the MDS was developed. SS noted the MDS comprises the maximum number of turbines with the maximum parameter sizes for all rotor parameters. MK noted that the risk factor for collision is a narrow band where flight heights overlap with the swept area rather than the maximum swept area so the MDS might not necessarily be the largest turbines. SS noted that iterative analyses have been undertaken to establish the MDS. SS also noted that the commitment for the raised air gap would remain constant even for smaller turbines, so Hornsea Four are confident that the MDS for the CRM is appropriate. SS confirmed that further text will be added to the annex to clarify this.

ACTION: MK to confirm advice on Band Option 3. EB noted that Band Option 3 is more sensitive to flight height data but NE to confirm (comment 6.89).

In relation to the migratory seabirds/non-seabirds CRM, SS noted that in line with the proportionate approach, APEM had reviewed the assessments for all Hornsea zone projects as well as other projects within the East Anglia zone and noted that all projects predicted no significant impacts for any species. SS stated that Hornsea Four is in the same area as these projects so it would be likely to have the same outcome. SS asked if attendees could agree that this will be the same as other projects and it can be considered in the Impact Register alone? MK highlighted that NE can understand why an individual project doesn't consider impacts on migratory waterbirds a problem but the issue is a cumulative one and that if one project does a qualitative analysis then NE can't consider it alongside all the other quantitative approaches and adequately consider the cumulative impact. Furthermore, other projects coming forward would also feel entitled to use a qualitative analysis. MK stated he would support further assessment rather than scoping out.

EB stated that with HOW03 there wasn't agreement with NE on the approach to estimate migrant seabird and non-seabird collision risk but it was agreed that it wouldn't alter the assessment but this was picked up by the Examiners - another reason to try and deal with it now. SS asked if the sCRM had a migrant seabird option? AM confirmed that it didn't have that capability.

ACTION: EB to provide NE advice on migrant seabirds/non-seabirds for HOW03.

MK asked if the migratory CRM was being run on little gull. SS confirmed that APEM are doing some work to compile what the North Sea population of little gull is so it can be apportioned out to the relevant sites.

PVA Modelling

AB gave an overview of the new NE PVA tool, stating that the tool gives everyone the ability to run a PVA in a transparent way, standardised across projects. AB stated that a few issues have been raised with the tool and NE will provide a timetable this week for fixing these although noting that they are minor issues. AB mentioned that outputs differ from previous PVAs in that the NE PVA tool presents the 'counterfactual' – i.e. the predicted future population size with and without the wind farm, which some previous PVAs did not present (some did). This follows recommendations from Green et al. (2016).. AB stated that NE are not that prescriptive about what goes into it and that it is likely that most people will use Horswill & Robinson (to be confirmed by AM and AB) but if there is other evidence available then we will

be able to give an opinion if that is the best approach or not. EA asked if NE would you advise that Hornsea Four still use the tools if the bugs aren't fixed in time? AB stated that NE would confirm once a timetable has been provided.

ACTION: NE to provide update on programme for the bug fixing of the NE PVA tool.

MK stated that if you are looking at a site, you would input the productivities for that site should they be available (as they are for FFC SPA). NE want the most up-to-date information to be used and to be very clear where it came from and why. JD stated that the tool should use the best available data and most up-to-date to make it appropriate, noting that for biogeographic assessment it might be better to use a different productivity. AB noted that you should focus on a representative time period (i.e. representative of the time the surveys were undertaken). AB stated that APEM should be clear of the reasoning for whatever parameters are used so NE don't have to come back with further queries.

SS asked about the FFC SPA kittiwake count in 1987. MK stated that this count has been scrutinised very carefully and it is NE & JNCC's view is that it is valid. AM stated that the RSPB have a preference for density independence outputs from any PVA should be used for assessment purposes – there are very good colony specific demographic rates so these should be used. AM advocates caution of interpretation of stochasticity as this could give a false impression on the extent of uncertainty. SS asked if all the information is contained in the Seabird Monitoring Programme Report for Flamborough & Filey Coast SPA? EB confirmed that there might be a more recent version available (2018) and the 2019 version might be available soon.

ACTION: EB to provide the latest Seabird Monitoring Programme Report for Flamborough & Filey Coast SPA. **Complete**

AM stated that the PVA tool produces a Leslie matrix rather than a Bayesian approach to the matrix, noting that stochasticity can give a false estimate of the level of uncertainty. AM stressed that caution should be used in the interpretation of stochastic outputs. AB confirmed that the model can do stochastic or deterministic but that NE prefer stochastic.

Next Steps

EA stated that Hornsea Four want to set up call to discuss any outstanding items such as barrier effects; lighting; cumulative assessments; and impact assessment methodology. EA also asked for a separate call to be set up to discuss draft RIAA ornithological responses. All attendees stated a preference for calls rather than face to face meetings.

ACTION: EA to send a doodle poll to agree call dates and times. **Complete**

AOB

AB stated that NE trying to get some independent advice on survey design and analysis although this will unlikely to be in time for Hornsea Four submission but will be done for Examination.

MK noted that the Evidence Plan Technical Panel need to have a conversation about alternatives and IROPI or we make time for a separate call. EA asked whether this was strategic across the Hornsea Zone or project specific? JD suggested that this should be a

strategic discussion as issues will be the same across HOW03 and HOW04. EA to discuss this with Maria Scarlett (Ørsted) to set something up. JD noted that submissions should be tackling this head on rather than waiting for this to come up in the Examination. EB highlighted that if that doesn't tie in with the submission of the application then maybe this discussion isn't a priority with all the others. JD stressed that it would be prudent to have Alternatives and IROPI material within the application.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
SS to clarify how precision has been calculated and consider presenting the precision figures calculated from both standard error and standard deviation. Complete (it is standard error over mean)	SS
NE to review the DBCB displacement approach and report back, mainly in relation to the species considered during the construction phase.	MK
NE to confirm the mortality rates for auks and gannets to use in in-combination/cumulative assessments.	MK
AB to provide an illustrative example of how to 'benchmark' the use of the SeaMast data and go through with SS. Complete (AB e-mailed SS, but requires additional discussion)	AB
Hornsea Four to provide a map with distances between the Greater Wash SPA boundary and the ECC.	Hornsea Four
APEM to provide a note to explain the calculation of the standard deviations in Table 1. To be provided in ES	APEM (in ES)
AM to check on where the pre-populated standard deviations in the sCRM came from for bird length and wind span (comment 6.83).	AM
NE to confirm what source should be used for establishing flight speeds in the sCRM for seabirds (all species).	MK
MK to confirm if it is possible to derive the standard deviation for site specific flight height data.	MK
MK to confirm advice on Band Option 3 (i.e. are NE in support of using BO3 for large gulls?) EB noted that Band Option 3 is more sensitive to flight height data but NE to confirm (comment 6.89).	MK
EB to provide NE advice on migrant seabirds/non-seabirds for HOW03.	EB
NE to provide update on programme for the bug fixing of the NE PVA tool.	NE
EB to provide the last Seabird Monitoring Programme Report for Flamborough & Filey Coast SPA. Complete	EB
EA to send a doodle poll to agree call dates and times. Complete	EA

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #6	15 January 2020
Meeting Date	12/11/2019	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – Ørsted</p> <p>██████████ – GoBe Consultants</p>	Our ref. HOW04/EP_TPOrnith_6
Absent	██████████ - RSPB	
Copy	██████████ – Ørsted	
	██████████ - Ørsted	
Next meeting	TBC	

Agenda

1. Review of previous meeting actions
2. Review of Impact Assessment Methodology
 - a) How the values have been reviewed / revised to define value, sensitivity and importance;
 - b) Use of matrix approach to determine impacts / significance.
3. Cumulative assessment
 - a) Data sources and methods for displacement and CRM in revised assessment;
 - b) Reasons for including / excluding projects in CEA tables / assessments;
4. Barrier Effect
5. Lighting Impact Assessment
6. Next Steps/AOB

Review of previous meeting actions

- SS to clarify how precision has been calculated for abundance estimates (standard error or standard deviation over the mean). **Complete.**
 - SS confirmed that it is the standard error over mean. AB confirmed that he was happy with that calculation.
- MK to review the DBCB displacement approach and report back, mainly in relation to the species considered during the construction phase and the extent of any buffers considered or not (if applicable). **Complete.**
 - AB noted that for puffin and gannet, the displacement during construction was based on the array area plus 2km buffer. AB also noted that a full matrix was

presented up to 100%. AB stated that the documents will be available on the PINS website. **Complete**

- MK to confirm the mortality rates that Natural England consider for assessment of displacement impacts for auks and gannets (1-10%?). **Complete**
 - AB confirmed that he needed to see the matrix before can confirm what Natural England's advice is on that. **Complete**
- AB to provide notes and proposed approach to estimating RTD abundance using original SeaMast data and more recent data sets. **Complete.**
 - AB has emailed SS about this although SS noted that he might send additional emails to clarify. AB asked MM to be copied in.
- Hornsea Four to provide a map with distances between the Greater Wash SPA boundary and the ECC. **Complete.**
 - Two maps provided via email on 13th and 14th November 2019.
- APEM to provide a note within the ES to explain the calculation of the standard deviations in Table 1. **Complete.**
 - SS confirmed that this would be addressed within the ES.
- AM to check on where the pre-populated standard deviations in the sCRM came from for bird length and wing span (comment 6.83). **Open**
 - JD to chase AM for feedback. SS stressed that it would be useful to get answers on this as soon as possible so that the revised CRM can be started.
- MK to confirm what source should be used for establishing flight speeds in the sCRM for seabirds (all species). **Complete.**
 - AB advised that Hornsea Four should look at Pennycuick (1997) & Alerstam *et al.* (2007) for most species and those sources have SDs for them apart from gannet. For gannet there are two options: use Skov *et al.* (2018) values or the flight speed in Pennycuick with no SDs. AB noted that the best advice is to run both options.
- MK to confirm if it is possible to derive the standard deviation for site specific flight height data for the Option 1 data. **Complete.**
 - AB stated that due to NE not currently having a method to calculating SD's in relation to site-specific flight height data as well as NE's advice that due to site-specific flight data not always being suitable to be used for the purpose of CRM their preference is to avoid such issues through using Band Option 2.
- MK to confirm advice on Band Option 3 (i.e. are Natural England in support of using Band Option 3 for large gulls?) EB noted that Band Option 3 is more sensitive to flight height data but Natural England to confirm (S42 comment 6.89). Natural England to advise on Band Option 3 for large gulls. **Complete.**
 - AB stated that the Natural England advice is to follow Band Option 2, and the use of Band Option 3 is not advised for any species. SS confirmed that Hornsea Four will discontinue the use of Band Option 3 analysis within the ES. EA asked if RSPB still want to see Band Option 3 run, as requested during technical panel #5? **Action:** JD to ask AM if that is still required.
- EB to provide Natural England advice on migrant seabirds/non-seabirds for HOW03. **Complete**
 - EB to send a link to the specific written representation or provide the text in an email.
- Natural England to provide update on programme for the bug fixing of the NE PVA tool. **Complete.**
 - AB stated that Natural England expect the issues to be resolved by the end of calendar year with an updated tool available mid-January 2020 but noted these

- fixes aren't expected to change the outputs dramatically. AB noted that this timeline might mean that the PVA modelling might require updating during the Examination process.
- SS asked Natural England what the scale of the issues and potential differences between the existing and updated version of the PVA tool may be. AB stated he would check and report back, but functions are currently not working as they should be.
 - sCRM (via the 'ShinyApp' interface) - AB concerned that projects are investing time in the sCRM when it could be wrong, so would be keen to hear from RSPB on what the problems are. AB highlighted that Hornsea Four needs a fallback (in case the sCRM is deemed to be erroneous) so the project should use the Band model spreadsheet as well as the sCRM.
 - SS highlighted that the sCRM can be run without variation (i.e. with stochasticity removed) to generate spreadsheets for all the band options. SS will test this to see if comparable to the old method.
 - EB to provide the last Seabird Monitoring Programme Report for Flamborough & Filey Coast SPA. **Complete.**
 - Provided on 12th November 2019.

Review of Impact Assessment Methodology

a) How the values have been reviewed / revised to define value, sensitivity and importance;

SS noted that for Sanderling, Natural England have stated that they should be of moderate sensitivity and the assessment stated a low sensitivity. SS noted that this didn't make much of a difference to the outcome of the assessment and also provided an initial indication (subject to the revised project design being approved) that the construction plans for the cable laying through the intertidal would be through the use of HDD, therefore reducing any activities of consequence to sanderling. SS confirmed that more text will be added in relation to justification of sensitivities.

b) Use of matrix approach to determine impacts / significance.

SS noted that Natural England had raised a comment about the use of the DMRB matrix. EA confirmed that the DMRB matrix is being used across all topics. EB noted that the project could consider the use of a different matrix for the assessment – e.g. CIEEM. MK and JD stated that it would be useful for some text to be added stating what other matrices have been considered and why they have been discounted and the current matrix used.

Cumulative assessment

Collision Risk – In relation to the projects selected for the CEA, SS noted that a project may be deselected if it has already been decommissioned or if there were data uncertainties. SS confirmed that the cumulative assessment will be updated as part of the ES Chapter and that the TCE Ornithology Headroom Report (2017) and associated spreadsheet were the sources for the majority of collision risk mortality estimates used in our cumulative assessment for Hornsea Four. The exceptions relate to new projects that have come into the PINS system since the publication of these data and where changes have been accepted as binding to previously consented OWFs (such as Sofia and East Anglia ONE). The CRM data termed 'Annual CRM Old CRM' are those which were used within our assessments, within Column M in the 'CRM Recalculation' tab within the above referenced Excel spreadsheet. SS

asked if Natural England were happy that those values are used? MK to take this away and confirm Natural England's position on this. MK stated that it is important to understand the level of processing undertaken on the cumulative values (if any).

ACTION: SS to send over The Crown Estate headroom spreadsheet. **Complete.**

ACTION: MK to confirm if the use of The Crown Estate headroom spreadsheet is appropriate for the cumulative assessment. **Complete.**

SS noted that herring gull and lesser black-backed gull were not taken forward into the cumulative assessment as the project alone impact was minimal. MK noted that if all projects did this then it would be hard to assess cumulative and in-combination impacts. It would be preferable for each project to update and provide a running total for the next project to pick up. AB confirmed it would be a bad precedent as Natural England won't be able to work out when each species is near or goes over a threshold. SS noted that this would be considered. SS asked if there is a current cumulative total for those species? MK stated that with the exception of the HOW03 data question, the assessment presented at the end of the Norfolk Vanguard Examination was one that Natural England were satisfied with. EA asked if Natural England were able to define those thresholds? MK stated that an increase of 1% above the baseline mortality rate is a trigger for a more detailed assessment.

Displacement – SS confirmed that the starting point for displacement cumulative tables were values agreed on other projects (cumulative auk numbers) and queried if that was still correct? MK confirmed that was the case as long as you are taking the final figures from the Vanguard examination, noting the outstanding comments on Boreas. The critical points to consider are around the use of buffers and presentation of matrices.

Barrier Effect

MK noted that there is no site-specific foraging data for auks but it seems entirely plausible that birds from Flamborough could reach the Hornsea Four site and beyond on foraging trips, or when accompanying chicks out to sea in the post-breeding period. MK expressed his concerns and stated that it is a difficult issue to address but more assessment is required. EA asked if MK had an idea of what he would like to see to address these concerns? MK noted that modelling was done for Scottish projects with respect to the (Isle of May) that looked at energetic impacts. SS appreciated that Hornsea Four is the closest of the Hornsea Projects to Flamborough Head, but if you take displacement into consideration then birds are not entering those areas. SS highlighted that more narrative and detail would be provided in the impact assessment but will be difficult to quantify. MK agreed that NE will discuss internally what might be appropriate.

Lighting Impact Assessment

AB noted that there is a new paper that has been published on the attraction of nocturnally migrating birds to artificial light (Rebke *et al.*, 2019) that AB can provide¹.

ACTION: AB to provide copy of the Rebke *et al.* (2019) paper. **Complete.**

¹ Available here: <https://www.sciencedirect.com/science/article/pii/S0006320718309054>

AOB

MK noted that a 'How To Read the PEIR' document would have been useful. EA noted that this had been drafted for PEIR and all agreed that a 'How To' guide for final ES would also be useful.

EA confirmed that a RIAA call will be scheduled for the next few weeks (now scheduled for 26/11/19) and the next face-to-face meeting will be organised for December/January. Based on availability, it was agreed that January would be most preferable.

MK noted that a lot of documents have been submitted to the Evidence Plan Technical Panel in relation to the Developable Area Approach (DAA) and asked if the project want Natural England's advice on these or whether they were just provided for information? EA confirmed that these documents were being provided for information and there are no further meetings planned in relation to the DAA.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
JD to confirm with AM if RSPB would still like to see Band Model Option 3	AM
MK to confirm the mortality rates that Natural England consider for assessment of displacement impacts for auks and gannets (1-10%). Complete <ul style="list-style-type: none"> AB confirmed that he needed to see the matrix before can confirm what Natural England's advice is on that. Complete 	MK
AM to check on where the pre-populated standard deviations in the sCRM came from for bird length and wind span (comment 6.83). Complete	AM
EB to provide Natural England advice on migrant seabirds/non-seabirds for HOW03. Complete <ul style="list-style-type: none"> EB to send a link to the specific written representation or provide the text in an email. 	EB
SS to send over The Crown Estate headroom spreadsheet. Complete.	SS
MK to confirm if the use of The Crown Estate headroom spreadsheet is appropriate for cumulative assessment.	MK
AB to provide copy of the Rebke <i>et al.</i> (2019) paper. Complete.	AB

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #7	03 March 2020
Meeting Date	26/11/2019	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ - RSPB</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p> <p>██████████ - Ørsted</p>	Our ref. HOW04/EP_TPOrnith_7
Absent	<p>██████████ – Natural England</p> <p>██████████ – Ørsted</p>	
Copy		
Next meeting	27 th February 2020	

Agenda

- Run through the English Sites that Natural England / RSPB consider need to be screened in;
- Define the designated features of above sites that Natural England consider need to be screened in;
 - This may involve an update in line with the upcoming release of the 2019 Foraging Range paper.
- Define the assemblage features of the above sites that Natural England /RSPB consider need to be screened in;
- What sites / designated features of sites did NE/RSPB consider should have been carried from alone to in-combination;
- Review the basis of what underpins Natural England /RSPB's decision making on the requirement to take a site feature (bird species) / assessment of said species from alone to in-comb or not;
- Update on little gull work we have done to define BDMPS population at Southern North Sea level;
- Update on proposed worst case being used for red-throated diver densities for consideration in the assessment of cable laying in the ECC.

DCO Submission Programme Update

JC confirmed the extension of the Hornsea Four DCO submission date to Q3 2020, noting that this is related to implications of the consent decision delay for Hornsea Three. JC stated that an engagement programme is currently being pulled together and this will be circulated in the new year. AB asked when the finalisation date will be for ES documentation. JC confirmed that documents need to be finalised and signed off one month prior to submission so this is likely to be August for the RIAA and the ES a few weeks before that. Hornsea Four will confirm the exact timings in due course.

Screening Document

SK confirmed that the HRA screening report and the subsequent update documents are currently being amalgamated into the one document, highlighting that this does not mean an update to screening – just creation of one document for clarity.

Run through the English Sites (and their corresponding features and assemblages) that Natural England / RSPB consider need to be screened in

General points

- AB confirmed that whatever are listed as the designated features on the Natural England site within the citations are the designated species of relevance.
- In relation to assemblages, AB clarified that conclusions need to cover the assemblages themselves rather than individual species. JC asked how this should be done. AB stated that the numbers of each species need to be put in context of the total number of birds in the assemblages (e.g. expressing the predicted level of impact for a species not recognised as a feature of the SPA or a 'named component' of the assemblage against the assemblage target abundance for the SPA in question).
- Update to the Thaxter *et al.* (2012) foraging range paper – AM confirmed that a second draft has been circulated and that the next draft is going to be provided to some developers for comment. AM stated that the RSPB are pretty happy with the updated paper and it details a greater foraging range for kittiwake. AM confirmed that the updated paper may be available before Christmas.

SS went through a screening spreadsheet¹ to discuss the sites and features screened in.

- **Northumberland Marine SPA** – all clear on features of this site to be included in the assessment are those within the individual SPAs within this wider area (see below sites).
- **Northumbria Coast SPA** – MK confirmed that in line with the proportionate approach, little tern doesn't need assessment as it seems like little tern are unlikely to be migrating through the Hornsea Four array area given their coastal distribution. JD stated that if little tern are not going to be assessed then the reasons for this need to be set out so there is an audit trail. It was agreed that Arctic tern would be the only species screened in, through connectivity during migratory periods.
- **Lindesfarne Ramsar** – MK noted that roseate tern have not bred there for decades. SS confirmed that little tern and waterbird species are screened out. It was agreed that no species would be screened in for this site.
- **Farne Islands SPA** - MK stated that there has not been recent nesting of roseate tern at this site. SS confirmed that cormorant and shag have been screened out with puffin screened in and black-legged kittiwake screened in only for the non-breeding season. MK agreed with that and also noted that the seabird assemblage of this site is also

¹ 'Updated HRA Screening results' – circulated to all attendees via email during call

important – razorbill in particular for this project. SS confirmed that the assemblage would also be considered.

- **Coquet Island SPA** – SS noted that the four tern species have been screened in with black-headed gull screened out due to the lack of connectivity and no evidence to suggest they would be migrating out to sea. AB agreed that approach sounds reasonable if none have been seen in the survey data. AM agreed.
- **Teesmouth and Cleveland Coast SPA** – SS confirmed that Sandwich tern have been screened in and noted that the key assemblage components would be screened out due to a lack of connectivity with the Hornsea Four array area. MK agreed with this.
- MK noted that there is a **Teesmouth and Cleveland Coast pSPA**² proposed with features such as breeding common tern, breeding pied avocet and non-breeding ruff. MK confirmed that the public consultation documents³ are still available on the Defra website.
- **Flamborough and Filey Coast SPA** – Seabird assemblage – MK noted that the named components of the seabird assemblage are fulmar and the non-named components are puffin, herring gull, shag and cormorant. SS noted that shag and cormorant are screened out due to distance, but this may change depending on the updated foraging range paper. MK noted that in-combination justifications for screening in/out must be clear. SS asked what other projects Hornsea Four would be interacting with in relation to herring gull in-combination – MK confirmed that it could be Westernmost Rough and Humber Gateway.
- **Hornsea Mere SPA** - MK confirmed that there is only one SPA feature and that is gadwall; all other features are SSSI features⁴. SS noted that both mute swan and gadwall are noted as qualifying features within the latest conservation objectives on Natural England’s designated sites website.
- **Humber Estuary SPA and Ramsar** – SS noted that there is an outstanding action in EB to provide a copy of Natural England’s advice on Hornsea Three in relation to migratory birds. MK stated that it wasn’t clear if Hornsea Four had looked at lines of flight and considered whether other sites would interact – for example why was The Wash not considered? SS stated that it wasn’t considered because it hadn’t been put forward for other projects in the Hornsea Zone. SS confirmed that some narrative would be added.
- **Greater Wash SPA** – SS proposed the screening out of common scoter on the basis of it being a distributed towards the southern end of the site and not found in numbers warranting assessment within the ECC. MK stated that a narrative should be provided to say that the bulk of population is further south off of Norfolk, and only the sightings in this area met the threshold of the maximum curvature analysis needed to delineate potential site boundaries for common scoter. MK confirmed that it probably needed to be considered as LSE, but no AEOI could be readily concluded with through the above narrative.
- SS asked if there were any other sites (other than ones relating to migratory waterbirds) that Hornsea Four should be including? MK confirmed that there are no additional sites that Natural England consider should be added.

² Post-meeting note from Natural England: On 16 January 2020, the Minister announced the classification of the pSPA, so this extended site with additional features now becomes an SPA and subsumes the previous SPA.

³ <https://consult.defra.gov.uk/natural-england-marine/teesmouth-and-cleveland-coast-potential-sp/>

⁴ Post meeting note from Natural England: Updated high-level conservation objectives and supplementary conservation advice were provided for the SPA in February and March 2019 respectively. These clarified the status of mute swan within the site as a qualifying feature –for its post-breeding and moulting (not wintering) population.

What sites / designated features of sites did Natural England/RSPB consider should have been carried from alone to in-combination

SS asked if attendees were content with how things have been carried from the alone to in-combination assessment or not been carried forward? SS noted the comment within the PEIR responses which queried why only Flamborough & Filey Coast SPA was considered within the in-combination assessment. SS stated that for the sites where it has been concluded that there is no LSE alone, the project considers that there would be no material contribution to any in-combination effect. MK stated that this narrative/methodology needs to be made clearer. MK gave an example for Coquet Island SPA and puffin – if there is no LSE alone as component of the assemblage then you might take the view that puffin are widely distributed in the non-breeding season so they could be interacting with other projects - could those impacts from multiple projects be summed with the Hornsea Four impact to warrant a consideration in the assessment? SS confirmed that this approach would be considered. MK noted that herring gull at Flamborough, Puffin at Coquet Islands, and auks at the Farne Islands are the examples that come to mind. SK asked if this is because Natural England have concerns about those populations? MK confirmed that was the case.

Little gull BDMPS population definition

SS stated that the project has followed the Bob Furness methodology for BDMPS to come up with migratory non breed population for little gull in Southern North Sea.

ACTION: SS to share note on little gull BDMPS population definition.

Red-throated diver densities

SS proposed that in order to get a density of RTD in the ECC, Hornsea Four want to look at a worst case scenario that looks at the higher density area within the Greater Wash SPA consultation documentation. The highest density from these data would then be assumed as the density of divers within the ECC out to the extent for the Greater Wash SPA seaward boundary (as there is no evidence that diver densities continue out as far as the array area). AB asked if that methodology could be put in writing for consideration.

ACTION: SS to provide an email/note on the proposed method of getting a density of RTD for the ECC.

Other Outstanding Actions

SS confirmed headroom spreadsheet sent out to Technical Panel members. AB to discuss this internally and confirm appropriateness of this.

ACTION: AB to confirm appropriateness of use of headroom spreadsheet.

JC noted that Hornsea Four are waiting to hear back from Natural England on the precision work (if the 4 months analysis shows no improvement in precision then no further analysis required). MK noted that it's hard to give a clear answer – it depends on the magnitude of the change in precision.

ACTION: Natural England to respond to email on precision decision. Hornsea Four to agree with NE and RSPB the threshold for precision.

SK Programme change

SK asked if there were any specific workstreams that consultees would like Hornsea Four to include in the pre-application programme? MK stated the alternatives/IROPI case and compensatory measures should be considered. JC stated that Hornsea Four wish to set up an examination workshop/ workstream to try and discuss and agree as many issues as possible prior to application.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
EB to provide a copy of Natural England's advice on Hornsea Three in relation to migratory birds	EB
SS to share note on little gull BDMPS population definition.	SS
SS to provide an email/note on the proposed method to estimate the density of the ECC.	SS
AB to confirm appropriateness of use of headroom spreadsheet.	AB

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #8	5 th May 2020
Meeting Date	27/02/2020	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ - Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p>	Our ref. HOW04/EP_TPOrnith_8
Absent		
Copy	██████████ – Ørsted	
Next meeting	TBC	

Agenda

- Introduction & Project Update
- 4 months Additional Camera Analysis
 - Overview of findings and next steps. Report will be shared after the meeting
- Collision Risk Modelling
 - sCRM update; parameters for ES Chapter; methods for calculating SDs and sCRM v CRM
- Seabird foraging ranges
 - Understanding and application of Woodward et al (2019) seabird foraging ranges for use in HRA Screening
- Cumulative CRM
 - Latest cumulative CRM update from TCE (TCE, Dec 2019) document
- Guillemot extended non-breeding bio season
 - Discussion on the use and estimation of realistic extended non-breeding bio season data for highly fluctuating guillemot at Hornsea Four
- Red throated diver densities
 - Use of Greater Wash SPA consultation paper data to estimate densities / abundance of red throated divers within the Hornsea Four ECC

Project Update

EA noted that as has been discussed during previous Ornithology Evidence Plan meetings, the Hornsea Four DCO Application submission date has been extended by 6 months from Q1 2020 (March 2020) to Q3 2020 (September 2020). This is due to uncertainties in current consenting landscape on which clarity is sought to inform Hornsea Four's consenting strategy and DCO Application. EA stated that there are a number of topics that have been highlighted by key stakeholders which would benefit from additional time to consider and improve the overall quality of our DCO Application. MK asked when the cut-off date for advice on assessments would be? EA confirmed that May would be the cut-off and after that time, the focus would move to Evidence Plan Agreements Logs and Statements of Common Ground. MK asked for a draft schedule of engagement for this Evidence Plan.

Action: Hornsea Four to provide a draft schedule of engagement for the Ornithology Evidence Plan.

EA stated that consultants are currently updating assessments, technical reports and annexes in relation to updates from PEIR to ES, s42 consultation responses; and incorporating any changes to the project description/design and any new baseline data. EA noted that site selection work is ongoing with minor updates to the offshore Export Cable Corridor (ECC) and the landfall refined down to one site from the two presented at PEIR.

EA noted that in relation to offshore and intertidal ecology, the first updated ornithology technical report (baseline) has been received for review and subsequent technical reports (displacement, CRM, PVA) and the chapter are being drafted/updated by APEM and will be received by Hornsea Four in due course.

Four Months Additional Camera Analysis

EA confirmed that the analysis of four cameras for the four months previously agreed with the Technical Panel members has been completed and the report will be provided later today (27th February 2020). EA stated that a further three months in the same year are now being analysed so that there is coverage of a whole breeding season. The report for this additional analysis will be shared with the Technical Panel once available. AB and AM were happy the analysis has been completed and looked forward to receiving the report.

Action: Hornsea Four to provide the four month additional camera analysis report.

SS gave an overview of the findings of the four month report, stating that analysis has shown very little difference in abundances and densities for key species, and no real difference in spatial distribution of those key species within and / or between years. SS noted that Hornsea Four are satisfied that this reanalysis has provided evidence that no significant differences are apparent within these data when analysing 4 or 2 cameras. The results show that as the baseline does not differ through additional analysis then the results of the impact assessments would be so similar as to be of negligible difference. AB asked if there was any difference to the confidence intervals? SS confirmed that there were no significant differences in the confidence intervals or the precision values.

Collision Risk Modelling

EA noted that a summary of CRM parameters had been sent round to Technical Panel members on the meeting invitation (2. Hornsea Four CRM Parameters & sCRM Test.pdf). SS

highlighted that the most significant change to the Project Design for the application stage is to the air gap, which has been raised since PEIR to 40 m MSL. SS noted that the document has attempted to capture Natural England's preferred parameters, put forward in S42 comments and through consultation during previous Evidence Plan meetings.

Table 1 – Maximum Design Scenario (MDS) for Hornsea Four WTG parameters.

AB noted that the WTG MW capacity isn't in the parameters. SS confirmed that Hornsea Four are not applying for a capacity, rather a maximum number of turbines and maximum turbines parameters to create a MDS. AB queried if there could be a greater number of smaller turbines if these large turbines weren't available, which may mean the worst case is not captured. SS noted that the maximum number turbines is 180, so there would never be any more turbines than that and if smaller ones were developed then they would also be designed with the raised air gap (40m MSL) and so any potential impacts would be reduced as a consequence.

AB queried the tidal offset. SS confirmed that Bill Band (creator of the model) has approved this method through discussion with APEM. AB stated this was acceptable.

Table 2 – Seabird species biometrics in CRM

SS noted that Natural England are in agreement with species biometrics for both body length and wingspan but that Natural England have raised issues relating to use of SDs surrounding each parameter from MSS sCRM. SS noted that the RSPB were asked to investigate how SDs were developed, but the response was that the sCRM development team were unsure. AM noted that the proposed SDs in Table 2 are sensible. AB noted that the lack of clarity regarding where the SDs came from introduces uncertainty into this part of the assessment, but MK noted that as these are the best numbers currently available, Natural England agree it is acceptable to use them so long as there is recognition of these difficulties and uncertainties in the CRM Technical Report and assessment, so there is an audit trail for when Natural England are providing advice.

Table 4 – Seabird flight speeds in CRM

SS asked if Natural England or the RSPB have any thoughts on the Bowgen and Cook (2018) paper. AB stated not in relation to flight speeds. SS noted that Natural England are in agreement with species' flight speeds, which are mostly from Cook *et al* (2014), that provided a summary of Pennycuick (1997) and Alerstam *et al.* (2007). SS also noted that Natural England are in agreement with use of SDs surrounding seabird flight speed, with Natural England suggesting using different approach for gannet, using Cook *et al* (2014) as well as Skov *et al* (2018) for a range. AB confirmed that Table 4 seems consistent with Natural England advice.

Table 5 – Nocturnal activity factor (NAF) rates and seabirds flight types in CRM

SS stated that Natural England wish to see a range of NAFs in ES assessments as no SDs are associated with them. SS noted that Hornsea Four would prefer an evidence-led approach supporting a lower range, but use of range provides an SD as suggested by Natural England. SS noted that Natural England are in agreement on flight type. AB noted this is consistent with what Natural England have advised. MK asked if there was any update on the progression of an unpublished paper on kittiwake nocturnal activity rates that RSPB had been part of? AM reported that it seemed to be terminally stalled, with the RSPB due to be co-authors on this but there was a fundamental disagreement on the tracking data, so this is unlikely to come in soon. AM highlighted that a report will be published from RSPB on kittiwake soon, but in the first instance not be in the format of a peer-reviewed paper.

Table 6 – Estimated proportion of seabirds flying at PCH.

SS highlighted that the revised PCHs are based on raised air draft of 40 m MSL. SS noted that Natural England currently do not agree with use of site-specific boat data, but Hornsea Four's position is currently to utilise these site-specific data in order to provide a realistic range of scenarios for CRM. AM queried if this table was meant to refer to the updated Johnston *et al* (2014) data? SS confirmed this was the case. AB asked how the values have been derived from the boat-based data? SS explained that the survey provider collated any data from previous boat-based surveys that overlapped with the Hornsea Four array area. SS noted that this was applied for the PEIR and it has been rejigged for use in the ES stage CRM, using the raised 40 m MSL air gap. EA noted that details of this methodology can be sent to the Technical Panel. AB requested that this information was shared.

Action: Hornsea Four to provide information on the methodology for deriving values from boat-based data.

MK highlighted that Natural England have long standing concerns with the use of boat-based data in Option 1 of the CRM and or sCRM, having raised this most recently during the examination phase of Hornsea Three, as well as for Hornsea One and Hornsea Two. MK noted that these reservations are only going to intensify for Hornsea Four due to the age of the zonal and project level data feeding into these calculations and the number of years between that data set and those used to define Hornsea Four baseline. MK suggested that an extremely robust case would need to be developed as to why these data are acceptable for use and to add further clarity as much as possible (e.g. number and length of transects overlapping, proportion of site covered, number of observations, how the flight heights were estimated and recorded in the field, and any post survey processing). AM added that it would be useful to present any validation e.g. if Hornsea Four are able to provide any details of any training in height estimation that surveyors had (not European Seabirds At Sea (ESAS) training as this does not include height estimation) and if there was any calibration testing of their ability to do estimate flight heights.

AB highlighted that there are no SDs presented in Table 6 and asked how these are going to be derived. SM confirmed that this could be written up and provided after the meeting.

Action: APEM to provide methodology of calculation of SDs in relation to Table 6 (Estimated proportion of seabirds flying at PCH).

Table 2b – Avoidance rates (ARs) seabirds in CRM

SS stated that the upper ARs are those from Bowgen & Cook (2018) for KI, LB, HG & GB. SS asked if Natural England or RSPB have an update on Bowgen & Cook or when that review would be available? AB stated that Natural England have some issues with use of Bowgen & Cook figures as they are based on median rather than mean values but noted that Natural England are trying to get some extra work done to come up with avoidance rates that they can feel comfortable with. AB stated that for Natural England, the least risky thing to do is to also do basic Band modelling and that would cover all bases for Examination. AB stated that Natural England can't confirm the timetable to get a firm Natural England view on the Bowgen & Cook paper but confirmed that it would be advice on all species rather than a species by species basis. SS asked if Natural England are advocating the use of the sCRM, using the more precautionary 'lower' avoidance rates presented in the table. AB stated that they currently do

not have a set of avoidance rates that they are comfortable in advising for use in the stochastic model. AB highlighted that whilst Natural England cannot currently provide advice on avoidance rates, they understand it is a huge priority and hope it will be resolved in a matter of months.

Action: Natural England (AB) to keep Hornsea Four updated with progress on NE's advice on avoidance rates.

AB highlighted the point that Natural England are not sure if deterministic avoidance rates are appropriate for use in a stochastic model. SS asked that if Natural England are not comfortable with use of avoidance rates in the stochastic model, the project could use the sCRM without the SDs? AB stated that the Natural England advice is to run the basic Band models using the SNCBs guidance (SNCBs, 2014), noting the difficulty to advise on any stochastic model. MK noted that the Norfolk Boreas OWF post-submission assessment team are also struggling with this issue at the moment and have presented the basic Band model rather than engaging with the sCRM tool due to the ongoing issues. SS noted that this was because MacArthur Green (who lead on the Norfolk Boreas ornithology assessments) are using their own R-code stochastic model, that in itself has not been audited or tested independently. SS noted that at the SNH workshop held on February 20th it was noted that the 'bugs' had been fixed in the MSS sCRM. MK reiterated that the only set of avoidance rates that Natural England are comfortable with are in the SNCB's 2014 advice using a deterministic model, but recognised that Hornsea Four may want to argue for the use of the Bowgen and Cook values.

AM stated that DMP Statistical Solutions, the statistical consultants leading on the development of the MSS sCRM, tested the output of the stochastic and deterministic Band model and found there was consistently less than 1% difference between them. SS asked if that has been published. AM confirmed that the best source would be the outputs of the SNH workshop last week, which are due to be issued in mid-late March. AB noted that Natural England would need to see evidence of this test before they could be comfortable. AM is happy with this approach.

Action: AM/Ørsted to set up a meeting with Dr Carl Donovan (DMP Statistical Solutions), AM and AB.

SS noted that Natural England requested ARs from SNCBs (2014) to be converted from 2SD to 1SD format and confirmed that APEM are able to do this. SM stated that it is simply a case of dividing by 2. AB noted that Natural England still have some questions about how the original SDs have been derived but will need to report back to the group on this as not sure that is the appropriate way to do it. AM stated that Natural England agreed with the use of the SNCBs (2014) advice on avoidance rates for use in CRM. The RSPB stated that their current position was in agreement for with Natural England with the use of the SNCBs (2014) advice on avoidance rates, with the exception of gannet in the breeding season, which they consider to be 0.980, though this assumption of a more precautionary macro-avoidance the evidence supporting the BTO review and SNCB position is drawn from out with the breeding season and breeding birds are likely to have a different behavioural response to turbines. EA noted that Hornsea Four will discuss internally about using Natural England and RSPB different preferred avoidance rates.

Action: Natural England (AB) to provide advice on how 2SDs should be converted to 1SD.

AM stated that the RSPB would be happy if the sCRM was run deterministically. AB highlighted that the differences between the sCRM and Band (2012) in the document show differences larger than 1% that AM is reporting. SS suggested a meeting with the sCRM statisticians to clarify this point. AM confirmed that the report from the SNH workshop would be available at the end of March. AB also noted that in the comparison tables for the CRM there might be some errors with Kittiwake BO2. SS confirmed that it will be double-checked, but that the difference viewed may simply be due to rounding. AB requested that output logs from sCRM could be provided – SS confirmed that this could be done.

Table 7 – Wind availability and mean downtime of WTGs.

SS noted that Natural England are in agreement with these SDs which were provided by Hornsea Four. AB queried why downtime doesn't vary. SS to confirm. MK noted that it would be useful to get some clarity on the downtime but confirmed that nothing stands out of concern in Table 7.

Action: SS to confirm why downtime doesn't vary / where the values come from.

Table 8 – Density of birds in flight

SM noted that the proposed method to calculate SDs around flying bird densities would be to use the highest and lowest values from the ranges of the CLs between the two years. These could be used as a proxy to calculate SD using rule of thumb (i.e. calculate SD of 2 values: lowest Lower CL and the highest Upper CL out of the 4 per species that we would have per month). That would capture variation between years. AB stated that this sounds sensible in practice but will have to get back to the Technical Panel to confirm thoughts on this issue.

Action: Natural England (AB) to provide confirmation that the alternate method is appropriate for calculating SDs around the densities of birds in flight.

CRM Next Steps

EA noted that the minutes would be sent round as soon as possible, tabulating the information with as much detail as possible to highlight similarities/differences, to help confirm any areas of agreement and disagreement before running the CRM.

Seabird Foraging Ranges

In relation to the Woodward *et al.* (2019) paper co-written by the BTO, NIRAS and the RSPB on Seabird Foraging Ranges for use in HRA Screening, SS noted that Mel Kershaw (Natural England) peer reviewed the paper and asked if Natural England could provide an update on their view of this paper? AB confirmed that Natural England have no issues with the report itself but haven't discussed how you use it and questioned if Hornsea Four were seeking assurance that there won't be any problems with results based on use of this paper. SS agreed and confirmed that Hornsea Four would like to use these new mean max foraging ranges for assessment purposes (HRA Screening in particular). AB noted that other projects have made use of some of the data in this report (Norfolk Boreas and Vanguard OWFs).

AB stated that it was difficult to comment on specifics without seeing what Hornsea Four are planning to do. AM noted that in relation to kittiwake and the Flamborough and Filey Coast: one issue using the mean max from the MS Excel spreadsheet data associated with the Woodward *et al.* (2019) paper was that trying to use these data from FFC SPA across years is that the more recent tracking used a different attachment method that gave a longer period

for tracking so made longer foraging trips as the chicks got older. AM noted that those trips are only captured from the 2017 data in that report so it may not be entirely appropriate or may need to be caveated. SS noted mean max and max values (especially for gannet) show some overlap between foraging ranges, but that is not usually the case for gannet. AB stated advice could be provided on that.

Action: Natural England (AB) to provide advice on mean max ranges and gannet overlaps.

SS asked if anyone knew anything about the site-specific max ranges for the Farne Islands kittiwake as these show shorter distances than for the other colonies. AM stated that he didn't know what the reason for that is, possibly differences in attachment methods but it does highlight that where there are site specific colony data that those are highlighted and used. AB confirmed that he was also not aware of a particular reason for this.

Red-throated diver densities

Regarding Red-throated diver densities from Greater Wash Consultation Report (2018) for the ECC:

SS stated that in response to Natural England's comments previously raised, that the densities from the northern most tip of the Greater Wash SPA were not used and values were instead derived using a precautionary approach from the peak density in the northern region of the Greater Wash SPA. SS asked if Natural England and RSPB agree with this logic? AB stated that the issue with suggested approach is that these data from the pSPA consultation paper were based on visual aerial surveys, which underestimate the number of divers, so as the SeaMast data uses digital data which is more accurate, combining the two would be more appropriate. AB stated that it is possible to scale up the difference in the methods between the visual and digital methods. SS to look into this again and consult with AB in order to prepare a revised position at the next evidence plan meeting.

Cumulative CRM

SS noted that there had been a recent cumulative CRM update from TCE (TCE, Dec 2019) document and asked if Natural England have been involved in consultation with TCE for this? AB stated that he didn't even know it had been updated but that Natural England cumulative CRM comments made at PEIR will still apply. AB stated that it would be useful to have a streamlined approach and he will discuss this with colleagues and discuss what role Natural England should play in this process, noting that the Marine Management Organisation (MMO) should also be involved. AB noted that there will be something in an upcoming Norfolk Boreas OWF submission about Natural England's position on the consented vs as built OWF cumulative situation. SS highlighted that the next iteration is due in May and it would be helpful for Natural England to get involved with its drafting to ensure standardisation across the industry. MK cautioned that the purpose of the TCE document is to understand the potential headroom available for Round 4 OWFs at the plan level HRA rather than for EIA purposes for cumulative assessments, as such caution is advised. MK noted that the spreadsheet could be used as a starting point for creating a wider spreadsheet to be used for cumulative assessments.

ACTION: EA to have a conversation with the Ørsted Strategic team and see if creating an EIA cumulative CRM spreadsheet can be raised with JNCC at a strategic level.

MK noted that Natural England will fall back on standard advice – i.e. they only consider changes to cumulative impacts where an OWF has been through a legal or licensing mechanism that secures the 'as built' project and prevents any future additional development. Then, MK advised that it is their advice that any revised CRM should be rerun using the precise turbine parameters rather than scaling and figures that the original consent was based on should be used where these are available. EA confirmed Hornsea Four would look out for the emerging advice on this topic from Natural England through upcoming representations during the Norfolk Boreas examination to understand Natural England's position on this, and that this topic would be returned to on a later Evidence Plan call.

Clarification from Evidence Plan #7 minutes

SS raised a query over hypothetical example of predicted level of impact from a species not recognised as a feature of the SPA or a 'named component' of the assemblage against the assemblage target abundance for the SPA in question. AB stated that this simply means that the level of an impact on such species should be assessed with consideration of the entire assemblage and that if such loss would not cause the assemblage to be subject to a significant adverse effect then this should be presented.

Guillemot extended non-breeding bio-season

SS noted that the months considered as the post-breeding dispersion bio-season are the most abundant months for guillemot within the Hornsea Four array area and 2 km buffer. The array area plus 2 km buffer abundance estimate is approx. 59,000 birds. In relation to the return migration, migration free breeding and migration free wintering seasons, SS noted that there are significantly lower abundances within the array area plus 2 km buffer of approx. 8,000 to 16,000 birds across these three bio-seasons.

SS noted that a normal bio-season is a 2-3 month window, which when applying the commonly used mean of the peaks from the first and second year of data provides a sensible approach and precautionary abundance for a bio-season. However, SS highlighted that when the same approach is applied to extended breeding seasons extreme peak months skew the data disproportionately and do not accurately reflect the abundance of a species over a longer period. SS proposed that when calculating extended bio-season abundances for use in impact assessment the mean of three bio-season's mean peaks should be considered as more appropriate and precautionary enough for the purpose of assessment. AB and MK concluded that a note would need to be prepared and issued ahead of the next evidence plan meeting in order for Natural England to review and provide any advice accordingly.

Action: Natural England (AB) to consider the proposal for calculating the guillemot extended breeding season ahead of next evidence plan meeting on receipt of a note to explain this proposed method.

Little Gull population

SS noted that a note had been produced by APEM on little gull which was provided to the Technical Panel for information. Natural England to consider this and can discuss this at the next Evidence Plan meeting.

PVA

AB provided an update on the model and that the final version is being uploaded in the next few days.

Action: Natural England (AB) to provide a link to the updated PVA model.

Horizon Scanning

EA asked if any EP members were aware of any upcoming useful information that may be useful for consideration in the Hornsea Four impact assessment process. AM confirmed nothing over and above what was discussed earlier in the meeting about the SNH meeting which is due in March. Nothing new flagged by Natural England.

Next Steps

Arrange call with Dr Carl Donovan before the next Evidence Plan meeting.

EA to call round Technical Panel members to agree the dates for the next Technical Panel meeting once the meeting with Dr Carl Donovan has been arranged.

EA to send round the Four Camera Report after this meeting for information purposes only, noting that it would be useful to know prior to the next meeting if Natural England don't agree with the outcomes.

Summary of Agreements and Disagreements

Agreements

Table 2 (Seabird Species Biometrics in CRM) - Natural England are in agreement with the seabird species biometrics in CRM for both body length and wingspan

Table 2 (Seabird Species Biometrics in CRM) - RSPB agree with the proposed SDs

Table 2 (Seabird Species Biometrics in CRM) – Since they are the best available, Natural England agree with the proposed SDs, as long as the uncertainties are recognised in the CRM Technical Report

Table 4 (Seabird Flight Speeds in CRM) - Natural England are in agreement with the species flight speeds and the use of SDs surrounding seabird flight speed

Table 5 (Nocturnal Activity Factor rates and Seabirds Flight Types in CRM) – Natural England are in agreement with this table as it is based on their advice

RSPB would be happy if the sCRM was run deterministically

Table 7 (Wind Availability and Mean Downtime of WTCs) - Natural England are in agreement with the SDs of mean downtime, subject to the clarification requested regarding the lack of downtime variation.

Disagreements

Table 2 (Seabird Species Biometrics in CRM) - Natural England have raised issues relating to use of SDs surrounding each parameter from MSS sCRM

Table 6 (Estimated Proportion of Seabirds Flying at PCH) - Natural England currently do not agree and have had long-standing concerns with the use of site-specific boat-based data in the Hornsea zone.

Table 2b (Avoidance Rates Seabirds in CRM) - Natural England have some issues with use of Bowgen & Cook avoidance rates figures but do not currently have a set of avoidance rates that they are comfortable in advocating in the sCRM.

Natural England would not be happy if the sCRM was run deterministically because the differences between the sCRM and Band (2012) in the APEM document (Table 1 Collision estimates using Band (2012) CRM and Table 2 Collision estimates using MSS (2018) sCRM through Shiny App (with SDs removed)) show differences larger than 1%

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to provide a draft schedule of engagement for the Ornithology Evidence Plan.	Ørsted
Hornsea Four to provide the four month additional camera analysis report.	Ørsted
Hornsea Four to provide information on the methodology for deriving values from boat-based data.	Ørsted
APEM to provide methodology of calculation of SDs in relation to Table 6 (Estimated proportion of seabirds flying at PCH).	APEM
Natural England (AB) to keep Hornsea Four updated with progress on NE's advice on avoidance rates.	AB
AM/Ørsted to set up a meeting with Dr Carl Donovan of DMP Statistical Solutions, AM and AB.	AM/Ørsted
Natural England (AB) to provide advice on how 2SDs should be converted to 1SD.	AB
SS to confirm why downtime doesn't vary / where the values come from.	SS
Natural England (AB) to provide confirmation that the alternate method is appropriate SDs around the densities of birds in flight.	AB
Natural England (AB) to provide advice on mean max ranges and gannet overlaps.	AB
EA to have a conversation with the Ørsted Strategic team and see if creating an EIA cumulative CRM spreadsheet can be raised with JNCC at a strategic level.	EA
Natural England (AB) to consider the proposal for calculating the guillemot extended breeding season at next evidence plan meeting after receipt of note on proposed method.	AB
Natural England (AB) to provide a link to the updated PVA model.	AB

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #9	9 th July 2020
Meeting Date	21/04/2020	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ - Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p>	Our ref. HOW04/EP_TPOrnith_9
Absent		
Copy	██████████ – Ørsted	
Next meeting	TBC	

Agenda

1. Welcome & Project Update
2. Additional camera analysis update
3. Little gull population
4. PVA parameters
5. QA results (s42 request)
6. Abundance estimates over extended non-breeding bio seasons
7. Red throated diver densities
8. Clarifications regarding Natural England's written response to sCRM workstream
9. Data sources for intertidal ornithology
10. General updates/AOB

1. Welcome & Project Update

EA noted that Hornsea Four is on track for a September 2020 DCO Application submission, highlighting that it is still business as usual with Ørsted working from home. EA stated that the Hornsea Four Engagement Strategy was shared with Natural England on 9th April within which three further pre-application Ornithology Evidence Plan meetings (with associated meeting objectives) were set out:

- May 2020 - to reach agreement on updated HRA Screening and PVA results and to ensure any remaining actions/topics that will inform the assessments are closed out;

- June 2020: to close out any outstanding issues on the RIAA and present PVA technical report; and
- August 2020: to review and agree the content of the agreement logs to inform Statements of Common Ground (SoCGs).

EB highlighted Natural England's limitations given the current working from home restrictions, and AM suggested Microsoft Teams as a good way to communicate and share documents. EB noted that the cut-off date for input into the ES would likely be in August 2020.

2. Additional Camera Analysis Update

- Document Reference: "HC00029 406 _The relationship between aerial survey coverage and data precision at Hornsea Four_FINAL.pdf"
- Objective: NE /RSPB to confirm whether they agree with Hornsea Four's position on the findings of the report, and if not state an alternate position and recommended next steps

EA gave a brief overview of the key findings of the report (4 interannual months June & August 2016 & 2017), stating that Hornsea Four consider that increasing survey effort would not result in important changes to impact assessment results, and therefore the conclusions reached by the impact assessment. EA reiterated that this report gives Hornsea Four sufficient confidence to close the topic and proceed with two cameras.

EA noted that the report has been updated with the months of April, May and July 2017 to provide a full season, using the same statistics and spatial data and this 7 month report will be reissued to the Evidence Plan Technical Panel shortly.

AB stated it was very positive that the additional camera analysis had been carried out. AB highlighted that formal feedback will be provided on the 7 month report but from looking at the 4 month report, it does appear that there is little added value in including additional camera data and doesn't reduce variability in a consistent way.

AB queried why cameras 2 and 3 have been used for the EIA baseline but comparisons have been made in the report between different camera scenarios (1&2 vs 3&4). AB highlighted that resolving this would be key before Natural England can present their final advice.

Action: EA to confirm detail/justification in relation to comparison between camera scenarios.

AB also requested that some basic additional data be provided that presents the abundance estimates with precision and UCL / LCL of each month for the key seabirds, as these data were only provided in graphical form in the report. AB asked if these data could be tabulated or put in a spreadsheet as an appendix to the report.

Action: EA to consider if a tabulated data appendix could be added to 7 month report.

EA asked if attendees could agree that there is no value to analysing any additional data and the matter can be closed if the 7 month report has similar results to the 4 month report? AB confirmed that Natural England would be happy to close the matter, depending on the outcome of the camera scenario query and whether the 7 month report has the same results

as the 4 month report – if patterns are the same, Natural England would be happy to close the topic based on the 7 month report. AM expressed thanks for carrying out the exercise and that the initial findings look good. AM stated that the RSPB have a similar opinion to Natural England on this and will be content to close the matter (pending review of 7 month report, which will provide sufficient content to close the topic) and will provide a formal response once the 7 month report is received.

3. Little Gull Population

- Document reference: APEM_Estimate of little gull population within the North Sea"
- Objective: NE /RSPB to confirm whether they agree with Hornsea Four's position on the findings of the report, and if not state an alternate position and recommended next steps

SS gave an overview of the work that has been done to calculate a population estimate for little gull (as no population estimate for little gull provided by Furness (2015)). SS noted that a range of 23,500 to 37,500 in English North Sea waters was calculated with an estimate of BDMPS for autumn migration for use in assessment of offshore wind farms of 30,500.

SS asked for feedback on the little gull note that was provided to the Evidence Plan Technical Panel. MK stated that Natural England is content with the use of the calculated population estimate within the note, highlighting that it provides the best available evidence and a clear audit trail but that it is important to acknowledge in the assessment the low data confidence and how poor the understanding of the population of little gulls is with quite broad estimates. AM noted that RSPB hadn't done a full review of the note so would defer to Natural England on this but in general agreed on the use of the estimates with caveats and qualifications required in the text to acknowledge the low data confidence. AM also noted that this is a difficult exercise and thinks the method presented is the best that can be achieved given the uncertainty. MK queried whether a copy of the map in Appendix 1 could be zoomed in to focus on the North Sea and requested a clear audit trail for how this figure was derived.

Action: SS to consider alternative ways of presenting the information in the map in Appendix 1 of the little gull note and add in notes to provide explanation of any data sources not specified in order to provide an audit trail as appropriate.

MK queried where the extreme lower limits had been calculated/sourced from.

Action: SS to confirm where the extreme lower population limits for little gull came from.

AB noted that it might be useful to raise little gull population estimates on a strategic level.

4. PVA Parameters

- Document Reference: "Consultation PVA Parameters.xlsx"
- Objective: NE to confirm if they agree with these PVA parameters or present alternative parameters so modelling can commence

SS confirmed that the species taken forward in the assessment will be gannet, kittiwake, guillemot, razorbill and puffin at Biogeographic, BDMPS and FFC population levels. SS asked for agreement on the species that should be considered in the PVA. AB's initial view was that the key species have been included, but Natural England haven't completed their review yet so formal feedback would be provided after their internal meeting on Monday 27th April. EA

asked if a formal response in writing will be provided? AB confirmed that a response could be provided in writing. EA confirmed that it would be useful to have it in writing to capture in the Hornsea Four Agreement Log.

Action: Natural England to provide written feedback on PVA species.

AB noted that the PVA spreadsheet refers to both individuals and pairs and Hornsea Four might want to consider sticking to one or the other rather than including both. AB also noted that Natural England would expect 5,000 simulations to be run for each species. AB also raised a query about productivity for Flamborough – were the individual values for one season or was this an average over longer period of time? SS confirmed that a call should be set up to discuss Natural England's response and any queries coming out of their review of the PVA parameters.

Action: SS to set up a call to discuss Natural England's response on PVA parameters once formal feedback received.

AB noted that there is information in the Boreas Deadline 2 submission in relation to their PVA modelling, highlighting that their guillemot modelling was undertaken using the Natural England PVA tool. AB confirmed that Boreas provided input and output logs for the PVA tools and Natural England would welcome this approach on Hornsea Four. SS confirmed that these logs would be provided for the PVA.

SS confirmed that the Natural England PVA tool appears to be working correctly now with the previous issues now resolved, which related to the model not running simulations for the required 5,000 times. AB requested that any issues with the PVA tool are added to the GitHub.

Post-Meeting Note to Natural England: SS reports that there may still be an issue with it running 5,000 times.

SS asked AM if there were any updated colony count reports expected imminently.

Action: AM to confirm if there are any updated colony count reports available or expected.
Complete - Flamborough and Filey Coast SPA Seabird Monitoring Programme 2019 Report provided.

AB noted that Natural England advice is to use colony counts for a time period closest to the project-specific survey time period so the 2017 colony counts should be used for the PVA. MB noted that the 2017 puffin count had very low accuracy which is why the data from the 2018 count has been used. SS confirmed that this narrative will be provided within the report.

MK asked if large gulls are being considered in the Hornsea Four PVA? SS confirmed that the project doesn't consider it necessary to undertake a PVA for lesser black-backed gull and herring gull as Hornsea Four found very few individuals of these species in the surveys so the risk for these species is so low that there would be no material contribution to any cumulative impacts. SS noted that in relation to great black-backed gull there is a low risk of collision and they don't breed at Flamborough Head so it would also not be included. SS highlighted that the Hornsea Four PEIR used the results of other projects' PVAs. MK noted the need to

consider cumulative impacts at the EIA scale, and stated that Natural England will consider large gulls in their formal PVA response.

Action: Natural England to include comment on PVA of large gulls in their formal PVA response.

5. QA Results (S42 Request)

- Document Reference: "Review and ID QC rates.xlsx"
- Objective: NE to confirm if this information is sufficient or state any further detail required

EA noted that Natural England had requested QA results in relation to the aerial survey and these had been provided by Hornsea Four. AB stated that the results look pretty standard compared to other projects but noted that there seems to be seasonal decline in ID rates in the winter and queried the reasons for this. AB is happy for this Section 42 request to be closed.

Action: EA to confirm why there might be a variation in ID rates by season.

6. Abundance Estimates over Extended Non-Breeding Bio-Seasons

- Document Reference: "Hornsea Four Abundance Estimates Method for Extended Non-breeding Bioseason_Issued 213020.pdf"
- Objective: NE to review and confirm agreement / position with use of method

SS outlined the two methods to calculate abundance estimates for the extended non-breeding season, noting that Hornsea Four's preferred choice is Method 2 (calculating the weighted mean of the three component bio season peaks within the extended non-breeding season for year one and year two separately) as it offers a more precautionary approach and considers a more refined weighting of these data across the entire non breeding bio season.

AB highlighted that from Natural England's perspective, advice has already been provided on how this should be calculated and this should be followed. AB noted that the BDMPS report underpins that advice and uses the smallest geographic unit that can't be broken down further. AB stressed that there would be limited value in trying to break it down and there would be lots of complications inherent in that process, noting that is unlikely that Natural England will agree with the methodology. AB considers that Method 2 does not adequately consider the worst-case. AB noted that you could provide a caveat in the narrative that a single month has a very large peak in comparison to the rest of the season.

SS noted that consideration of the mean of two peaks (Method 1) would appear to be over-precautionary for Hornsea Four, as it is located in a different area to other projects that have used this method, providing the reason to consider a different approach for Hornsea Four. SS highlighted that the method aims to look at birds across the individual bio-seasons that form the extended non-breeding bio-season and the impact of the project on species across the whole of the season without being biased towards a single month or single shorter bio-season. AB reiterated that Hornsea Four should follow Natural England's standard advice and not get into complicated and time-consuming methods, but if they do not, should include some narrative about how the project is different and why the project considers it is be a precautionary figure. MK also stated that both methods could be presented if desired, as long as the method advocated by Natural England is included in the assessment.

AB noted that the time period is not relevant to worst-case displacement scenarios. SS stated that the mean peak of other projects may be represented by approximately 1,000 birds that more accurately reflects usage over the extended non-breeding bio-season, whilst for Hornsea Four despite many months within the extended non-breeding bio-season being of similar abundance to other offshore wind farms, an increase during the dispersal period of approximately 40,000 individuals for a short time over-inflates the abundance when considering over a longer period and therefore will alter the potential estimated impacts and how they are perceived to be.

EA asked if Natural England's advice could be different for different projects? EB noted that Natural England haven't considered different advice for different projects. EB noted that Natural England's advice was written to apply to all projects and should be applied across the board, including to the Hornsea Four assessment and highlighted that in order for SNCBs to change advice for specific projects, a significant period of review and consultation would be required which would not be compatible with project timescales. EB noted that if included, Hornsea Four would need to be clear on how the different method was presented and rationale behind it. AM noted that the use of novel approaches need to be clearly justified and presented alongside assessment using standard guidance. AB emphasised the importance of highlighting why Hornsea Four may require a different methodology. SS stated that Hornsea Four will take onboard the advice note, the additional advice provided in this meeting to consider the best way forward, and to provide an explanation of what Hornsea Four are trying to achieve with this new method, should it be incorporated into the narrative of the assessment process.

7. Red-throated Diver Densities

- Document References: "Greater Wash Consultation Report 2018.pdf" and "RTD Displacement_HOW04 ECC_Issued_20200420.pdf"
- Objective: To gain formal agreement on the method of estimating the density and abundance of red-throated divers within the Hornsea Four ECC , as discussed between Alex Banks (NE), Matt Boa and Sean Sweeney (APEM)

SS gave an overview of the discussions that have taken place in relation to the methodology for calculating red-throated diver densities, noting that abundance estimates have been produced for each of the SeaMaST datasets used for assessment of divers present within a 2 km buffer of a cable laying vessel. MB stated that a maximum of three red throated divers are estimated to be at potential risk of disturbance & displacement.

SS asked if Natural England are content to use this data in the Hornsea Four assessment? AB stated that if the note follows the outline approach discussed then it will be acceptable but will review and confirm acceptance of the use of these calculations. AM noted that the approach seems appropriate.

Action: AB to confirm acceptance of the red throated diver density calculations.

8. Clarifications regarding Natural England's Written Response to sCRM Workstream

- Updated results of the CRM v sCRM deterministic modelling re-run for gannet and kittiwake have been shared with NE, along with parameters and details of how to run the model in this manner. Document References:

- Kittiwake CRM Audit Trail" zip file
- Simulated Windfarm sCRM Test_Kittiwake Parameters_Issued 140420.pdf"
- Gannet CRM Audit Trail" zip file
- Hornsea Four sCRM Test_Gannet Parameters_Issued 310320.pdf"

Objective 1: MSS (2018) sCRM

- Do Natural England agree that there is <1% difference in results between Band (2012) CRM and MSS (2018) sCRM?
- Do Natural England agree that the sCRM is fit for purpose for the Hornsea Four collision estimates?

SS presented the results of the CRM vs sCRM comparison and noted the difference for kittiwake of 0.001% for Band Option 1 and 0.002% for Band Option 2, and that Hornsea Four are confident that they are in a good position to use the sCRM in the Hornsea Four impact assessments. SS highlighted that through further conversation with Carl Donovan, he explained that the minimal differences between the two models could be due to the way trig functions differ between R and Excel, with Carl noting that he would trust the outputs of R over Excel.

AB confirmed that Natural England had managed to test both the kittiwake and gannet data and written advice would be provided on this shortly, noting that Natural England will be able to agree it is appropriate to use sCRM in a deterministic way.

Action: Natural England to provide advice on sCRM based on test runs carried out.

AB noted that Natural England have been able to exactly replicate the values of the Band (2012) model with the MSS (2018) model, so the difference is in fact zero. AB highlighted that if zero is entered instead of 0.00001 for any standard deviation value and the truncated normal option is not used, it removes an element of stochasticity from the sCRM so it can match the Band model values. AB noted that the response will provide advice on how Natural England replicated the Band (2012) model. AB queried why the gannet example was based on Hornsea Four data but the kittiwake example used simulated data. SS noted that this was due to the low kittiwake densities for Hornsea Four, meaning that the same accuracies couldn't be matched and APEM have gone back to Carl on this.

Action: SS to redo the kittiwake sCRM test run with the Hornsea Four data.

AB highlighted that Natural England would like to see the file logs within the Hornsea Four application.

Action: SS to include sCRM file logs within application documents.

AB asked if maximum likelihood flight height values had been used when running the models. MB confirmed that maximum likelihood flight height values had been used. AB highlighted that the bird flight height distribution stops at 300m in the model but noted that the Hornsea Four turbines are taller than that. AM noted that this issue has been addressed on another project so this has already been addressed.

Action: AM to provide response on 300m vs 500m flight height in sCRM.

Objective 2: sCRM parameters (for being run deterministically)

EA asked if Natural England could confirm in writing that the input parameters provided are acceptable to Natural England.

Action: Natural England to confirm CRM parameters in written response.

AM noted he was grateful that Hornsea Four set up the meeting with Carl Donovan on 12th March 2020, that sCRM is the best approach, and highlighted that the RSPB were pleased to see the sCRM finally being used after so long in development.

9. Data Sources for Intertidal Ecology

- Document Reference: Offshore and Intertidal Ornithology Baseline Characterisation Report, Table 1
- Objective : NE/RSPB to confirm the data sources outlined in Table 1 are the most appropriate to use data sources to use for intertidal ornithology

MK stated that if the Hornsea Four landfall was within a designated site then Natural England would be requiring an intertidal site-specific survey programme, but since the Hornsea Four landfall isn't within a designated site, then Natural England consider that using the data sources outlined in Table 1 is appropriate, and proportionate to the level of risk. MK noted that it might be worth checking the latest Yorkshire Bird Report (only covers 2015) in case that has additional information to feed in.

10. General updates / AOB

SS stated that Hornsea Four are looking to progress a study on migratory non-seabirds, noting that this is being discussed internally and will be incorporated into the assessment.

AM highlighted a new monitoring report (Bempton Cliffs Seabird Report 2019) was circulated to attendees after the meeting.

Next Steps

EA noted that the next meeting will discuss any outstanding actions.

MK noted the need for time to discuss apportioning and SS confirmed that this could be discussed in June meeting.

MK noted that the Hornsea Three and Vanguard decisions will be made in the coming months and will influence discussions after that point and there is a need to discuss the derogation case at future Evidence Plan meetings or some other forum. EB noted that Gail Boyle (PINS) was clear that it would be important to highlight in the DCO Application where there has been agreement and disagreement in relation to the derogation case.

Action: EA to confirm the appropriate forum to discuss derogation.

Summary of Agreements and Disagreements

Agreements

4 camera analysis: Natural England and RSPB provisionally agree that there is no value in analysing any additional data and the topic of 4 camera analysis can be closed. This is subject to the 7 month report showing similar results and subject to the outcome of the use of cameras 1&2 and 3&4 rather than 2&3, as used in the EIA.

Little Gull Population: Natural England and RSPB agree with the use of the calculated population estimate within the note, subject to the inclusion of a caveat in the assessment detailing the low data confidence.

QA Results: Natural England happy that the Section 42 request can be closed after receipt of the spreadsheet.

Natural England agree with the method of estimating the density and abundance of red throated divers within the Hornsea Four ECC, pending AB's review of the document.

Natural England and RSPB agree it is appropriate to use the sCRM in a deterministic way for the purpose of the Hornsea Four EIA.

Natural England agree that the data sources outlined in Table 1 of Offshore and Intertidal Ornithology Baseline Characterisation Report are appropriate.

Disagreements

Natural England disagree with the method proposed for Abundance Estimates over Extended Non-Breeding Bio-Seasons - advice has already been provided on how this should be calculated and this should be followed.

Pending

Pending Natural England's written comments on proposed PVA parameters, including confirmation that they are happy with the species to be taken forward for analysis.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
EA to confirm detail/justification in relation to comparison between camera scenarios.	EA
EA to consider if a tabulated data appendix could be added to 7 month report.	EA
SS to consider alternative ways of presenting the information in the map in Appendix 1 of the little gull note and add in notes to provide explanation of any data sources not specified in order to provide an audit trail as appropriate.	SS
SS to confirm where the extreme upper and lower population limits for little gull came from.	SS
Natural England to provide written feedback on PVA species.	Natural England
SS to set up a call to discuss Natural England's response on PVA parameters once formal feedback received.	SS
AM to confirm if there are any updated colony count reports available or expected. Complete - Flamborough and Filey Coast SPA Seabird Monitoring Programme 2019 Report provided.	AM
Natural England to include comment on PVA of large gulls in their formal PVA response.	Natural England

Action	Responsible
EA to confirm why there might be a variation in ID rates by season.	EA
AB to confirm acceptance of the red throated diver density calculations.	AB
Natural England to provide written advice on sCRM based on test runs carried out.	Natural England
SS to redo the kittiwake sCRM test run with the Hornsea Four data.	SS
SS to include sCRM file logs within application documents.	SS
AM to provide response on 300m vs 500m flight height in sCRM.	
Natural England to confirm CRM parameters in written response.	Natural England
EA to confirm the appropriate forum to discuss derogation.	EA

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #10	9 th July 2020
Meeting Date	09/06/2020	
Place	Teleconference	
Participants	<p>██████████) – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████) – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p>	Our ref. HOW04/EP_TPOrnith_10
Absent	██████████ – Natural England	
Copy		
Next meeting	16/06/20	

Agenda

1. Welcome and Introductions
2. Hornsea Four Project Update including Derogation Overview
3. Hornsea Four migratory species CRM screening
4. Hornsea Four PVA Parameters
5. Productivity , Mortality Rates and Seabird Populations
6. Review actions from previous meeting
7. Next Steps plan for subsequent technical panel meetings
8. Horizon scanning / Any other business?

Hornsea Four Project Updates

AB provided an update to the Technical Panel stating that today was his last day in his current role and will be a Principal Advisor in a strategic capacity from 10/06/20 onwards. AB noted that his level of ongoing engagement on Hornsea Four is not yet clear. AB confirmed that Mike Meadows, a Natural England Senior Ornithologist (Marine Renewables) will be taking over on Hornsea Four.

EA reiterated that Hornsea Four is on track for a September 2020 DCO Application submission. EA highlighted that ornithology deliverables are currently being finalised and these will include a chapter and five technical reports (Offshore and Intertidal Ornithology Baseline Characterisation Report; Offshore Ornithology Displacement Analysis; Offshore

Ornithology Collision Risk Modelling; Offshore Ornithology Population Viability Analysis; and Offshore Ornithology Migratory Birds Report).

Derogation Overview

JC informed the Technical Panel that Hornsea Four had planned to prepare an In-Principle Derogation Case to have ready for Examination, but noted that the project are now preparing a Full Derogation Case for Application. JC stated that the case (in-principle vs full) presented at the DCO Application could change during Examination, but that will depend on the Hornsea Three and Norfolk Vanguard decisions.

JC confirmed that four species are being considered in relation to compensation measures (kittiwake, gannet, guillemot, and razorbill) and Hornsea Four are looking for compensation measures that would work collectively across all species. JC highlighted that this will be discussed at the Derogation workshop which is being arranged for the end of June.

JC noted that work is underway in relation to the alternatives case which started with reducing the Agreement for Lease (AfL) between Scoping and PEIR with the developable area approach. JC stated that discussions have been taking place in relation to shipping and navigation and Hornsea Four are awaiting an internal decision on the creation of a Structures Exclusion Zone (SEZ) in the south of the array area, which would reduce the area within which WTGs and OSS would be located by about 20%. JC noted that if the SEZ is adopted, the assessments submitted as part of the DCO Application would not take this reduction into account although the bounding coordinates of the SEZ would be included within the DCO to secure the commitment to the SEZ. JC added that at this stage the plan is that the relevant assessments would be updated in the pre-Examination stage.

AB asked what project boundary will be considered in the DCO Application? JC confirmed that the PEIR boundary (for the array area) is being maintained to the point of DCO Application.

EB asked for clarity on the timing of submission of the updated assessments and HRA. JC confirmed that the relevant assessments and the HRA will be submitted in the post-Application/pre-Examination stage. EB highlighted concerns about reviewing two sets of documents within a short space of time and the resourcing constraints associated with this. EB noted that other projects took this kind of approach during Examination and there was not time to discuss the changes fully, so this needs to be carefully managed. JC confirmed that the relevant updated documents would be submitted before the start of the Examination. EB asked if this approach has been discussed with PINS? JC confirmed that PINS were aware of these plans. JC conceded that the timing was unfortunate, but the change is likely to be necessary (once signed off by the internal Orsted Steering Committee) and would have significant benefits for offshore ornithology. AM reiterated EB's concerns relating to the resourcing of the review of two sets of documents, highlighting that the RSPB are currently significantly stretched due to furlough implications.

JC confirmed that Hornsea Four have made PINS aware of this approach and have taken legal advice. EB noted that Hornsea Three and Norfolk Vanguard are cautionary tales as it was not possible to deal with these kinds of changes during Examination. JC noted that Hornsea Four are planning to submit these changes as soon as possible before Examination. SS noted that most offshore wind farms change their site at some point. EB stated that this

approach places additional emphasis on ensuring alignment on methodologies so the key focus in Examination can be the updated assessment outcomes and derogation. All agreed.

Hornsea Four Migratory Species CRM Screening

- Document Reference: "2. Hornsea Four Migropath CRM Species Screening_Issued_20200526"
- Objective: NE/RSPB to review and confirm position / agreement of the migratory species to be included in our assessments. NE/RSPB to confirm if information is sufficient or if any further detail is required?

AB confirmed that MK has considered this note and will follow up with written advice. AB stated that in general, there are some features of the SPA (non-seabirds) that Natural England would expect to be added to the list. AB noted that little gull was an obvious omission from the migratory seabirds included in the note, so it was good to know it's absence from the screening note was a typo and it had in fact been included.

Action: Natural England to provide written advice on the screening of species for consideration through Migropath migratory modelling and subsequent Collision Risk Modelling (CRM).

Hornsea Four PVA Parameters

- Document: "3. Hornsea Four PVA Parameters_Issued_"
- Objective: NE/RSPB to review and confirm agreement / position with use of these parameters for use in our PVAs with respect to each species

SS noted the Natural England PVA tool appears to be fully functional and requested feedback on the PVA parameters provided in the short note. AB noted that Natural England have some queries about why some parameters have been chosen. In relation to biogeographical scale input parameters, AB noted that the global productivity demographic region has been chosen and Natural England would recommend the use of the national Horswill and Robinson (2015) region. SS questioned why this was considered appropriate for further information. AB stated the global region is not always the most appropriate set of data to use due to the age of the data for some colonies and being weighted by some colonies having vastly more data than others. MB noted that they had originally considered that the global region had the most representative values, but APEM would check the other options and report back to the group. AB highlighted that whatever region is chosen; adequate justification should be provided for the choice, for which SS agreed seemed a logical process and would be taken into account.

Action: APEM to check options for the demographic regions and report back to the group.

In relation to the BDMPS scale input parameters, AB queried why the CRB Eastern UK region was chosen and noted that the Natural England's advice is to use the national Horswill and Robinson (2015) rates unless evidence is provided as to why another choice was used. MB and SS noted that they had originally considered specific regions following the process provided in the guidance for using the Natural England PVA Tool, but APEM would check the other options and report back to the group.

MB asked when a more detailed PVA guidance document would be available, following comments from AB that such a document is currently being drafted. AB clarified that it would not be a guidance document, more of a review of what underpins the dropdown options within the Natural England PVA Tool. AB stated that another Senior Ornithologist from the Marine Renewables team at Natural England, Mel Kershaw, is currently working on this and the Technical Panel will be notified when this is available. SS thanks AB for the update.

In relation to the Flamborough and Filey Coast (FFC) SPA scale input parameters, AB queried whether the range in the note should be 2009 to 2019? MB confirmed that was correct and there was an error in the document. AM confirmed that 2009 – 2019 was an appropriate time span. AM asked if the sCRM allows for tuning of the model to reflect the recent trends? AB and SS confirmed that they did not believe it was possible, but would check.

Action: AB to check with Mel Kershaw about whether tuning of the Natural England PVA Tool's model is possible.

AB stated that it might be more appropriate to use the national Horswill and Robinson (2015) rate for puffin. AB noted that the Natural England advice is to take average of the 2017 and 2018 puffin counts. SS noted that Hornsea Four are of the opinion that 2017 was a poor count and asked if there was a 2019 count. MB confirmed that they didn't manage to do a full puffin count in 2019. AB stated that Natural England do not consider 2017 to be a poor count so the advice to take an average still stands. AB noted that if Hornsea Four are going against advice provided then justification should be provided. AM stated that the RSPB concur with Natural England on PVA matters.

Action: Natural England to provide written advice on PVA Parameters.

Productivity, Mortality and Seabird Populations

- Document: "1. Dem Rates & Col Cots_Hornsea Four_Issued_20200528"
- Objective: NE/RSPB to confirm whether they agree with these productivity and mortality rates, the data used to determine each, as well as seabird populations for use in our upcoming revised assessments for Hornsea Four.

AB confirmed that written advice will be provided. AB noted that the approach looks similar to Norfolk Boreas, but not identical (e.g. guillemot). SS noted that this would be reviewed, but a thorough account of the source data had been undertaken and all values recalculated for the purpose of this project. AB stated that it would be useful to make use of any site-specific aerial data where possible, particularly for species where juveniles are identifiable. SS confirmed that the site-specific data have been reviewed and there are some instances where it may be incorporated, but the sample sizes may not be large enough to provide a breakdown on a monthly basis. AB recommended the addition of narrative about that comparison of age structure in the ES. AB also noted that the impact should be summed across the year and compared with the largest BDMPS as has been done in Norfolk Boreas. SS noted that this method is still being debated between Norfolk Boreas and Natural England and also formed part of the assessments for Hornsea Three and Norfolk Vanguard, whose consent decisions may shed further light on this matter. AB reiterated that the use of the largest BDMPS is the Natural England advice. AB noted it is good news that the latest Woodward *et al.* (2019) note on foraging ranges is being used. AM confirmed that RSPB align with the Natural England advice.

Action: Natural England to provide written advice on Productivity, Mortality and Seabird Populations.

In relation to the regional breeding populations, AB noted that it was good to see the Woodward *et al.* (2019) report being used. AM also welcomed the use of the Woodward *et al.* (2019) report.

AB also commented that the updated proportions for adult / non-adults presented in Table 5.1 of the note on 'Dem Rates & Col Counts' had not been applied through the updated Table 5.2. SS noted this error, which would be updated accordingly and applied throughout the upcoming assessments.

Actions from Technical Panel Nine

EA ran through each of the actions from the last meeting with a status update on each item.

Action	Responsible	Update
EA to confirm detail/justification in relation to comparison between camera scenarios.	EA	Complete. Provided in APEM's note "APEM Review of 2 v 4 Camera Data.pdf", submitted with the updated 4 camera report.
EA to consider if a tabulated data appendix could be added to 7 month report.	EA	Outstanding. In APEM's note "APEM Review of 2 v 4 Camera Data.pdf", submitted with the updated 4 camera report.
SS to consider alternative ways of presenting the information in the map in Appendix 1 of the little gull note and add in notes to provide explanation of any data sources not specified in order to provide an audit trail as appropriate.	SS	Ongoing. The maps were an outputs from the online bird recording website TrekTellen website. APEM will test is a different map output can be provided.
SS to confirm where the extreme upper and lower population limits for little gull came from.	SS	Complete. SS to provide update on July 15th.
Natural England to provide written feedback on PVA species.	Natural England	Complete. Received. More written feedback to be provided.
SS to set up a call to discuss Natural England's response on PVA parameters once formal feedback received.	SS	Complete. This meeting represents that call. Further conversations to take place next week and perhaps a separate call with Mel Kershaw.
AM to confirm if there are any updated colony count reports available or expected.	AM	Complete. Flamborough and Filey Coast SPA Seabird Monitoring Programme 2019 Report provided.
Natural England to include comment on PVA of large gulls in their formal PVA response.	Natural England	Complete. Provided in NE's last response (15/05/20). SS still not doing large-gulls.
EA to confirm why there might be a variation in ID rates by season.	EA	Complete. Provided in email of 12/05/20 alongside meeting minutes.
AB to confirm acceptance of the red throated diver density calculations.	AB	Complete. Received from NE in email of 15/05/20.

Action	Responsible	Update
Natural England to provide written advice on sCRM based on test runs carried out.	Natural England	Complete. Received from NE in email of 15/05/20.
SS to redo the kittiwake sCRM test run with the Hornsea Four data.	SS	Ongoing. Part of assessment for application.
SS to include sCRM file logs within application documents.	SS	Ongoing. Part of assessment for application.
AM to provide response on 300m vs 500m flight height in sCRM.	AM	Outstanding. AM to provide comment on the minutes. SS to add narrative in the assessment.
Natural England to confirm CRM parameters in written response.	Natural England	Complete. Received from NE in email of 15/05/20.
EA to confirm the appropriate forum to discuss derogation.	EA	Complete. Discussed at start of this meeting.

AOB

In relation to counter-factual outputs, AB welcomed a discussion about this at the next meeting. SS also requested further comments from Natural England and the RSPB on their opinions with respect to interpreting the outputs from the PVA models, as it was currently unclear with respect to recent development applications that had used the Natural England PVA Tool.

Next Steps

EA confirmed that the next Ornithology Technical Panel Meeting #11 will take place on 16th June 2020 to discuss cumulative CRM tables for GX, KI & GB; cumulative displacement tables for GU, RA & PU; 4 camera analysis update; and HRA Screening. SS confirmed that feedback on cumulative CRM and displacement is the priority for the next meeting. MM confirmed that Natural England will be able to comment on the documents submitted by APEM in advance of this meeting and "APEM Review of 2 v 4 Camera Data.pdf" but not necessarily the full 4 camera report.

EA noted that Ornithology Technical Panel Meeting #12 is currently scheduled for 15th July 2020 and this will be the last opportunity to close out outstanding topics and feed information into our assessments. The Ornithology Technical Panel Meeting #13 on 25th August 2020 will be to review and agree the content of the agreement logs to inform SoCG.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Natural England to provide written advice on Migropath CRM Species.	NE
APEM to check options for the demographic regions and report back to the group.	APEM
AB to check with Mel Kershaw about whether tuning of the PVA model is possible.	AB
Natural England to provide written advice on PVA Parameters	NE
Natural England to provide written advice on Productivity, Mortality and Seabird Populations.	NE

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #11	
Meeting Date	15/07/2020	07 th December 2020
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████) – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ - Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p>	Our ref. HOW04/EP_TPOrnith_11
Absent	N/A	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Agenda

1. Welcome and Introductions;
2. Hornsea Four Project Update;
3. Presentation of revised offshore ornithology data for all 24 months, following changes to the array area since introduction of the Structures Exclusion Zone (SEZ) and methods for use of MRSea for abundances of key species;
4. Present the results from Collision Risk Modelling (CRM) and displacement assessments that were completed prior to SEZ, utilising parameters agreed with Natural England;
5. Present the outputs and conclusions from our pre-SEZ Population Viability Analysis (PVA) work;
6. Provide a chance to discuss any outcomes from the Hornsea Three and Norfolk Vanguard decisions;
7. Discuss apportionment methodology for the Report to Inform Appropriate Assessment (RIAA);
8. Additional Camera Analysis;
9. Habitats Regulations Assessment (HRA) Screening Update;
10. Review actions from previous meetings;
11. Next Steps;
12. Horizon scanning / Any other business?

Hornsea Four Project Updates

EA explained that a Structures Exclusion Zone (SEZ) had been proposed by Hornsea Four as a result of ongoing shipping and navigation stakeholder requests which would reduce the array area by 18%. EA highlighted that the project agreed that the SEZ would have no

infrastructure present, in order to ensure that adequate sea room would remain to allow marine operations, such as pilotage and general navigation, to continue and mitigate shipping and navigation impacts. EA noted that in June 2020, Hornsea Four committed to implementing the SEZ and that this was taken forward as a change to the Hornsea Four Order Limits which will be reflected in the Development Consent Order (DCO), Environmental Impact Assessment and the RIAA that will be submitted as part of the DCO Application. EA further noted that the 'funnel' where the offshore Export Cable Corridor (ECC) meets the array area has also been reduced to fit in with the smaller array area. EA stressed that the proposed application date has now been extended as a result of this change and is currently anticipated to be mid-November. JB confirmed that Hornsea Four are still in discussions with The Crown Estate about deadlines so this will be confirmed once these discussions have been concluded. JB noted that additional time may be required to consider the derogation case and compensatory measures.

EA discussed the evolution of the Hornsea Four boundaries from Scoping to PEIR and now to the DCO Order Limits, noting that the Order Limits reductions is a positive step for ornithology as the array area now avoids highest densities of auks in the southeast of the PEIR array area which will reduce potential impacts on Flamborough and Filey Coast (FFC) Special Protection Area (SPA). EA stated that the Order Limit reduction would result in reductions in collision risk to gannet and kittiwake.

MK asked what the separation distance will be between Hornsea Project Two and Hornsea Four. EA confirmed that there will be a gap of 2.2 nautical miles between the centrepiece of the southernmost Hornsea Four turbines to centrepiece of northwesternmost Hornsea Project Two turbines. SS noted that Hornsea Four will have the highest air draft of any offshore wind farm. MK further queried whether the smaller array area would have a smaller maximum number of turbines. EA confirmed that 180 turbines are still the maximum design scenario.

EA confirmed that all ornithology deliverables are now being updated with the new Order Limits and these will include a chapter and five technical reports (Offshore and Intertidal Ornithology Baseline Characterisation Report; Offshore Ornithology Displacement Analysis; Offshore Ornithology Collision Risk Modelling; Offshore Ornithology Population Viability Analysis; and Offshore Ornithology Migratory Birds Report).

3. Updated Offshore Ornithological data for DCO Array Area

- Objectives: Discuss changes in baseline data for five key species respective design-based abundance estimates used for displacement and collision risk analysis.

SS noted that design-based abundance estimates have been established for the array area and buffers for all species, including five key species (gannet, kittiwake, guillemot, razorbill and puffin). SS stated that in addition to the use of design-based abundance estimate Hornsea Four have taken on the previous consultation advice from Natural England about the use of the MRSea to produce density and abundance estimates, which is currently being progressed for the seven species with sufficient data (fulmar, gannet, kittiwake, great black-backed gull, guillemot, razorbill and puffin). SS noted that these two data sources would be combined (MRSea and design-based abundance estimates) to determine the baseline characterisation for use in the revised impact assessments, highlighting that unidentified or scarcer species cannot be processed by MRSea.

MK noted that the use of MRSea is really positive, but queried whether the reduced Order Limits has implications for the transects and coverage of the data? SS confirmed that the entire dataset is utilised for the MRSea analysis, with the area of interest (i.e. reduced array area) then extracted, so all original data are taken into account as well as other environmental data such as bathymetry. MK stated that it would be useful to provide a narrative as to whether the number of transects or coverage has been reduced, including with respect to the number of zonal transects used for generation of Option 1 flight heights.

Action: SS to confirm the effect of the reduced array area on the transects and level of coverage. **Post-meeting note:** APEM can confirm that the level of coverage for the revised DCO array area still exceeds 10% coverage and the reduction of coverage between the PEIR and DCO is 0.04%. APEM can also confirm that the MRSea modelling uses data from the original AFL plus a 4 km buffer, so utilising all data available on offshore ornithology from the site-specific surveys.

SS outlined the comparisons made between the PEIR and DCO abundance estimates and densities for the five key species (gannet, kittiwake, guillemot, razorbill and puffin). SS noted positive changes for gannet in relation to the reduced array area with reduced densities across all months (except one) and all bio-seasons. SS highlighted that similar patterns were observed for kittiwake, guillemot, razorbill and puffin.

SS stressed that overall the reduction is very positive for all five key bird species with a robust set of data that confirms these reductions. MK agreed that these results are likely to be very positive but Natural England would await the results of the full MRSea analysis for further detail. MK noted that it was logical that the reduction in the array area would result in fewer bird interactions and therefore reduced impacts. AM agreed with MK's points and noted that the reduction is very welcome and positive alongside the turbine height confirmation and looks forward to receiving the updated MRSea.

4. Preliminary CRM and displacement Results

- Documents: "1. O&M Displ Values & Imp Ass_Hornsea Four_20200623.pdf" and "2. sCRM Values & ImpAss_Hornsea Four_20200623.pdf"
- Objectives: Natural England and RSPB to review documents and provide initial comment on results. Seek agreement that Lesser black backed gull and Herring gull are of no material contribution to the cumulative totals.
- Question: Range of outputs presented include the central estimate alongside those from the range of parameters Natural England provided. Hornsea Four would like to understand Natural England and RSPB's views on the upper/lower estimated collision outputs from sCRM (when run deterministically) and how Natural England and RSPB interpret the use of these numbers within the assessment process?

SS highlighted that the materials issued in advance of the meeting were based on the pre-SEZ array area and associated assessments, with these assessments currently being updated so the numbers will change.

CRM

SS gave an overview of sCRM values that were presented in the document and explained that the ranges represent Band Option 1 – Band Option 2, but only Band Option 2 is

presented for the “SNCB annual” figure as this is Natural England’s preference. SS noted that the central estimated collisions value is the one that would be used in the impact assessment, in line with the recent decisions on other projects. MK noted that previous examination representations will show that Natural England tend to take a range-based approach due to the uncertainties around these assessments, principally the variability in bird densities within the site and the difficulty in capturing that variability in a survey programme. Natural England have advocated this to decision makers and MK noted that there is a risk of false precision if using a single figure. MK clarified that Natural England don’t base decisions on upper values – though these upper values can be used as a way of ruling out impacts. For example, if the upper value is still not sufficient to be a cause for concern then the impact can be ruled out. SS noted the difficulty comes in the cumulative assessment when using upper and lower estimates. MM highlighted that the range serves two purposes: to give an understanding of what the variation might be and whether the central estimate is something that could be relied upon or not, but also gives decision maker a framework for their risk judgement rather than a single figure.

AM noted that RPSB agreed with Natural England on this point, with focus on the central value but using the range to understand the variability. AM stated that the RSPB don’t advocate the use of any threshold, noting that predicted mortalities need to be considered with contextual information and the range gives an indication of how likely the central value is to be representative.

Displacement

MK repeated the Natural England advice that assessments should use a matrix with a range of values for auk displacement rather than a single figure for both displacement percentage and mortality, as set out in the SNCB displacement advice note. SS confirmed that a matrix would be presented within the DCO application documents but the values in the displacement document were produced to give an indication for the purpose of a discussion at this meeting and to provide a summary of how potential impacts have been assessed and interpreted.

SS asked if Natural England are still advocating the use of 10% mortality to predict potential impacts from displacement? MK confirmed that it is the range that should be considered rather than the 10% mortality specifically. MK noted that it is an expression of the level of uncertainty in terms of mortality and sub-lethal effects and the best method currently available at the moment. MK stated that Natural England have previously accepted a range of 30 – 70% displacement for auks, with a more detailed evidence base available for gannet. MM stated that the evidence base for the mortality ranges is expert opinion only although there is an ORJIP project underway to evidence these ranges better. SS asked where the range for gannet should be.

Action: MM to confirm NE’s position on the range of displacement they advocate for gannet impact assessments. **Post-meeting Note:** Natural England has accepted the use of a 60-80% displacement range in previous OWF examinations.

SS noted that evidence suggest that gannets are not displaced further than the array area as opposed to out to a 2km buffer. AM stated that the 60-80% displacement comes from the macro-avoidance rates identified by Cook et al (2014) for the avoidance rate review and there has been further evidence from APEM and ORJIP work where there was ‘pooling’ of

gannets outside the wind farm but within the 2km buffer. AM highlighted that the problem with the ORJIP data was that the 'pooling' was largely in response to the presence of fishing vessels there and all data (including APEM work) is out with the breeding season. AM stated that for other species, the rates are based on expert opinion as there is so much conflicting evidence. For example, for guillemot there was 60% displacement at Belgian wind farms and recently there have been studies showing 0% displacement of guillemots – hence the need for a range-based approach.

MK highlighted that it is unclear how the birds will reach to the gap between Hornsea Project Two and Hornsea Four. SS confirmed that APEM will consider if there is any evidence from other wind farms with a gap. MK concluded that Hornsea Four are at liberty to present the figures that they consider to be the most appropriate with the evidence to support those figures, so long as the full matrix is provided, and that Natural England will use take a range-based approach when formulating its advice.

5. Preliminary PVA Results

- Documents: "3. HOW04 PVA Outputs_Issued_20200625.
- Objective: Provided for information only.
- Question: Hornsea Four would like to understand Natural England and RSPB's opinions of the results and views on how they would interpret the results.

SS noted that the PVA analysis was run for a total of five species at a biogeographic and BDMPS scale and presented in the referenced document. SS stated that the comments raised through the Evidence Plan process have been taken onboard in relation to this assessment, but the SPA level runs have not been completed yet.

MK highlighted that in the Boreas Examination documents, the gannet and kittiwake PVA totals are higher than the ones in the Hornsea Four document so this should be checked. MK noted the issue could be the same for auks so that should also be checked. SS noted that the figures in the Hornsea Four document were produced before the recent decisions on Vanguard and Hornsea Three so these will be reviewed, and the Hornsea Four figures updated, where appropriate. MK recommended looking at Natural England's Boreas submission for Deadline 4 and Deadline 8 for Vanguard – these two representations will provide the latest Natural England position on PVA for the auks.

SS asked what actions Natural England and RSPB are undertaking to increase the levels of productivity at FFC SPA, noting that the current level of productivity means that the population would take a long time to reach the levels stated in the Conservation Objectives, even without the presence of offshore wind farms. MK confirmed that there are ongoing efforts by RSPB, The Wildlife Trust (TWT) and the Flamborough Head European Marine Site management group to ensure the cliffs and immediate surrounding waters are not subject to undue levels of disturbance. MK stated that the next steps are investigations into what can be done to improve productivity, noting that managing the seas is the biggest challenge. AM stated that the RSPB are undertaking site-based work to improve productivity at the site. In terms of the wider issues with kittiwake populations, AM noted that the main issues are food supply and climate change and the RSPB put a lot of resources into protecting birds at FFC SPA as well as working with developers to reduce impacts. AM highlighted that productivity has been really poor recently and it looks like 2020 is also going to be a poor year. AM noted that historically the productivity has risen quickly in the past and while there has been doubt

cast on these estimates, the investigations into that have concluded that those were reliable estimates. EB noted that the citation population figures are the important thing and they can be debated but ultimately it is these citation figures that need to be used.

6. Discuss outcomes of Hornsea Three and Norfolk Vanguard decisions

- Objective: Discuss implications for Hornsea Four.
- Questions:
 - What is Natural England and RSPB's position on the Secretary of State's (SoS) decisions for Hornsea Three and Norfolk Vanguard?
 - In particular, are Natural England and RSPB in agreement with the cumulative / in combination totals that the SoS stated would not cause an Adverse Effect on Integrity (AEoI) with respect to the kittiwake and gannet features of the FFC SPA from Norfolk Vanguard?
 - Following the Hornsea Three and Norfolk Vanguard decisions, do Natural England and RSPB consider that any advice provided to Hornsea Four should be updated / amended as a consequence of the SoS's interpretations / decisions?
 - Of note, given the SoS's position that they favour the Applicant's recommendation for the use of Bowgen & Cook (2018) avoidance rates, are Natural England and RSPB now in agreement with this also?

EB stated that Natural England were pleased to note that the SoS based their decision on the parameters that fell more closely in line with Natural England's advice. In terms of the finer detail, Natural England are still working through all of the documentation for both project decision. EB confirmed that the advice shared within this Evidence Plan Technical Panel should still be considered as Natural England's latest position. MK noted the inconsistent use of different totals for the in-combination assessments for the two projects and stated that Natural England were still digesting this information. MK noted that Natural England are getting some legal input in relation to the decision, particularly in relation to the use of *de minimis*. EB noted that the SoS's decisions are hard to follow as the HRA shows the position of all parties and it not always clear what the SoS has based the decision on.

EA asked if Natural England could issue a note or summary of their thoughts on the decisions once these have been considered by their legal team? EB stated that it might not be appropriate for Natural England to formally comment on the decisions but some of the narrative may be drawn out through the Statement of Common Ground (SoCG) process. EA agreed that the SoCG process would be a good place to capture this.

In relation to the use of Bowgen and Cook (2018), MM confirmed that Natural England are not advising the use of Bowgen and Cook (2018) and are still advising the use of the joint SNCBs response (SNCBs, 2014) to the Marine Scotland Science Avoidance Review (Cook et al, 2014). MM stated that Natural England are going to be undertaking a project this year to update the joint SNCB avoidance rate note, noting that it was intended to be published in Q3 2020 but that could change due to COVID.

7. Apportionment methodology for RIAA

- Objectives:
 - Natural England & RSPB to agree on use of Furness (2015) to apportion birds during the non-breeding bio seasons

- Natural England & RSPB to provide input on what additional data may be available in the coming months that may contribute to Hornsea Four's revised methods and assessments
- Discuss SNH guidance note on apportionment (2018)

SS noted that refined methodology for the final RIAA will be shared prior to TP #12.

Does Natural England and RSPB agree with the use of Furness (2015) for apportionment during the non-breeding bio season?

MM agree that Furness (2015) is still what Natural England would advocate using. AM added that it depends on how it is used, noting that in relation to the use of the migratory breeding season periods, it is really important to get site-specific data. AM highlighted that the EOWDC sponsored GLM tagging of auks should be looked at, as well as the MacArthur Green-led workstream. AM noted that these studies show clear patterns of distribution of non-breeding auks.

MK asked for clarity on the question. SS confirmed that the intention for the non-breeding season was to use the Furness (2015) paper to apportion birds to different SPAs during this period. MK confirmed that was appropriate as long as the seasons as defined in Furness (2015) were not going to be used. MK recommended the use of site-specific data for defining periods of colony attendance.

Can Natural England and RSPB provide insight as to their preferred method of breeding season apportionment?

AM stated that the Woodward et al. (2019) work is welcomed and highlights the importance of looking at site-specific data for avoidance, noting that it now has a wider spread across the breeding seasons for FFC.

Does Natural England and RSPB agree with the multi layered approach to apportionment set out in the SNH guidance note on apportionment (2018)?

MM confirmed that the SNH method is the best method currently available. AM noted that the apportioning tool developed by CEH (UK Centre for Ecology and Hydrology) only considered Scottish waters but there have been discussions about extending that to UK waters, initially in relation to kittiwake but timescales are unclear.

MK noted that the SNH tool is geared towards multiple colonies that might be contributing to birds within a wind farm. MK highlighted that Hornsea Four are in a different place here as there is only one large colony in the vicinity. MK confirmed that the steer from Natural England in terms of the breeding seasons apportionment is that in this context the project should start with 100% apportioning in the breeding season as the first port of call given the relative closeness of Hornsea Four to FFC SPA. SS considers that there are non-breeding adults that are within the wind farm so Hornsea Four will follow an evidence-based approach. MK stated that Natural England would consider the evidence brought forward by Hornsea Four during the Examination.

MK asked if there was going to be a paper about the apportioning methodology that could be discussed at the next meeting. SS confirmed that a methodology note would be produced for discussion at the next meeting.

8. Additional Camera Analysis

- Documents: "HC00029 406_The relationship between aerial survey coverage and data precision at Hornsea Four_F...(05992618_A)" and "APEM Review of 2 v 4 Camera Data.
- Objectives: Natural England and RSPB to comment whether they agree with Hornsea Four's position on the findings of the report and are confident in proceeding with two cameras in Hornsea Four's DCO Application? If in agreement, please also state whether Natural England and RSPB are now confident in the baseline data characterisation for Hornsea Four's ornithology assessment? If not, please state an alternate position and recommended next steps.

EA noted that Hornsea Four agree with the conclusions of both camera reports and are confident in proceeding with two cameras analysis to the Hornsea Four DCO Application. EA further noted that for Hornsea Three, the SoS concluded that "the variation in observations for the months where there are two years of data is within acceptable limits and is sufficiently robust to determine potential LSE and AEol".

MM stated that it was a really positive thing for the project to look into this. AB had asked that Table 1 is updated to include the density and variability values for species/months within the ES and requested clarity on which values will be used when we have more than one estimate in a given month. SS confirmed that the intention is not to integrate any of the additional data into the baseline characterisation and that Hornsea Four are proceeding with the original two camera dataset, noting that this dataset, combined with the use of MRSea data and would hope that Natural England would be satisfied with the baseline characterisation. MM stated that Natural England will have to wait to see the full results of the MRSea analysis.

MK asked about which camera data is going to be used. SS confirmed it was the two central cameras (cameras 2 and 3) and the data from these will be used within the ES. MM noted that where it isn't cameras 2 and 3 used then it would be good to understand which camera configurations are used for which months. MK noted that Natural England have been doing some work on survey design, which this work is usefully inputting to as it indicates that increasing coverage from a 10% transect design to 15% or to 20% through additional cameras makes little difference to the precision of the data outputs. This will inform a guidance document that NE is currently preparing having undertaken some research into industry best practice for aerial digital surveying in order to inform developers, data providers and survey design in the future to improve baseline characterisation. SS acknowledged that APEM had taken part in Natural England's research, providing information on different survey methods and results. MM noted that there is also a PhD student looking at the relationship between transect spacing and coverage of red throated diver surveys in relation to their ability to detect change.

AM confirmed that RPSB is content that the two camera dataset is appropriate. MK confirmed that Natural England are content to progress with the original two camera dataset for the Hornsea Four DCO application.

EA asked if Natural England and RPSB are now confident in the Hornsea Four baseline characterisation? MK confirmed that the key issues from PEIR (24 months of data and two cameras) have now been addressed but Natural England will await the outputs of the MRSea analysis. MM stated that the caveat to that is understanding what impact the reduced area will have on the baseline data. AM confirmed that RSPB are in agreement with Natural England.

EB asked if the Technical Panel could see the MRSea analysis before the DCO Application is finalised? SS confirmed that this could be shared once completed. EB noted that we all (Hornsea Four, NE and RSPB) want to close out the baseline data, so the more information that can be provided earlier the better.

Action: Hornsea Four to share the outputs of the MRSea analysis ahead of the next Evidence Plan meeting.

9. HRA Screening Update

- Documents: "B2.2 Annex 1 Habitats Regulations Assessment Screening Report (06073704_
- Objective: Provided for information only, but do let us know if you have any high level comments or concerns with respect to any designated sites and/or their features.

SS noted that the updated HRA Screening report was provided to the Technical Panel for information to illustrate the revisions which have been made to the original document, incorporating previous advice through the Evidence Plan and official consultation responses.

MK stated that if formal feedback is required then Natural England can do this but there hasn't been time for an in-depth review. AM confirmed that RSPB haven't reviewed the document either.

10. Review of Actions from Previous Meetings

Action	Responsible
Natural England to provide written advice on Migropath CRM Species. Complete	NE
APEM to check options for the demographic regions and report back to the group. Complete	APEM
AB to check with Mel Kershaw about whether tuning of the PVA model is possible. Complete <i>MK confirmed that tuning is possible but noted it makes things complicated and less transparent as there are multiple ways to tune, so preferred approach is not to tune.</i>	AB
Natural England to provide written advice on PVA Parameters. Complete	NE
Natural England to provide written advice on Productivity, Mortality and Seabird Populations. Complete	NE
AM to provide response on 300m vs 500m flight height in sCRM. Complete <i>AM considered that this action was resolved at the last meeting and is content with the approach put forward at technical panel #10.</i>	AM
EA to consider if a tabulated data appendix (showing basic additional data be provided that presents the abundance estimates with precision and UCL / LCL of each month for the key seabirds) could be added to 4 camera report. Ongoing Action: MK to ask AB if this is still required?	EA

Next Steps

EA gave a summary of the agenda for the next (and final) EP meeting on 25th August 2020. MariaM confirmed that Natural England are no longer available for that date. EA asked if Natural England could suggest suitable dates. EB asked for notification of when the materials would be available to allow Natural England to decide if there is time to consider them prior to the preferred date. EA confirmed that material would be provided 3 weeks in advance of the meeting.

Summary of Agreements and Disagreements

Agreements

Natural England and RSPB agreed that the use of MRSea to produce density and abundance estimates is a positive step.

Natural England and RSPB agreed that the preliminary results of the updated abundance estimates and densities for the reduced array area are very positive.

Natural England agree with the use of Furness (2015) for apportionment during the non-breeding bio season. RSPB are also in agreement, but note it depends how Furness (2015) is used.

RPSB and Natural England agree that the two camera dataset is appropriate and are content to progress with the original two camera dataset for the Hornsea Four DCO application.

Natural England and RSPB are confident in the Hornsea Four baseline characterisation, pending review of the MRSea Analysis.

Disagreements

Natural England are not advising the use of Bowgen and Cook (2018) avoidance rates.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
SS to confirm the effect of the reduced array area on the transects and level of coverage.	APEM
MM to confirm the range and extent of displacement for gannet.	MM
Hornsea Four to share the outputs of the MRSea analysis ahead of the next Evidence Plan meeting.	APEM
MK to ask AB if a tabulated appendix is still required to be added to the 4 camera report.	MK

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #12	
Meeting Date	19/10/2020	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – APEM Ltd</p> <p>██████████ – APEM Ltd</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – GoBe Consultants</p> <p>██████████ – Ørsted</p>	18 December 2020
Absent	██████████ - Royal Society for the Protection of Birds (RSPB)	
Copy	██████████ – Ørsted	Our ref. HOW04/EP_TPOrnith_12
Next meeting	TBC	

Agenda

1. Welcome and Introductions
2. Hornsea Four Project Update
3. CRM and Displacement Advice Note
 - Focus on the apportionment methodology
4. Gannet and Razorbill – potential for AEoI with respect to FFC
 - Discuss the paper "HOW04_Ass of AEoI for FFC SPA GX&RA_Final_Issued 20200923.pdf"
 - Receive responses to the six questions posed in the above paper
5. Ornithology Baseline Data
6. Review actions from previous meetings
7. Next Steps
8. Horizon scanning / Any other business?

Welcome and Introductions

EA noted that Martin Kerby will no longer be working on the project. MariaM noted that Alex Banks will be supporting MM when needed for Hornsea Four. EB noted that this would be mainly in the background but will be invited to meetings if needed. EB noted that Emma John (who was the Hornsea Three lead from Natural England) has joined the call today and is going to be contributing to Hornsea Four, mainly in relation to compensation.

EA noted that going forwards, further technical panel meetings are likely given the programme extension but stated that these meetings may be integrated with Project Seabird/Derogation meetings.

Hornsea Four Project Update

EA noted that the DCO submission date for Hornsea Four has been extended further to mid-February 2021. EA highlighted that this decision has been taken in consideration of the

ongoing Derogation discussions in relation to Hornsea Three. EA noted that the extension will allow Hornsea Four to engage on project specific issues and set the framework for any resultant Derogation (species) and Compensation Measures (scale and applicability).

EA gave an overview of how the Hornsea Four project boundaries have changed between Scoping and DCO application.

CRM and Displacement Advice Note

EA noted that Hornsea Four provided four documents¹ to Natural England on 07/08/20 in relation to potential alone and in-combination collision risk and displacement mortality, as apportioned to FFC SPA. EA stated that Natural England provided a written response on 03/09/20.

Alone and In-Combination Note.pdf

SS gave an overview of the background to the displacement and collision risk note, highlighting that it covered displacement mortality rates for gannet (GX), razorbill (RA), guillemot (GU) & puffin (PU) with data up to Norfolk Vanguard; and collision mortality rates for GX and kittiwake (KI) up to Norfolk Vanguard; additional data from more recent OWF projects (including Hornsea Three, Norfolk Boreas, and EA1N & EA2) were also provided, whilst Thanet Extension OWF had now been removed.

SS gave an overview of the comments received from Natural England, stating that there was agreement on the approach on use of WCS in ESs and / or updated assessments from Examinations; agreement on GU & RA in-combination totals up to Norfolk Vanguard for displacement; and a minor discrepancy on GX abundances for autumn migration. SS welcomed the agreements and confirmed that the discrepancy would be investigated.

Action: APEM to investigate the discrepancy related to GX abundances for autumn migration.

SS also noted that Natural England requested consideration (even if 0 birds) for PU on additional OWFs; **agreement reached on GX & KI in-combination totals up to Norfolk Vanguard for collision risk**; and noted that the Natural England position on KI at FFC SPA is that collision risk (in-combination) had already exceeded level for an AEol at EA3.

SS asked if Natural England could provide advice on the data for other projects? MM stated that the numbers for Hornsea Three are unclear and may need to be updated. EB suggested that Hornsea Four could look at what Natural England have advised on Norfolk Boreas. EB highlighted that the only numbers that were revised for Hornsea Three after the parameter changes were for kittiwake so there are no values for other species. EB stated that this is a point that Natural England will raise with the ExA as it causes problems with in-combination assessments for other projects. SK asked if that means that Natural England consider the Hornsea Three figures for those other species to more precautionary than they need to be? EB confirmed that there is no way to know how the numbers would change when the assessments are re-run.

¹ Alone and In-Combination Note.pdf; Hornsea Four RIAA_KI Apportionment Note 20200806.pdf; O&M Displ Values & Imp Ass_Hornsea Four_20200806.pdf; sCRM Values & Imp Ass_Hornsea Four_20200806.pdf

SS asked if Natural England agree with the EA1N and EA2 figures? MM noted that he would have to look into that and provide a response at a later date.

Action: MM to confirm Natural England's position on the additional data from more recent OWF projects (including Hornsea Three, Norfolk Boreas, and EA1N & EA2).

MM mentioned that it was difficult to find some of the CRM input parameters and that it is important to get clarity and transparency on what is fed into the modelling. SS noted that the note has built on previous discussions and notes from the Evidence Plan so it is understandable that it would be difficult to come into the project at this stage and follow the previous discussions. MM asked if reference could be made to previous submissions. EA suggested Agreement Log codes could be added too.

Action: In future notes, APEM to add reference(s) to previous documents that have been submitted by Hornsea Four through the Evidence Plan Process and agreement log codes to indicate, for example, where parameters have been agreed between NE and Hornsea Four.

Hornsea Four RIAA_KI Apportionment Note

SS gave an overview of the background to the apportionment note, stating that it was based on the SNH (2018) approach for apportioning breeding seabirds.

SS gave an overview of the comments received from Natural England, stating that there was a request to use wider extended breeding bio-season (March to Aug for KI); Natural England couldn't provide any comment on integrity judgements until the extended breeding bio-season assessed; Natural England considered the standard approach to post-breeding season apportionment was not appropriate; and they wished to see range of values up 100% apportionment during breeding bio-season and disagree with 10% sabbatical rate proposed.

SS noted that there is evidence in support of sabbaticals and adult proportions, but the alternate Natural England WCS would be considered. SS stated that for months outside of non-migratory breeding bio-season strong evidence of non-FFC SPA birds, so use of approximately 50% overall abundances would be used as a compromise. SS asked for Natural England's thoughts on that compromise. MM confirmed that the Applicant's position and Natural England's position on this should be presented in the ES. SS asked whether Natural England's position on this is 100% apportionment through the extended breeding season? MM confirmed that was the case and highlighted that Natural England do not agree with the 10% sabbatical rate. SS asked if Natural England agree with the site-specific data on adults? MM confirmed agreement but did not agree on the juveniles not being considered.

MM noted that we may have to agree to disagree on the apportioning for Kittiwake and that two sets of values using both Natural England's preferred method and the Applicant's preferred method should be presented within the application. EA stated that going forwards, it might be best for Hornsea Four to set out what we think is Natural England's preferred methods on apportionment and to get Natural England to confirm so their position within the Hornsea Four application is correct. MM agreed that process would be useful. EB highlighted that the ExA will be interested to understand what difference these differing methods on apportionment makes to the overall assessment outcomes, noting that the difference is what is important rather than the values themselves. EB noted that therefore it is important

to present values using both the Applicant's preferred method and Natural England's preferred method in the DCO Application, otherwise it will be asked for during Examination.

Action: APEM to set out Natural England's position on apportionment. Natural England to confirm this summary of their position is correct.

Hornsea Four O&M Displ Values & Imp Ass Note

SS gave an overview of the background to the O&M displacement note and the comments received from Natural England, stating that full matrices would be presented in the Displacement Annex and some in the ES chapter. SS confirmed that full matrices were included in the note but that a clearer breakdown would be provided by species in the ES. SS also noted that Natural England requested the use of upper and lower 95% confidence intervals of abundances / densities. SS confirmed that assessments will consider a range of displacement & mortality rates, annual totals and smaller scale populations but not the upper and lower confidence intervals as Hornsea Four consider that there is already a lot of precaution built in. MM highlighted that using confidence intervals is an expression of confidence in using the midpoint and stated that Natural England wouldn't necessarily suggest using the upper value – this will depend on the range. EB stated that having an idea of the range of variability is important and sets the midpoint in context. SS confirmed that all confidence intervals are presented in the Baseline Technical Report so it is possible for the reader to investigate these without it being presented in the assessment. EB reiterated that Natural England want to see the confidence limits presented in the assessment and will request that in Examination if it is not presented in the ES.

Action: Hornsea Four to consider presentation of Confidence Intervals within Application.

Hornsea Four sCRM Values & Imp Ass Note

SS gave an overview of the background to the note on the Hornsea Four alone assessment of collision risk to seabirds. SS summarised the comments from Natural England, noting that there was apparent difficulty in following the approach to calculations. There were also queries on differences in mortality rates and comments on the HRA input. SS confirmed that the note related to the EIA level assessments only, so no SPA level assessment was included.

Gannet and Razorbill – potential for AEol with respect to FFC

SS gave an overview of the gannet and razorbill note relating to the FFC SPA, confirming that the aim of the note was to receive responses to the six questions posed within the document. MM confirmed that Mel Kershaw and Sophie Allen at Natural England have reviewed the document as well as MM. EA requested a written response to those questions from Natural England by the end of October/early November (**Post Meeting Note:** date for receiving written response now set as Wednesday 4th November 2020). MM agreed that this programme would be possible. All agreed on that approach.

Action: Natural England to provide a written response on the six questions posed in "HOW04_Ass of AEol for FFC SPA GX&RA_Final_Issued 20200923.pdf"

Action: Natural England to provide update on the PVA guidance. **Complete**

SS noted that Natural England raised queries on the source of the productivity rates used for both gannet and razorbill. SS confirmed that the correct rate is in the latest note - there had

been an error in the text of the original draft of the note (for internal review) and the productivity rates are correct now and were correct in the final version submitted to Natural England. MB noted that productivity rates for APEM's assessments had come from the source data, whilst it appeared that Natural England's rates may have come being read from a graph rather than specific numbers provided in the text. MM requested that APEM provide their source data and also that Natural England would confirm their source data and calculations via a written clarification.

Action: APEM to confirm the correct productivity rates for the gannet and razorbill note (and other species) related to the FFC SPA by 23rd October. **Complete.**

MB asked for confirmation from Mel Kershaw on how her productivity rates were calculated (from the graph?).

Action: Natural England to confirm how their productivity rates were calculated and what source data was used.

MM queried why the PVA assessment for impacts on gannet from the project alone were not presented. SS noted that certain PVA runs were prioritised for this stage. SS highlighted that Natural England had agreed for a previous project that there was no AEol on gannet from the project alone so this was deprioritised. MM highlighted that as the upper limits of the collisions takes it beyond 1% of baseline mortality then Natural England would want the case for no AEol demonstrated. SS asked whether Natural England could agree that there is no AEol (gannet) for the project alone based on other projects? MM stated that they could not give a definitive answer without clarity on the productivity questions.

SS asked whether Natural England could agree that there is no AEol (razorbill) for the project alone based on other projects? MM responded "probably" with the caveat that productivity rates needed to be clarified.

SS noted that Natural England had queried a question about the interpretation of razorbill PVA outputs and had request clarity on what is being asked here. SS confirmed that this relates to Natural England's conclusions on gannet for other projects being based on final consideration of the counterfactual of growth rates determined from PVA outputs alone and in-combination, whilst for razorbill it has focussed on the likelihood of displacement rates and mortality rates and basing final conclusions on thresholds not likely to be reached. MM thanks SS for the clear explanation but confirmed that he didn't know the answer but it would be included in the written response.

Action: MM to include advice on the interpretation of razorbill PVA in written response.

SS noted a correction from Natural England on the gannet baseline mortality rates and confirmed this would be corrected.

SS noted that Natural England have requested the PVATool log files to be appended to any amended assessment, or assessments for other species. It would also be helpful to present all the PVA input parameters in any document presented to NE for comment, rather than referring to another document. MM requested to see the updated log files if the productivity rates change.

MM noted that there are some references back to the Hornsea Three PVA but provided a note of caution on a direct comparison as that was slightly different from the Hornsea Four PVA. MM confirmed that the input parameters for the PVA appear correct but Natural England need to consider the in-combination totals and will provide feedback in the written response.

Question 1 – Gannet Displacement & Collision; Razorbill Displacement

1. *Considering the totals presented in Tables 1 to 3 (see pages 9-11), do Natural England agree that the values up to Norfolk Vanguard do not represent the level of impact that is considered to have reached the point of an AEol for the gannet and razorbill features of the FFC SPA?*

MM highlighted that a definitive answer cannot be provided without clarity on the productivity rates.

Question 2 - Density independent counterfactual metrics for growth rates and population size

2. *Considering the PVA outputs presented in Tables 4 and 5 (see page 13 and page 14), do Natural England agree that the values for the density independent counterfactual metrics for growth rates and population size represent an accurate account of potential impacts / effects to make a judgement of whether an AEol is apparent for the gannet and razorbill features of the FFC SPA?*

MM queried whether this relates to the project alone or in-combination? SS confirmed that this was related to in-combination for gannet and both alone and in-combination for razorbill. MM reiterated that the uncertainty in productivity rates means that Natural England can't provide a definitive answer on this, noting that the important factor for gannet will growth rates. MM noted that if the growth rate is 2% or below then it will be on the cusp below the current conservation objectives. MM noted that the note refers to the SPA citation and not the conservation objectives. SS confirmed that both were used and the note acknowledges that the population would be predicted to grow if growth rates between 2-5% are used. MM confirmed that this question will be answered in the written response.

Action: MM to revert (in written response) with growth rates range to consider.

Questions 3 and 4 – Gannet PVA

3. *Considering the conclusions of the PVA outputs and assessment of Hornsea Four alone, do you agree that these values do not represent the level of impact that is considered to have reached the point of an AEol for the gannet feature of the FFC SPA?*
4. *Considering the conclusions of the PVA outputs and assessment of Hornsea Four in-combination with all other projects, do Natural England agree that these values do not represent the level of impact that is considered to have reached the point of an AEol for the gannet feature of the FFC SPA?*

MM reiterated that a definitive response can't be provided until clarity is offered on the productivity rates. EA questioned what Natural England needed in order to provide a definitive answer? MM noted that in the first instance, the key thing we can do is look at productivity rates and the key thing Natural England can do is look at in-combination totals.

Action: APEM to provide response on productivity rates.

Action: MM to provide response on in-combination totals, after Norfolk Vanguard (already agreed).

EB highlighted that it would be good to focus on areas where we disagree and where those differences make a material difference to the outcomes. EB also stated that the aim is to agree to disagree with issues that don't make a difference and focus on the main issues. All agreed on this approach. SS and EA emphasised the importance of getting Natural England's positions on AEol for gannet and razorbill because, following this approach, Hornsea Four are keen get agreement on species where no AEol is anticipated so compensation measures do not need to be prepared for these species.

Questions 5 and 6 – Razorbill PVA

5. *Considering the conclusions of the PVA outputs and assessment of Hornsea Four **alone**, do Natural England agree that these values do not represent the level of impact that is considered to have reached the point of an AEol for the razorbill feature of the FFC SPA?*
6. *Considering the conclusions of the PVA outputs and assessment of Hornsea Four in-combination with all other projects, do Natural England agree that these values do not represent the level of impact that is considered to have reached the point of an AEol for the razorbill feature of the FFC SPA?*

MM reiterated that a definitive response can't be provided until clarity is offered on the productivity rates.

4. Ornithology Baseline Data

EA noted that at the Technical Panel Meeting #11, Natural England and RSPB agreed that the two camera dataset is appropriate ([OFF-ORN-1.19](#)) and they are content to progress with the original two camera dataset for the Hornsea Four DCO application. Natural England and RSPB also stated that they are confident in the Hornsea Four baseline characterisation, pending review of the MRSea Analysis.

EA stated that the MRSea Methodology and updated Hornsea Four baseline was provided to NE on 07/08/20, with a written response received on 26/08/20 which stated that they agreed that these documents appear to be consistent with the discussions that have taken place during the Evidence Plan process, noting that Natural England would need to see the full details of the work to be able to fully agree. EA also noted that Natural England welcomed the use of the MRSea modelling methods but consider that it is not possible to ascertain from the documents provided how well the model is performing, and would welcome clarification regarding this.

EA stressed that Hornsea Four would like written confirmation that Natural England are confident in and able to agree with the Hornsea Four baseline data characterisation and will be providing two documents to facilitate this (by end October): Offshore & Intertidal Ornithology Baseline Characterisation Report, and the Offshore Ornithology MRSea Report.

EB noted that it would be useful to have those documents to review, and pending that review, Natural England should be in position to agree that the baseline is sufficient.

Action: EA to provide Offshore & Intertidal Ornithology Baseline Characterisation Report, and the Offshore Ornithology MRSea Report.

In relation to the clarifications requested by Natural England, SS confirmed that these queries should be closed out by information provided within the two reports.

Review of Actions from Previous Meetings

Action	Responsible
SS to confirm the effect of the reduced array area on the transects and level of coverage. Closed. MB confirmed that this is detailed in the baseline report and that coverage isn't reduced.	APEM
MM to confirm the range and extent of displacement for gannet. Ongoing – see actions below.	MM
Hornsea Four to share the outputs of the MRSea analysis ahead of the next Evidence Plan meeting. Closed. MRSea Annex to be provided.	APEM
MK to ask AB if a tabulated appendix is still required to be added to the 4 camera report. All agreed that this can be closed.	MK

Next Steps

EA highlighted that with the programme extension, further Evidence Plan meetings are likely but these may be more focused on Project Seabird. EA confirmed that Hornsea Four will provide an engagement plan for meetings between now and DCO application, via the SLA. EB confirmed that MariaM will advise on any resource constraints upon receipt of the engagement plan.

Action: EA to provide engagement plan (via SLA) for future meetings and MariaM to advise on any resource constraints.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
MM to confirm the range and extent of displacement for gannet (e.g. out to 2 km Buffer or only within the array area) – Action from Meeting #11.	MM
APEM to investigate the discrepancy related to GX abundances for autumn migration.	SS
MM to confirm Natural England's position on the additional data from more recent OWF projects (including Hornsea Three, Norfolk Boreas, and EA1N & EA2).	MM
In future notes, APEM to add references to previous submissions and agreements within the Alone and In-Combination Note.pdf to provide transparency to the data / parameters used in assessments.	SS
APEM to set out Natural England's position on apportionment. Natural England to confirm this summary of their position is correct.	SS & MM
Hornsea Four to consider presentation of Confidence Intervals within Application.	EA & SS
Natural England to provide a written response on the six question posed in "HOWO4_Ass of AEol for FFC SPA GX&RA_Final_Issued 20200923.pdf"	Natural England

Action	Responsible
Natural England to provide update on the PVA guidance. Complete	Natural England
APEM to confirm the correct productivity rates for the gannet and razorbill note related to the FFC SPA by 23 rd October. Complete	APEM
Natural England to confirm how their productivity rates were calculated and what source data was used.	MM
MM to include advice on the interpretation of razorbill PVA in written response.	MM
MM to revert (in written response) with growth rates range to consider.	MM
APEM to provide response on productivity rates. Complete	APEM
MM to provide response on in-combination totals, after Norfolk Vanguard (already agreed).	MM
EA to provide Offshore & Intertidal Ornithology Baseline Characterisation Report, and the Offshore Ornithology MRSea Report.	EA
EA to provide engagement plan (via SLA) for future meetings and MariaM to advise on any resource constraints.	EA/MariaM

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #13	
Meeting Date	23/11/2020	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ Natural England</p> <p>██████████ – Natural England</p> <p>██████████ - Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – APEM Ltd</p> <p>██████████) – GoBe Consultants</p> <p>██████████ Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████ Ørsted</p> <p>██████████) - Ørsted</p>	17 December 2020
Absent	██████████ GoBe Consultants	Our ref. HOW04/EP_TPOrnith_13
Copy	██████████ – Ørsted	
Next meeting	No further Ornithology Evidence Plan meetings are planned	

Agenda

- Hornsea Four Project Update
- Baseline and MRSea Technical Reports
- Final cumulative and in-combination assessments – projects since Norfolk Vanguard
- Presentation of updated PVA model results
- Review of actions from previous meeting
- Next Steps/Horizon Scanning
- AOB

Hornsea Four Project Update

EA noted that the DCO submission date for Hornsea Four has been extended to 17th March 2021. EA highlighted that this decision has been taken in consideration of the ongoing compensation workstream and the associated meetings organised for 25th November and 18th January. JB noted that the project wanted to have as much time as possible to talk about derogation but are mindful of their hard deadline with the Crown Estate in relation to the Agreement for Lease.

EB queried why this was the last Ornithology Evidence Plan Technical Panel meeting and noted that Natural England haven't seen any outputs for anything other than gannet and razorbill at present. EA confirmed that the chapter won't be available in enough time to incorporate a review by the Evidence Plan Technical Panel and any updates prior to DCO Application submission. EA suggested that discussions on the ornithology application documents might be best captured in Statement of Common Ground (SoCG) or Project Seabird meetings. EB asked if Hornsea Four could confirm if there would be a chance to comment on application documents before they are finalised? EA confirmed that there would not be enough time for the Evidence Plan Technical Panel to comment on documents

before application. EB noted the risk associated with Natural England not having the opportunity to comment on these documents before submission (particularly in relation to kittiwake and guillemot).

SS noted that the majority of data and assessment methodologies and parameters that will form the basis of the ornithology application documents have been issued to Natural England and the RSPB via the Hornsea Four Evidence Plan Technical Panel through the process and advice received from both parties have been considered and, where appropriate, incorporated into the decision-making for the final assessments. MM noted that the assessments for gannet and razorbill have been presented, but not guillemot or kittiwake, and these are the species where Natural England have concerns. SS stated that that the apportionment and assessment results for kittiwake have been provided previously and the gannet and razorbill information was provided in order to try to rule out an Adverse Effect on Integrity (AEol) for these species. SS noted that the preliminary results for all species have been presented at previous meetings and that the final run of the guillemot assessment (as well as other key species) would be presented later in this meeting. EA confirmed that Hornsea Four will likely share more notes with Natural England and the RSPB prior to DCO Application, although these might be shared through the Project Seabird forum rather than the Evidence Plan Technical Panel.

Baseline and MRSea Technical Reports

EA noted that the following two documents were provided to Natural England on 29th October 2020 and to RSPB on 4th November 2020:

- A5.5.1 ES Volume 5 Annex 5.1 Offshore and Intertidal Ornithology Baseline Characterisation Report (04285807_A); and
- A5.5.6 ES Volume 5 Annex 5.6 Offshore Ornithology MRSea Report (06554919_A).

EA stated that Natural England and RSPB confirmed during Technical Panel Meeting #11 that they are confident in the Hornsea Four baseline characterisation, pending review of the MRSea Analysis. Following review of the MRSea Note, Natural England noted they would need to see the full details of the work to be able to fully agree. EA highlighted that Hornsea Four would like to close this out and focus on more prominent issues at examination. EA noted that Natural England provided a written response on 20th November 2020 which stated that Natural England *“welcome the general explanation of the merits of model-based over design-based, but note that a detailed explanation of the choice in each case, or a comparison of the model and design-based abundance estimates have yet to be provided as requested”*.

MM highlighted that Natural England have confidence in the baseline but were asking for clarification on model performance and reassurance that model-based estimates are better than design-based estimates. SS noted that the Natural England response asked for some information on model testing and diagnostics. SS confirmed that plots of observed versus fitted values, cumulative residual plots, and autocorrelation function plots (items 1-3 in Natural England’s response) have been reviewed by the statistician and if these plots were ill-fitting then the model run would have been stopped and / or results not used. SS confirmed that no such issues occurred and therefore the models ran well and were fit for purpose for the species selected for analysis. However, SS noted that the above three referred model plots were not saved as outputs and rerunning the models would produce different numbers, so unfortunately they could not be provided. MM and AM confirmed that they would accept SS’s explanation that these plots were checked and were appropriate. MM noted that it would be useful if this explanation was provided in the document itself. SS confirmed that for

two other MRSea outputs, variance inflation factors and P values for each model coefficient and variable could be provided (items 4-5 in Natural England's response). SS confirmed that items 4 and 5 would be added to the final MRSea report.

Action: SS to include commentary on items 1-3 of Natural England's model testing and diagnostics list and add outputs of items 4-5 into the MRSea Report.

SS noted that Natural England posed five questions within their written response and each question was discussed in turn:

Q1: *"Data from the wider Hornsea Project Four zone seems to have been fitted to the model and then "clipped" the predicted model densities to derive values that apply to the now reduced Hornsea Project Four area (plus further clipped to derive estimates for the footprint only and the footprint +2 km buffer). This may be the best approach as it uses the largest amount of data available in the model, but it would be helpful to understand whether a model applied just to the current proposed array area would give a better fit."* SS confirmed that the best fit was to use the entire dataset from the original AfL plus 4 km buffer rather than just use the reduced Order Limits plus the 4km buffer. SS noted that if the reduced Order Limits were used then the data wouldn't be as strong and it would be a smaller dataset. MM confirmed that Natural England are content with that explanation.

Q2: *"Explanation as to why two different models have been fitted for each species is requested – one has "bioseason" as a factor and the other doesn't. For example, one model could be fitted, and a test performed to establish whether either a year/season or year/month is the best fit as a factor variable in the model (i.e. whichever is significant/best explains the data)."* SS confirmed that two models have been used, the first model was to provide monthly data to determine the baseline (monthly abundance and density estimates), whilst the second model was to allow people to visually/spatially see where the birds across standard bio-seasons. MM confirmed that Natural England are content with that explanation.

Q3: *"Water depth and distance from SPA seem to be the only factors considered as model variables. Were other variables considered, and if so why were only these two used?"* SS confirmed that water depth and distance were the only factors considered. SS explained that other variables were not used due to data availability and scale (spatially or temporally), meaning that a standard approach of using water depth and distance from SPA was taken. MM confirmed that Natural England are content with that explanation.

Q4. *"It would be helpful to understand what smoothing terms were applied – e.g. how many knots/splines etc – and how were these selected?"* SS confirmed that some text will be added to the report to provide detail on smoothing terms.

Action: SS to include text on smoothing terms in the MRSea Report.

Q5: *"It is not clear whether the models and predicted densities/abundance values are for "all birds" or "birds in flight" etc? Presumably densities of birds in flight only would be needed for CRM, but displacement would require birds in flight+birds on the water?"* SS noted that if the multiple MRSea models are run separately for flying, sitting and all birds then the totals do not add up / align. The method taken was to run as all birds, with sitting and flying apportioned out according to the raw count data for each behaviour, noting that this method results in the best precision as uses the entire data set at the starting point. MM confirmed that Natural England are content with that explanation.

MM noted that if the agreed actions discussed are carried out then Natural England will have confidence in the model and the data. AM agreed on this point.

Final Cumulative and In-Combination Assessments – Projects since Norfolk Vanguard and Presentation of Updated PVA Model Results

EA noted that Hornsea Four are aiming to get agreement on numbers feeding into the final cumulative and in-combination assessments for projects since Norfolk Vanguard, highlighting that in Technical Panel Meeting #12, agreement was reached on numbers up to Norfolk Vanguard and Hornsea Four have since received updates from Hornsea Three and the EA1N and EA2 examinations which we would like to reach agreement on.

Gannet

Gannet collision risk cumulative and in-combination updates

SS noted that the in-combination totals (EIA level and apportioned to FFC SPA – Tables 1 & 2 from slides) from projects up to Norfolk Vanguard have been updated to reflect the Non-Material Change values for EA3. SS also noted that EA1N & EA2 values have been updated using the Deadline 1 collision risk update values, and the Hornsea Three values have been updated based on the CRM totals associated with the final parameter changes. MM asked for the source of the Hornsea Three numbers. SS confirmed that these were requested by Natural England at the last meeting as previously only kittiwake numbers were presented for the final parameter changes. EA noted that Hornsea Project Three therefore undertook the modelling for these species since the last meeting. EB asked if Hornsea Three are planning to submit those updates to BEIS at some point so they are in the public domain and can be used for in-combination assessments for other projects and SoS can use them in the Hornsea Three decision.

Action: EA to confirm if Hornsea Three are planning to submit updated collision risk numbers for species other than kittiwake (gannet and GBBG).

EA asked if Natural England can agree with the figures presented from Norfolk Vanguard onwards (as shown in Table 1 & 2 in slides). MM stated that Natural England would confirm this in writing. EB suggested that Hornsea Four treat this as a live issue up until submission as numbers will likely get revised down during the Examination process for some projects.

Action: Natural England to confirm in writing their position on collision risk numbers from projects since Norfolk Vanguard (for all species).

Gannet Flamborough & Filey Coast (FFC) SPA final figures

SS noted the following displacement mortality totals for gannet apportioned to the FFC SPA using a displacement rate of 60 – 80%, 1% mortality rate:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method for displacement within the Array Area only is 3.09 to 4.12 adults;
- **In-combination** total for all projects using the **Applicant's** apportionment method for displacement is 52.33 to 69.78 adults;
- Hornsea Four **Alone**, using the **Natural England** apportionment method for displacement within the Array Area only is 3.40 to 4.54 adults; and
- **In-combination** total for all projects using the **Natural England** apportionment method for displacement is 52.65 to 70.20 adults.

SS also noted the following collision mortality totals for gannet apportioned to the FFC SPA:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method is 11.41 (range of 4.19 to 39.54) adults;
- **In-combination** total for all projects using the **Applicant's** apportionment method is 298.8 (range of 291.58 – 326.93);
- Hornsea Four **Alone**, using the **Natural England** apportionment method is 17.62 (range of 1.43 to 140.07) adults; and
- **In-combination** total for all projects using the **Natural England** apportionment method is 305.0 (range of 288.82 – 427.46).

AM noted that RSPB have a difference of opinion on the breeding season avoidance rate to be used in the CRM, so will disagree with Hornsea Four and Natural England on the collision mortality rates. AM highlighted that despite that, it might be that the RSPB don't disagree on the project alone outcome. MM confirmed that Natural England are likely to agree on the conclusions of no AEol alone or in combination for gannet based on the predicted impact and the likely growth rates of the colony at FFC SPA but would like the opportunity to check the figures.

Action: Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.

Gannet FFC SPA PVA Results

SS presented the gannet PVA results and growth rates in relation to the FFC SPA (Tables 11-12 in the slides):

- For Hornsea Four **alone**, the reduction in the growth rate is calculated to be between 0.06 – 0.10%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 12.
 - Therefore an AEol can be ruled out for the gannet feature of FFC SPA for Hornsea Four **alone**.
- For Hornsea Four **in-combination**, the reduction in the growth rate is calculated to be between 1.55 – 1.66%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 12.
 - Therefore an AEol can be ruled out for the gannet feature of FFC SPA for Hornsea Four **in-combination**.

MM again confirmed that Natural England agree that an AEol can be ruled out for gannet in relation to the project alone. MM noted that he follows the logic but cannot confirm Natural England's position on the possibility of AEol in-combination, although the likelihood is that Natural England will conclude no AEol. MM stated that advice was provided on growth rates in one of the previous advice notes, noting that the lower growth rates don't seem very likely for FFC. AM confirmed that the RSPB haven't seen the advice note from Natural England in relation to growth rates so an opinion can't be provided at this stage.

Action: Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.

Kittiwake

Kittiwake collision risk cumulative and in-combination updates

SS noted that the in-combination totals (EIA level and apportioned to FFC SPA – Tables 3 & 4 from slides) from projects up to Norfolk Vanguard have been updated to reflect the Non-Material Change values for EA3. SS also noted that EA1N & EA2 values have been updated using the Deadline 1 collision risk update values, and the Hornsea Three values have been updated based on the CRM totals associated with the final parameter changes.

Action: Natural England to confirm in writing their position on collision risk numbers from projects since Norfolk Vanguard (for all species).

Kittiwake FFC SPA final figures

SS noted the following collision mortality totals for kittiwake apportioned to the FFC SPA:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method is 31.12 (range of 12.65 to 113.92) adults;
- **In-combination** total for all projects using the **Applicant's** apportionment method is 464.8 (range 446.32 of – 547.59);
- Hornsea Four **Alone**, using the **Natural England** apportionment method is 94.98 (range of 13.18 to 538.66) adults;
- **In-combination** total for all projects using the **Natural England** apportionment method is 528.6 (range of 446.85 – 972.33)

SS highlighted that the Natural England method presented in the above totals considered a greater degree of precaution as it included the upper confidence levels in the Johnston et al. (2014) flight height data. MM highlighted that Natural England cannot conclude that there will be no AEol in-combination for kittiwake. MM noted that although it won't make a difference to the final conclusion, the mortality rate of 73 birds for Hornsea Three's contribution is the Applicant's figure and in the SoS decision, both the Applicant's figure of 73 and Natural England's figure of 104 are used. MH acknowledged Natural England's position on these numbers.

Post-Meeting Note: Hornsea Four would like to highlight that Natural England have advocated the use of Hornsea Three's contribution of 73 birds for other projects' in-combination assessments. See Natural England's Deadline 14 response¹ to Examining Authority's Fifth round of Written Questions (specifically the response to question 5.8.6.2) *"We can therefore update the FFC SPA kittiwake incombination collision total to account for the revised central predicted figure for Hornsea Project Three of 73 adult collisions (compared to 182 as presented by the Boreas Applicant in REP2-035)"*.

EA asked if MM had any thoughts on the figure of 94.98 birds (Natural England's apportionment method, Hornsea Four alone), querying if that was the number that Natural England would advocate being used to inform the compensation case? MM noted that this would be confirmed in writing.

Action: Natural England to confirm agreement (or otherwise) on the 94.98 kittiwake number for compensation (Natural England's apportionment method, Hornsea Four alone).

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002408-DL14%20-%20NE%20-%20Response%20to%20WQ.pdf>

Kittiwake FFC SPA PVA Results

SS presented the kittiwake PVA results and growth rates in relation to the FFC SPA (Tables 13 & 14 in the slides):

- For Hornsea Four **alone**, the reduction in the growth rate is calculated to be between 0.04 – 0.11%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 14, with the exception of 1987 - 2017.
 - Therefore an AEol can be ruled out for the kittiwake feature of FFC SPA for Hornsea Four **alone**.
- For Hornsea Four **in-combination**, the reduction in the growth rate is calculated to be between 0.56 – 0.64%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 14, with the exception of 1987 – 2017 and 2000 - 2017.
 - Therefore an AEol can be ruled out for the kittiwake feature of FFC SPA for Hornsea Four **in-combination** when considering against the long term and most recent colony growth rates.

SS asked if there was a chance that Natural England could change their mind about their current position on kittiwake being subject to an AEol in-combination, given the new numbers presented following the CRM and PVA outputs. MM confirmed that there was not a big chance, but that they would certainly look into it and provide appropriate feedback. AM confirmed that the chance was even slimmer from the RSPB's perspective.

Action: Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.

AM noted that for FFC SPA, productivity has been declining over the last few years and the RSPB look as the PVA outputs as contextual rather than a direct comparison, highlighting that there is a lot of uncertainty about how the population will be doing in 30 years' time, regardless of wind farms. SS pointed out that the models have been run for 35 years as this is the operational lifetime of Hornsea Four.

MH asked which colony growth rate Natural England are using in drawing the conclusion of adverse effect. MM confirmed that this information would be provided in writing.

Action: Natural England to confirm which growth rate is being relied on to conclude an AEol for kittiwake in-combination.

Guillemot

Guillemot displacement mortality apportioned to the FFC SPA

SS noted that the in-combination totals (EIA level and apportioned to FFC SPA – Tables 5 & 6 from slides) have been updated with the latest Hornsea Four figures.

Guillemot FFC SPA final figures

SS noted the following displacement mortality totals for guillemot apportioned to the FFC SPA using a displacement rate of 50% with a 1% mortality rate to present the Applicant's position and a displacement rate range of 30 – 70%, with a 1 – 10% mortality rate range for Natural England's position:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method for displacement within the Array Area plus 2km buffer is 30.68 and a range of 18.41 to 429.55 adults;

- **In-combination** total for all projects using the **Applicant's** apportionment method for displacement is 155.87 and a range of 93.52 to 2,182.14 adults;
- Hornsea Four **Alone**, using the **Natural England** apportionment method for displacement within the Array Area plus 2km buffer is 19.46 to 453.96 adults; and
- **In-combination** total for all projects using the **Natural England** apportionment method for displacement is 94.57 to 2,206.55 adults.

MM noted that Natural England's last advice note provided advice on the numbers for in-combination assessment so that represents the latest update. MM had no comments on the numbers but noted that there is the increase in the density of guillemot in the post-breeding season and the concern is how little is known about guillemot distribution. MM highlighted that the data suggests that the Flamborough Front is important in that breeding / post-breeding seasons so could indicate that this area is important to the species. MM stated that given the increase in numbers in the early post-breeding season, it is likely that a large proportion of these birds are going to be from FFC. AM agreed with MM on these points. AM noted that there has been some recent work from Heligoland tracking guillemot in the breeding season, with 75% displacement recorded during the breeding season. AM clarified that there was no suggestion that an estimate should be done based on 75% displacement but it is interesting to note and suggests that there is the potential for quite a high range of displacement. AM confirmed that a final decision on AEol for guillemot could only be made once the final PVA is submitted with the full outputs.

Guillemot FFC SPA PVA Results

SS presented the guillemot PVA results and growth rates in relation to the FFC SPA (Tables 15 & 16 in the slides):

- For Hornsea Four **alone**, the reduction in the growth rate is calculated to be between 0.02 – 0.42%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 16.
 - Therefore an AEol can be ruled out for the guillemot feature of FFC SPA for Hornsea Four alone.
- For Hornsea Four **in-combination**, the reduction in the growth rate is calculated to be between 0.09 – 2.03%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 16.
 - Therefore an AEol can be ruled out for the guillemot feature of FFC SPA for Hornsea Four in-combination.

MM again noted that the logic makes sense for the project alone and agree with the conclusion of no AEol in relation to predicted impacts on abundance, but that we also need to think of the area in the wider context. MM confirmed that Natural England consider that these wider impacts need to be considered before no AEol alone and in-combination can be confirmed. AM stated that the RSPB are likely not to object for the project alone but also need to consider the conclusion for in-combination.

Action: Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.

Razorbill

Razorbill displacement mortality apportioned to the FFC SPA

SS noted that the in-combination totals (EIA level and apportioned to FFC SPA – Tables 7 & 8 from slides) have been updated with the latest Hornsea Four figures.

Razorbill FFC SPA final figures

SS noted the following displacement mortality totals for razorbill apportioned to the FFC SPA using a displacement rate of 50% with a 1% mortality rate to present the Applicant's position and a displacement rate range of 30 – 70%, with a 1 – 10% mortality rate range for Natural England's position:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method for displacement within the Array Area plus 2km buffer is 1.52 and a range of 0.91 to 21.29 adults;
- **In-combination** total for all projects using the **Applicant's** apportionment method for displacement is 32.74 and a range of 19.64 to 458.33 adults;
- Hornsea Four **Alone**, using the **Natural England** apportionment method for displacement within the Array Area plus 2km buffer is 0.95 to 22.07 adults; and
- **In-combination** total for all projects using the **Natural England** apportionment method for displacement is 19.68 to 459.12 adults.

Razorbill FFC SPA PVA Results

SS presented the razorbill PVA results and growth rates in relation to the FFC SPA (Tables 17 & 18 in the slides):

- For Hornsea Four **alone**, the reduction in the growth rate is calculated to be between 0.00 – 0.06%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 18.
 - Therefore an AEol can be ruled out for the razorbill feature of FFC SPA for Hornsea Four alone.
- For Hornsea Four **in-combination**, the reduction in the growth rate is calculated to be between 0.06 – 1.34%.
 - Colony still predicted to grow when compared against all growth rates calculated in Table 18.
 - Therefore an AEol can be ruled out for the razorbill feature of FFC SPA for Hornsea Four in-combination.

MM thanked Hornsea Four for updating the productivity rates following the latest Natural England advice and agreed with the logic presented. MM confirmed that Natural England agree with the conclusions from the project alone but would have to confirm at a later date the conclusion for in-combination. AM stated that the RSPB are likely not to object for the project alone but also need to consider the conclusion for in-combination.

Action: Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.

Puffin

Puffin displacement mortality apportioned to the FFC SPA

SS noted that the in-combination totals (EIA level and apportioned to FFC SPA – Tables 9 & 10 from slides) have been updated with the latest Hornsea Four figures.

Puffin FFC SPA final figures

SS noted the following displacement mortality totals for puffin apportioned to the FFC SPA using a displacement rate of 50% with a 1% mortality rate to present the Applicant's position and a displacement rate range of 30 – 70%, with a 1 – 10% mortality rate range for Natural England's position:

- Hornsea Four **Alone**, using the **Applicant's** apportionment method for displacement within the Array Area plus 2km buffer is 0.38 and a range of 0.23 to 5.35 adults;
- **In-combination** total for all projects using the **Applicant's** apportionment method for displacement is 5.41 and a range of 3.25 to 75.76 adults;
- Hornsea Four **Alone**, using the **Natural England** apportionment method for displacement within the Array Area plus 2km buffer is 0.25 to 5.74 adults; and
- **In-combination** total for all projects using the **Natural England** apportionment method for displacement is 3.26 to 76.16 adults.

Puffin FFC SPA PVA Results

SS presented the puffin PVA results in relation to the FFC SPA (Table 19 in the slides). SS noted that the productivity rates have been amended based on the latest advice from Natural England. SS confirmed that an AEol can be ruled out for the puffin feature of FFC SPA for Hornsea Four alone and in-combination.

MM stated that he was unsure what the colony growth rate was for puffin. MM also noted that puffin is component of the seabird assemblage rather than a feature in its own right so this requires a subtly different assessment.

AM will ask the reserve staff about any other data on puffin that would help inform this assessment. EB highlighted that there was a puffin census carried out a few years ago.

Action: RSPB to investigate whether any puffin information is available from reserve staff or the recent census.

Summary

MM agreed with the general approach taken and thanked the project for taking the previous Natural England advice onboard. AM thanked SS and EA for presenting the information in a clear manner.

Status of Positions on AEol:

Species	Natural England Current Position	RSPB Current Position
Gannet Alone	No AEol	No AEol
Gannet In-Combination	TBC – No AEol likely	TBC
Kittiwake Alone	AEol	AEol
Kittiwake In-Combination	AEol	AEol
Guillemot Alone	No AEol	No AEol
Guillemot In-Combination	TBC – needs consideration	TBC – needs consideration
Razorbill Alone	No AEol	No AEol
Razorbill In-Combination	TBC – needs consideration	TBC – needs consideration

Review of Actions from Previous Meetings

EA to pick up any outstanding actions over email.

Status of Actions from Technical Panel #12:

Action	Responsible
MM to confirm the range and extent of displacement for gannet (e.g. out to 2 km Buffer or only within the array area) – Action from Meeting #11. Complete	MM
APEM to investigate the discrepancy related to GX abundances for autumn migration. Complete – will be added to in-combination table in final document for submission.	SS
MM to confirm Natural England’s position on the additional data from more recent OWF projects (including Hornsea Three, Norfolk Boreas, and EA1N & EA2). Complete	MM
In future notes, APEM to add references to previous submissions and agreements within the Alone and In-Combination Note.pdf to provide transparency to the data / parameters used in assessments. Complete – will be added to in-combination table in final document for submission.	SS
APEM to set out Natural England’s position on apportionment. Natural England to confirm this summary of their position is correct. Complete	SS & MM
Hornsea Four to consider presentation of Confidence Intervals within Application. Noted	EA & SS
Natural England to provide a written response on the six question posed in “HOW04_Ass of AEol for FFC SPA GX&RA_Final_Issued 20200923.pdf” Complete	Natural England
Natural England to provide update on the PVA guidance. Complete	Natural England
APEM to confirm the correct productivity rates for the gannet and razorbill note related to the FFC SPA by 23 rd October. Complete	APEM
Natural England to confirm how their productivity rates were calculated and what source data was used. Complete	MM
MM to include advice on the interpretation of razorbill PVA in written response. Complete	MM
MM to revert (in written response) with growth rates range to consider. Complete	MM
APEM to provide response on productivity rates. Complete	APEM
MM to provide response on in-combination totals, after Norfolk Vanguard (already agreed). Pending	MM
EA to provide Offshore & Intertidal Ornithology Baseline Characterisation Report, and the Offshore Ornithology MRSea Report. Complete	EA
EA to provide engagement plan (via SLA) for future meetings and MariaM to advise on any resource constraints. Complete	EA/MariaM

Next Steps

EA confirmed that there are two Project Seabird Compensation Workshops in the diaries: 25th November 2020 and 18th January 2021.

EA confirmed that the minutes for this call would be sent out to attendees ASAP after the meeting to agree timescales on the actions identified.

SS asked if Natural England or RSPB were aware of any forthcoming papers or model updates? MM and AM confirmed that they were not aware on any updates. EB noted that there was a 2020 Flamborough monitoring report available and would provide this.

Action: Natural England to provide 2020 Flamborough monitoring report.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
SS to include commentary on items 1-3 of Natural England's model testing and diagnostics list and add outputs of items 4-5 into the MRSea Report.	SS
SS to include text on smoothing terms in the MRSea Report.	SS
EA to confirm if Hornsea Three are planning to submit updated collision risk numbers for species other than kittiwake (gannet and GBBG).	EA
Natural England to confirm in writing their position on collision risk numbers from projects since Norfolk Vanguard (for all species).	Natural England
Natural England and RSPB to confirm in writing their position on AEol (alone and in-combination) for all species.	Natural England & RSPB
Natural England to confirm agreement (or otherwise) on the 94.98 kittiwake number for compensation (Natural England's apportionment method, Hornsea Four alone).	Natural England
Natural England to confirm which growth rate is being relied on to conclude an AEol for kittiwake in-combination.	Natural England
RSPB to investigate whether any puffin information is available from reserve staff or the recent census.	RSPB
Natural England to provide 2020 Flamborough monitoring report. Complete	Natural England

Summary of Agreements

Agreement
Natural England and RSPB are confident in the Hornsea Four baseline data characterisation

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Offshore & Intertidal Ornithology Technical Panel Meeting #14	
Meeting Date	04/03/2021	
Place	Teleconference	
Participants	<p>██████████ – Natural England</p> <p>██████████ Natural England</p> <p>██████████) – Natural England</p> <p>██████████ – Natural England</p> <p>██████████ – APEM Ltd</p> <p>██████████) – APEM Ltd</p> <p>██████████ APEM Ltd</p> <p>██████████ – Ørsted</p> <p>██████████ – Ørsted</p> <p>██████████) – Ørsted</p> <p>██████████ - Ørsted</p> <p>██████████ Ørsted</p> <p>██████████ – GoBe Consultants</p> <p>██████████ - GoBe Consultants</p> <p>██████████ - GoBe Consultants</p>	<p>29 April 2021</p> <p>Our ref. HOW04/EP_TPOrnith_14</p>
Absent	██████████ - Royal Society for the Protection of Birds (RSPB)	
Copy		
Next meeting	TBC	

Agenda

- Project Update
 - Recap of updated timescales for DCO submission
 - Recap of Natural England's positions on AEol following Technical Panel meeting #13
- Auk Habituation and Displacement Report
 - Overview of key findings from the review (provided 22/02/21)
 - Receive feedback from Natural England/RSPB following their review
 - Discussion of displacement matrices rates from RIAA
- AEol
 - Overview of Guillemot PVA paper (provided 01/03/21)
 - Natural England to elaborate on work they'd like to see in order to further understand the importance of the array area to auks and reach a conclusion on AEol
- Mitigation Measures
 - Overview of mitigation options Hornsea Four are exploring (Developable Area Approach)
 - Discussion of any further mitigation options Natural England/RSPB have in mind (turbine spacing, array alignment) and any supporting evidence Natural England can provide to support such mitigation
- Next Steps

EA noted that the objectives were to present Hornsea Four's proposed approach to mitigation to further reduce Hornsea Four displacement impacts on auks; to understand the impact the

proposed mitigation would have on Natural England's conclusions on AEol and corresponding compensation requirements; and to discuss any additional information the project can explore to refine the displacement impact assessment.

Hornsea Four Project Update

EA confirmed that Hornsea Four have recently determined to extend the DCO Application submission to 15 September 2021, noting that the extension has been taken in consideration of the acceptance challenge in providing a Derogation case at the point of DCO Application. EA stated that the extension is required for Hornsea Four to engage on the project specific issues of evidence, the feasibility and deliverability of compensation measures and to set out a clear and engaged consultation framework for the resultant Derogation (species) and Compensation Measures (scale and applicability).

EA noted that Natural England provided advice at the last Evidence Plan meeting (November 2020) and in writing with respect to AEol, noting the clear position on gannet (no AEol) and kittiwake (AEol). EA highlighted that Natural England couldn't confirm no AEol for guillemot and razorbill

Post-Meeting Note: Natural England advised that for gannet (in-combination), position on AEol is pending a revised PVA with updated Hornsea Three values and that if the Developable Area #3 is progressed then Natural England might need updated Hornsea Four figures if gannet densities increase in the remaining array area.

Auk Habituation and Displacement Report

SS gave an overview of the report, explaining that Hornsea Four have undertaken a review of latest literature regarding auk displacement and habituation incorporating post-construction studies of 15 different OWFs. SS noted that the most comprehensive review to date (Dierschke et al. 2016) concluded auk mean displacement outcome from OWFs as weak; categorised this as a statistically significant reduction of <50% in terms of the site footprint and buffer zones in those studies; and noted a non-significant (low confidence) reduction of >50% displacement in density post-construction compared to pre-construction abundances. SS stated that the evidence suggests differences in displacement rates between seasons, with ~20% reduction during breeding season compared to non-breeding season across German OWFs. SS noted that the data suggest a correlation between high displacement rates and high turbine densities, densities significantly higher than those being proposed for Hornsea Four. SS concluded that there is emerging evidence of habituation suggesting displacement rates are expected to decline over the lifespan of OWFs.

SS asked for Natural England's thoughts on the use of a 50% displacement and 1% mortality rate. MM noted that Natural England had provided a response on the Dierschke report in the Vanguard Examination. MM disagreed with 50% displacement, noting that it is taken as an average so assumes the area is an average area of sea. MM further noted that the Dierschke report highlighted that there was a whole range of displacement rates from 0 to 75% so it would be hard to work out what influenced the different displacement rates. MM noted that data on displacement rates from a comparable site to Hornsea Four would be informative in this regard. MM confirmed that the matrix approach is the best approach and the displacement rates have to be put into context in relation to the scale of risk.

SS recognised the limitations of the Dierschke report but noted that higher displacement rates were associated with smaller projects and that larger scale studies over a longer period of time with wider turbine spacing suggest that birds are returning with time. MM suggested looking at

the Leopold et al. (2013) study which examines the effects of turbine density on guillemot displacement.

SS asked Natural England to agree whether 70% displacement and 10% mortality are too precautionary. MM confirmed that has never been Natural England's position. MK noted that the matrices are crude measures and attempt to capture sub-lethal as well as lethal effects, but are the best approach at the moment, highlighting the importance of putting the site into some kind of ecological context. MK stated that there is no evidence regarding mortality effects from displacement and so a range approach is best rather than focussing on one number, as this gives SoS a realistic sense of our understanding and the level of risk that their decision is being based on.

MH noted Natural England's concerns but stressed that the Hornsea Four challenge is to present a 'without prejudice' compensation case that requires a single number to inform the compensation. PG also highlighted the need to frame the risk from a compensation perspective and consider what is more likely and narrow the range down. MM noted these concerns but stated the end decision is for the SoS; Natural England's role is to provide advice on risk to the site conservation objectives. MM noted that there are two workstreams that could be undertaken to narrow the range - using tools such as SeabORD and/or exploring mitigation such as turbine spacing and layouts.

EA asked what values or ranges Natural England are using to come to their position of AEol on auks? MM confirmed that Natural England are not focussing on a single threshold figure but at a range of values, as well as looking at how important this area is in the breeding and post-breeding season.

MH noted that the SeabORD tool relies on good tracking data which isn't available. MM stated that it might be possible to put the importance of Hornsea Four for auks into context using the parameters that go into the model – rather than using the model itself. MM stated that the Kirsten Kober (JNCC) paper, the Marine Ecosystems Research Programme (MERP) data and Seabird Mapping & Sensitivity Tool (SeaMaST) data could be used to corroborate that. MM noted that some of the post breeding moult population is flightless for a period. MH asked if Natural England have an opinion on whether adult moulting birds will be actively displaced from the wind farm at that time? MM confirmed that they would be more vulnerable and as assumption would have to be made that they reacted in the same way. MH confirmed that Natural England are requesting that the array area is put into a wider context to draw conclusions and consider the displacement mortality ranges. MM confirmed that interpretation was correct. MK suggested that the Cleasby et al. (2020) paper which outlines modelling of seabird home ranges could be useful to see the extent of areas that might be important with respect to foraging birds in the breeding season. MK asked what birds are present for that post-breeding season? MH stated that combining habitat modelling and density hotspot areas in the absence of GPS tracking data could allow the project to draw conclusions on densities observed and environmental drivers in that particular area.

MK asked about years 1 to 3 of the data and asked whether there was any data from studies that went further than that, noting that the Peschko et al (2020) paper looked at an area where there had been wind farms present for some time. MK noted the risk in relying on years 1-3 as changes over that limited time could just represent environmental variability. SS confirmed there are constraints and limitations to post-construction monitoring and there are limited projects that go beyond 3 years. SS confirmed that the information reviewed in the report will be tabulated to highlight study results in relation to footprint size, turbine densities, season and number of study years. Possible correlations between footprint size, density

(distance between turbines or distance between wind swept area) and displacement effect reported could also be explored. MK added that buffers would be a useful addition to that. MK also suggested looking at Lincs and London Array OWF data.

Action: APEM to tabulate habituation and displacement post-construction monitoring data and consider correlations.

Assessment of Potential for an AEol Alone and In Combination with Respect to the Guillemot Features of the FFC SPA

SS and MB presented the numbers for guillemot (alone and in-combination displacement and PVA), noting that the parameters for the modelling have been discussed and agreed with the Evidence Plan at previous meetings. SS noted Vanguard numbers have been kept in. EA noted Hornsea Three numbers are subject to separate discussions.

MK asked if the reduction in final population sizes has been used as well as growth rate? SS confirmed this has been discussed and agreed in previous meetings but noted that it is less reliable than growth rate. MK suggested Natural England would take that away and confirm.

Post-Meeting Note: MK stated that Natural England's advice is that both the counterfactuals of reduction in growth rate and the final population size should be presented, recognising that the two counterfactuals have varying reliability in different contexts – these should be set out in the associated narrative regarding the PVA outputs. SS highlighted that Natural England's advice is a significant change in stance and may cause issues in future, as the PVAs agreed to be used are not designed to provide accurate population sizes. SS noted that further discussion is likely on this topic ahead of simply adding it in, as it may cause more confusion.

MB highlighted previous conversations had through the EP process, including that because PVA for a density independent model (Natural England's preferred method) has no population regulation (i.e. a colony can grow exponentially) it is more reliable to base assessments on reduction in population growth.

Action: Natural England to re-confirm their position on the use of population growth being the main determining output from the NE Seabird PVA tool rather than final population sizes predicted in model.

MB noted that the difference between the evidence-based approach and the Natural England approach was the use of sabbatical rates (evidence-base applies a sabbatical rate, whilst the Natural England approach does not), highlighting that the in combination values are very similar for both approaches. MB stated that colony growth rates suggest the FFC SPA colony is in favourable condition with a colony growth rate trend suggesting it would still retain a positive growth rate and increase in size following impacts even considering the higher levels of displacement and mortality alone and in-combination. MB further noted that during the time span of 2008-2017, when the growth rate has increased, 16 OWFs became operational in the North Sea. MB confirmed that growth is still predicted at the colony when considering any reduction in growth rate from PVA outputs, therefore an AEol from Hornsea Four alone and in combination can be ruled out.

SS asked Natural England on the basis of the numbers put forward, whether they would agree that there is no AEol on the basis of these numbers? MM confirmed agreement (without prejudice), adding a caveat about the post-breeding season. MM noted that there is a stable isotope study that looked at the post-breeding locations showing some degree of segregation

and a geolocator study from Isle of May. MM confirmed that Natural England would take that question away and consider.

Action: Natural England to confirm position on AEol for guillemot based on numbers presented in 'Assessment of Potential for an AEol Alone and In Combination with Respect to the Guillemot Features of the FFC SPA' document, following detailed review.

MK asked whether the PVA is taking into account productivity trends at the colony? MB confirmed that the model uses the average of the productivity rates from the past 10 years (2009 -2019) – as agreed through the EP process at previous meetings, noting that the Natural England Seabird PVA tool only uses a mean value. MK stated that a narrative approach to considering the extent of connectivity between the SPA and the Hornsea 4 array area in the post breeding season. This would help with the understanding of how important this area is to birds and the implications of the array area not being available to these birds at this time. MK also noted that it would be interesting to see how the Scottish experience (Forth and Tay) has played out in terms of closeness of sites to breeding colonies.

MB confirmed that Natural England are requesting the establishment of the value of this area at different times of the year. MK confirmed that was the case, suggesting the consideration of the Cleasby data.

Action: Natural England to consider how to consider sites with close proximity to colonies.

MH stated that the proximity to colonies seems to be Natural England's main risk area, noting project concern about the absence of tracking data which would be the hard evidence that both project and Natural England would like. MH highlighted that the project would like to get to a position to be as confident as possible in the data being presented and asked if these data are pulled together, would Natural England have the certainty to make the decision on AEol? MM confirmed that it would never result in enough certainty, but once all the data is explored then Natural England can come to a decision.

Mitigation Measures - Developable Area Approach

EA noted that Hornsea Four aim to investigate, without prejudice, the potential for further site reduction and a Developable Area Approach Note was submitted to attendees the week preceding the meeting. EA stated that further refining the site may reduce/eliminate the potential for AEol upon the guillemot and razorbill features of the FFC SPA.

SS asked for Natural England's thoughts on this approach. MK confirmed that Natural England consider it positive that the Developable Area is being looked at again. MM asked if there were differences in distributions between the breeding and post-breeding seasons? SS confirmed distributions were quite similar. MH asked Natural England to confirm which period they consider birds to be most sensitive? MM concluded that vulnerability is between breeding and post-breeding season is likely to be about the same.

JC confirmed that there is a potential workstream identified in relation to turbine layouts, although noted that evidence is limited and patchy. JC stated that if a layout mitigation option is deemed useful then it could take the form of a layout principle. MH stated that historically projects have used quite uniform layouts and the monitoring data is quite sparse but the project are doing an initial scoping exercise to understand what data exists and how useful it might be. MH conceded that if the data is too patchy then the project will focus efforts on contextualising the importance of the area instead. MH confirmed that Hornsea Four will draft

a scope for this work and would like to agree it with Natural England (noting tight timescales). MK confirmed that Natural England will do their best to facilitate this.

Action: Hornsea Four to prepare a scope of future work for agreement with Natural England and advise Natural England on timescales.

EA asked if Natural England consider that these mitigation measures will be effective in reducing the auk numbers to be compensated for. MM confirmed that Natural England hopes so as taking out an area of higher densities of auks will reduce the impact.

EA queried whether Natural England think there are feasible compensation measures to compensate for auks for Hornsea Four? MM confirmed that Natural England have been working on a report on compensation measures that will be issued in March or early April that might provide some answers on that.

Action: Natural England to share compensation measures report as soon as it is available.

Flamborough Front – Connectivity

EA noted that Natural England have questioned the potential the connectivity between the Flamborough Front and the Hornsea Four array area in the post breeding season. EA asked Natural England for some further explanation on this point. MM noted that the Camphuysen paper in relation to the post-breeding dispersal of guillemot identified the Flamborough Front as an area that birds tend to go to, presumably due to the higher productivity. MM stated that this might explaining why this area is important.

EA noted that Hornsea Four are carrying out a prey distribution workstream that will include consideration of the Flamborough Front.

Next Steps

PG noted that the consequence of displacement is something that the marine mammal topic has considered – looking at the concept that the level of disturbance is linked to motivation of that animal to be in that place. PG queried whether evidence was available to be able to draw any level of distinction between important areas and motivation.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
APEM to tabulate habituation and displacement post-construction monitoring data and consider correlations.	APEM
Natural England to confirm position on the use of final population sizes in model.	Natural England
Natural England to confirm position on AEol for guillemot based on numbers presented in 'Assessment of Potential for an AEol Alone and In Combination with Respect to the Guillemot Features of the FFC SPA' document.	Natural England
Natural England to consider how to consider sites with close proximity to colonies.	Natural England
Hornsea Four to prepare a scope of future work for agreement with Natural England and advise Natural England on timescales.	Hornsea Four
Natural England to share compensation measures report as soon as it is available.	Natural England

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Archaeology Technical Panel Meeting 1	28 January 2019
Meeting Date	18/12/2018	
Place	Ørsted, 5 Howick Place, London	
Participants	<p>██████████) – Historic England</p> <p>██████████) – Maritime Archaeology</p> <p>██████████ – Ørsted</p> <p>██████████) – GoBe Consultants</p>	Our ref. HOW04/EP_TPMArch_1
Absent	<p>██████████ Historic England</p> <p>██████████ – Hull Archaeology Partnership</p>	
Copy	██████████	
Next meeting	Not planned	

Agenda

1. Welcome and safety brief
2. Introductions
3. Aims and Objectives of Meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportionate Approach
7. Scoping Review
8. Landfall
9. Next Steps
10. AOB

Introductions

EA provided a Health and Safety Briefing, facilitated general introductions, and LK then outlined the aims and objectives of the meeting – with the main aim of this meeting to be the establishment of the Marine Archaeology Evidence Plan Technical Panel to discuss the data and information to be included in the Hornsea Four Environmental Statement in relation to Marine Archaeology.

Introduction to Hornsea Four

LK presented an overview of Hornsea Four, the consenting programme, route planning and site selection undertaken to date. LK noted that the Hornsea Four Scoping Report was submitted to the Secretary of State on 15 October 2018. This was a 782-page report which adopted a front-loaded, proportionate EIA approach. The associated 182-page Scoping Opinion was adopted by the Secretary of State on 23 November 2018.

LK noted that since the submission of the Scoping Report, further route planning and site selection work has been taking place, with route appraisal and refinement works, offshore Export Cable Corridor (ECC), landfall, onshore ECC and onshore substation location refined and an internal design freeze set for 14 December. In relation to the preparation of the Preliminary Environmental Information Report (PEIR), the project parameters are being finalised, baseline data collection is underway, and the Scoping opinion has been evaluated.

Principles of the Evidence Plan Process

LK presented an overview of the Evidence Plan process. PN noted that she had been involved in the Evidence Plan process for Hornsea Three so was familiar with the approach.

Proportionate Approach

LK presented an overview of the proportionate approach to EIA, outlining the five methods being used to achieve this proportionate approach: Impacts & Effects Registers, Commitments Register, the Evidence Plan Process, innovative ways of presenting data, and directed questions in Scoping.

PN stated that Historic England understands what Hornsea Four are aiming to achieve with the proportionate approach but highlighted that Historic England have a fundamental concern about this approach in relation to marine archaeology.

BM noted that this proportionate approach is new to all parties and founded on the basis of utilising the evidence base from other projects in the area, applying embedded mitigation measures, with the outcome resulting in no or a negligible impact on archaeological receptors.

Scoping Review

BM gave an overview of the aims and objectives of the marine archaeology scoping report section which were to

- Provide an overview of the planned development and study area;
- Detail baseline sources utilised;
- Provide an initial overview of the baseline offshore historic environment (not comprehensive at this stage);
- Approach to mitigation and highlight survey limitations;
- Likely significant effects, scoping in/out; and
- Next steps.

BM gave an overview of the baseline marine archaeological environment which includes a diverse range of recorded lost watercraft of all types and periods. BM noted that the initial study of the scoping areas resulted in 100 known wrecks and obstructions within the UKHO and NRHE data sets, though there are several thousand located along this stretch of coastline. BM highlighted that no known aircraft losses occur within the study area, though this is not unusual despite the intensity of aerial activity along this coast during the Second World War, but also during the First World War.

BM noted that early site planning by the Hornsea Four team has clearly incorporated historic environment data with some noted route deviations around known wrecks.

BM highlighted that the baseline section presented within the scoping report was not intended as a comprehensive study for the purposes of scoping but intended to characterise the

proposed development area in general terms to illustrate the types of historic environment receptors for the purposes of scoping impacts in a proportionate way. BM also noted that the technical report and subsequent PEIR chapter will present a detailed baseline environment where all archaeological receptors will be examined both thematically and on a case by case basis.

BM gave an overview of the submerged prehistoric landscapes found within the scoping boundary. BM noted that the notable submerged landscape studies were the Humber REC by Tappin *et al.* located away to the south, and the more directly North Sea Palaeolandscapes Project coordinated by Vince Gaffney. In relation to palaeolandscapes, BM noted that Historic England's scoping response referred to the Lost Frontiers Project but highlighted that this has not yet been published. PN stated that she has attended a conference in York where this project was presented and noted that their website has a long bibliography that may be of use. BM stated that several papers were published by the team on Dec 8th but that these focus on methodologies rather than the actual findings of the project and this is unlikely to be available until after the ES submission.

BM gave an overview of the embedded mitigation measures that Hornsea Four have committed to at this stage, highlighting that these measures are as per industry standard. BM stressed that a full detailed desk-based assessment will be undertaken for PEIR. BM also noted that in relation to geophysical surveys, a reduced coverage survey has been undertaken in 2018 which will allow for the characterisation of marine archaeology to inform the PEIR, with a commitment to full coverage geophysical survey in 2019-2020, with full coverage of areas within the DCO Order limits.

BM stated that the desk-based assessment will not just consider known wrecks from the likes of UKHO and Hull City Council, it will cover everything identified from the interpreted geophysical data and unexpected discoveries that may arise. BM stressed that Hornsea Four are keen to keep things focussed but that does not mean lack of willingness to do a really thorough assessment. BM also noted that the geophysical data will be interpreted at a later stage than is typical for these kinds of projects which has associated risks related to late and unexpected discoveries. BM highlighted that there will be pragmatic mechanisms within the Written Scheme of Archaeological Investigation (WSI) to deal with those. BM noted that the WSI will contain several work packages, how detail will be assessed, ongoing consultation, and how data going to be analysed. BM stated that the Evidence Plan process will allow open discussions and to give Historic England the opportunity to shape the mitigation that Hornsea Four are proposing.

BM gave an overview of the reduced coverage geophysical surveys that have been undertaken in 2018 which will form the basis of characterisation and mitigation development at PEIR, noting that full coverage surveys will be undertaken in 2019, the results of which will be included in ES. LK also noted that benthic grabs have been and will be undertaken alongside geophysical survey and geotechnical surveys will also be taking place in 2019, both offshore and in the intertidal area. PN noted that the survey detail is similar to what usually presented in these kind of projects.

Landfall

EA explained that a detailed appraisal is being undertaken to refine the landfall zone from scoping to PEIR. The appraisal highlighted the abundance of World War Two beach defences,

which were investigated further during site walkover surveys in November. EA noted that Hornsea Four want to avoid areas of high densities of these beach defences. EA highlighted that the feedback from the site visit was that these defences are likely to be more important to the public than to historic England. PN agreed that this was most likely the case.

BM queried what was the worst case in relation to export cable laying. EA confirmed that HDD and trenching is currently being considered and the worst case would be the removal of the structures and placing them back after completion of the works. BM noted that Hornsea Four would have to undertake a condition assessment and look at the group value and rarity. PN stated that Historic England have agreed to removal of intertidal structures previously, but that approval is agreed on a case by case basis and would need to involve both the Historic England local office and the local authority.

Next Steps

BM confirmed that a comprehensive desk-based assessment will be integrated into the technical report to support the PEIR assessment chapter. BM noted that the WSI is currently being drafted and will be provided to Historic England for comment.

Action: Provide a draft WSI for discussion.

PN stated that she appreciated being talked through the process and now has a fuller understanding of what Hornsea Four are trying to achieve. However, she highlighted that corporately Historic England's primary concern with the approach relates to the exclusion of aspects of the historic environment from the full statutory EIA process, which would limit Historic England's ability to input during the Planning Inspectorate application process and therefore in our statutory role as heritage advisors. As such, it is likely that Historic England would have to object to the approach on principle, despite the goodwill shown by Hornsea Four.

BM noted that although some impacts have been scoped out of the assessment, Historic England will still be directly involved in the WSI and mitigation process. LK noted that Hornsea Four would like input from Historic England to ensure that the mitigations are appropriately worded and adequately secured within the dMLs to provide Historic England with comfort that the historic environment will be appropriately considered.

PN noted that some different phrasing and additional information in the scoping report could have been included to make the approach clearer, i.e. what happens to things that are scoped out? PN noted that Historic England's objection to this approach is not likely to change and they will likely escalate this through the process. BM confirmed that all receptors will be detailed and incorporated into the chapter but the scoped out impacts just not assessed in the same way as typically undertaken for other projects, due to the embedded mitigation.

Action: Hornsea Four to consider and develop the best way to present information so that the receptors are still detailed, and next steps outlined.

Action: Hornsea Four to provide the draft WSI for discussion at the next Technical Panel meeting.

AOB

All agreed to consider how to progress marine archaeology for Hornsea Four and to have one or two further meetings prior to PEIR submission.

LK and EA thanked all participants for joining the Technical Panel meeting. Meeting minutes would be circulated by Ørsted within the next few days for comment / sign-off in the New Year.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Archaeology Meeting #2	19 December 2019
Meeting Date	13/11/2019	
Place	Ørsted, Howick Place, London	
Participants	<p>██████████ Historic England</p> <p>██████████ – Maritime Archaeology</p> <p>██████████ – Ørsted</p> <p>██████████) – GoBe Consultants – by phone</p>	Our ref. HOW04/EP_MA_2
Absent	<p>██████████ – Hull County Council</p> <p>██████████ East Riding of Yorkshire Council</p>	
Copy	██████████ – Ørsted	
Next meeting	TBC	

Hornsea Four Update

EA provided an update on Hornsea Four development activities such as route planning and site selection (southern landfall option (A4) selected, HVAC booster station search area reduced and reintroduction of WTG gravity base foundations into the project envelope), receipt and review of S42 responses, updating of Technical Report and Chapter for Application.

EA noted that the project had committed to using HDD in the intertidal area and not open cut trenching. EA confirmed that during the reinstatement phase at landfall, Hornsea Four propose to provide signage within the order limits detailing the wartime history of the immediate area associated with existing historic features, including beachfront defences and pillbox guard posts. PN asked if any intertidal heritage assets, such as anti-tank blocks, will need to be moved if using HDD methods.

ACTION: Hornsea Four to confirm if now that HDD is committed to whether the heritage assets at landfall are going to need to be removed.

Programme to DCO

EA gave an overview of the Hornsea Four programme which includes Evidence Plan meetings in November and December 2019 and final application submission in Q1 2020, most likely the end of February 2020.

Impact Register Updates & Scope of the EIA at ES

EA gave an overview of the changes that will be made to the Impacts Register post-PEIR. PN commented that Historic England may have further comments on the revised register, once received.

ACTION: Hornsea Four to provide updated Impacts Register.

Data Collection & Description of Baseline Environment – S42 Responses

CH gave an overview of the documents presented at PEIR and presented a review of the baseline environment for archaeology.

Mitigation: PEIR Approach

CH noted that some of the wording of the archaeology commitments have been updated – updated wording shown below.

ID	Measure Proposed
Co46	Primary: The offshore export cable corridor and the array will be routed to avoid any identified archaeological receptors pre construction, with buffers as detailed in the Marine Written Scheme of Investigation WSI.
Co140	Primary & Tertiary: A Marine Written Scheme of Archaeological Investigation (WSI) will be developed in accordance with the Outline Marine WSI. The Marine WSI will include the requirement for Archaeological Exclusion Zones (AEZs) to be established to protect any known / identified marine archaeological receptors and the implementation of a protocol for Archaeological Discoveries in accordance with 'Protocol for Archaeological Discoveries: Offshore Renewables Projects' (The Crown Estate, 2014).
Co166	Secondary: A geophysical survey (including a UXO survey) will be undertaken prior to construction and will be subject to a full archaeological review in consultation with Historic England.
Co167	Secondary: A geotechnical survey will be undertaken prior to construction, including a staged geoarchaeological assessment and analysis of geotechnical data inclusive of publication, in consultation with Historic England.

Outcome of EIA – S42 Responses

CH gave an overview of Historic England's S42 responses, welcoming the generally positive response.

CH noted that all comments on the Outline WSI will be addressed and the document updated and confirmed that there are no disagreements on Historic England's comments on the document. PN confirmed that once these updates are satisfactorily made then Historic England would be content with the document as part of the application submission.

Impact of Remedial Work on Cables – Section 42 Responses

CH noted Historic England's comments on the consideration of the impacts from cable repair and remediation activities and new areas of impact. PN provided some clarity on the comment noting that the use of jack-ups and trenching equipment might not be in the same area as they were for construction. PN confirmed that Historic England are advocating a proportionate approach, likely comprising a review of AEZs or data as the additional cable length required for the repairs is often laid perpendicular to the original cable route. CH asked if this was a question of wording rather than reassessment. PN confirmed that tightening of wording rather than a new assessment would be appropriate.

Post-meeting note: Following advice from the Ørsted cable specialist team they confirmed that prior to construction a corridor up to 200m wide will be surveyed (with the data assessed for archaeological potential). Before any repair/exchange event a MBES survey will take place, therefore no part of the replacement cable or the removed cable or will be laid on seabed that has not been surveyed.

In light of this, we suggest the following amendment to the wording of impact MA-0-7 for the Operation and Maintenance phase:

“Scour, penetration, draw down and compression effects caused by (a) the presence of WTC substation foundations, and (b) the exposure and replacement of inter-array and export cables or the use of cable protection measures (such as remedial cable burial), impacting archaeological receptors and exposing such material to natural, chemical or biological processes and causing or accelerating loss of the same”

Next Steps

CH confirmed that the next steps will be the production of the ES chapter, Technical Report and Outline WSI incorporating and fully addressing all Section 42 consultation responses from Historic England including updated based on recent geophysical data assessments from MSDS.

AOB

PN and EA discussed the knowledge-sharing workshop that will be set up between Historic England and Ørsted. PN highlighted the three topics she would like to cover in the workshop are:

1. Lessons learn session with Hornsea One (and/or Hornsea Two)
2. Session on the ground model
3. Visibility of data processing/“work in progress” e.g. GIS imagery when defining Archaeological Exclusion Zones (AEZs)

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to confirm if now that HDD is committed to whether the historic artefacts at landfall are going to need to be removed.	Hornsea Four
Hornsea Four to provide updated Impacts Register.	Hornsea Four

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan Marine Archaeology Meeting #3	14 May 2020
Meeting Date	12/05/2020	
Place	Teleconference	
Participants	[REDACTED] – Historic England [REDACTED] Maritime Archaeology [REDACTED] – Ørsted [REDACTED] – GoBe Consultants	Our ref. HOW04/EP_MA_3
Absent	N/A	
Copy	[REDACTED] – Ørsted	
Next meeting	TBC	

Aims and Objectives

EA gave an overview of the aims and objectives of the meeting which were to discuss feedback received from Historic England on the Outline Marine Written Scheme of Investigation (WSI); clarify specific comments and present further details to resolve all responses; and aim to seek agreement on the WSI ahead of DCO submission.

Hornsea Four Project Update

EA gave an overview of the Hornsea Four programme which is on track for a September 2020 date for DCO Application submission, with the project currently reviewing and finalising DCO documentation. EA noted that Hornsea Four will be drafting Statements of Common Ground with stakeholders during Q2 and Q3 2020 and the project will be in touch with Historic England in the coming months to discuss this document.

Site Investigations Schedule

EA gave an overview of the site investigations schedule that is presented within the Outline Marine WSI, noting that documents for DCO submission have been updated with data acquired during the Geophysics 1A survey in 2019. EA stated that the Geophysical 1C (pre-geotech) survey was completed at the end of March 2020, with the Geotechnical 1A survey currently underway. EA noted that the survey reports for these recent/ongoing surveys will be available in Q4 2020. EA highlighted that further updates to the survey schedule, made after the submission of the DCO, will be communicated separately to Historic England. PN noted she had no questions on the survey schedule at present and found it useful to know when the survey reports will be ready.

Marine Archaeology Study Area

CH noted that the Marine Archaeology Study Area has changed between PEIR and DCO Application, due to refinements to the Order Limits, with the main change being the narrowing of the offshore Export Cable Corridor in the vicinity of the intertidal area. CH noted that this change has influenced the number of marine archaeology receptors that are considered within the Outline Marine WSI and the other marine archaeology application documents as shown in the table below.

Receptor	PEIR Study Area	DCO Study Area
Geophysical anomalies	195 (153 within the Order Limits)	180 (153 within the Order Limits)
Known Wrecks and Obstructions	25	25
Intertidal and terrestrial sites	62	50
Wrecks of Archaeological significance	7	7
Archaeological Exclusion Zones	25 Known Wrecks 7 Geophysical Anomalies	25 Known Wrecks 7 Geophysical Anomalies

PN appreciated this overview of updates to the study area and did not have any comments.

Outline Marine WSI

CH highlighted that the mitigation measures detailed in the Outline Marine WSI remain unchanged. PN agreed that we have covered the commitments in detail previously, and Historic England are happy as they currently stand.

CH gave an overview of the minor amendments suggested by Historic England on the Outline Marine WSI and noted that all the comments in the table below will be actioned by Hornsea Four with the Outline Marine WSI updated accordingly.

Historic England comments	Hornsea Four Comment
The description of heritage receptors should reference aviation remains.	Agreed
The wording of paragraph 1.1.1.2 should be clarified	Agreed
Further detail on the role and responsibilities of the Retain Archaeologist should be included in Section 2	Agreed
Section 4 should be updated prior to submission of the DCO application, including recent data if available.	Agreed
Paragraph 4.6.1.2 should include reference to the Ancient Monuments and Archaeological Areas Act 1979	Agreed
Paragraph 6.1.1.3 should state that 'the applicant will engage a retained archaeologist to implement the final WSI	Agreed
Bullet points in paragraph 7.9.1.1 should say "an application"	Agreed
Within Annex 1, Section 4 reference should be made to both the Historic England Regional Science Advisor and the Local Authority archaeologist	Agreed
Annex 1, Section 4 reference to the Historic England Marine Planning Team should be amended to Unit.	Agreed

Regarding Historic England's comment: "Further detail is required in Section 7.2 'Archaeological Recording, Reporting, Data Management and Archiving' with regards to the standards that are anticipated for the project."

CH asked if PN could clarify the detail required by Historic England in relation to Section 7.2 of the Outline Marine WSI. PN stated that upon second review, the relevant detail is included in Section 7.3 "Method Statements" of the WSI, so this comment can be disregarded. CH stated that further cross-references would be added to where the detail is presented to make this section clearer. PN agreed this would be sufficient.

Regarding Historic England's comment: "Paragraph 7.3.1.2 should include a timeframe for the delivery of the method statements to the archaeological curators for review, prior to the commencement of the relevant works"

CH asked PN what timeframe Historic England would recommend in relation to the delivery of method statements to the archaeological curators for review, prior to the commencement of works. PN stated that a minimum of 20 working days would be required. CH confirmed that 20 working days would be agreeable so the Outline Marine WSI would be updated to reflect that. EA noted it would be good to discuss campaigns on a case-by-case basis if there were any issues meeting the 20 working days timescale.

Regarding Historic England's comment: "The decommissioning impacts described in Table 3 'Potential impacts on heritage receptors' should include the direct effects of jack-up footprints on archaeology. Conversely, the draw down effects of the voids left by jack-ups is only considered for decommissioning, but would also be relevant to each phase. The table should therefore be amended to ensure that all relevant impacts are considered for each phases of the developments life"

CH suggested some amendments to the "potential impacts" description text to detail disturbance, removal, intrusion, compression, drawn down and/or penetration for all phases of the project. PN confirmed that these changes would be appropriate and address Historic England's comments, noting that it is really important that the impacts are clear and explicit. PN appreciated the additional clarity that had been added, and considered the updated wording a really good addition to the impact description. EA noted that these changes would be carried across to the Impacts and Effects Register, in the Marine Archaeology Chapter and within the Outline Marine WSI.

LK asked if Historic England could agree that (subject to the discussed changes being made) the Outline Marine WSI is appropriate and fit for purpose. PN confirmed that in theory Historic England are happy with the Outline Marine WSI but that cannot be confirmed until the DCO application as a whole has been received and reviewed. EA queried whether a holding position could be captured within the Evidence Plan Log, stating that as it currently stands, HE is currently in agreement with Outline Marine WSI but may amend its position once they have reviewed other documents within the final DCO Application? PN confirmed that a legal view would have to be sought on this but if text is provided this could be considered.

Action: Hornsea Four to provide some Outline Marine WSI agreement text for review. **Complete – provided alongside draft meeting minutes.**

Action: PN to get a legal view on the Outline Marine WSI agreement text to confirm whether this would be acceptable.

Next Steps

EA noted that Hornsea Four will be submitting the Environmental Statement as part of the DCO Application, with all documents fully addressing the Section 42 consultation response from Historic England and the comments received more recently on the Outline Marine WSI.

EA highlighted that the next step is to start to draft the Statement of Common Ground (SoCG) with Historic England in relation to both onshore and offshore archaeology (both topics within the same SoCG). PN confirmed that Keith Emerick would be leading on the SoCG for Hornsea Four and PN would provide comments to Keith for inclusion. PN agreed it is beneficial to start working on the SoCG now, especially given the uncertainties to the examination process given COVID-19 restrictions.

EA asked if there was any other application documents that Historic England wanted to review prior to DCO application submission? PN confirmed that no other documents are required for review and thanked Hornsea Four for the tremendous effort put in to engage with Historic England.

Summary of Actions

A summary of the actions and associated responsibilities are provided in the table below.

Action	Responsible
Hornsea Four to provide some Outline Marine WSI agreement text for review. Complete – provided alongside draft meeting minutes.	Hornsea Four
PN to get a legal view on the Outline Marine WSI agreement text to confirm whether this would be acceptable.	PN

Appendix C3 – Onshore Evidence Plan Meeting Minutes

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 1 - Pre-scoping	12 September 2018
Meeting Date	12 September 2018	
Place	Brough Business Centre	
Participants	[REDACTED] – Orsted [REDACTED] – ERM Water [REDACTED] – ERM Ecology [REDACTED] – ERYC Biodiversity [REDACTED] – Yorkshire Wildlife Trust (YWT) [REDACTED] – Natural England (NE) [REDACTED] – Natural England (NE)	Our ref. Hornsea Four EP Onshore Ecology TP Meeting #1
Absent	N/A	
Copy	[REDACTED]	
Next meeting	TBC (November 2018)	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim:

Initial meeting to discuss the approach to the scoping report, the scope of any proposed surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

JC presented an overview of Hornsea Four, the consenting programme, route planning and site selection, proportionate EIA and tools used i.e. commitments register and impacts/effects register.

Action – JP and J to ensure that all SSSI's are named in the commitment table relevant to these sites.

EB requested that additional clarification be added to the impacts and effects register to make it clear that the “likely significance of effect” is not the same as the term “likely significant effects” used in HRA assessments, and that this proportionate approach (and associated tools) are for the EIA and not applicable to the HRA. JC and JP confirmed.

Action – JC to ensure that all future reference includes “the likely significant effects (applicable to the 2017 EIA Regulations)”

JP presented the onshore ecology EP position paper as the basis of discussion for the first meeting.

JP presented the initial findings of designated sites within the scoping boundary plus a 1 km buffer.

JC presented the sensitivity/constraints mapping Orsted have undertaken to refine the indicative route and demonstrate that designated sites and priority habitats were given a buffer and avoided by the permanent project footprint.

Action – JP to propose updated wording of Co2 (avoiding sensitive areas) to JC that should encapsulate all sites avoided e.g. LNR, LWS, YWT, priority habitats etc. to provide further assurance.

NE, YWT and ERYC would like to see the refined indicative route when available to provide assurance that these sites will be avoided.

Action – JP to send VG the scoping boundary shapefile (including the 200m indicative permanent cable corridor) via Susan Hunt at ERYC to allow VG to review the designated sites and provide feedback following the council's October review of designated sites.

JP outlined the approach taken for the Phase 1 Habitat survey i.e. high-resolution aerial photography plus ground-truthing and invited comments from the panel. The panel agreed in principle that it was an appropriate methodology for a Phase 1 Habitat survey given the context of Hornsea Four, subject to review of the Phase 1 maps.

JC also highlighted the benefits of aerial phase 1: it's safer, quicker and allows 100% coverage of the route unconstrained by access and H&S concerns.

JP advised that the Phase 1 Habitat map book will be available as an Annex to the scoping report due to be released 8th October for detailed feedback and suggestions. NB: The annex does not include a full Phase 1 Habitat report, just the map book.

Action – JC/JP to arrange a copy of the aerial photography to be sent to YWT and ERYC

JP invited feedback on the scope of the Phase 2 surveys proposed. In principle, the panel were in agreement subject to reviewing the Phase 1 habitat maps of the 700 m indicative cable route, due to be released 8th October with the Scoping Report.

- DC asked what the schedule will be for the Phase 2 surveys. JP confirmed it will be a full year's survey to cover all optimal survey windows for the various species and habitats. JC highlighted that the results of these surveys will likely not be included in the PEIR as they will not be complete when it is published.
- DC queried the exclusion of detailed grassland surveys. JP responded that from the Phase 1 habitat survey and ground-truthing, areas of semi-improved grassland were initially identified; however, upon ground-truthing, the majority of these areas were downgraded to poor-semi improved. Given the intensity of land use in the area, any areas of unimproved grassland are highly likely to already be designated and none have been identified to date, so no further detailed grassland surveys are proposed at this stage.
- VG queried the exclusion of pink-footed goose. JP responded that there were no records of pink-footed goose within in the Hornsea Four scoping area and that the wintering bird surveys proposed would identify any significant presence of the species.
- The panel agreed that water vole was a key concern as they use ditches as well as 'natural' watercourses.

JP presented the proportionate approach to EclA and how it has been applied to determine the scope of the onshore ecology, highlighting the conclusion to only conduct simple assessments.

- The panel agreed to provide comment following the scoping report which would have more detail than the position paper. There were no concerns raised in the meeting.
- There was agreement in principle for scoping out impacts from accidental pollution events, subject to review of the more detailed scoping report.

JP invited discussion on opportunities for strategic mitigation for project.

EB raised that strategic GCN mitigation may not be appropriate for the project depending on the level of GCN interest. Further discussions are planned following initial survey results.

DC commented that YWT has several amenable landowners open to having ecological mitigation placed on their land so this is an option Hornsea Four could explore if appropriate.

No specific action on strategic mitigation, JP will share any ideas/evidence with the panel via email and follow up conference calls as necessary as the surveys progress.

JP briefly outlined the HRA screening conclusion of no LSE from Hornsea Four onshore.

EB queried whether the NE impact risk zones had been used in the decision.

JP responded that they had not been specifically relied on for the conclusion. Impact effect pathways were the primary consideration and given the nature of the existing landscape (intensive agriculture), the onshore components and the distance between the onshore components and the closest European sites with relevant pathways of effects, it was concluded that there are no LSE on European sites for onshore ecology.

VG asked if we had considered the Humber Estuary SAC specifically in relation to sea lamprey. JP responded that it had not been screened in as it was unlikely the lamprey would travel that far upstream from the Humber. Further evidence of this can be provided if necessary following HRA screening report release.

The HRA screening report will be available for comment 8th October.

Minutes of Meeting

Meeting Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 2 – Post Scoping / Pre-PEIR

Meeting Date 8 January 2019

Place County Hall – Beverley

Participants [Redacted] Ørsted
 [Redacted] – RHDHV Lead Ecologist
 [Redacted] – RHDHV Project Manager
 [Redacted] – RHDHV Assistant Project Manager
 [Redacted] – ERYC
 [Redacted] - ERYC
 [Redacted] Natural England
 [Redacted] – Natural England
 [Redacted] – RSPB
 [Redacted] - RSPB
 [Redacted] – Yorkshire Wildlife Trust

Absent N/A

Copy [Redacted]

Next meeting April 2019

8 January 2019

Our ref. Hornsea Four EP Onshore Ecology TP Meeting #2

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Project Four Update
5. Review of Actions from Previous Meeting
6. Current Surveys
7. Scoping Opinion review
8. Next Steps
9. AOB

Aim:

To update stakeholders on Hornsea Project Four since the initial meeting, to provide an overview of the methodology and preliminary results for surveys currently being undertaken, and to discuss the responses received during the Scoping process, accompanied by a discussion on the next steps in relation to seeking agreement with

stakeholders on the data and information to be included in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES).

Minutes and Actions

Hornsea Project Four Update -

AS gave a short re-cap on the Scoping Report and the front-loaded proportionate approach to the Environmental Impact Assessment (EIA), before giving an overview of the route planning and site selection (RPSS) refinement which has been taking place and touching on the start of the baseline data collection and evaluation of the Scoping opinions.

Review of Actions from Previous Meeting -

CS touched on actions from the first meeting:

Action: To ensure that all SSSIs are named under the Commitment relevant to these sites.

Status: CS stated that this is in progress and will be circulated once updated.

Action: Julian Carolan (JC) to ensure that all future reference includes 'the likely significant effects (applicable to the 2017 EIA Regulations).'

Status: CS stated that this was actioned and included within the Scoping Report.

Action: Josie Preece (JP) was to propose the wording of Co2 (avoiding sensitive sites) to JC, which would encapsulate all sites avoided in the RPSS process e.g. Local Nature Reserves, Local Wildlife Sites, Yorkshire Wildlife Trust sites, priority habitats etc. to provide further reassurance to stakeholders.

Status: CS stated that this had been completed and provided within the Scoping report.

Action: JP to send VG the Scoping boundary shapefile (including the 200m Indicative Permanent cable corridor.

Status: CS confirmed that the shapefile had been provided to all evidence plan attendees.

Action: JP to arrange a copy of the aerial photography to be sent to YWT and ERYC.

Status: AS gave a hard drive with a copy of imagery to DC and SH.

Current Surveys –

CS presented an overview of the Overwintering Bird surveys undertaken in November and December 2018. CS explained that a total of 35 vantage points (VPs) had been identified covering the refined landfall, onshore export cable corridor (ECC) and onshore substation (OnSS). The surveyors waited 5 minutes before commencing the 15 minute survey period and recording the species and numbers and at each VP

location plus a 250m radius. CS stated that the survey methodology follows standard practice and referenced '*Bird Census Techniques*' by Bibby et al, 2000. She explained that some of the December VPs were updated to avoid crop fields, and at the request of landowners.

DC questioned where the VPs were shown on the presentation image.

CS replied by explaining the image, before agreeing to circulate the survey points accompanied by a summary of the initial findings. CS went on to summarise that an adult female Peregrine Falcon had been identified outside of the OnSS search areas.

CS explained that the findings would feed into the technical report and PEIR Chapter. The Breeding Birds survey would also be completed after the Overwintering Birds surveys.

JD asked if CS could confirm whether a Willow tit or Marsh tit was sited.

CS responded that it could be either, as there was no call heard to differentiate between the species.

Scoping Opinion -

CC reviewed the responses reviewed at Scoping, outlining the following:

- Internationally designates sites would be specified within PEIR and scoped into the assessment where required, for stand-alone and in-combination effects;
- Nationally Forestry Inventory data would be obtained and included with PEIR;
- The inclusion of mitigation and compensation for Ancient Woodlands, if recorded, would be reviewed following the completion of the Extended Phase 1 Habitat Survey;
- All woodland would be assessed for value/ impact and would be considered for mitigation and/or compensation at PEIR. Further information would be obtained following the completion of the Extended Phase 1 Habitat Survey in February 2019.
- Further information on hedgerows would be obtained from the 2019 Extended Phase 1 Habitat Survey, the findings of which would be reported within the PEIR.
- The rationale for any buffer zones being used, for either desk and/ or species surveys would be explained and justified within the PEIR. Similarly, any changes from the Scoping report would also be explained.
- Where possible, unprotected areas of woodland, mature and unprotected trees would be avoided through the Co2. These would also be explored further following the Extended Phase 1 Habitat survey in February 2019;
- Opportunities to enhance the nature conservation interest of site in line with NPPF would be explored following the Extended Phase 1 Habitat survey.

Next Steps –

CC provided an overview of the upcoming ecology surveys, confirming that the Extended Phase 1 would be an exercise in consolidating and gathering further

information in order to help refine and focus surveys further. CC explained that the imminent surveys would likely include a Great Crested Newt Habitat Suitability Index (HSI) assessment of all ponds within and up to 250m around the refined onshore ECC. The eDNA of these ponds would then be carried out in the survey season commencing mid-April, following standard industry guidance.

CC also touched on the likely Phase II surveys to take place:

- Breeding Bird surveys;
- Great Crested Newt eDNA;
- Monthly bat activity transect surveys;
- Bat emergence and re-entry surveys of features assessed as having medium or high bat roosting potential. No further surveys of features will be undertaken of features assessed as having low or negligible potential;
- Water vole & otter presence and absence surveys would be undertaken on waterbodies assessed as being of optimal habitat; and
- Badger presence and absence surveys.

VG questioned whether other data sources will be used to inform the surveys.

CC confirmed that all species data records would be analysed preceding the accompanying surveys.

DC mentioned that not all of the Water vole data may have been recorded centrally.

CS questioned whether the YWT hold any such information.

Action – DC to investigate whether the YWT might have any additional data we can use.

CS then further questioned whether all of the data that the ERYC and YWT hold would be included in the Biological records.

Action - DC said that wasn't a certainty and that that he would investigate further.

JD confirmed that that the RSPB did not have any additional data to share.

VG flagged that there are 48 wildlife sites which have recently lost their Designated status.

Action – VG to provide this data update in the Council's Scoping response.

CS asked EB/ MM whether the eDNA surveys are sufficient to inform the PEIR and Environmental Statement (ES), and that presence and absence surveys would not be advised by Natural England pre-application.

Action – EB responded that she would need to confer with colleagues before providing a response.

TM/JD then questioned the reasoning behind using eDNA surveys versus traditional presence/absence survey methods.

CS answered that if the eDNA comes back as positive then newts are likely to be present, and therefore mitigation would be required. It is during the pre-Construction phase that a project would look to undertake traditional survey methods in order to understand population sizes. CS explained that this has been sufficient for pre-application purposes on other projects.

AS asked whether any attended has any other questions or concerns that they would like to raise at this stage, and no attendees expressed anything further.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 2 – Post Scoping / Pre-PEIR	8 April 2019
Meeting Date	8 April 2019	
Place	Brough Business Centre, Brough	
Participants	<p>██████████ – Ørsted</p> <p>██████████ – RHDHV Lead Ecologist</p> <p>██████████ – East Riding of Yorkshire Council (ERYC)</p> <p>██████████ – Environment Agency</p> <p>██████████ – Natural England (via teleconference)</p> <p>██████████ – Natural England (via teleconference)</p> <p>██████████ – RSPB</p> <p>██████████ – Yorkshire Wildlife Trust</p>	Our ref. Hornsea Four EP Onshore Ecology TP Meeting #3
Absent	N/A	
Copy	██████████	
Next meeting	(May/ June 2019) TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. Next Steps
8. Biodiversity Net Gain
9. Any other business (AOB)

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. For Ørsted to provide an update on Hornsea Project Four activities and to review the actions from the previous technical panel meeting;

2. To discuss the proportionate approach Ørsted is taking to the PEIR and ES;
3. To present the evidence base to be provided to scope out effects where complete consensus has not been achieved with key stakeholders;
4. To discuss the next steps in relation to seeking consensus with stakeholders on the proposed approach to the PEIR, including what additional evidence or information is to be provided at the next technical panel meeting in May/ June.

Specifically, in relation to the:

- a. Evidence base
- b. Baseline data
- c. Assessment methodology
- d. Mitigation/ enhancement.

Hornsea Four Update (AS)

AS presented the Interim PEIR boundary which showed a further refined OnSS search area, an 80m onshore ECC route, with access tracks and logistics compound locations, and a refined landfall search area. AS explained that this boundary was refined from Scoping and that the landfall and OnSS search area would be further refined when presented at PEIR.

AS went on to update the panel on the community newsletter which was delivered to thousands of addresses in the area in March 2019 and which updated the local community on the news about the scheme and a summary of the Local Information Events which took place in October 2018.

AS then provided an update on the projects approach to proportionality, including the Impacts and Effects and register, the Commitments Register, the Evidence Plan process, the use of innovative ways of presenting data and focussed questions, as the tools driving proportionality.

Summary of previous actions

CC touched on any remaining outstanding actions and statuses from previous Hornsea Four technical panel meetings:

1. Ensuring all SSSIs area named in the Commitments register – CC confirmed that this would be provided by Hornsea Four with the updated Commitments register at PEIR.
2. YWT to confirm is they hold additional data above and beyond what was contained within the biological records search, specifically in regarding water voles – LH confirmed that the YWT would follow up on this after the meeting.
3. East Riding of Yorkshire Council (ERYC) to provide details of any Local Wildlife Sites (LWS) which have recently lost their designated status.

Action 1 - VG responded that information on the LWSs that had recently lost their designated status would be provided after this technical panel meeting.

He also mentioned that Hornsea Four should be mindful of Moor Lane in particular. As although it might recently have lost its designated status, it is a diverse and ancient hedgerow, and as such might be a remnant of ancient woodland or ancient trackway to Beverley. He mentioned that that site integrity survey is due to be undertaken on it, but that the project will need to be careful about how it is crossed.

Action 2 – Hornsea Four to follow up with ERYC on the proposed crossing method for the Moor Lane former LWS.

Previously distributed materials

CC touched on the materials which have been previously distributed to the Technical Panel, including the minutes meeting minutes from the first and second meetings for which Hornsea Four had yet to receive comments or confirmation of agreement.

Action 3 – AS asked that a representative from each of the organisations present at the previous technical panel meetings, provide any comments or confirmation on agreement on following documents by *Monday 22nd April 2019*:

- Minutes from the first and second technical panel meeting;
- Ecology and Nature Conservation Technical Panel Meeting 3 Position Paper;
- Onshore Ecology Strategy
- Over-wintering bird Interim Technical Report; and
- The Phase 2 Onshore Ecology Method Statement

*(It should be noted that this it has since been noted that Monday 22nd April is bank holiday, and so it would follow that any comments should have been provided by **Wednesday 24th April**, to take in to account the two public holidays.)*

Approach to PEIR – Baseline updates

CC provided the following update to the technical panel:

An updated Extended Phase 1 Habitat Survey (EP1HS) was undertaken in February 2019, the findings of which will be reported on and included as a technical appendix to the Ecology and Nature Conservation PEIR chapter. Due to limited landowner access and some boundary alterations that were made after the survey was completed, approximately 40% of the interim PEIR boundary was surveyed. The remaining areas were then reviewed using the high-resolution aerial imagery obtained by Hornsea Four.

Key findings include the following:

- Arable land was found to be dominant with predominantly species poor intact hedgerows as boundary features;

- Woodland, grassland and scrub were encountered more infrequently; and
- Networks of ditches (i.e. field margin drains) dykes, streams and rivers were found to be present.

CC stated using information gathered during the EP1HS, the following Phase 2 species specific surveys are planned to be undertaken during the 2019 season:

- Great crested newt eDNA – 83 ponds had been identified via GIS within and up to 250m of the interim PEIR boundary. All ponds (subject to landowner access) would be subject to a Habitat Suitability Index (HSI) assessment and eDNA sampling;
- Water vole presence/absence – 73 watercourses had been identified that would be subject to two survey visits (subject to landowner access). One visit would be undertaken in the first half of the breeding season (April to June) and the second would be undertaken in the second half of the breeding season (July to September);
- Otter presence/absence – 11 watercourses has been identified as suitable for supporting Otters and therefore would be subject to two survey visits, which would be completed in conjunction with the water vole survey;
- Badger presence/absence survey – to be completed within areas not accessible during the EP1HS (subject to landowner access), as well as a re-survey of those areas covered during the EP1HS;
- Breeding birds – vantage point (VP) surveys would be undertaken monthly between April and June 2019;
- Bat roost survey (emergence/re-entry) – 58 features were assessed as offering moderate/high suitability for roosting bats, and would be subject to 2-3 dusk/dawn emergence/re-entry surveys; and
- Bat activity transect/static detector survey – 70 features were found to offer moderate/high suitability, and therefore would be subject to monthly transect surveys between May and October 2019.

CC confirmed that no surveys are planned for the following species:

- Reptiles – However, mitigation measures (i.e. Reptile Precautionary Method of Working) would be proposed at PEIR;
- Hedgerow survey – information on hedgerows was collected within areas where access was granted during the EP1HS;
- Invertebrates – no evidence of habitats suitable for supporting significant populations of invertebrate species were noted during the EP1HS;
- Dormice – no records of dormice and no suitable habitats for dormice were recorded during the EP1HS.

CC continued that mitigation measures would be proposed for the following, at PEIR:

- Low suitability features for both roosting and commuting/foraging bats;
- Nesting bird species; and

- Reptiles

MF asked whether Hornsea Four had compared the data from the Extended Phase 1 Habitat Survey with the soil data.

CC confirmed that this comparison has not been undertaken, this will be addressed through the Geology and Ground Conditions and/or the Land Use and Agriculture chapter, with a cross reference to these chapters included within the Ecology chapter.

MF also asked whether what the ratio of 'improved' to 'unimproved' pasture was along the proposed project footprint.

CC answered that no areas of unimproved grassland/pasture were recorded within the areas where access was granted during the updated EP1HS. Improved and poor semi-improved grassland were recorded in small, discrete areas, typically used for grazing or paddocks.

CC went on to explain that all wet ditches recorded within areas covered by the updated EP1HS would be scoped into to the water vole presence/absence survey, following comments from the previous technical panel meeting with regard to suitable/unsuitable ditches potentially ruling out water vole populations.

MF commented that there can often be good water vole populations in the middle of cornfields, and so it may be worth checking for water voles in all ditches.

LH commented that the Otters should also be picked up in the water vole surveys.

CC confirmed that the otter presence/absence survey would be undertaken at the same time as the water vole presence/absence survey

CC confirmed that a check for badger field signs was undertaken during the updated EP1HS, but that the areas where no landowner access was granted remain outstanding. CC explained that the previously inaccessible and unsurveyed areas would form the basis for the badger presence/absence survey (to be undertaken in 2019). Although the additional presence/absence survey would also include those areas previously surveyed to account for the mobility of the species (subject to landowner access).

MF pointed out that badgers are making a come-back in the area, and that they disperse in November and December, when the young are ousted from the setts. As such the environment can change rapidly with regards to where badgers are found.

CC updated that panel that a total of 83 ponds had been identified within and up to 250m of the Interim PEIR boundary, using OS mapping. CC explained that

these ponds (subject to landowner access) will be subject to a Habitat Suitability Index (HSI) assessment and subsequent eDNA sampling within the appropriate survey season (mid-April to mid-June 2019).

MM asked why a 250m buffer from the proposed project footprint was proposed rather than the 500m proposed by NE.

CC responded that in line with accepted research, although GCN may travel up to 500m from breeding ponds, this is only where suitable connecting habitat is present e.g. ponds. Or where there are limited hibernation and/or foraging habitats within 250m of a breeding pond. Additionally, projects of a similar scope to Hornsea Four have previously been consented using the 250m buffer. As noted during the updated EP1HS, the predominant habitat throughout those areas surveyed consisted of arable fields, either in crop or ploughed, which act as a natural barrier to GCN movement. The GCN eDNA survey will include a HSI assessment, which takes into consideration the quality of the terrestrial habitat for each pond.

LH commented that surveying ponds within a 250m buffer of the proposed project boundaries was generally standard for other projects of a similar size.

CC asked whether, based on the discussion the approach proposed by Hornsea Four was acceptable.

MM confirmed that this was acceptable.

[NE subsequently commented on the meeting minutes with the following: *"The question asked was whether the explanation made sense rather than whether it was acceptable.*

In answer to this question, the advice from our wildlife licensing team is that as there is potential for GCN to travel much further distances a 500m buffer is recommended - and possibly further afield if there is suitable connective habitat.

From the discussion at the meeting it was suggested that the surrounding habitat was unlikely to be suitable.

If it is clear that this is the case (noting that Phase 2 surveys have not been completed) then this may be sufficient to support the application."]

(It should be stressed that this advice is given without prejudice to any potential EPS license application

CC went to explain that the Phase 2 bat surveys would include the following:

- All features offering moderate/high suitability for roosting bats would be subject to the appropriate number of emergence/re-entry surveys (i.e. two surveys for moderate features and 3 surveys for high features) which would be undertaken between June and August 2019; and

- All features offering moderate/high suitability for commuting/foraging bats would be subject to monthly bat activity transect and static detector surveys between May and October 2019.

[NE subsequently commented on the meeting minutes with the following:
"N.B. We couldn't hear this part of the discussion very well over the phone."

"We would recommend that [the bat] surveys take place within the month of October (It's not clear if this means May to October inclusive)"

LH asked whether trees as well as structures were surveyed during the EP1HS.

CC confirmed that both trees and structures were surveyed during the EP1HS.

CC asked the technical panel attendees whether it would be acceptable to use static detectors (in place of a walked activity transect) for isolated features, such as standalone hedgerows, which may act as connecting features but where there will be no impact from the project on the wider habitat.

[NE subsequently commented on the meeting minutes with the following:
"We are not too clear what is meant by 'isolated features'. We'd welcome further details and photographs of examples if possible."

Regarding the use of static surveys, we would welcome further details as to how the behavior of the bats will be determined (i.e. foraging vs commuting) and how this could be used to give an indication of the numbers present."

LH answered that it is difficult to say without seeing the transects, and asked whether it would be possible for Hornsea Four to share the proposed transects in order for YWT to provide a full response.

Action 4 – CC confirmed that it would be possible and that the proposed bat survey transects would be mapped and shared after the technical panel meeting.

MF commented that river systems were also important to bat species for commuting and foraging.

CC responded that these features have been taken into consideration and will be included within the bat activity transect/static detector surveys where appropriate.

LH commented that even species poor hedgerows, with low connectivity can sometimes be found to still be important for bats.

CC agreed and responded that all hedgerows within the areas accessed during the updated EP1HS were assessed individually in accordance with BCT guidance, and aerial imagery was used to identify potentially suitable hedgerows/features within areas where no access was granted during the EP1HS.

LH commented on whether any mitigation would be included for overwintering works on any features not subject to species specific phase 2 surveys, i.e. features assessed as providing low suitability for roosting or commuting/foraging bats

CC responded that any mitigation would be provided in the EP1HS report and within the Commitments Register.

CC provided an update that although a reptile survey had been proposed within the Scoping Report, following a review of the biological records in conjunction with the data that was collected during the updated EP1HS, reptile surveys were not thought to be required. Only small, discrete areas suitable for reptiles were recorded during the updated EP1HS, and one record (grass snake) was returned from the data search (within the wider 2km buffer of the interim PEIR boundary). However, appropriate mitigation would be included, formed of a Reptile Precautionary Method of Working, to be implemented within all areas of habitat suitable for reptile species during construction works.

MF pointed out that if any reptiles were to be found, they would mostly be found by rivers rather than in the cornfields.

VG commented on focussing mitigation within areas suitable for reptiles only so as to not make it an onerous task that could become overlooked

VG questioned whether the hedgerow survey had been completed yet.

CC confirmed that this information will be provided in the updated EP1HS report. The hedgerow assessment was in line with JNCC habitat information (such as 'species-poor/species-rich intact/defunct etc.) and followed the Hedgerow Survey Handbook and was in line with the Hedgerow Regulations (1999).

[Approach to PEIR – Proportional EIA](#)

CC went on to address the potential impacts identified at Scoping, including those on which a consensus might not have been reached with stakeholders:

Question 1 – Is the proposed scope of the Phase 2 species specific surveys acceptable?

All Stakeholders agreed that the proposed approach was acceptable.

EB also commented, that in relation to scoping out the effects on certain designated sites, it would be good to include a list of Commitments in the PEIR alongside the impacts, and signpost these where necessary, as the relevant information can often be spread out, therefore making Chapters hard to read.

AS confirmed that this was completed at Scoping and that this approach would be carried through to PEIR.

Question 2 – Is the proposed methodology and/or survey effort for the Phase 2 species specific surveys as outlined in the accompanying Phase 2 Method Statement, and Hornsea Four Ecology Strategy acceptable?

Action 5 - VG commented that he, at first glance, would need to look in to Moor Lane, the former LWS in particular, as the project would need to be careful about potentially building through the roots of ancient trees, therefore rendering them unstable. Additionally, VG confirmed he would also look in to the potential crossing of Raventhorpe Embankment (LWS).

Action 6 - All stakeholders agreed that they agree subject to reviewing the previously distributed materials.

MF confirmed that Crayfish should be scoped out, as there are no Crayfish in the area.

VG stated that Hornsea Four should bear in mind that the substrate under the River Hull is gravel, and therefore using HDD could be more of a technical issue.

[NE subsequently commented on the meeting minutes with the following: *"We would welcome further discussion on the crossing of the River Hull SSSI!"*]

Question 3 - Is the proposed approach to scoping out direct impacts on designated sites during construction acceptable?

MF pointed out that water itself can be a pollutant if the project were to cross-contaminate between watercourses and/or catchments. Similarly, bentonite breakouts could also potentially contaminate.

Action 7 – Hornsea Four to provide a response on how the trenches are to be de-watered and how bentonite breakouts would be dealt with.

LH also commented that transporting soil could leave scope for cross-contamination. For example, it would be good to state that the project won't transport soil between sites, therefore using the embedded mitigation to scope out the impact.

VG stated that he would be in favour of Hornsea Four using a Construction Environmental Management Plan (CEMP) to tie up areas of embedded mitigation related to construction, for example. As otherwise finding the embedded mitigation can sometimes be hard within the documentation.

LH asked whether Hornsea Four had found any signs of invasive species as a part of the EPIHS.

CC answered that no invasive species had been found, but if any were to be found then they would be subject to management measures.

MF followed by stating that biosecurity would be important for the area, as the region is unique in having a low rate of invasive species when compared to other regions in the UK.

VG informed the panel that giant hogweed had been in an area which flowed in to the River Hull.

All stakeholders agreed that the proposed approach was acceptable, subject to reading and responding to the previously submitted documentation after the technical panel meeting.

[NE subsequently commented on the meeting minutes with the following:
"It should be noted that measures intended to avoid or reduce impacts on European designated sites should be considered in an Appropriate Assessment. (Noting the recent People Over Wind Ruling by the Court of Justice of the European Union.)"]

Question 4 - Is the proposed approach to scoping out impacts on fish during construction acceptable?

All stakeholders agreed that the proposed approach was acceptable.

[NE subsequently commented on the meeting minutes with the following:
"Have the potential impacts on Sea/River Lamprey been considered?"

(Both are features of the Humber Estuary SAC and River Derwent SAC)."]

VG then confirmed that the majority of the streams in the area are derived from the Wolds. Whereas, if there were likely to be any signs of fish these would most likely be present in watercourses derived from the Holderness. He confirmed that as there are no records of fish, it would then follow that there are unlikely to be fish in the area.

VG and LH confirmed that they would defer to the EA on fish related impacts.

MF stated that the Hornsea Four approach seemed acceptable.

Question 5 - Is the proposed approach to scoping out impacts on habitats or species during construction acceptable?

All stakeholders agreed that the proposed approach was acceptable, subject to reading and responding to the previously submitted documentation after the technical panel meeting.

[NE subsequently commented on the meeting minutes with the following:
"I'm not sure this was agreed. I think the point was made that the technical panel had not had the opportunity to read the documentation as it was only provided a few hours before the meeting."

I would suggest noting this as such here and asking this question again at the next meeting."]

Question 6 - Is the proposed approach to scoping out impacts on habitats and species during decommissioning acceptable?

All stakeholders agreed that the proposed approach was acceptable.

[NE subsequently commented on the meeting minutes with the following:
"As per the comment above, I don't think this was agreed at the meeting given that the documentation was not supplied in advance.

again, I would suggest this point is confirmed at the next meeting."]

MF questioned whether an environmental clerk of works would be presented through the decommissioning process.

CC confirmed that this would be the case and that decommissioning would follow industry standards.

Question 7 – Which approach for the presentation of incomplete phase 2 survey data (for ongoing surveys) is preferred by Technical Panel members for the PEIR? i.e.

- the use of placeholders to acknowledge that this information is outstanding; or
- partially completed assessments.

VG proposed that placeholders should be used a minimum, rather than attempting to draw conclusions from incomplete data.

JD suggested a hybrid approach, where partial baseline data is presented where it is available in a technical report. However, where baseline data is incomplete, no partial assessment would be attempted for PEIR. This is so that stakeholders can be made aware of incomplete data, so that they can help mitigate this early on.

All other stakeholders agreed with using this approach.

Action 8 – Hornsea Four to use the hybrid approach and present baseline data where there is incomplete baseline at PEIR, with no assessment in the accompany Ecology and Nature Conservation Chapter.

EB commented that ideally Hornsea Four should submit a PEIR when the project has had the opportunity to obtain the majority of the baseline data, so that stakeholders have the opportunity to comment, rather than leaving until DCO application.

[NE subsequently commented on the meeting minutes with the following:
"The main point here is that it is unlikely that Hornsea Four receive meaningful comment on partial information.

We note that Hornsea 4 have proposed a cut-off point for additional evidence shortly after the PEIR, implying that there may not be scope to follow up on any issues that arise prior to the application being submitted."]

LH questioned whether there would be an opportunity to scope in impacts at a later stage if this is appropriate.

AS confirmed that this would be possible it is was deemed appropriate.

Action 9 - AS also asked that all stakeholder review the previously distributed materials and provide comments, questions and/or agreement on the proposed approaches in 2 weeks as per the EP terms of reference.

Next Steps – PEIR Submission

CC provided a recap of activities that were planned prior to PEIR submission, including a reiteration of phase 2 surveys and their planned dates (see previous sections), and concluded with the anticipated results that may be included at PEIR are as follows:

- Updated EPIHS
- Over-wintering birds;
- eDNA for ponds where access had been granted; and
- Badger

Biodiversity Net Gain (BNG)

CC proposed the following questions as the basis for driving any stakeholder comments and advise that the technical panel might have on biodiversity net gain:

Question 8 - What is the panel's view on how biodiversity net gain could be applied to Hornsea Four?

VG advised that it might be good to focus on more meaningful BNG opportunities in fewer locations, which can be managed more long-term basis. For example, at the landfall and the permanent onshore substation (OnSS) site.

VG also advised that there might be an opportunity in checking the conditions of ponds within the vicinity of the project, which can be surveyed at the same time as the GCN surveys, for example. Due to the increasing area of specialized arable land, ponds are no longer maintained, and so opportunities may be present in enhancing ponds which are in the process of drying out or being scrubbed up.

JD also advised that Hornsea Four should perhaps use a similar strategy to Hornsea Three in looking to fill gaps in hedgerows. The project should look for similar opportunities as this along the project route.

LH similarly commented that hedgerows and grass verges might be a good opportunity, as it might be that these areas could add up sufficiently if applied along the proposed project route.

Question 9 - Which biodiversity metric would the panel recommend implementing?

LH & VG commented that the metric will hopefully be coming soon from DEFRA as it was advertised that it would be published in the Spring, and that it would be 'Ecometric' rather than on biodiversity net gain.

LH expanded by commenting that it would generally be recommended that the project should defer to the DEFRA metric, but that it should be noted that it should be used as a good advisory tool as the metric has not been 'set in stone' yet.

LH also expressed that if BNG is compulsory on smaller projects, then they would view that it should be taken as compulsory for larger projects and should also be scaled.

Question 10 - Are there any current 'hot topics' with regards to biodiversity – in line with the County BAP?

VG expressed that the County BAP expired a few years ago, and that ERYC are in the process of finalizing the new approach for a 25-year management plan.

Question 11 - Are there any 'candidate' LNRs or local/regional schemes within the county that could be enhanced as a part of the initiative?

VG answered that LWSs might be a possibility for BNG, but that ERYC doesn't have a up-to-date assessments on their condition. Ultimately, the use of any such areas for BNG would be subject to landowner agreement in order to maintain them, if maintenance were needed. VG continued that there may be some condition issues which might be fixed by a 'one-off,' however, in other places further maintenance may be required to maintain biodiversity.

Question 12 - Are there any current (or planned) biodiversity net gain initiatives from similar development projects the project should be aware of?

None of the stakeholders new of any similar current or planned BNG initiatives which Hornsea Four should be aware of.

Question 13 - Does the panel have any indication of when net gain will be become mandatory for Nationally Significant Infrastructure Projects (NSIPs)?

Question 14 - Would the panel consider any non-biodiversity net gain initiatives applicable?

None of the stakeholders had any comments to make on whether they had any indication of when net gain would become mandatory for NSIPs or whether the panel would consider any non-biodiversity net gain initiatives applicable.

AOB

Action 10 – MF commented that he would pass on the Hornsea Four materials previously distributed to the technical panel to his colleagues in the Fisheries department for comment.

Action 11 - Stakeholders requested that Hornsea Four send out dates for the next Technical Panel meeting as soon as possible. They also expressed that if possible, it would be preferable for the meeting to take place in the second week of June 2019.

Summary of Actions:

Action Number	Action	Responsible
1	VG responded that information on the LWSs that had recently lost their designated status would be provided after this technical panel meeting.	ERYC (VG)
2	Hornsea Four to follow up with ERYC on the proposed crossing method for the Moor Lane former LWS.	Hornsea Four (AS)
3	Stakeholders to provide comments, question and/ or agreement on the meeting minutes from previous meetings, and previously distributed materials for the third ecology technical panel meeting	ERYC (VG), NE (EB/ MM), YWT (LH) and MF (EA)
4	Hornsea to share the proposed bat transects with stakeholders in order to understand whether it is acceptable to stakeholders for only static detectors to be used where there are standalone hedgerows.	Hornsea Four (AS)
5	VG to look in to Moor Lane (former LWS), and the potential crossing of Raventhorpe Embankment (LWS).	ERYC (VG)
6	All stakeholders agreed that they agree subject to reviewing the previously distributed materials.	All
7	Hornsea Four to provide a response on how the trenches are to be de-watered and how bentonite breakouts would be dealt with.	Hornsea Four (AS)
8	Hornsea Four to use the hybrid approach and present baseline data where there is incomplete baseline at PEIR, with no assessment in the accompanying Ecology and Nature Conservation Chapter.	Hornsea Four (AS)
9	AS also asked that all stakeholder review the previously distributed materials and provide comments, questions and/or agreement on the proposed approaches in 2 weeks as per the EP terms of reference.	All
10	MF commented that he would pass on the Hornsea Four materials previously distributed to the technical panel to his colleagues in the Fisheries department for comment.	EA (MF)
11	Stakeholders requested that Hornsea Four send out dates for the next Technical Panel meeting as soon as possible. They also expressed that if possible, it would be preferable for the meeting to take place in the second week of June 2019.	Hornsea Four (AS)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 4 - Post Scoping / Pre-PEIR	09 July 2019
Meeting Date	09 July 2019	
Place	Brough Business Centre, Brough	
Participants	<p>██████████ Ørsted</p> <p>██████████ – RHDHV Lead Ecologist</p> <p>██████████ – Environment Agency (EA)</p> <p>██████████ – Natural England (NE) (via teleconference)</p> <p>██████████ – NE (via teleconference)</p> <p>██████████ – Royal Society for the Protection of Birds (RSPB)</p> <p>██████████ – Yorkshire Wildlife Trust (YWT);</p> <p>██████████ – NE; and</p> <p>██████████ – EA.</p>	Our ref. Hornsea Four EP Onshore Ecology TP Meeting #4
Absent	Vaughan Grantham – East Riding of Yorkshire Council (ERYC)	
Copy	Lauren Kirkland (GoBe)	
Next meeting	Post-PEIR - TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. HRA Update
8. Next Steps
9. Any other business (AOB)

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. Provide an update on Hornsea Project Four activities and review actions from the previous technical panel;
2. Present the evidence base to be provided to scope out effects where complete consensus has not been achieved with key stakeholders;
3. Discuss the next steps in relation to seeking consensus with stakeholders on the proposed approach to the Preliminary Environmental Information Report (PEIR) and what additional evidence or information is to be provided PEIR
 - a. Specifically in relation to: Evidence base / Baseline data; Assessment methodology; Mitigation / Enhancement; and
4. Proportionality and 'How to read this PEIR.'

Hornsea Four Update (AS)

AS explained that the following main activities had taken place since Scoping to inform the PEIR:

- Evaluation of the Scoping Opinion – to inform the impacts which are to be assessed, and further mitigation which needs to be brought forward in the PEIR to provide further confidence to stakeholders;
- Project Parametres – being finalised to inform the basis of the assessments;
- Baseline data collection – for Ecology this involved continuing with the phase 2 surveys;
- Drafting of technical reports and PEIR Chapters;
- PEIR Submission: will be 13 August 2019.

AS explained that the following activities were also taking place in relation to Site Selection and consideration of alternatives:

- Landfall – the refinement of the landfall sites to just two sites (A3 & A4);
- Onshore Substation – site is down to one site, close to Creyke Beck substation;
- Onshore export cable corridor – has been refined as a part of the Route Planning Site Selection BRAG approach, and in response to landowner feedback.

In relation to the landfall EB asked whether although there are 6 circuits and 18 cable, would there be a need for contingency circuit.

AS responded that there would most probably be a need for a contingency transition joint bay (TJB) at landfall, but she would double-check.

Action 1 – AS to check whether there is an additional TJB in the Project Description.

Summary of previous actions

CC listed the following action from the previous meeting, with their status:

Action	Responsible	Status Update
VG responded that information on the LWSs that had recently lost their designated status would be provided after this technical panel meeting.	ERYC (VG)	Update provided
Stakeholders to provided comments, question and/ or agreement on the meeting minutes from previous meetings, and previously distributed materials for the third ecology technical panel meeting	ERYC (VG), NE (EB/ MM), YWT (LH) and MF (EA)	NE have provided comments
Hornsea to share the proposed bat transects with stakeholders in order to understand whether it is acceptable to stakeholders for only static detectors to be used where there are standalone hedgerows.	Hornsea Four (AS)	Provided – to be discussed further today if required.
VG to look in to Moor Lane (former LWS), and the potential crossing of Ravenhorpe Embankment (LWS).	ERYC (VG)	Pending
All stakeholders agreed that they agree subject to reviewing the previously distributed materials.	All	NE and YWT have provided some responses on previously distributed materials.
Hornsea Four to provide a response on how bentonite breakouts would be dealt with.	Hornsea Four (AS)	To be provided in full at PEIR
Hornsea Four to use the hybrid approach and present baseline data where there is incomplete baseline at PEIR, with no assessment in the accompany Ecology and Nature Conservation Chapter.	Hornsea Four (AS)	This has been undertaken and will be shown at PEIR.
MF to pass on the Hornsea Four materials previously distributed to the technical panel to colleagues in the EA Fisheries department for comment.	EA (MF)	Response pending

Approach to PEIR – Baseline updates

Baseline data collection updates include the following:

- Great crested newt (GCN) *Triturus cristatus* eDNA survey – In progress
 - 22 ponds (of a total of 84) surveyed in April 2019. All remaining ponds where access has been agreed were surveyed by the end of June 2019;
- Bat activity transect and static detector surveys – In progress
 - Surveys commenced in May 2019 and will continue through to October 2019 (inclusive);

- Bat emergence/re-entry surveys – In progress
 - Surveys commenced in June 2019 and will continue through to August 2019 (inclusive);
- Breeding bird survey – Completed
 - Surveys undertaken between April and June (inclusive);
- Water vole *Arvicola amphibious* and otter *Lutra lutra* – In progress
 - First survey visit completed in May 2019, second survey visit to be undertaken in July 2019;
- Badger *Meles meles* presence/absence survey – in progress.

Preliminary findings from these surveys is as follows:

- GCN
 - 34 ponds accessible, 12 of which were dry or no longer present;
 - 22 ponds subject to a Habitat Suitability Index (HSI) assessment and eDNA survey; and
 - Two ponds with confirmed GCN presence – both ponds situated approximately 400 m from the onshore export cable corridor (ECC) with no viable connecting habitat.
- Water vole and Otter
 - Total of 72 watercourses identified to be surveyed for water vole, and of these a total of 11 were assessed as potentially suitable for Otters;
 - 24 watercourses surveyed in May 2019, 25 watercourses were dry and one inaccessible due to livestock;
 - Water vole field signs recorded in four watercourses, consisting of cut vegetation. However no other corroborating evidence was recorded (such as burrows and/or latrines); and
 - No signs of otter presence.
- Bats – activity transect
 - Full transect surveys has been completed in four out of the nine transects. Inclement weather meant no survey was undertaken in a total of two transects. Partial transects undertaken in two transects due to either limited access and/or livestock presence. Furthermore one transect was not subject to any survey due to a lack of landowner access agreement. Preliminary results from both the activity transect and static detectors include the presence of the following bat species:
 - Daubenton *Myotis daubentonii*
 - Common pipistrelle *Pipistrellus pipistrellus*
 - Noctule *Nyctalus noctula* and
 - Soprano pipistrelle *Pipistrellus pygmaeus*.

CC raised in relation to the GCN mitigation, that as some of the ponds could not have been surveyed therefore would the panel like the mitigation to assume presence in these ponds, and would the presence be trapping or landscape mitigation.

EB mentioned that this mitigation would be one for the GCN licensing team. EB said that she would contact the team to ask when it would be a good time to start the licensing process, as there were also some new licensing policies in place.

Action 2 – NE to engage with licensing team and advise Hornsea Four on the next steps in relation to obtaining a draft license for GCN, in particular.

CC mentioned that she would also look at the new licensing policies which are in place.

LH mentioned that in places that district licensing was now in place, and whether this could be an option for Hornsea Four.

LR responded that although district licensing was in place in some areas, East Riding of Yorkshire Council (ERYC) was not yet on the list. It was true that NE were taking a more strategic outlook on licensing, but that he would ask the licensing team for the timescales on this.

Decommissioning

CC stated that same criteria was going to be used for decommissioning as for construction. This is because the process for decommissioning is considered to be the same or less than decommissioning. As for example, the cables would be left in situ, and the link boxes and joint bays would only be removed if it made sense environmentally.

[No comments were received from the panel]

Impacts on Fish

CC stated that fish would be dealt with in the baseline section of the Ecology and Nature Conservation Chapter, as it has been scoped out of the Phase II assessments. A cross reference would also be provided to the Hydrology and Flood Risk Chapter.

[No comments were received from the panel]

Previously distributed materials

CC touched on the following previously distributed materials:

Distributed materials	Responses received	Outstanding questions
Round Three Technical Panel Position Paper	None	n/a
Onshore Ecology Survey Strategy	n/a	n/a
Over-wintering bird interim technical report	None	n/a
Breeding bird method statement	None	n/a

Distributed materials	Responses received	Outstanding questions
Phase 2 Onshore Ecology Method Statement	NE	To be discussed today as necessary.

The following materials were also issued in advance of the meeting:

- ‘How to read this PEIR’ – a guide intended to help the reader navigate the various documents and registers that will be provided by Hornsea Four at the point of Preliminary Environmental Information (PEI);
- the Impacts/ Effects Register for Water Resources and Flood Risk updated since Scoping – the register sets out and documents all potential impacts/ effects associated with Hornsea Four. This will be provided at the evidence plan meeting itself; and
- DCO Application Register – this provides a log of all documents, reports and drawings for Hornsea Four and includes the necessary documentation to secure the Commitments set out in the Commitments Register; and
- Hornsea Project Four onshore Ecology Technical Panel #4 Position Paper.

Approach to PEIR – Proportionate EIA

Impacts on white-clawed crayfish and fish: Construction phase

CC states that stakeholders had previously agreed to scope this impact out (at Technical Panel Meeting #3 held on 8th April 2019). However comments received from Natural England on the meeting minutes suggest this was not wholly understood at the meeting. Considerations regarding to white-clawed crayfish remain to be as the position at scoping, i.e. there are no records of white-clawed crayfish within the onshore footprint of Hornsea Four.

All stakeholders at the meeting agreed that this was the case.

CC followed that in regard to considerations to fish, it was highlighted that all EA Main Rivers and Internal Drainage Board (IDB) drains will be crossed via HDD methodologies and as such impacts to fish are not expected. This will be covered within the Hydrology and Flood Risk Chapter with a cross reference within the onshore Ecology and Nature Conservation Chapter.

Impacts on habitats or species: Construction phase

EB questioned the approach to the River Hull Headwaters SSSI stating that Natural England would like to understand the potential impacts that Hornsea Four might have on the SSSI.

LR reinforced the NE are particularly interested in the associated habitats that the River Hull Headwaters SSSIs is designated for. And related to this, any

impacts on the eco-hydrology and geology of the river, especially if these might be long term, for example from increased incision or lateral movement.

MF stated that below the River Hull Headwaters SSSI there is likely to be boulder clay followed by chalk, as in other locations. If this also the case in this location then there shouldn't be any issues.

EB followed that NE would normally expect projects to carry out ground investigations prior to application in order to provide further information on the potential impacts and therefore mitigation that might be required.

AS answered that carrying out the ground investigations at this site would not change the mitigation, as the project as already committed to using Horizontal Directional Drilling (HDD) (or other trenchless technologies) to cross the River Hull Headwaters SSSI (Co1) and that a hydrogeological risk assessment would be carried prior to its crossing. Any risk assessment and crossing method statement would need to be agreed prior to any survey works and construction works taking place (Co18).

EB responded that it is not possible to know whether the mitigation is sufficient without carrying out the ground investigations.

AS then responded that the project has committed to provide a full bentonite breakout measures, the outline measures of which would be provided in the Outline Code of Construction Practice (OCoCP), and that all standard mitigation measures would apply to the crossing. The project would also take the approach of locating the entry and exist pits outside of the area of the River Hull Headwaters SSSI, and would not take access across the watercourse, in order limit impacts. The detailed crossing methodology and ground investigations would still be captured during the detailed design phase, pre-construction. AS stated that Hornsea Four would also investigate and provide further information on the historic incision rates and lateral movement of the River Hull Headwaters SSSI, and provide this information to NE.

EB responded that this should perhaps be picked up after the submission of the PEIR.

MF commented that historically the River Hull Headwaters rises and falls slowly and hasn't really moved. But that a colleague in the EAs geomorphology team may have some more information.

Action 3 – Hornsea Four to investigate lateral movement of the River Hull Headwaters SSSI and organise separate session with Natural England on designated sites.

HRA Update

EB asked where the coastal processes parts of the assessment would be picked up, as the intertidal area in particular tends to fall through the cracks.

Additionally, pink-footed geese questions have been raised by NE in relation to the other side of the Humber.

AS responded that the coastal processes would be picked up by in the offshore in the 'Marine Geology, Oceanography and Physical Processes' Chapter, and that she would raise the pink-footed geese question again with the offshore team to ensure it is picked up and addressed.

Action 4 – AS to raise HRA pink-footed geese with the offshore team.

Next Steps – PEIR Submission

AS explained that as a part of the Proportionate approach to the EIA Hornsea Four had adopted some tools to help stakeholders navigate the documentation and the assessments. This guidance has been provided to stakeholders in the form of the 'How to read this PEIR document':

1. How to Read this PEIR – documents the order in which the PEIR documents should be read:
2. Impacts Register
 - a. Simple vs. Detailed assessments – AS explained the difference between simple and detailed assessments;
 - b. Updated Impacts Register – sets out the following:
 - i. Magnitude, sensitivity, and significance of all potential impacts and receptors;
 - ii. Embedded mitigation measures and commitments – reduce LSE
 - iii. Sets out the scope; and
 - iv. Defines and justifies MDS – relevant for each impact.
 - c. Coding:
 - i. "Scoped out" – PINS agreement (grey)
 - ii. "Scoped in" – simple vs. detailed (yellow/ green); and
 - iii. Disagreement on LSE (red).
 - d. Impacts which are coded as red can be due to: (i) Lack of evidence; (ii) Lack of certainty; and (iii) Disagreement with PINS.
3. Commitment Register – Commitment register shows the unique IDs, relevant project element, identifies the topic they are relevant to, and the relevant documentation for securing the commitment. They can be suggested by the public, stakeholders and technical contributors to the EIA. The register is also interactive and searchable.
4. DCO Application Register – logs all documents and drawings and whether they will be submitted at PEIR and/ or DCO, includes necessary documentation to secure the Commitments set out in the Commitments Register, and is a live document.
5. PEIR chapter and technical reports – AS summarised the structure for the Chapters and technical reports.

AOB

LG asked whether the shapefiles for the PEIR boundary and the Crossing Schedule would be sent through.

AS answered that they were currently been signed-off and that these would be sent to stakeholders in the next couple of weeks.

Action 5– AS to distribute PEIR boundary and crossing schedule to stakeholders once signed of internally.

Summary of Actions:

Action Number	Action	Responsible
1	AS to check whether there is an additional TJB in the Project Description.	AS (Ørsted)
2	NE to engage with licensing team and advise Hornsea Four on the next steps in relation to obtaining a draft license for GCN, in particular.	EB/MM (NE)
3	Hornsea Four to investigate lateral movement of the River Hull Headwaters SSSI and organise separate session with Natural England on designated sites.	AS (Ørsted)
4	AS to raise HRA pink-footed geese with the offshore team.	AS (Ørsted)
5	AS to distribute PEIR boundary and crossing schedule to stakeholders once signed of internally.	AS (Ørsted)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 5 – Post PEIR	13 November 2019
Meeting Date	13 November 2019	
Place	Natural England, Foss House, York	
Participants	<p>██████████ – Ørsted;</p> <p>██████████ – RHDHV Lead onshore Ecologist;</p> <p>██████████ – RHDHV Air Quality Specialist;</p> <p>██████████ – GoBe (RIAA & HRA Specialist)</p> <p>██████████ – Environment Agency (EA);</p> <p>██████████ – Natural England (NE);</p> <p>██████████ – Natural England (via teleconference);</p> <p>██████████ – Natural England;</p> <p>██████████ – Yorkshire Wildlife Trust (via teleconference)</p>	Our ref. Hornsea Four EP Onshore Ecology TP Meeting #5
Absent	<p>██████████ (East Riding of Yorkshire Council (ERYC));</p> <p>██████████ Royal Society for the Protection of Birds (RSPB)</p>	
Copy	██████████ GoBe); ██████████ (EA)	
Next meeting	N/A at this stage. NE session on designated sites to be organised for February 2020.	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Design Evolution Updates
6. Air Quality & RIAA
7. Key Section 42 Responses & Discussion
8. 'Impacts Register' and Proportionality
9. Key Questions for Consideration
10. AOB

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. Provide an update on Hornsea Project Four with regards to the evolution of the design of the project since the Preliminary Environmental Information Report (PEIR) was submitted, and to review any outstanding actions from the last onshore ecology technical panel meeting;
2. To summarise the key Section 42 responses received from stakeholders in relation to onshore Ecology, and Hornsea Four's position in response;
3. To seek consensus with stakeholders on the proposed approach to the Environmental Statement (ES) and agree additional evidence or information which might need to be provided to accompany or inform the ES. These may be more specifically be related to the:
 - a. Evidence base;
 - b. Baseline data;
 - c. Assessment methodology; and
 - d. Mitigation / Enhancement / Commitments.
4. Present a draft Impacts Register, delivering proportionality for discussion and agreement with stakeholders.

Hornsea Four Update (AS)

AS presented the following changes to the red line boundary since PEIR:

1. Landfall – The southern landfall site (A4) had been chosen in favour of A3, as a result of various technical and public consultation considerations. For example, the emergency beach access to the northern landfall, could result in the Project having to use Auburn Sands, where there is an existing café and car park for beach users. Similarly, the main access to site A3 would potentially be restricted by needing to taking regular construction traffic over Fraisthorpe Bridge, in order to avoid taking any construction traffic through Fraisthorpe as requested by nearby landowners and the local community. AS also explained the project had now committed to using Horizontal Directional Drilling (HDD) (or other trenchless technology), as opposed to any open cut techniques, at the landfall. This was in response to consultation comments and concerns from stakeholders.
2. Landfall A4 – It was explained that the project had also incorporated a 100 m buffer around an RSPB maintained suspected barn owl nesting site into the Order Limits. Further details on this would be covered by CC later on in the meeting. This was to allow maximum flexibility when constructing the temporary access for the landfall.

3. Onshore export cable corridor (ECC) – AS explained that many changes had also taken place along the cable route, again in response to landowner, local community and stakeholder feedback.
 - a. For example, we were able to re-route the onshore ECC route more than 30 m away from two active badger setts, one east of Bridlington Road and one on a field boundary east of the B1249). The first re-route also accommodated a tenant's change request.

MF mentioned that there has also been reports of main badger setts near to the Hornsea Four landfall site.

CC explained that Hornsea Four will be conducting a series of pre-construction surveys, including for badgers, as stated in the Outline Ecological Management Plan (OEMP) submitted as a part of the PEIR. These would identify any badger field signs and setts, to which the appropriate mitigation would apply.

EB reiterated that pre-construction surveys would need to take place. She also enquired as to when Hornsea Four would be looking to start the Letter of No Impediment (LONI) process in relation to European Protected Species (EPS) where the baseline data collection has been completed for this phase of the project. EB mentioned that it could take place between submission and the relevant rep stage, but that for Hornsea Project Three, this process was started a bit late.

AS responded that this process could be started as soon as it suited NE but would follow up separately to confirm and start the process for the relevant species.

Action 1 – Hornsea Four and Natural England to work together to identify the process and programme for draft EPS licenses.

4. Onshore Substation access track (off of the A1079) – AS explained that in response to stakeholder feedback the access track had been moved away from Birkhill Wood ancient woodland, where it was previously adjacent to it. This access track would also be used to facilitate the construction of some of the onshore ECC and would also be made permanent. These changes were also as a result of consultation feedback received from local residents, land owners, and the local community who requested that construction traffic should not pass through Park Lane (and Cottingham).
 - a. Hornsea Four has also committed to a 'new' and 'existing' landscape boundary, as well as an area for an attenuation area within the onshore substation site. AS stated that these areas will be secured via the works plans.
5. 400 kV connection area – AS explained the area had been greatly reduced to the west and south of Creyke Beck, but that the Maximum

Design Scenario (MDS) within this area, is still a 40 m wide permanent and 60 m temporary cable corridor with a maximum of 4 circuits.

LO stated that he was pleased to see this positive change to moving the OnSS access track away from the ancient woodland in line with NE's guidance. LO also suggested that it might be a good idea to conduct a focussed session between Ørsted and NE on designated sites, and to talk through the cross over between different chapters.

Action 2 – Hornsea Four to organise session with Natural England focussed on designated sites.

EB stated that it would be advisable to provide a separate document specifically on onshore designated sites.

Action 3 - AS responded that Hornsea Four would look at sign-posting and improving cross-referencing between the relevant documents for DCO, as opposed to providing a separate document specifically for NE. And that the additional workshop with NE could be a good opportunity to identify where this would be required.

AS then presented the Hornsea Four programme to DCO, where the project was in the process of review Section 42 consultation responses received, and technical specialists were updating assessments where appropriate. The project was simultaneously in the process of holding technical panel meetings, which would largely be concluded by December 2019 with a view to submitting the DCO application in Q1 2020.

[Air Quality & RIAA \(Section 42 comments\)](#)

Summary of S42 comment -

Air Quality: *There is no assessment of dust from construction to receptors within 200 m (note that Natural England disagrees with the IAQM thresholds for the assessment of air quality on Sites of Special Scientific Interest) (Natural England)*

CG stated that Ørsted did not carry out an assessment of dust impacts at human and ecological receptors at PEIR, as the project committed to the mitigation measures recommended in the IAQM guidance document, which comprise embedded mitigation. These measures would prevent significant impacts from occurring at ecological receptors, in accordance with the guidance. A separate assessment of ecological receptors is therefore not considered to be required. CG therefore questioned whether the proposed mitigation measures as recommended in the IAQM guidance is acceptable.

LO stated that the approach was acceptable, however, would this apply to designated sites more than 50 m from construction works, e.g. the River Hull Headwaters SSSI, which is sensitive. CG stated that the recommended mitigation measures which would be implemented are considered to be effective

for human receptors up to 350 m from the dusty activities, so would also be effective at mitigating impacts on designated sites within 200 m.

LO stated that Ørsted may need to look in to the feasibility of implementing all measures around the SSSI during construction, as a lot of work may be required by the project. LO stated that the guidance also talks about residual measures, but overall the approach seems to be sensible.

EB asked if there were any European designated sites (i.e. those that would fall under consideration of the Habitats Regulations Assessment) in the air quality construction dust study area.

LO confirmed that there are no sites in relation to construction dust for inclusion in the Habitat Regulations Assessment, and that the air quality measures would only apply to SSSIs.

Summary of Section 42 comment –

Air Quality: There is no assessment of impacts from NO_x (traffic) to receptors (Natural England)

CG stated that the consideration of the NO_x Critical Level will be included in the ES.

Summary of Section 42 comment –

Air Quality: It is unclear how many AADT movements will be made along the haul road and whether this requires assessment (Volume 3, Chapter 7: Traffic and Transport also does not contain this information).

CG stated that the number of Annual average daily traffic (AADT) haul road movements is currently being looked in to. Once these have been established, they will be screened against the criteria in order to establish whether a detailed assessment is required.

NE confirmed that this approach was acceptable.

Summary of Section 42 comment –

Air Quality: The in-combination assessment only includes traffic growth, it does not include other sources (farming/industry etc.) (Natural England)

CG confirmed that, at the Humber Estuary, other potential industrial sources will be considered in-combination where necessary. With regard to farming, given that the immediate area is primarily urban, it is not anticipated that there would be any air emissions from these sources which would lead to any significant in-combination effect.

CG stated that the most likely in combination effects of agriculture are anticipated to be on Bryan Mills Field SSSI. CG also questioned where this data and information would be available from, as only planning applications could be used to determine any future intensification of agricultural processes.

LO stated that any projects under construction up to 2018 would already be included in the background data, meaning that processes in operation prior to this would not need to be considered separately.. LO also stated that NE holds Impact Risk Zone data, which prescribe different thresholds for different activities and should be used to work out which sources to include..

Action 4 – LO stated that NE would provide Hornsea Four with the data for farming for the East Riding of Yorkshire and the Humber Estuary.

CG stated for information that the Humber Estuary would be considered as intertidal and therefore would sit with the offshore assessments and GoBe.

The RIAA will draw on the outputs from the AQ assessment, as it is the findings of the AQ assessment (alone and in-combination) that will inform the assessment within the RIAA.

SK asked how the Impact Risk Zones interact with the APIS guidelines.

LO answered that the Impact Risk Zones would relate to scale, and that for certain sized projects they will give certain emissions. CG stated that these total in-combination impacts will be included within the air quality assessment which will inform the RIAA.

The inclusion of Humber Estuary saltmarsh within the RIAA will be informed by the AQ assessment alone and in-combination – in terms of the potential for effect (including potential extent/timing/duration) and the potential significance of that effect.

Action 5 – LO stated that he would provide a link to the guidance and would make sure that the assessment has been conducted in relation to NE guidance.

SK noted that this is assumed to be the June 2018 'NE approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations' unless NE advise otherwise.

LO continued that the MAGIC dataset was the go-to dataset for the assessment. Where threshold is over 1% then it should be scoped in and considered LSE. Then it may be that the appropriate assessment route needs to be followed. However, the LSE is very coarse and almost no scale is applied, therefore it has to be made appropriate.

[Approach to PEIR – Baseline updates](#)

[Extended Phase 1 Habitat Survey](#)

CC summarised the following update:

The 2019 EP1HS has now been completed throughout the Hornsea Four onshore boundaries (plus a 50 m buffer), where land access has been granted. As discussed with stakeholders at previous Evidence Plan Technical Panel meetings, high-resolution imagery has also been used to inform the scope of Phase 2 species specific surveys, in order to maximise coverage, as only 50% EP1HS coverage had been achieved by PEIR. However, since PEIR almost 100% survey coverage has been achieved, minus 2 – 3 fields, where neighbouring field and high-resolution imagery were used. Having ground-truthed the majority of the remainder of the survey area, no additional species-specific surveys are required at this time.

Wintering and Migratory Birds:

CC summarised the following update:

- Characteristic assemblages of over-wintering birds recorded throughout the over-wintering bird survey (conducted between November 2018 and March 2019 inclusive). This is consistent with the area and the habitats present within the survey area (i.e. predominantly arable land with some instances of scrub and woodland). Species recorded consisted of farmland passerines along with ducks, geese and waders, which is characteristic of the mix of habitats present.

The highest numbers of BOCC4 'red' status birds were recorded within hedgerows throughout the survey area, this was consistent within the survey vantage points across the onshore export cable corridor (ECC) and within the survey walkovers undertaken in and around the onshore substation (OnSS).

Breeding Birds:

CC summarised the following update:

- Breeding bird survey was designed to follow on from the over-wintering bird survey effort. Similar assemblages of farmland passerines, ducks, geese and waders were recorded throughout the survey area.
- The highest number of BOCC4 'red' list status birds were recorded within arable fields, with Linnet and Skylark occurring most frequently.
- A pair of breeding barn owls were recorded within two locations during the breeding bird survey. Two adults were observed actively hunting and taking prey to a nest location:
 - Location 1 - an ash tree approximately 350 m from the onshore ECC near Bryan Mills Beck; and
 - Location 2 - a derelict barn immediately adjacent to an existing farm track that had been identified to be used by Hornsea Four, east of the Bridlington Road.
- Due to the proximity of the access track to the nesting site, and taking into consideration guidance from Shawyer (2011), and Ruddock and Whitfield (2007), a 100 m buffer around the barn has been included

within the Order Limits, to allow sufficient flexibility to minimise disturbance as a result of construction works associated with Hornsea Four, should it be required.

CC asked whether stakeholders considered that the additional 100 m buffer around the barn owl nesting site is considered to be sufficient.

MF mentioned that there might be barn owl boxes located on the Humber and suggested that Hornsea Four could commit to incorporating barn owl boxes in and around Bryan Mills Beck

LH followed by responding that in East Riding of Yorkshire barn owls are known to use the watercourses, so it may be possible to provide other boxes.

EB stated that it looks like Hornsea Four had done as much as it can to aid with mitigation, and that the guidance has been followed.

Great Crested Newts (GCN)

CC summarised the following update:

- A total of 85 ponds were identified within, and up to 250 m of the PEIR boundary. Access was granted to a total of 74 ponds during the Great Crested Newt (GCN) survey window (mid-April to mid-June).
- Of those 74 ponds, a total of 42 were subject to a GCN eDNA survey; 30 ponds were dry or no longer present and a further two were inaccessible due to electric fencing and locked gates.
- Three ponds returned a positive result for the presence of GCN. Two of those ponds are now located outside the onshore footprint (including 250m buffer) of Hornsea Four. These ponds were approximately 100 m from an existing road that was to be used by Hornsea Four as an access track, however the requirement for this access road has now been removed. .
- The third pond is located approximately 200 m from the onshore ECC, with potential pathways including a hedgerow and a ditch (dry at the time of the survey).
- Potential mitigation options for this pond include the use of fencing during the GCN active season to ensure GCN cannot move from the pond to the area of the onshore ECC. No mitigation is thought to be required at this time for the two further ponds now outside the Hornsea Four Order Limits.
- Eleven ponds were not granted access during the 2019 survey season and remain to be subject to both a Habitat Suitability Index (HSI) assessment and an eDNA survey. These ponds are situated within a golf course, where the closest pond is approximately 150 m away from the onshore ECC.
- **Proposed mitigation** for these ponds is as follows:
 - Pre-construction HSI and eDNA survey to ascertain presence of GCN;

- If GCN presence is confirmed, the application of fencing to deter movement of GCN during the active season is proposed.

EB responded that it sounded like we were ready to start speaking to the licensing team and start the Letter of No Impediment (LONI) process.

Action 6 – EB to follow up with the licencing team and get back to Hornsea Four on how to start this process after the meeting.

CC asked what NEs view would be to the mitigation for the ponds where an HSI survey wasn't conducted due to access not being granted.

LO responded that HSI suitability modelling could be an option. District licensing has not been set up for East Riding of Yorkshire, however, the evidence base has been set up, therefore NE could perhaps look to provide Hornsea Four with that data. Then it would be for Hornsea Four and NE to discuss and agree how this data is applied to the normal licensing approach, as this has never been done before.

LO responded that the surrounding ponds could be used as supporting evidence base, but that it would be too precautionary to assume that there were newts in all pond which could not accessed and therefore surveyed.

LO also suggested that compensatory measures could be more appropriate and effective than installing fencing. Further discussion regarding GCN to be undertaken with NE at the LONI/species mitigation meeting in 2020.

Action 7 – EB stated that it would probably be best for them to take this way and speak to the licensing team to see if they had any thoughts on a proportional approach to these ponds. It perhaps requires a discussion at a more strategic level before Hornsea Four submits it's LONI.

Water voles:

CC summarised the following update:

- Total of 86 watercourses identified within a 50 m buffer of the onshore infrastructure. Only dry watercourses were scoped out of the 2019 water vole survey, as agreed with stakeholders at the second Hornsea Four onshore Ecology Technical Panel meeting on 8th January 2019.
- A total of 52 watercourses were dry during the 2019 water vole breeding season and therefore assessed as sub-optimal. A further two watercourses were no longer present, and one watercourse was situated within a field with cows present, therefore unsafe to survey.
- Water vole field signs (i.e. latrines, pathways, burrows) were recorded in three watercourses. A population density exercise (Dean et al. 2016) indicates a low population of water vole within these three watercourses.

- Two of the three watercourses with confirmed water vole presence will be crossed via HDD and one watercourse will be subject to open cut or HDD methods. Displacement has been recommended within the watercourse potentially to be subject to open cut crossing methods.
- **Proposed mitigation:** Any displacement will be conducted under a class licence and supervised by a suitably qualified ecologist. Displacement will follow the methodology as described within the Water Vole Mitigation Handbook (Dean et al. 2016).

MF asked whether the watercourse which could potentially be cut by open cut, was a large colony.

CC responded that it was low density, as only one latrine and one burrow was observed during the survey.

MF responded that he couldn't argue with displacement as the proposed mitigation as it is a low population.

LH mentioned that displacement should be treated carefully, as it can fragment already fragmented populations. She mentioned that YWT may be able to help with this if Ørsted provide the information to them.

Action 8 – Hornsea Four to provide information on potential water vole displacement to YWT.

LO stated that the EP1HS was carried out in February, which isn't the optimal time of the year to carry out the survey. This was particularly relevant to the habitats within the River Hull SSSI. Recommended that the citation for the SSSI was checked with regard to associated bird assemblages and ensure this is covered within the impact assessment

CC responded that habitats were checked on subsequent visits to the area during the bat surveys and remains to consist of poor semi-improved grassland within the Hornsea Four Order Limits.

AS also mentioned, that the project had now made a commitment to locate the HDD entry and exit pits a minimum was 20 m away from the River Hull Headwater SSSI.

LO stated that this was a really positive change and commitment made by Hornsea Four.

LO continued that the SSSI citation was for the breeding bird assemblage around the SSSI. These areas can therefore be considered as functionally linked...

Action 9 – CC state that she would check the SSSI citation and include in the assessment as appropriate.

LO questioned what mitigation would apply duration operation, for example, if the cables needed to be excavated.

CC confirmed that construction mitigation would apply for operation also.

LO questioned that the River Hull Headwater SSSI is expected to move, and that there is a concern that even using HDD to cross the river, may affect the hydrogeology of the river over time. However, that it might be worth picking up how decommissioning might affect the flow the river over time, in the separate session to be organised with NE.

CC responded that it would be worth picking this up with Ian Dennis the Hydrology specialist who has carried out the geomorphological survey work on the River Hull Headwater SSSI.

In relation to Question 10 on the Position paper ('Are stakeholders in agreement that all access tracks have been located a sufficient distance from ecological receptors to minimise any potential impacts?') LO stated that most of the access tracks had been located sufficient distance away from ecological receptors. However, he was unclear as to what the access tracks would look like. As for example, in relation to the access track nearest to Birkhill Wood the concern is that hydrocarbons and heavy metals flowing out and into the ancient woodland. It would therefore be useful to understand whether there is a greenfield which could interrupt the flow of this run off, and as well as the design and usage (numbers).

Action 10 – Hornsea Four to provide NE with details on the design of the access tracks i.e. width, depth, how much they are going to be used etc.

CC also informed that the project has tried to use existing access tracks wherever possible, in order to minimise any impacts.

LO said that this was promising and the sort of further information and detail which he was not aware of but would be useful. He reiterated that it would be good to bring this information together in a separate session, as there may be sufficient evidence based to remove these sorts of concerns.

Otters:

CC summarised the following update:

- The Otter presence/absence survey was undertaken at the same as the water vole survey, within a total of 14 watercourses being subject to an otter survey. No presence of Otters were recorded within the survey area.
- Desk study results show Otters using watercourses that flow through the survey area, although all results were outside of the survey area.
- **Proposed mitigation** for Otters includes the following:

- Avoidance of working at night where possible. Within areas where longer working hours are required (i.e. HDD locations), low level, directional lighting will be focussed away from watercourses;
 - Otter proof fencing will be installed to ensure Otters cannot access working areas;
 - Where necessary, excavations adjacent to larger watercourses will be covered overnight or will have access/egress installed to prevent entrapment; and
 - Any vehicles left overnight will be checked each morning prior to use.

In relation to the proposed mitigation LH asked where Otter fencing is proposed, as some projects commit to using it across the whole route. However, it can be expensive and if no Otters are found then there wouldn't be much point in using it.

EB followed by stating that it is useful to have the mitigation stated in the Chapter etc, so that where Otters are found, then it can be used on site as appropriate.

LH also stated that there needs to be consideration of whether using the fencing is going to be helpful, as it can fragment populations. Fencing could mean fragmenting populations, if you were to fence the corridor near watercourses for example.

Action 11 – Hornsea Four to take away this advice and provide an update on the approach and justification on Otter mitigation.

Bats:

CC summarised the following update:

- No bat roosts have been recorded during the emergence/re-entry surveys between May and September 2019. All features (trees/structures) assessed as having high suitability for roosting bats were subject to three separate survey visits, and all features assessed as having moderate suitability were subject to two separate survey visits.
- No surveys of trees assessed as having low potential have been undertaken, as per the Bat Conservation Trust (BCT) guidance.
- All structures within the Hornsea Four survey area which were assessed as having high or moderate potential were subject to the appropriate number of surveys outlined above.
- Monthly activity transect surveys were undertaken between May and October 2019. Initial results show a number of bat species using the 2019 survey areas. The highest concentration of bats recorded were shown to be using the network of hedgerows and public footpaths within and around the OnSS. The key species include:
 - Common pipistrelle (*Pipistrellus pipistrellus*);

- Nathusias' pipistrelle (*Pipistrellus nathusii*);
- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Myotis spp.;
- Noctule (*Nyctalus noctula*); and
- Daubenton (*Myotis daubentonii*).
- The results from the transect surveys within and around the OnSS show a consistent number of bats utilising the network of hedgerows surrounding the public footpaths as commuting routes, with foraging activity being recorded within the areas of scrub vegetation bordering the arable fields. These surveys were focussed in and around the OnSS due to the permanent infrastructure proposed within this area. However, any pertinent information with regard to the preservation of bat commuting and/or foraging routes will be applied to other locations within the survey boundaries where applicable.
- A total of 20 static detectors were deployed throughout the survey area (in accordance with survey access agreements that had been granted for each surveying visit). Each static detector was placed within a transect route and also within key locations where no transect survey was undertaken.
- Preliminary results from the static detectors show the highest density of bats using the habitats within and around the OnSS. All static detectors were deployed once per month and were left in situ for a total of five nights.
- Potential impacts on bat species, during construction and operation, within proximity of the proposed OnSS relate to noise, lighting and disruption to utilised commuting routes. Planned mitigations, for discussion with stakeholders, within this area include the following:
 - Operational lighting design in accordance with Guidance Note 8 (Institute of Lighting Professionals);
 - Construction lighting will be focussed away from commuting corridors and directed towards work areas;
 - Design of OnSS to incorporate existing vegetation within landscaping and possible maintenance of a dark corridors along existing commuting routes; and
 - Avoidance, where practicable, of the removal of large sections of hedgerows that form existing commuting routes

CC question whether the approach to bat mitigation was acceptable to stakeholders.

LH answered that usually a maximum LUX level of 0.5 is considered appropriate.

AS responded that the project was looking at a dark corridor along the northern boundary of the OnSS, and that we are currently speaking to our technical team about this.

LH question how many of the high and moderate bat habitats are going to be removed, as the guidance says that it is difficult to prove there are no roosts.

Therefore it would be good to commit to precautionary measures for these habitats also.

Action 12 – Hornsea Four to provide response and possible precautionary mitigation for moderate and high suitable bat habitats.

MF also responded that there are very few trees in the Holderness. Few bats live in the Wolds, and where they do, they often live in sluices. As such, could the project possibly use bat boxes at the OnSS.

LH also stated that the YWT would be looking forward to committing to taking only removing 5 m sections of hedgerow, for the hedgerow directly south of the OnSS and within the onshore ECC.

CC responded that measures in relation to bats would apply along the onshore cable corridor during pre-construction also.

Badgers:

CC summarised the following update:

- Two active main setts have been recorded within the Hornsea Four Order Limits. Additional field signs (including latrines, tracks and snuffle holes) were also recorded.
 - One sett with 12 entrances; and
 - One sett with 4 entrances and exploratory digging within its immediate surroundings.
- The onshore ECC has been re-routed to avoid these two active main setts to ensure that all works are outside of the zone of influence (i.e. 30 m).
- One disused main sett has been recorded adjacent to the OnSS.
- Pre-construction surveys to ensure the sett remains inactive and disused are proposed. On the assumption that this sett remains to be disused, and subject to agreement with stakeholders, no licence will be required to destroy the disused sett. However, if evidence is recorded to indicate that this sett has been active, a licence application will be submitted to Natural England (NE) to destroy the sett and all works will be undertaken in accordance with the licence submission.
- General **proposed construction mitigation**, as included in the Outline Ecological Management Plan (OEMP) at PEIR:
 - Where possible, works free buffer zones within areas of known badger activity to ensure territories are maintained;
 - Avoidance of night working, unless essential. Lighting will be focussed on work areas and away from areas of value to foraging badgers (i.e. scrub, rough grassland and woodland); and
 - Lighting will be kept to a minimum in locations with known badger setts nearby.

CC asked whether it would be acceptable to stakeholders to evacuate the disused setts without a licence if they are subject to a rigorous survey effort to confirm the setts are still disused.

MF responded that we would need to soft-block it (which would require a licence) and / or use camera traps.

LH also responded that they have found it useful to sticks in front of the entrances in combination with sand traps, as any present badgers would need to knock of the sticks to use entrances.

MF said that Otters and rabbits can however use disused badger setts so this might be accurate in establishing the presence of any badgers.

LH stated that this is where using sticks in combination with sand traps if helpful.

EB stated that if the specialist checking the setts is satisfied that the setts is disused, then a licence wouldn't be required.

LH asked that the project ensures that standard measure are in place for badgers as well as Otters i.e. where there might be open excavated pits during construction. It would also be good to avoid winter working also.

Action 13 – Hornsea Four to ensure that standard measures are in place for badgers and Otters, and that winter working will be avoided where possible.

Outline Ecological Management Plan (OEMP):

MF asked about whether any invasive species were found.

CC responded that although no invasive species were recorded during the Hornsea Four Ecology surveys, measures were provided in the Outline Code of Construction Practice (CoCP) at PEIR.

MF elaborated that vehicles can bring in invasive species e.g. mud, Japanese knotweed etc. which can affect the area later in time. Recommended that preventative measures alongside a management plan are included for construction works.

AS responded that the Outline CoCP stated that wheel washers would be used where necessary during construction, for example at the OnSS. But that the project would look in to whether further measures were applicable.

EB mentioned that preventative measures would be preferable which can be used if required during construction.

Action 14 – Hornsea Four to look further into further preventative measures in relation to invasive species.

'Impacts Register' and Proportionality

CC stated that as per the position paper provided prior to the meeting, Hornsea Four proposed to scoping the following impacts out of further assessment in the Environmental Statement:

Impact	Hornsea Four position at PEIR	Hornsea Four position at ES	Stakeholder response in technical panel meeting
<p>Direct impacts on habitats: Construction phase</p> <p>Temporary construction areas could occupy areas leading to loss and/or degradation of designated sites.</p>	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on non-designated sites: Construction phase</p> <p>Construction compounds, access roads and other infrastructure will temporarily occupy areas leading to loss and/or degradation of non-designated habitat</p>	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on white-clawed crayfish and fish: Construction phase</p> <p>Open cut trenching, used to cross watercourses could lead to loss of habitat, disturbance and / or connectivity severance on white-clawed crayfish and fish.</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on reptiles: Construction phase</p> <p>Construction activities will temporarily occupy areas leading to loss and / or degradation of habitat, loss of habitat connectivity and harm or mortality of individual reptiles.</p>	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on habitats or species: Construction phase</p> <p>Construction could cause damage to habitats or species from accidental release of pollutants</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.

Impact	Hornsea Four position at PEIR	Hornsea Four position at ES	Stakeholder response in technical panel meeting
<p>Impacts on habitats: Operation phase</p> <p>Excavating a section of cable for maintenance or repair could cause temporary habitat loss or degradation</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on protected species: Operation phase</p> <p>Operation and maintenance activities of the onshore cable route could cause disturbance to protected species</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on habitats or species: Operation phase</p> <p>Operation and maintenance activities could cause damage to habitats or species from accidental release of pollutants</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on habitats: Decommissioning phase</p> <p>Decommissioning of onshore cable could cause temporary loss or degradation to habitat</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on habitats: Decommissioning phase</p> <p>Decommissioning of the onshore substation could lead to temporary habitat loss or degradation</p>	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.
<p>Impacts on habitats or species: Decommissioning phase</p> <p>Decommissioning of the onshore substation could lead to damage to habitats or species from accidental release of pollutants</p>	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA, YWT and NE agreed with the 'Hornsea Four proposed position at ES'.

EB questioned whether all the salient mitigation in relation to the impacts would be captured in sufficient detail in the Impacts Register, and how this would be picked up during construction.

AS responded that there is mitigation column in the Impacts Register, and as all mitigation is and will continue to be given a commitment number, the relevant mitigation would be listed next to the impact in the register.

EB stated that there should be adequate signposting from the Chapter to the Impacts Register, as the PEIR assessment won't be submitted with the Environmental Statement.

AS to ensure that there is sufficient signposting from the Ecology and Nature Conservation Chapter to the Impacts Register.

MF commented that there are signal crayfish in the River Hull, but that these were invasive.

AOB

LH asked the project to ensure that there is consistency between the different documents on what watercourses we have committed to using HDD on, or not.

AS confirmed that the projects commitment (Co1) was as follows:
"All Environment Agency (EA) main rivers, Internal Drainage Board (IDB) maintained drains, main roads and railways will be crossed by HDD or other trenchless technology as set out in the Onshore Crossing Schedule. Where HDD technologies are not practical, the crossing of Ordinary watercourses may be undertaken by open cut methods. In such cases, temporary measures will be employed to maintain flow of water along the watercourse. Main rivers will not be temporarily dammed and/or rerouted." But that the project would ensure that all documents are clear and consistent.

LH also mentioned that although YWT would defer to NE on air quality issues, that it might be worth applying buffers for habitats in relation to the different NO_x Zones.

MF also asked whether stockpiles (i.e. topsoil and subsoil bunds) would be covered with plastic sheeting and not stored in the flood plain.

AS stated that Hornsea Four have updated their commitments to state that storing topsoil and subsoil in the floodplain would be avoided where possible. However, it is not possible to commit to anything further as large parts of East Riding of Yorkshire and therefore the onshore ECC are covered by flood zone. AS also stated that the topsoil and subsoil bunds would not be covered with plastic or anything similar, as this would result in greater vehicles movements, and is therefore not considered to be practical. Additionally, the project is conscious of the environmental impacts of using plastic to cover the bunds. However, the Hornsea Four would investigate if anything further could be done.

MF also asked whether it was still the case that decommissioning would not entail excavating the onshore export cables.

CC confirmed that this is the case, and that the onshore export cables would be left in situ.

AS also confirmed the export cables would be left in situ with the cable ends cut and sealed as a precautionary measure. The jointing pits and link boxes would only be removed if feasible with minimal environmental disturbance.

EB emphasised that it would be useful for Hornsea Four to produce a standalone document covering designated sites, as although impacts are being scoped out at a broader EIA level, there may still need to narrative specifically in relation to designated sites, to remove the need for specific questions in relation to these site

EB asked if an additional meeting might be required.

CC answered that another meeting wasn't anticipated at this time.

LH stated that she was happy with the mitigation in general and would be happy to have further discussion on water voles on a case by case basis. If additional questions where to arise are the baseline emerges and evolves, this can be discussed on an ad hoc basis, but that this doesn't necessarily require a meeting.

Summary of Actions:

Action Number	Action	Responsible
1	Hornsea Four and Natural England to work together to identify the process and programme for draft EPS licenses.	AS (Ørsted) & EB, MM (NE)
2	Hornsea Four to organise session with Natural England focussed on designated sites.	AS (Ørsted)
3	Hornsea Four to improve sign-posting between relevant documents in the final Environmental Statement.	AS (Ørsted)
4	NE to provide Hornsea Four with the data for farming for the East Riding of Yorkshire and the Humber Estuary.	LO (NE)
5	LO to provide link to guidance and to check that the RIAA has been conducted in line with NE guidance.	LO (NE)
6	NE to follow up with the licencing team and get back to Hornsea Four on how to start this process after the meeting.	EB, MM (NE)
7	NE to speak to the licensing team to see if they had any thoughts on a proportional approach to GCN mitigation, as it perhaps requires a discussion at a more strategic level before Hornsea Four submits it's LONI.	EB, MM (NE)
8	Hornsea Four to provide information on potential water vole displacement to YWT.	AS /CC (Ørsted)
9	Hornsea Four to check the SSSI citation and include in the Ecology and Nature Conservation assessment as appropriate.	AS /CC (Ørsted)
10	Hornsea Four to provide NE with details on the design of the access tracks i.e. width, depth, how much they are going to be used etc.	AS /CC (Ørsted)

Action Number	Action	Responsible
11	Hornsea Four to take away this advice and provide an update on the approach and justification on Otter mitigation.	AS /CC (Ørsted)
12	Hornsea Four to provide response and possible precautionary mitigation for moderate and high suitable bat habitats.	AS /CC (Ørsted)
13	Hornsea Four to ensure that standard measures are in place for badgers and Otters, and that winter working will be avoided where possible.	AS /CC (Ørsted)
14	Hornsea Four to look further into further preventative measures in relation to invasive species.	AS (Ørsted)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology Technical Panel Meeting 6	01 April 2020
Meeting Date	01 April 2020	
Place	Skype Teleconference	
Participants	<p>██████████ – Ørsted Onshore Consents Lead</p> <p>██████████ – RHDHV Lead Ecologist</p> <p>██████████ – RHDHV Onshore Project Manager</p> <p>██████████ – Natural England (NE)</p> <p>██████████ – NE</p> <p>██████████ – NE; and</p> <p>██████████ (Wildlife licensing) - NE</p>	Our ref. Hornsea Four EP Onshore Ecology TP #6
Absent	None	
Copy	██████████	
Next meeting	1 st July 2020 via Skype	

Agenda

1. Welcome
2. Introductions
3. Discussion on all onshore baseline survey reports to agree:
 - Survey scope;
 - Survey methodology;
 - Survey results;
 - Proposed mitigation measures; and
 - Further survey requirements or next steps.
4. Discuss and agree mitigation and licensing requirements for:
 - Great crested newts;
 - Birds;
 - Bats;
 - Badgers;
 - Water voles; and
 - Otters.
5. Letter of No Impediment (LONI) process and timescales; and
6. Any Other Business (AOB).

Agenda Item 3 - 5: Review of all onshore baseline survey reports

1. Water vole Survey Report:

- a. **Survey scope** - CC advised that 70 watercourses had been identified during the 2019 Extended Phase 1 Habitat Survey (EP1HS), 11 of those 70 watercourses were dry, therefore a total of 59 were scoped into the 2019 water vole survey effort.

NE agreed with survey scope and methodology.

- b. **Survey methodology** – Surveys undertaken in accordance with industry guidance.

NE agreed with methodology followed.

- c. **Survey results** –
 - A total of 27 watercourses were dry; 18 were inaccessible and therefore surveyed from the bank using binoculars; 14 watercourses were fully surveyed.
 - Water vole presence recorded in 6 watercourses.
 - Relative population estimate undertaken and water vole population established as low.
 - Five watercourses will be crossed via HDD.
 - One watercourse will be crossed via open cut and so displacement exercise will be required for this one watercourse.
- d. **Proposed mitigation measures** –
 - Displacement exercise under class licence and in accordance with water vole mitigation handbook will be undertaken for one watercourse.
- e. **Further survey requirements or next steps** –
 - All 70 watercourses will be resurveyed pre-construction.

CS agreed with this conclusion and further survey requirements.

- CC expressed that LONI for water voles will be required.

CS advised that all 3 tests are needed for water voles (i.e. method statement, draft licence application) – draft licence review is c. 30 days determination, but due to COVID-19, some of the timescales for determination may have been affected.

- Draft licence application for displacement on the one watercourse is based on survey data available at this time although acknowledgement of other watercourses needs to be made in the draft license.

CS agreed with this conclusion and stated that that pre-construction surveys will need to be taken into consideration.

Action 1 – CS also explained that the constraints encountered during the baseline surveys e.g. where some areas were not fully accessible, need to be acknowledged in the application.

2. Otter Survey Report:

- a. **Survey scope** – A total of 14 watercourses (larger main drains and/or main rivers with flowing water) were surveyed. The surveys were undertaken concurrently with water vole survey with two visits undertaken (one in May and one in August).

NE agreed with survey scope.

- b. **Survey methodology** – NE standing advise adhered to during all surveys. NE agreed with survey scope.
- c. **Survey results** –
 - Desk study showed presence in some watercourses within the Order Limits, but no signs of otter noted during survey.
 - Landowner information relating to otters was provided to the surveying team within four watercourses.
 - All 14 watercourses will be crossed by HDD (secured by Commitment 1).
- d. **Proposed mitigation measures** –
 - No LONI for otter required at this time as no evidence of otter recorded to date.
 - Mitigation would include fencing of adjacent areas (construction areas only) to prevent entrapment with exit points and maintenance commuting routes throughout. This will be provided in the Outline Ecological Management Plan (OEMP) to be provided in draft for the next meeting in July.

CS advised that consideration of avoidance of impacts to otter, i.e. avoidance of night working should also be used.

Action 2 – CS stated that consideration of compensation is also needed should evidence be found during preconstruction surveys.

- e. **Further survey requirements or next steps** –
 - All 14 watercourses will be resurveyed prior to construction.
 - AS advised that there would be no planned night-time works. The Project has made a commitment to core working hours, and that night-time working would be avoided where possible.

CS advised that areas where there is confirmed, or anecdotal presence working at night should be avoided.

2. Over-wintering Bird (OWB) Survey Report:

- a. **Survey scope** - Vantage points and transect walkover surveys of OnSS included habitats that were identified to be characteristic of area and local landscape. Surveys undertaken between November 2018 and March 2019 (a total of 6 separate survey visits).

NE agreed to survey scope.

- b. **Survey methodology** – N/A
- c. **Survey results** – N/A
- d. **Proposed mitigation measures** – N/A
- e. **Further survey requirements or next steps** – N/A

NOTE: CS advised that she did not review OWB survey report as it is unlikely that there will be any licensing requirements. Furthermore, LR advised that there are no concerns relating to OWB as there are none within the SSSI impact zones.

3. Breeding Bird (BB) Survey Report:

- a. **Survey scope** – Although NE advised that the breeding bird survey report had not been reviewed prior to the meeting, NE agreed with survey scope that was outlined within the breeding survey report as this had been presented at the previous onshore ecology technical panel meetings. No further comments or concerns raised on survey scope for the breeding bird survey effort.
- b. **Survey methodology** – NE agreed with survey methodology as this had been presented at the previous onshore ecology technical panel meetings.
- c. **Survey results** – NE agreed with survey results, although it was acknowledged that a review of the breeding bird survey report had not been undertaken prior to the meeting.

LR advised that he would review the report and provide any comments once his review had been completed.

d. **Proposed mitigation measures:**

CS stated that the barn owls at the landfall were of interest, where breeding barn owls may be present. Natural England confirmed that a license was not required if no nest is to be destroyed, and if the terrestrial habitat is likely to be unaffected.

CC clarified that the road adjacent to the derelict building is a proposed access route and an existing farm track.

CS queried if it was just access or whether storage compound/machinery stored there?

AS advised 100 m buffer around barn has been included within the Order Limits to allow flexibility when micro-siting the access track if it appears there is an active nest during the pre-construction surveys. AS confirmed that no accommodation will be present at the landfall and that the access track is only to facilitate access to construction at the landfall.

CS confirmed she was happy for access track to have been moved and no requirement for welfare or storage. CS agreed that 100 m buffer as a minimum should be applied to the barn owl nesting site (derelict building).

CS queried if standing machinery will be present? CC advised no standing or idle machinery would be present on the access track, only access track will be used for machinery to travel along.

CS requested a plan to show the location of the nesting site, proposed access track and distance of landfall from the derelict building.

AS advised, it is approximately 500 m, as the crow flies, to the landfall from the derelict building. AS explained that the exact location of the landfall access track would be planned in consultation with stakeholders and that a pre-construction check for barn owls will be required as per the OEMP.

CS asked whether it would have been possible to locate the access track to the south, as a view from google street view indicated that the barn opened to the

north and that therefore the barn owls are likely to fly from the derelict building to the north. Therefore, if the access track could be moved to the south this may avoid disturbance to the barn owls.

AS advised that this would be considered but at this time the proposed access track is currently as shown in the plan.

Action 3 – Hornsea Four to provide response on the location of the landfall access track to the north of derelict building.

Action 4 - LR advised that as 373 ha of arable land is to be affected by Hornsea Four that this needs to be acknowledged in the Environmental Statement with regards to ensuring there is no net loss for farmland birds.

LR advised that the River Hull headwaters SSSI has breeding bird (BB) species listed in its SSSI citation. LR requested that it would be useful to understand the works in and around the River Hull headwaters to determine impacts to BB and how they would be mitigated for.

CC advised that River Hull headwaters will be crossed via HDD (or other trenchless technologies). The habitats adjacent to the River Hull are arable and therefore HDD entry and exit pits will be located within ploughed farm fields (a minimum of 20m from the river as per Commitment 18) rather than within areas of vegetation which the BBs are likely to use.

LR accepted this conclusion and that no impacts to BB species are therefore likely to arise.

LR queried if BB survey covered areas of arable land and/or farmland birds.

CC advised of the findings from the BB survey report.

Action 5 - LR had not reviewed the BB survey report and will provide comments once it has been reviewed.

- e. **Further survey requirements or next steps –**
 - No draft licence for barn owls will be required as no nesting site would be destroyed.
 - Embedded mitigation measures for BB are identified.

CS advised that avoidance needs to be considered in the first instance – i.e. avoidance of working in breeding season if possible. CC advised that this is the case and is secured by the commitment relating to this requirement.

EB questioned how pre-construction surveys would be secured in the DCO.

AS advised the landfall access track is secured via the Works Plan and that the pre-construction surveys are detailed in the OEMP. Both the Works Plan and the OEMP is secured via the DCO.

Action 6 - CC will ensure that this is clearly stated in the OEMP.

Action 7 - LR will review the report and mitigation measures and provide any comments accordingly.

4. Badger Survey Report:

- a. **Survey scope** – CC advised that the badger survey had been undertaken concurrently with the Extended Phase 1 Habitat Survey, with one visit in February and one in September 2019, and in accordance with industry survey guidance. NE agreed with survey scope.
- b. **Survey methodology** – CC advised that surveys had been undertaken in accordance with NE and Mammal Society guidance. Surveys had been undertaken in February and September 2019 and included the area within the Order Limits plus a 50 m buffer.

NE agreed with the survey methodology followed.

- c. **Survey results –**

- Two active main setts noted but these are avoided and are outside 30 m of the proposed construction works.

CS advised that September is not optimal surveying period for badger and vegetation growth may have limited visibility for checking of badgers. Pre-construction surveys should be undertaken in October and/or November. CS agreed with survey approach and methodology taken, whilst acknowledging the survey limitations.

- d. **Proposed mitigation measures –**

- Works free buffer zones within areas of known badger activity;
- Avoidance of night working unless essential;
- If night-time working is required, lighting will be focussed on work areas and away from areas of value to foraging badgers, where possible;
- Standard mitigations for badgers to be utilised, including ensuring the covering over of any excavations, or assuring a means of escape is installed;
- The disused sett will be subject to a suite of surveys to determine its status, this was proposed to be done via the use of tight packed straw wedges to determine occupancy.

CS does not agree with the use of tight packed wedge of straw for checking for badger presence, as this has potential implications of infringement of welfare act. CS advised that sticks, camera traps, double sided tape, and damp sand should be used as a preference. For example, Target Note (TN) 8 is not on a public right of way (PRoW) and so potential security may not be an issue for the use of such equipment where usually theft may be considered a risk.

- e. **Further survey requirements or next steps –**

- No LONI for badgers anticipated based on the results obtained to date.
- If the disused sett is still confirmed to be disused in the pre-construction surveys, no licence would be required to destroy the sett, as confirmed by CS.
- **Action 8** - OEMP needs to include pre-construction survey check in October and November, along with a statement of what will be done.
- **Action 9** - NE position is that no straw wedge to be used from an animal welfare perspective. Therefore, this is to be removed as a proposed monitoring measure from the badger survey report and the OEMP.

5. Great Crested Newt (GCN) eDNA Survey Report:

- a. **Survey scope** – 60 ponds had been identified through the 2019 survey effort. These had been identified from the Extended Phase 1 Habitat Survey (EP1HS) and Ordnance Survey (OS) mapping. A 250 m buffer around the onshore Order Limits had been applied.

NE agreed with survey scope and use of the 250 m buffer.

b. **Survey methodology** –

An eDNA survey effort had been undertaken in 2019 of all ponds within and up to 250 m of the onshore Order Limit boundaries. The eDNA survey was undertaken in accordance with industry guidance and by licenced GCN ecologists. NE agreed with survey methodology, whilst acknowledging the access limitations for some of the ponds.

c. **Survey results** –

- 53 out of 60 were granted access in 2019 – 1 pond (A32) returned a positive eDNA result. This pond is approximately 200 m from onshore ECC and the habitat between the pond and the Order Limits is comprised of arable field, hedgerow and dry ditch. Therefore, it is concluded that there is potential for GCN movement.
- 7 ponds were not surveyed in 2019 due to no access being granted. Previous discussions with NE indicated that mitigation measures for the 1 pond with positive GCN would also apply to these 7 ponds that were not accessed for the purpose of the EIA assessment.

NE agreed that this is acceptable.

CS queried Pond A08 and A011 as these two ponds had a positive eDNA result.

CC clarified that these two ponds are now outside of the 250 m GCN survey area and were approximately 450 m from the onshore ECC but within 250 m of a proposed access road which has now been removed from the Order Limits. Furthermore, there is a solar farm between these ponds and the onshore ECC and therefore it is considered that GCN movement across these areas would be unlikely.

d. **Proposed mitigation measures** –

- Proposed mitigation measures would be the use of GCN exclusion fencing.

CS advised that NE would be unable to provide definitive comments regarding the proposed mitigation measures given the information that had been provided to them and therefore unable to provide full comments at this time. This would be subject to further discussions once more detailed mitigation proposals are provided to NE.

e. **Further survey requirements or next steps** –

- CC clarified that all 60 ponds (as identified at the outset of the GCN effort) will be subject to a further survey during pre-construction to establish presence or absence and then subsequently population sizes where positive results are obtained.

NE agreed this as being acceptable approach.

- CC explained that mitigation fencing (i.e. GCN exclusion fencing) would be proposed to be around and limited to Pond A32 where the positive GCN was recorded.

Limited comments were received from NE at this time as the information needs to be presented in a draft licence. NE happy with what has been proposed but a draft licence would be needed with a full suite of documents (e.g. method statement) being required.

CS advised that a draft GCN licence would not be possible at this time as only eDNA survey results are available, as there are no further population estimate surveys for GCN planned to be undertaken prior to DCO submission. CS advised that this requires further consideration from NE as to what could be provided from them in terms of a LONI. CS indicated that this would need to be checked and confirmed back to the project as it is likely that consideration of Licensing Policy (LP) 4 will be required.

Action 10 – Hornsea Four to review Policy LP4 and engage further with Natural England on the GCN draft EPS license and LONI. CS to investigate further whether it might be possible for Hornsea Four to use LP4.

6. Bat Emergence/Re-entry Survey Report:

- a. **Survey scope** – Features identified through the EP1HS and review of aerial imagery.

NE agreed with survey scope and approach taken.

- b. **Survey methodology** –
- Low suitability features (trees) - no surveys were undertaken as agreed previously and in accordance with BCT guidance. There are no buildings with low suitability.
 - High/moderate features – all moderate suitability features were subject to two separate survey visits and all high suitability features were subject to three separate visits. . All surveys undertaken between May and September.
- c. **Survey results** –
- No confirmed roost sites identified through survey effort.

CS identified that the survey report does not consider hibernation or transitional bat roosts, i.e. there is no reference to hibernating bats. CS advised that hibernating bats still need to be considered and ruled out pre-consent or if this is not possible then need to acknowledge this as requiring further survey within the OEMP.

- With some features there were survey constraints with regards to low light levels. Further surveys will be required due to proximity of the proposed development.

CS advised that use of thermal imagery, and at height inspection may need to be considered where low light limitations were experienced during the baseline surveys.

CC advised that there are no planned construction works to be undertaken within 15 m of these potential bat roosting trees.

CS accepted this, but consideration of further survey would still be required and included in the OEMP should it be identified as being required pre-construction.

- CC also advised that colder weather experienced in September – bat activity was recorded during the surveys.

CS advised that this is acceptable.

- d. **Proposed mitigation measures –**
 - Soft felling of all low suitability trees, in accordance with BCT guidance and NE standing advise;
 - If construction plans change and work is required within 15 m of the undetermined bat roosts, an internal inspection will be undertaken and appropriate mitigation will follow; i.e. if a bat roost is confirmed, a NE bat licence application will be submitted.
- e. **Further survey requirements or next steps –**
 - No roosting bats recorded at this time, therefore no LONI will be sought by Hornsea Four.

CS highlighted that as potential impacts on hibernating bats have not been considered in the report. This along with the low light levels experienced during the 2019 survey effort, this means that more surveys will be needed on those particular features where such constraints have been noted.

Action 11 - CC advised that these would be undertaken pre-construction, and this would outlined in the OEMP.

CS accepted this approach.

- CC explained that no trees identified for bats (moderate or high suitability) and are considered to need felling at this time.
- Trees (low suitability) will be felled in accordance with BCT guidance (soft fell).

CS recommended that these should be left in situ for 24-48 hours once soft felled.

Action 12 - CC acknowledged this and to ensure the OEMP includes this.

7. Static Bat Detector Survey Report:

- a. **Survey scope** - No surveys in April as no landowner access agreements in place. Surveys were undertaken between May and October and bat presence was recorded.

NE accepted survey scope.

- b. **Survey methodology** – survey methodology followed the guidance contained within the BCT guidelines, static detectors were placed within secure locations in areas adjacent to moderate and high suitability features. The static detectors were left in situ for a total of 5 nights each month between May and October 2019.

NE accepted survey methodology.

- c. **Survey results** – survey results show a diverse assemblage of bat species throughout the survey area, including several NERC species

such as *Plecotus spp*, *Pipistrellus nathusii* Nathusias' pipistrelle, *Nyctalus noctula* Noctule and *Pipistrellus pygmaeus* Soprano pipistrelle.

No concerns were raised from NE on the technical malfunction of static detector. NE accepted that such instances occur. NE acknowledged that this has been taken into consideration and that the project has taken the results of both the static and monthly activity transect survey results in order for an understanding of bats using the landscape to be made, so no concerns of data gaps highlighted.

- d. **Proposed mitigation measures** – Not applicable, as survey findings from the static detector survey effort are used to supplement the activity transect survey results. The proposed mitigation measures relating to foraging and/or commuting bats are therefore covered by the activity transect point of discussion of the meeting.
- e. **Further survey requirements or next steps** – Not applicable, as survey findings from static detector survey effort are used to supplement the activity transect survey results. Therefore, any further surveys that may be required for foraging and/or commuting bats are covered by the activity transect point of discussion of the meeting.

8. Bat Activity Transect Survey Report:

- a. **Survey scope** – Scope of the survey included all features assessed as moderate or high suitability for commuting and foraging bats, in accordance with BCT guidelines. No surveys were undertaken during April due to a lack of landowner access agreements. Survey was undertaken concurrently with the static detector survey.

NE agreed with survey scope.

- b. **Survey methodology** – methodology in accordance with the BCT guidelines, all features assessed as moderate or high suitability for commuting and foraging bats were organised into walkable transects and were walked each month, with surveyors recording data such as bat species, location and activity.

NE agreed with methodology followed during the 2019 survey effort.

- f. **Survey results** – survey results show a diverse assemblage of bat species throughout the survey area, including several NERC species such as *Plecotus spp*, *Pipistrellus nathusii* Nathusias' pipistrelle, *Nyctalus noctula* Noctule and *Pipistrellus pygmaeus* Soprano pipistrelle

NE agreed with survey results and did not identify any areas of concern or features that had been missed as part of the 2019 survey effort.

- c. **Proposed mitigation measures** –
 - CC highlighted that the vegetation (hedgerow) to the north of the OnSS had been shown to be used by a high number of bats and a diverse range of species. Current plans for the OnSS along the north edge will ensure that parts of the hedgerow will be retained as per the works plan and the OEMP, will be and used as landscaping.
 - CC advised that up to a 10 m wide dark corridor buffer will also be applied.

CS queried if night working at OnSS will be undertaken.

AS advised that no plan for night-time working will be undertaken.

- Hedgerow to the eastern edge of the OnSS – currently used by bats and that this applies to all hedgerows where a section will require removal.

CC advised that a structure could be placed in removed sections of hedgerows to maintain connecting links. CS advised that oil drums planted with trees have been used on another project to maintain connecting links where severance had occurred.

CS queried what level of moveable structure will be required.

CC advised that this would be subject to discussion with NE.

CS advised that mitigation measure or moveable structure would need to be substantial to ensure that bats use such features i.e. it would need to look and mimic the hedgerow being removed as much as possible.

CAS confirmed with CS that the project will need to consider growth rates of the features being replanted to ensure establishment of hedgerow is achieved at its early opportunity. Also to ensure that such mitigation measures, if relied on for maintaining bat corridor networks, are in place and functioning to ensure impacts on foraging/commuting bats are managed and minimised as much as possible.

d. **Further survey requirements or next steps –**

- NE agreed that no further monthly bat activity transect surveys were required to be undertaken at this time.
- CC advised that the access road at the onshore substation (OnSS) the temporary access track would be 15 m, reduced to 10 m to maintain the permanent access road in to the OnSS. Therefore, a 10 m section of hedgerow will require removal permanently. The hedgerow is an established and well used by foraging/commuting bats. CC advised that the project will utilise an existing gap in the hedgerow for access to the OnSS. There is an existing gap which is circa 10 m and the permanent access track will require an additional approximate distance of 5 m of hedgerow to be removed.

CS did not highlight any concerns with the additional 5 m of hedgerow being required to be removed but that the project should seek opportunities for a section of the existing track that will not form part of the permanent access track to be planted up with similar hedgerow/shrub species to compensate for the additional 5 m that would be lost by the permanent access track.

AS advised that she would need to explore this further with the onshore substation technical team to see whether such opportunities might be possible.

CS queried why the permanent access track could not follow the existing gap in the hedgerow more closely. AS advised that this because a specific bend-radius for the road is required in order to facilitate the size of vehicle which would be transporting the transformer in to the OnSS.

CS acknowledged this as being a constraint.

EB queried how the area between the permanent access track and the temporary working area would be accessed by the landowner once it is handed back to the landowner.

AS to check and confirm as currently unknown.

EB/CS advised that there may be an opportunity for additional planting to be undertaken to infill the gap between the perm and temp access track at the OnSS.

CS advised that there are options in order of preference from highest to lowest:

1. Filling in the gap more substantially between the temporary and permanent access track, where it enters the compound.
2. Bettering the hedgerow along the northern boundary of the temporary compound to the east of where the OnSS access track enters the compound.

Action 13 – AS to follow up on these options and provide response to NE for the next technical panel meeting.

9. Extended Phase 1 Habitat Survey Report:

- a. **Survey scope** – CC explained that the Extended Phase 1 Habitat Survey area covered all areas within the onshore Order Limits plus a 50 m buffer and followed the JNCC Phase 1 Habitat Survey methodology. NE accepted scope for this survey and no concerns raised.
- b. **Survey methodology** –
 - CC advised that the EP1HS had been undertaken in February and September 2019.
 - A 95% coverage of onshore order limits plus the 50m buffer had been achieved.

NE advised that they had only undertaken a rapid review of EP1HS report prior to the meeting. However, NE confirmed acceptance on the survey methodology that had been taken for both the desk and field-based surveys.

LR stated that he was satisfied now that some surveys has been undertaken in September, and that the surveys are now sufficient.

- c. **Survey results** – The EP1HS survey concluded that arable land is the dominant habitat type within the survey area, with the majority of boundary features made up of species poor intact hedgerows. Woodland, scrub and semi-improved grassland occurred more infrequently. A total of 73 watercourses including ditches, drains, streams and rivers were also recorded.

LR stated that as a minor comment it would be useful if on the EP1HS maps and/or target notes that reference to the SSSI is included or made reference to.

CS queried if all habitats within the landfall will be restored following completion of the works? AS advised that the transition joint bays will be a permanent structure (concrete manholes). No trees would be planted along the cable corridor on top of the cables, but that vegetation would be replanted with hedgerows an shrubs, for example. 80 m for construction and reduced to 60 m permanent easement within which the export cables would be microsited. AS outlined decommissioning assumptions, i.e. cables left in situ and removal of all above ground infrastructure.

- d. **Further survey requirements or next steps** – Not applicable, as findings from the Extended Phase 1 Habitat Survey have been used to inform

the species-specific further survey requirements. No further surveys for habitats have been identified.

NE agreed with conclusions and that no further surveys, other than the species-specific ones already identified, were required.

Agenda Item 6: Any Other Business

- LR queried the use of the Biodiversity Net Gain (BNG) metric to identify if there is no net loss using the habitat information obtained to date from the surveys undertaken to date.

AS advised that no net loss has been calculated would investigate this further.

Action 14 - CS raised a point regarding stock piling of vegetation and for measures to be in place to avoid animals using them, i.e. ensure they are not stored on the ground (i.e. elevated) and/or in areas that have been identified as suitable

- OnSS access track and ancient woodland (Birkhill Wood) – CC advised that access track had previously been moved to 100 m from the woodland for which NE agreed was acceptable. CC advised that there had been a slight alteration to this location now due to feedback received from the landowner. Therefore, a 15 m buffer had now been applied to the access track, in accordance with NE advise on ancient woodland buffer.

LR advised consideration with regards to dust should be made.

CC advised that the appropriate and agreed measures would be provided in the Outline Code of Construction Practice (CoCP), but that an initial air quality and transport numbers appraisal had been undertaken to determine that the 15 m buffer was sufficient.

LR agreed with the application of a 15 m buffer from the ancient woodland to the location of the OnSS access track.

EB requested clarification on how impacts on SSSI would be presented. CC advised that as discussed previously, no impacts on SSSI have been identified and so would not be in the Ecology and Nature Conservation Chapter. This impact would be covered in the Impacts register.

EB advised that the SoS will need to undertake an assessment on the SSSI and ancient woodland so the project will need to ensure the appropriate information is sign posted within the Environmental Statement (ES).

AS advised that the Impacts register is being updated and reviewed internally and will be circulated to the NE for review and comment prior to the next technical panel meeting. The Impacts register tells the 'story' between Scoping, PEIR and ES and all mitigation as well agreement log references which are pulled from correspondence and meetings with stakeholders and will link to the Statement of Common Ground (SoCG). AS suggested that this is covered as an agenda item at the next meeting for which NE agreed is a sensible approach.

Action 15 - AS to issue Impacts register and include as an agenda item at the next meeting.

EB raised that NE had not had sight of the agreement logs to date.

AS advised that these are being drafted and will form the basis of the SoCG and applies to both on and offshore aspects.

Next Steps and Summary of actions:

- **Action 16** - CC will update where required, the documents that have been raised during this meeting, i.e. the bat emergence/re-entry survey report to make clearer the trees which were not surveyed/ where there were limitations / no planned works within 15m of the structures, and the eDNA survey report.
- **Action** -LR to review and provide comments on the BB survey report.
- **Action** - Updates to technical reports, I&E register to be issued at least 3 weeks prior to next meeting.
- **Action** - CS requested if updates of reports could be highlighted so that these can be clearly seen as to what the changes have been. AS advised that updated reports will not necessarily be reissued but would NE like to see them again? CS advised that this would not be essential but would be desirable to see or be confirmed as to what has been changed to address the comments or concerns raised.
- **Action** - AS advised that OEMP would cover these points and that bat roost emergence/re-entry survey report would be the only one requiring to be reissued with changes. The OEMP is the key document so this would be the document for where changes/updates should be made and for this to be reissued to NE.
- CAS advised that a 2020 survey effort was planned for April but considering COVID-19 situation, this is currently on hold and will be reviewed as and when movement restrictions are updated and/or change. No site surveys will be undertaken as they are not considered essential or critical to the project.

NE agreed with this position and raised no concerns on the approach taken.

- LR raised a point on geomorphology impacts which is planned to be addressed at the next technical panel meeting with Natural England.
- **Action 17** - LR to obtain a copy of the river restoration plan (c. 2014) and circulate a copy to the project. This document was prepared for works associated with the River Hull SSSI for which may be useful for the project to consider as may present opportunities whilst ensuring that any proposals from Hornsea Four to not prevent the SSSI achieving favourable conditions.

Summary of Actions:

Action Number	Action	Responsible
1	Hornsea Four to ensure that any baseline survey limitations are acknowledged in the relevant draft licenses. Draft license for water vole and GCN to be drafted and provided to NE.	CC
2	Hornsea Four to acknowledge in relevant documentation that consideration of compensation (in relation to Otters) should also be made if any evidence be found during pre-construction surveys.	CC
3	Hornsea Four to provide response on the location of the landfall access track to the north of the derelict barn at the landfall access track.	AS
4	Hornsea Four to provide response in relation to ensuring no net loss for farmland birds, and ensure this is acknowledged in the Ecology Chapter.	CC

Action Number	Action	Responsible
5	LR to review Breeding Birds survey report and to provide comments.	LR (NE)
6	Hornsea Four to ensure that the pre-construction surveys are clearly secured in the OEMP.	CC/ AS
7	LR to review the OEMP and mitigation measures when the draft report is received by NE to review.	LR (NE)
8	OEMP should include that the preconstruction surveys for badgers should be undertaken October to November.	CC
9	Hornsea Four to ensure that no straw wedge should be used for pre-construction badgers surveys.	CC
10	Hornsea Four to review Policy LP4 and engage further with Natural England on the GCN draft EPS license and LONI, in order to reach agreement. CS to investigate further whether it might be possible for Hornsea Four to use LP4, and to advise on how GCN LONI can be progressed/provided if GCN population estimate survey data is not available.	AS/CC/CS (NE)
11	OEMP to contain details of pre-construction checks to be undertaken specific features where low light levels were experienced during the baseline surveys.	CC
12	OEMP to state that any soft fell is to be left in situ for 24-48 hours after felling, in relation to bats. The project to progress proposed mitigation measures, and present to NE, on how foraging/commuting bats will be mitigated for when sections of hedgerow are removed.	CC
13	Hornsea Four to investigate and provide response on bat mitigation at the onshore substation, to cover suitable mitigation, reinstatement and compensation plan to show the areas of hedgerow/vegetation that will require removal and how it will be reinstated and/or compensated for.	CC
14	General measures for the OEMP regarding stockpiling should state that any stockpiled vegetation should not be stored on the ground and/or in areas that have been identified as suitable.	CC
15	AS to issue Impacts register and include as agenda item for the next meeting.	AS
16	Bat emergence/ re-entry survey report to make clearer that trees which were not surveyed/ where there were limitations/ no planned works within 1.5m of structures.	CC
17	LR to provide copy of River Hull headwaters restoration plan to the project.	LR (NE)
18	SoCG and agreement logs to be circulated to NE for discussion and agreement.	AS

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology and Nature Conservation Royal Society for the Protection of Birds (RSPB) Technical Panel Meeting – Post-PEIR / Pre-DCO	30 June 2020
Meeting Date	30 June 2020	
Place	via Microsoft Teams	
Participants	<p>██████████ (Ørsted Consents Lead);</p> <p>██████████ - Royal HaskoningDHV (RHDHV – Lead Ecologist);</p> <p>██████████ – RSPB</p> <p>██████████ - RSPB</p> <p>██████████ – RHDHV (Assistant Project Manager).</p>	Our ref. Hornsea Project Four Onshore Ecology and Nature Conservation RSPB TP Meeting
Absent	n/a	
Copy	██████████ (RHDHV); ██████████ (GoBe).	
Next meeting	N/A	

Agenda

1. Welcome and introductions;
2. Agenda;
3. Hornsea Four Update;
4. Agree Over-wintering and breeding bird survey scope;
5. Agree Over-wintering and breeding bird survey methodology;
6. To provide an overview of over-wintering and breeding bird survey results;
7. To agreement further survey requirements;
8. To agree proposed mitigation measures;
9. Discussion of Section 42 comments; and
10. Any other business (AOB)

Meeting Notes

Detailed Agenda:

1. To provide Hornsea Project Four update;
2. To provide an overview and seek agreement on the following for the over-wintering and breeding bird survey reports:
 - a. Survey scope (including how features/areas have been identified or discounted for further survey);
 - b. Survey methodology followed (including survey timings and any limitations encountered);
 - c. Survey results;
 - d. Discussion and agreement of further survey requirements (i.e. pre-construction surveys);
 - e. Discussion and agreement of proposed mitigation measures - specifically the RSPB barn owl site near the landfall access track;
 - f. Discussion of Section 42 comments – and Hornsea Four responses.
3. AOB

Agenda Item 1 – Hornsea Project Four Update

AS - Route refinement has taken place since the Preliminary Environmental Information Report (PEIR) with a number of changes in the route to accommodate landowner requests, technical requirements and other improvements. Site selection refinement has resulted in changes at landfall since PEIR with a reduction in area, commitment to HDD (or other trenchless techniques) and the inclusion of a 100 m buffer around a potential barn owl nesting site within the landfall access track. The main onshore export cable corridor (ECC) route change is the additional route option and main logistics compound at Station Road to account for non-consensus between land interests. It is anticipated that both options will be carried forward to Development Consent Order (DCO) application, and that a decision will be made during examination. At the Onshore Substation (OnSS) there has been further refinement of the site footprint, refinement of landscaping and the landscape mitigation secured. There has also been changes to the OnSS access track after discussion with landowner, however a 15m buffer will be kept around the ancient woodland and additional landscaping area secured partly to protect the roots for some veteran trees and partly to provide additional mitigation for potential impacts on bats. The 400 kV National Grid Electricity Transmission connection area has significantly reduced since PEIR and now only include the area to the south and south-west of Creyke Beck substation.

Agreement on the over-wintering surveys

CC – As per discussions at the technical panel meetings at start of year, over-wintering bird (OWB) surveys were undertaken November 2018 – March 2019.

AM – Asked whether standard 3 hour VPs were used.

CC – The VPs were surveyed for a 5 hour period after dawn, and took into considering weather conditions (for example, no survey was conducted in fog, heavy rain etc.).

AM – The VPs seem to provide fairly good coverage. He explained that he would need to look in more detail at methodology set out in report.

CC – The VPs were designed to include habitats representative of wider area.

AM – The figure shows two circles, what does the inner circle indicate?

AS – The dotted line is the 250 m buffer, the inner circle is segmented to show months surveyed and access.

AM – Subject to quick additional check of the methodology, AM stated he would be happy to sign off on the scope of the OWB report.

AS – Said she would provide copies of draft OWB survey reports for the Environmental Statement (ES).

CC – Explained that there were limitations around landowner access. However, indications of usage of habitat were still obtained by surveyors during the survey period despite access restrictions. CC asked whether there were any further questions?

AM/AD – Answered that they had no further questions.

CC – Provided an overview of the OWB survey results.

AM – Stated that the results seemed reasonable.

Action 1: AS to send OWB and Breeding Bird draft ES technical report to AM/ AD.

Agreement of over-wintering and breeding bird survey methodology

CC – The breeding bird (BB) surveys were undertaken and designed to follow the OWB surveys, however consideration was given to the limitations experienced during the OWB surveys and certain VP's were moved (to prevent these issues) and hence there is more coverage for the BB surveys.

AM – Stated that he would need to check on actual timing of surveys within the survey period.

CC – Stated that the project would be able to provide the draft ES annex for the RSPBs review.

AS – Confirmed this will be provided, along with the OWB report.

CC – Also confirmed that the same 5 hours survey cycle was used for the BB as was used for the OWB.

AM – Stated that this seemed fine but he would still like to be sent the draft report to check.

Action: AS to send BB technical report to AM and AD.

Overview of over-wintering and breeding bird survey results

AM – Stated that he had read the results slides and that all seems fine, so there was no need to present the slides.

Further survey requirements and commitments

CC – Hornsea Four has adopted several bird related commitments. She summarised Commitments (Co) 33, 122 and 168 to protect/reduce the impact on birds. CC asked if these were satisfactory.

AM – Stated that they seemed absolutely fine, and that he was happy with commitments.

Barn Owl mitigation measures at the landfall access track

CC – There is a Barn Owl nesting site immediately adjacent to an existing farm track identified for access track to the landfall with a sign attached to the derelict barn which indicates that it is RSPB managed site. During survey the presence of barn owls on all survey occasion have been noted. Have agreed with NE that track will be 100 m away and no construction activities will be undertaken near it (just traffic). Pre-construction surveys will also be undertaken. CC asked whether the mitigation and the survey requirements were acceptable.

AM – Agreed that the 100 m buffer provided around the Barn Owl nesting site to allow for the micro-siting of the access track is an appropriate buffer. However, questioned whether the site was actually managed by the RSPB as indicated by the signage.

AD – Asked for the grid references to be provided so that they could make internal enquiries.

CC – Stated that the coordinates would certainly be provided.

AM – Stated that he wanted to confirm site ownership to minimise disturbance from survey checks which might be undertaken by Ørsted, the Ecological Clerk of Works (ECoW) /RSPB etc.

AD – Stated that he would also like to make sure that everyone is aware of what is planned, and would let Hornsea Four know if it is RSPB site or not.

CC – To confirm, CC stated that Ørsted would send copies of the OWB and BB reports for review and for final agreement on the methodology for both surveys.

AM – Stated that he was fairly confident that everything would be okay, but would just like to undertake a final check.

AD – Asked that previous communication indicated that there was a second barn owl location.

CC – Confirmed that there was a second location but that this location was now situated more than 100 m away from the onshore ECC in the vicinity of the Station Rd logistics compound (to the west of the proposed logistics compound location/cable corridor).

AD – Stated that he understood and agreed.

CC – Confirmed that now that the 100 m buffer had been agreed, that the same mitigation measures would apply should any further barn owl nesting sites be discovered during any pre-construction ecological surveys.

AD – Confirmed that he understood and agreed.

Action 2: AS/CC to send grid reference of Barn Owl nesting site to AM and AD.

Action 3: AM/AD to confirm situation around RSPB responsibility/management of site.

Section 42 comments

AS – Explained that there was only one Section 42 comment received from the RSPB, however I assume this was probably made when other case officers were allocated to Hornsea Four.

AD – Confirmed that the comment was not made directly by AM or AD, but would pass over to AM for his views.

AM – Explained that he would welcome that the Outline Ecological Management Plan (OEMP) state that the deterrence of ground nesting birds should be used 'sparingly'. "When necessary" (as it currently state) as it is rather vague but if discussions will be had prior to the technique being used then this removes the vagueness of the statement. They would ideally want more details on timing etc

– i.e. not to be used during nesting/breeding/chicks. He stated that he would assume the “relevant stakeholders” would include RSPB, NE etc.

CC – Confirmed that the use of ground-nesting deterrence would only be used outside of breeding season.

AD – Asked for this to be stated in the OEMP text for clarity.

AS – Confirmed that the text would be updated accordingly.

Action: AS to update text for inclusion in OEMP

AOB

AS – Thanked AD and AM for listening to our summary of two years work, we will await your final sign-off after reviewing the OWB and BB reports and then your comments on the ES in due time.

AM – I have no further comments, thank you for taking time to set up the meeting and for chasing us to get the meeting to happen.

AS – No problem, if you have any further questions please feel free to get in touch.

AD – Said he would like to echo AM and say thanks. AD stated that he has no further questions at this time.

Summary of Actions:

No.	Action	Responsible
1	Send OWB and Breeding Bird technical reports to AM & AD for final agreement.	AS
2	Send grid reference of nesting site near landfall access track to AM and AD, for them to investigate it being a potential RSPB site, further.	AS/CC
3	Confirm situation around RSPB responsibility/management of barn owl nesting site adjacent to landfall access track.	AM/AD
4	Update proposed mitigation text for inclusion in OEMP.	AS

Minutes of Meeting

Meeting Hornsea Four Evidence Plan: Onshore Ecology and Nature Conservation Natural England Technical Panel Meeting No.7 – Post-PEIR / Pre-DCO

Meeting Date 01 July 2020

Place via Microsoft Teams

Participants [Redacted] (Ørsted)
 [Redacted] - Royal HaskoningDHV (Lead Ecologist)
 [Redacted] – Royal HaskoningDHV (Hydrology & Flood Risk Lead)
 [Redacted] – Royal HaskoningDHV (Air Quality Lead)
 [Redacted] – Royal HaskoningDHV (Project Manager)
 [Redacted] – Natural England (NE)
 [Redacted] – NE
 [Redacted] – NE
 [Redacted] (Wildlife licensing) - NE

Absent None

Copy Lauren Kirkland (GoBe)

Next meeting N/A

01 July 2020

Our ref. Hornsea Project Four Onshore Ecology and Nature Conservation NETP Meeting

Agenda

1. To discuss and agree the mitigation measures for crossing designated sites or sensitive habitats.
2. To discuss and agree the mitigation measures (if required) for managing impacts to habitats.
3. To present the initial findings from the Air Quality modelling assessment with regards to dust and/or nitrogen deposition.
4. To present responses to NE comments raised on baseline survey reports from Meeting #1.
5. To discuss and agree updates to mitigation and follow up action specifically in relation to the following:
 - a. Bat mitigation at the onshore substation;

- b. Proposed solution for draft GCN EPS licence.
6. Commitments – Updates to Ecology commitments since PEIR and how these link to the rest of the documentation e.g. the Outline Ecological Management Plan, Ecology and Nature Conservation Chapter and the Works Plan.
 7. To present and agree the Impacts register for onshore ecology receptors.
 - a. To explain how this links to the Commitments Register, relevant Chapters and management plans.
 8. To present the Hornsea Four crossing schedule which will be submitted as part of the DCO application.

Meeting Notes

Agenda:

1. To discuss and agree the mitigation measures for crossing designated sites or sensitive habitats.

Geomorphology

ID summarised the key points from the position paper and PowerPoint slides. Two crossing points of the River Hull Headwaters SSSI (West Beck and Foston Beck) are proposed. Crossings would also be required for tributaries that drain into the SSSI rivers. As set out in position paper, direct impacts on the SSSI are likely if no mitigation measures are put in place. However, a suite of mitigation measures have been identified, namely Co1 and Co18, to prevent impacts. Trenchless crossing techniques will be used, with HDD entry and exit pits at least 20m from SSSI and cable depth will be at least 1.2m deep. Because there would be no direct interaction with the channel, the proposed HOW04 infrastructure is not considered to have an impact on the channel, its stability and/or natural movement during construction or operation.

More detailed geomorphological work will be undertaken to confirm mitigation measures and further work are acceptable and meet Natural England's requirements.

NE had previously raised concerns re channel changes and migration. ID advised that the river system is of low energy and gradient, and there is no evidence of significant bank adjustment or lateral instability. The overall planform has been generally stable, apart from a small area near Wansford where the meanders have widened.

ID advised that no significant geomorphological activity of channel changes were recorded during the site walkover surveys. ID advised that no significant channel adjustments have been identified and it is therefore considered that the proposed works associated with HOW04 will not impact the channel directly. No significant impacts are anticipated to constrain the river's natural movement.

LO advised that the SSSI may be assessed as unfavourable condition on geomorphological grounds. LO advised that we need to avoid being prevented in the

future in undertaking any works to improve the SSSI that may not be possible due to HOW04 being consented.

LO advised that this part of the channel may be able to become more naturalised in the future and HOW04 should not prevent this as being possible.

ID advised that historical data and maps (e.g. OS First Edition mapping from the 1850s) had been reviewed and used to inform the assessment that has been undertaken. ID advised that no significant change has been identified through this data review and the changes that have been noted in the vicinity of the crossing points are that the channel has become slightly narrower.

ID advised that using the information available at this time, in combination with the HOW04 infrastructure being a considerable distance from the river, the proposals would therefore not restrict or prevent any future improvement works to be undertaken.

ID also advised that decommissioning phase will consider leaving infrastructure in-situ rather than removing, as removing it will likely result in a significant impact (e.g. excavation of the channel bed and banks).

AS advised that there is a commitment relating to the decommissioning phase for which will be agreed with stakeholders. AS also advised that the cable would be removed via the duct with the duct being left in-situ, i.e. no ground disturbance.

LO requested consideration should be given in respect to this and the potential impacts of geomorphology and in turn the favourable condition of the SSSI in the future. LO requested that narrative is provided in the impact assessment to address this point.

LO agreed with the commitments that have been presented relating to the geomorphological and sediments and contaminants. Consideration needs to be made to the decommissioning aspect regarding long term

Sediments & Contaminants

ID explained the potential consideration of sediment and contaminants. Fine sediments are a potentially major impact with regards to chalk rivers. Measures have been identified to control the supply of sediment and contaminants – secured through Co14 and Co124.

No significant impact anticipated on the river from HOW04 relating to sediments and/or contaminants.

LO advised that comments previously had been provided by him regarding the River Hull. A check should be made of all of those comments to ensure they have been addressed.

Re HDD, LO happy with approach taken on the location. Risks associated with HDD (frackout, stability) need to be duly considered and mitigated for. Previous experience by NE for another project crossing the River Leven (information available via ERYC so is publicly available). Similar principles from that project will apply to the River Hull. LO advised that information will need to demonstrate how risks will be dealt with need to be considered and adequately addressed.

LO queried extension of Order Limits around the railway line. AS advised that this was due to Network Rail requesting specific requirements and learning from previous Hornsea Projects (HOW01 and HOW02). The extension to the Order Limits for HOW04 has been driven by stakeholder rather than for natural requirements.

LO suggested providing the planning application information relating to the River Leven crossing to HOW04 to review the information that was submitted and agreed by NE relating to crossing of a main river.

LO highlighted that no discharges will occur until EA permission has been sought. ID advised that this links to Co21 – no direct discharge into the River Hull will be undertaken, however discharge from HOW04 will use settlement tanks, ponds and drains before a discharge is made into a neighbouring drain which may be directly connected to the River Hull. All of this will be subject to a EA permit.

LO highlighted the risk of the River Hull being a SSSI and hence the higher consideration being given. LO mentioned that not EA permitting may not cover all potential discharges. ID advised that it is likely that HOW04 will require a bespoke EA permit to cover the entire scheme rather than splitting into smaller work packages.

LO advised that mitigation measures will need to be secured but also that monitoring requirements will need to be identified. LO queried the proposed monitoring requirements, including the identification and agreement of trigger points. AS advised that consideration of monitoring has not been made at this time.

LO reiterated that the SSSI has higher consideration than others given its high environmental protection. LO advised that the EA are more than likely going to request NE to review any permit application.

LO advised that sediment is the key concern and that monitoring measures will be required.

LO queried if the HDD pits will be dewatered as if this is undertaken in low flow times this will have a potentially significant impact on the SSSI. LO also advised that dewatering of HDD pits may need to be programmed to be within an agreed period to avoid potentially significant impacts on the SSSI. AS advised that the EA had already advised that NE will need to be consulted and for HOW04 to ensure this is undertaken.

AS suggested that appropriate mitigation measures are agreed with NE post consent. LO agreed that this was acceptable.

2. To present the initial findings from the Air Quality modelling assessment with regards to dust and/or nitrogen deposition.

CG outlined the approach taken to the AQ assessment, as outlined and presented in the position paper.

AQ study area slightly changed since PEIR but same screening principles remain unchanged. Humber Estuary, Bryan Mills Field and River Hull Headwaters SSSI – for the SSSI's the project traffic flows have not breached the significant criteria – the project alone did not trigger an assessment but it was triggered for the in-combination impacts.

AQ assessment methodology has been adapted since PEIR to reflect and address the comments provided by NE previously.

Re construction dust, NE advised that guidance only considered sites within 50m whereas NE wanted up to 200m. HOW04 has committed to adherence to the dust mitigation measures as part of a commitments.

NOx critical levels have been calculated at the three designated sites.

Consideration of the traffic flows along the haul road have also been made – project traffic flows have been reviewed for three specific areas.

In-combination projects for AQ assessment using the SSSI impact risk zones. Humber Estuary identified one project, Bryan Mills Field identified – most projects were agricultural and ammonia was the key consideration. One project required consideration of airbourne oxides of nitrogen but ammonia was the key pollutant.

LO agreed with AQ approach and principles applied. Also agree that all comments received previously have been addressed.

HRA

LSE identified for 3 sites – SAC, SPA and Ramsar. NE raised this at PEIR and this has now been addressed for ES and now taken through to Stage 2 – project on its own does not trigger Stage 2 but it is the in-combination aspect that triggers the Stage 2.

Project alone does not result in a 1% above critical load so does not trigger the Stage 2.

Estimate extent of saltmarsh within each site. Data to inform baseline extent of saltmarsh has used 2011 EA data – this is not consistent with the conservation objectives as there is a difference in the extent of salt marsh.

No information regarding current condition – LG advised that 2010 data (informing the SSSI condition status reporting) had been used and LO advised that this is the latest data. EB advised that the condition is currently unfavourable and recovering. EB advised that an updated assessment has been recently completed but the date for when it is published and/or available is unknown.

On the basis it cannot be determined which value (lower or upper end) is most appropriate, the assessment has referred to the critical load *range* (20 - 30 (kg N ha⁻¹ year⁻¹)) and noted that the values fall at the lower end of that range.

- For NN, it is estimated, that 0.36% and 0.33% of the saltmarsh within the SAC and SPA would be subject to NN deposition totalling 23.15 (kg N ha⁻¹ year⁻¹), respectively from the project acting incombination.

- For NOX, is estimated that 0.19% of the total saltmarsh within the SAC and 0.18% of the saltmarsh within the SPA saltmarsh would fall within the area of threshold exceedance, due to in-combination sources.

Concluded no adverse effect on the site integrity. LO agreed with this given the figures that have been presented.

Bryan Mills Field

Project alone not significant (<1% critical load) for nitrogen.

Project in-combination is above 1% critical load but only slightly.

LO agreed with 1.3% combination contribution.

LO advised that there is a rule of thumb threshold for NE below which impacts would not be significant (generally 10% following detailed modelling).

River Hull Headwaters

Project alone not significant. Nutrient and nitrogen is 0.1% (due to traffic flows not breaching screening criteria).

Larger in-combination contribution – acid is 7.7% nutrient and nitrogen. Is 13.2%.

Ecological assessment has been undertaken on broadleaved woodland – mid and high levels have not be exceeded but lower level is breached. Existing background contributions already exceed loads due to agricultural.

LO queried the AQ modelling as the woodland is sporadic and not necessarily within the area where the project will cross. LO queried if the correct ecological receptors had been identified.

CG explained the AQ study area map to show the transects that had been considered in relation to the assessed road network, which is located some distance from the DCO boundary. LO agreed with location and transects identified.

LO suggested that narrative is needed to explain the AQ position to clearly state that HOW04 is only contributing a small amount whereas the in-combination levels are already exceeded.

AQ modelling has been undertaken on a worst case scenario – which is acceptable by LO.

LO advised that there are no immediate concerns or objections to the AQ assessment and/or its outputs but will need to ensure appropriate narrative is presented in the documentation.

3. To present responses to NE comments raised on baseline survey reports from Meeting #1.

- i. **Bat emergence and re-entry survey report.**
- ii. **Breeding birds.**

Bat emergence and re-entry

CC outlined text that had been updated in the bat emergence and re-entry survey report.

CS reviewed slide and updated text and agreed with updates made.

CS queried what type of hibernation survey would be undertaken. CC responded to say that it would be undertaken in accordance with BCT guidance. CS advised that should there be any derivation then this would need to be agreed with NE. CS also suggested that reference to the Bat Roosting Survey Guidance and Bat Identify Book should be made regarding survey methodology.

CS queried the pre-construction effort for all trees within and up to 50m of the buffer and whether only medium and high potential features will be surveyed. CC advised that this would form the focus but all surveys will be undertaken in accordance with BCT guidance.

CS queried if aerial tree surveys would be undertaken. CC advised that tree climbing surveys will be undertaken.

CC confirmed no buildings will require removal.

CS agreed that updated text is acceptable.

Breeding Birds

CC advised that the HDD entry and exit pits will be located at least 20m from SSSI habitat (Co18) and within arable fields.

Pre-construction surveys will be undertaken along with implementation of appropriate mitigation measures.

LO acknowledged that generic mitigation measures had been identified.

LO raised that breeding birds are mentioned on the SSSI citation and given their mobility may not be nesting within the boundary they may be using the functional habitat for loafing and therefore will require consideration.

LO advised that specific mitigation should be identified and implemented around the River Hull – consideration of disturbance and displacement and how they could be managed through sensitive timings, use of screens etc. LO did acknowledge that the pre-construction surveys may inform the mitigation measures but need to consider potential measures and potential compensation requirements.

No haul road will be across the River Hull but the haul road will be up to the HDD entry/exit pit location. LO advised that although this is acknowledged there is a possibility that birds may be impacted on as a result of the project given the use of the habitat that may not fall within the SSSI boundary but is considered to be functionally linked.

LO also raised whether seasonal constraints could be applied to this location, i.e. avoidance of nesting season. AS advised that this may not be possible but will discuss with the technical team as to the option(s) that may be available.

LO advised that visual and noise disturbance also needs to be considered and position to be presented as to what measures can be implemented.

CS advised the mitigation hierarchy needs to be considered and if it is not possible, then justification needs to be presented.

4. To discuss and agree updates to mitigation and follow up action specifically in relation to the following:

a. Bat mitigation at the onshore substation.

AS provided an update on the OnSS mitigation proposals and regarding the proposed access track, advising that the residual areas not used for the access track will be used for planting.

CS requested a figure to be provided to show the access track and landscape mitigation so it is clear as to what area is being proposed and how it compared to what was previously.

AS to prepare a before and after figure to be produced and circulated to CS.

CS queried lighting considerations and hedgerow severance within the OnSS design, advising that appropriate mitigation measures will need to be identified and incorporated within the proposals.

b. Proposed solution for draft EPS licences (GCN and wvs).

GCN licence

CS advised that GCN licence application had not been reviewed prior to the meeting and therefore would be unable to provide comments until it had been reviewed. CS advised that NE have been unable to review the submitted document and will not be able to review and/or provide comments before mid-end of August.

In the absence of NE having reviewed the documentation prior to the meeting, CC provided an overall summary on the draft licence application had been prepared, based on principles of Policy L4 and assuming a large GCN population and that predicted impacts during construction phase (temporary terrestrial habitat) are anticipated.

CC advised that installation of exclusion fencing, drift fencing and pit fall traps is proposed. The trapping exercise as per GCN guidance for large GCN population has been assumed.

Strimming of works down to 5mm under GCN licenced ecologist supervision – CS queried 5mm but no further comments provided by CS as to reasons behind this reference.

CS queried if a single line fence to cover 250m buffer was only as where would the drift fencing be placed? CC confirmed that this was the case but for the fencing to be reviewed and updated where necessary.

CS would expect to see the inclusion of compensation within a licence application under Policy L4 – NE unlikely to require large amounts of compensations but nevertheless an element of compensation would be expected for the impacts that result in a loss rather than temporary impacts. CS also queried if Policy L1 or Policy L4 were being progressed. CC advised that Policy 4 will be progressed.

CS queried why a Reasoned Statement was not provided. CC responded that the understanding is that it was not considered required for NSIP or projects of overriding public interest. EB confirmed that Reasoned Statement is needed.

Water voles

CS advised that the survey report does not provide the requirements of a draft licence application. An application and method statement (A19) would be expected and therefore should be submitted to complete the draft application.

CS not reviewing water vole draft licence and has asked for a colleague to review instead. Initial review of the submitted document has identified some information is missing or incomplete.

CS advised that NE are unable to provide comments on drafted wv licence documents within the imminent timescale -mid to end of August currently anticipated to be the earliest.

CS advised that a LONI letter will be provided with detailed comments following the resubmission of the wv and GCN licence documentation.

5. Commitments – Updates to Ecology commitments since PEIR and how these link to the rest of the documentation e.g. the Outline Ecological Management Plan, Ecology and Nature Conservation Chapter and the Works Plan.

LO confirmed that a review of the documents has not been undertaken.

EB advised that due to annual leave a full review of the documents has not been possible by all NE attendees, therefore a follow up meeting would be welcomed to allow this review to have been completed.

6. To present and agree the Impacts register for onshore ecology receptors.

- a. To explain how this links to the Commitments Register, relevant Chapters and management plans.**
- b. Materials to be distributed prior to the meeting – Ecology and Nature Conservation tab of the Impact Register.**

Item not covered during the meeting as NE advised that review of submitted documents had not been undertaken.

7. To present the Hornsea Four crossing schedule which will be submitted as part of the DCO application.

AS presented example of crossing schedule and approach that has been taken. River Hull example, as per PowerPoint slide, presented to attendees.

LO advised that he will review the crossing schedule and provide any comments should there be any.

Any other business

EB queried SoCG process and the approach to be taken as it would be beneficial for agreements reached to date to have been captured and documented within the SoCG.

EB advised that due to NE staff only returning from leave recently, an internal discussion will be required to ascertain availability and timescales for NE to provide comments. EB to advise separately to AS once this internal discussion has been held.

Agreed that separate meetings may be required for reviewing comments on ES documents and draft licence documentation.

EB advised that NE would like to see all updated reports to ensure NE have had sight of all DCO documentation prior to it being formally submitted. CAS advised that although accepted, it should be noted that some of the documentation already issued to NE has not changed (and not anticipated to change) and therefore will be as for DCO submission.

EB referred to recent communication regarding offshore changes and implications for onshore deliverables. AS advised that onshore programme will continue on previous timescales with the intention that agreements will be continued to be sought.

BNG

AS outlined current BNG proposals.

LO welcomed the proposed BNG approach and suggested that it would be useful to contact the River Hull Headwaters responsible officer. LO to provide contact details.

LO raised that focus tends to be on the figures and therefore we should include narrative around the BNG opportunities and how they are considered on a wider landscape scale.

AS advised that baseline surveys specific for BNG will not be undertaken pre-consent but will be captured (and undertaken) as part of the pre-construction survey effort. CAS advised that although no specific BNG baseline surveys will be undertaken, a suite of baseline data is available through the ecological survey effort that has been undertaken. LO agreed with this approach.

LO queried how NE would fit into the process in terms of reviewing the BNG proposals and ensuring the figures are correct. EB responded to advise that an internal discussion

will be required to confirm who would be best placed to provide the required input and advise for BNG.

Summary of Actions:

No.	Action	Responsible
1	ID to ensure (if not already) Hydrology & Flood Risk ES Chapter includes narrative regarding the consideration of the River Hull Headwaters SSSI geomorphology and that HOW04 will not prevent future works to be undertaken which prevents favourable condition of the SSSI to be met.	ID
2	AS to review and update if required wording relating to the consideration of the HOW04 decommissioning phase.	AS
3	ID to check that all comments received from NE to date regarding sediments and contaminants have been addressed.	ID
4	LO to provide details relating to the River Leven SSSI planning application for HOW04 to then review and identify and incorporate any relevant requirements.	LO
5	CG/CC to ensure (if not already) appropriate wording is included in the AQ and Ecology ES Chapters to explain the AQ position and the predicted HOW04 contribution when compared to already high in-combination levels.	CG/CC
6	CC to ensure (if not already) the Ecology ES Chapter, oEMP and bat survey reports include reference to guidance for hibernating bat survey methodology.	CC
7	CC to prepare a technical note to detail and present the predicted noise modelling levels of the HDD rig at the River Hull Headwaters SSSI.	CC
8	AS to provide a before and after plan for the OnSS bat mitigation proposals to NE.	AS
9	CC to review and update water vole and GCN licence documentation to ensure they are compliant with NE requirements and all documentation has been prepared that would be required for a formal draft licence application.	CC
10	NE to arrange an internal meeting to discuss and confirm timescales for the provision of comments on the Ecology ES Chapter, oEMP and I&E register.	MW

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Ecology and Nature Conservation Natural England Technical Panel Meeting No.9 – Post-PEIR / Pre-DCO	16 September 2020
Meeting Date	16 September 2020	
Place	via Microsoft Teams	
Participants	<p>██████████ (Ørsted)</p> <p>██████████ - Royal HaskoningDHV (Lead Ecologist)</p> <p>██████████ – Royal HaskoningDHV (Hydrology & Flood Risk Lead)</p> <p>██████████ – Royal HaskoningDHV (Onshore Project Manager)</p> <p>██████████ – Natural England (NE) Senior Responsible Officer</p> <p>██████████ – NE Case Officer for HOW04</p> <p>██████████ – NE Sustainability Officer</p> <p>██████████ – NE Lead Conservation Advisor – Responsible Officer for River Hull SSSI</p>	<p>Our ref. Hornsea Project Four Onshore Ecology and Nature Conservation NETP Meeting</p>
Absent	None	
Copy	██████████ (GoBe)	
Agenda		

1. To present the Hornsea Four response on Natural England’s comments relating to. Position paper attached, but please note it is not expected that attendees should have read this prior to the meeting:
 - Potential impacts associated with potential lateral movement and restoration plans associated with the River Hull Headwaters SSSI.
2. To discuss and agree comments on the following materials previously distributed on 9 June 2020:
 - A3.3. ES Volume A3, Chapter 3 – Ecology and Nature Conservation; and
 - F2.3 ES Volume F2, Chapter 3 – Outline Ecological Management Plan.
3. Commitments – Updates to Ecology commitments since PEIR and how these link to the rest of the documentation e.g. the Outline Ecological Management Plan, Ecology and Nature Conservation Chapter and the Works Plan. Previously distributed on 9 June 2020.

4. To present and agree the Impacts register for onshore ecology receptors. Ecology tab of the Impacts Register previously distributed on 9 June 2020.
5. To explain how this links to the Commitments Register, relevant Chapters and management plans.

Meeting Notes:

1. To present the Hornsea Four response on Natural England's comments relating to:
 - Potential impacts associated with potential lateral movement and restoration plans associated with the River Hull Headwaters SSSI.

ID explained that Natural England had raised two primary concerns with regards to the two River Hull Headwaters SSSI crossings: i) direct disturbance as a result of the construction of crossings, and ii) the potential for longer term constraints on geomorphological processes as a result of the presence of operational infrastructure.

In response to point i), ID advised that there would be no direct interaction with the river as HDD will be used to cross the river at the two locations. This is secured in Co1.

In response to point ii), ID explained that the river in the reaches that would be crossed by HOW04 is a low energy, low gradient perched system, and rates of channel adjustment are expected to be very low. The restoration action plan measures that have the greatest ability to instigate geomorphological change in the river is the removal of Foston Mill Weir (which has been ruled out as unfeasible, although a bypass channel is proposed as an alternative) and the removal of small weirs such as Broady's Weir, which has already been undertaken. The walkover survey did not identify any significant instability in response to these actions and it is therefore assumed that significant lateral and vertical adjustment is unlikely to occur.

ID advised that HOW04 is therefore unlikely to give rise to significant impacts or changes to the river and its potential for future adjustment. However, HOW04 has committed to measures (Co1 and Co18) that will minimise and/or manage the potential for impact. In particular, the site-specific hydrogeological risk assessment committed to under Co18 (informed by GI data) will be used to ensure that permanent infrastructure is sufficiently offset from the bed and banks of the river to avoid direct impact and constraints on future movement.

LO advised that detail comments will not be provided by NE at this time as document has not been reviewed.

CMcG advised that processes in the river restoration plan are on various timelines. One of the main queries was relating to the historic mills and the historic palaeochannels. Request from NE relating to the outcome of any ground investigation works as to informing the identification of these. NE agreed that the river is a low energy system.

GI work/findings to be shared once available. NE are keen to understand any linkages between the ground waters as information (Lidar) is blurry and unclear as to what is practical on the ground.

CMcG to provide a copy of a short report detailing the works undertaken at Broady's Weir. Follow up work has been undertaken following the structure's removal. Advised that there has been no change to the flow regime and works are related primarily to allowing the channel to become more natural, i.e. floating glyceria.

CMcG advised that for Foston Mill, any medium to long term actions to address issues are likely to be further downstream. Impounding influences likely to be c.200m but unlikely to result in geomorphological implications for the proposed river crossings.

LO raised questions regarding the commitment to HDD and 20m buffer from the SSSI, is the operational easement in the region of 30m? AS advised that entry and exit pits would be 20m from SSSI but no further commitments relating to operational set back are included in the current HOW04 commitments. AS also advised that Co18 requires the completion of a hydrological risk assessment, for which would be circulated and agreed with NE which will include any additional set back requirements.

LO queried technical feasibility and whether there is a flexibility in the depth of cable burial should a deeper depth be required. AS advised that there is flexibility in burial depth (currently 1.2m below hard bed) but this will be determined following findings from the GI works and in turn inform the method statement.

LO queried timescales for lateral movement and duration of infrastructure being in place. LO requested confidence in whether work had been undertaken with regards to erosion rates. ID advised that this would be covered the hydrogeological risk assessment as it will be informed by the specific infrastructure locations. CMcG advised that the river is benign and more of an issue around Driffield when working on or around the gravel beds (Network Rail had issues).

ID explained that chances for lateral or vertical adjustment to the river as a result of HOW04 would be unlikely given the heavily modified channels and perched above the channel, i.e. they are not anticipated to be naturally moving.

LO requested narrative around certainty of the river condition will not be impaired and that there is flexibility in varying the cable burial depth if required.

LO confirmed that a thorough review of the position paper will be undertaken and detailed comments to be provided within agreed timescales.

Breeding birds section of position paper – CMcG highlighted that topography of river crossing locations will need to be considered when reviewing disturbance to bird species, e.g. both visually and from noise levels. Species using in-channel and marginal vegetation will need to be considered and whether channel is isolated in terms of visibility and noise levels. Species using the wider arable fields may vary as lapwings may behave differently to others.

CMcG also raised comments around specific works within the floodplain and bird habituation particularly with regards to birds behaving as a result of

LO raised comment on breeding bird and noise modelling contours and potential impacts on noise from HDD operations. Comment raised on disturbance from other works being undertaken within DCO limits such as vehicle movements, cable laying works etc within this area. CMcG advised that species by species consideration will be required as they may be using different areas of the river and/or adjacent areas. Species using the arable areas for instance may not be using the river margins as they are not providing their habitat requirements. Species interaction between floodplain and river margins need to be covered and by species by species.

Breeding bird guidance – NE has a rule of thumb of c.55dBA for breeding birds, i.e. anything below 55dBA unlikely to result in nest abandonment but may result in some disturbance or temporary flight.

2. To discuss and agree comments on the following materials previously distributed on 9 June 2020:

- **A3.3. ES Volume A3, Chapter 3 – Ecology and Nature Conservation; and**
- **F2.3 ES Volume F2, Chapter 3 – Outline Ecological Management Plan.**

ES Chapter

LO confirmed that NE will provide formal comments on ES chapter via a technical note. However, LO advised that the only sections to be reviewed in light of earlier discussions will be related to breeding birds. LO advised that he is generally happy with ES chapter with the exception of the breeding bird section for which will need to be reviewed further following receipt of the position paper.

CS explained that Table 3.13 presents what has or has not been assessed in the ES chapter. NE agreed with information presented and welcomed that sign posting had been made clear and well presented in the chapter.

MM/EB advised that NE will provide formal comments on ES chapter via formal process; however these comments will be primarily focussed on the protected species sections as comments from Claire Storey had been provided via email.

MM/EB advised that they did not have any comments on the ES chapter and therefore agreement was provided on its content and conclusions drawn.

oEMP

LO generally happy with information presented in the oEMP and advised that the sign posting within the document is clear and well presented.

Although LO agreed that he is generally satisfied with the oEMP content, it was highlighted that subject to NE's review of the position paper, further updates may be required to the breeding bird sections to reflect the earlier discussions of this meeting.

LO noted that Table 2 of the oEMP details the breeding bird survey requirements. LO requested clarification that if the SSSI locations will be included in the breeding bird survey effort. CS advised that all survey locations will be identified and agreed with NE prior to surveys being undertaken.

Section 3.3.1 – LO requested that paragraphs 3.3.1.5 and 3.3.1.6 need to consider that legislation afforded to breeding birds is clear and accompanying mitigation measures. LO confirmed that he agrees with the approach with regards to nesting birds but mitigation works relating to the SSSI may be problematic as this would infringe SSSI considerations. HOW04 to review information and if required, will need to acknowledge that temporary impacts may arise and therefore enhancement measures may be required. For example, if one area of bird habitat is temporarily lost or temporarily impacted then a replacement area(s) would be needed for the duration of the works.

LO confirmed that biosecurity measures are dealt with by the CoCP and the clear sign posting within the oEMP to reflect this is welcomed.

Section 4.3.1.4 and Section 4.4.1.4 regarding breaching mitigation measures – although useful to consult NE, LO advised that reference to the LPA also needing to be consulted should be included.

Section 4.4.1 measures detailed within this section are for generic bird species but HOW04 will need to review and include any species specific or SSSI measures that may be required.

MM advised of Claire Storey's comments on the oEMP which included reference to Co26 and hedgerow removal. MW explained that if hedgerow removal is required that has been identified as supporting foraging/commuting bats, these hedgerows will need to be replaced with similar aged hedgerows to that which was removed, i.e. like for like replacement rather than the use of whips or smaller hedgerow planting.

MM also advised that Claire Storey had recommended that all sections of felled trees will need to be left in situ for a period of 24hrs.

MM highlighted that Section 3.3.2.8 should include reference to the consideration of thermal imagery for the required pre-construction bat survey effort.

Although MM verbally provided Claire Storey's comments on the oEMP, MM and EB advised that NE will provide formal comments on the oEMP via the formal SLA process.

3. Commitments – Updates to Ecology commitments since PEIR and how these link to the rest of the documentation e.g. the Outline Ecological Management Plan, Ecology and Nature Conservation Chapter and the Works Plan. Previously distributed on 9 June 2020.

LO advised that Co33 advised that wording may need to be reviewed should re-survey confirm changes to existing conditions, particularly regarding the specific SSSI requirements as currently wording may be considered too generic.

4. To present and agree the Impacts register for onshore ecology receptors. Ecology tab of the Impacts Register previously distributed on 9 June 2020.

- To explain how this links to the Commitments Register, relevant Chapters and management plans.

AS explained purpose and aim of I&E register to ensure NE understand document's purpose and how requirements are secured.

The I&E register presents the information in one place and provides a narrative at the varying milestones of the project.

LO has no comments on I&E register and ties together with the other ecological documents, i.e. consistent information being presented across all documents.

No comments from MW/EB on the I&E register and therefore agreement obtained on the information presented.

Onshore BNG:

HOW04 only developing onshore BNG opportunities and up to 13 proposed locations – as identified from EP1HS survey and LWS condition surveys. Two of these 13 sites are related to the River Hull crossing locations.

CMcG enquired as to limits of BNG areas. AS clarified that these areas are limited to the DCO limits.

LO queried whether offsite opportunities could be explored. AS clarified that HOW04 is looking for onsite opportunities in the first instance. CMcG advised that the SSSI within the DCO limits is small and therefore opportunities may be limited, for instance works to the river channel may be possible but these would be downstream improvements rather than within the DCO limits.

LO and CMcG to discuss and explore potential BNG opportunities, providing an update to AS once available, particularly with regards to up and/or downstream opportunities related to the river restoration plan. CMcG advised that John Trail is the Yorkshire WLT and site manager for Skern for who may be able to provide input and suggestions.

SoCG

EB advised that a specific onshore SoCG meeting is to be organised for where all NE agreements are recorded and agreed.

Summary of Actions:

No.	Action	Responsible
1	LO and CMcG to review HOW04 Position Paper and provide further and detailed comments to AS.	LO/CMcG
2	MW to provide formal NE comments on onshore ecology ES chapter to AS.	MW
3	MW to provide formal NE comments on oEMP to AS.	MW

No.	Action	Responsible
4	LO and CMcG to explore and prepare a list of potential BNG opportunities within and around the River Hull Headwaters SSSI to AS.	LO/CMcG

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Historic Environment Technical Panel Meeting 1 - Pre-scoping	11 September 2018
Meeting Date	11 September 2018	
Place	Brough Business Centre	
Participants	<p>██████████ Ørsted, Offshore Environment Manager</p> <p>██████████, Environmental Resource Management, Historic Environment Specialist</p> <p>██████████), Historic England Inspector of Ancient Monuments, Hull and East Riding of Yorkshire</p> <p>██████████ Principal Archaeologist, Humber Archaeological Partnership</p>	Our ref. Hornsea Four EP Onshore Historic Environment TP Meeting #1
Absent	██████████ Principal Archaeologist, East Riding of Yorkshire Council	
Copy	██████████, Ørsted, Hornsea Four Consents Project Manager	
Next meeting	October/November 2018	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim:

Initial meeting to discuss the approach to the scoping report, the scope of any proposed surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by

providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

DK presented an overview of Hornsea Four, the consenting programme, route planning and site selection, proportionate EIA and tools used i.e. commitments register and impacts/effects register.

1. Welcome and Safety Brief

DK welcomed all participants and notes that no fire alarms were planned for the duration of the meeting. Fire exits were identified, and muster points located. No further safety issues were noted.

2. Introductions

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

3. Aims and Objectives of the meeting

DK outlined the purpose and process of the meeting, identifying the following key aims:

- To introduce the Hornsea Four project and its key elements;
- To detail the Evidence Plan process and the role of stakeholders in this;
- To detail the proportionate approach to Environmental Impact Assessment (EIA) applied by Hornsea Four; and
- To present the scoping phase of assessment for the historic environment topic.

4. Introduction to Hornsea Four

DK introduced Hornsea Four and proceeded to detail the location of the project, its key elements and the potential implications of these from an environmental perspective. The project introduction was detailed in a Microsoft (MS) PowerPoint presentation. DK stated that this would be shared with attendees along with minutes from the meeting. KE noted that, should Ørsted wish to continue engagement with Historic England (HE) then this would be subject to a pre-application consultation charge. KE noted that he had logged this internally.

DK and JM described Hornsea Four project elements to the stakeholders. Hornsea Four was described as comprising up to 180 offshore wind turbines, offshore export and array cables, possible offshore booster stations, an onshore landfall compound, an onshore cable route and a substation to link the overall project to the national grid. It was noted that design was still ongoing and subject to change, but that more detail would be provided at Scoping.

Action 1: DK to share presentation slides

Action 2: DK to pursue pre-application charge process with HE

5. Principles of the Evidence Plan Process

DK described the Evidence Plan process. The process is designed to engage with all relevant stakeholders at an early stage of design development and EIA in order to identify key areas of interest for specific environmental topics, to ensure that all relevant sources have been consulted, to agree a method and approach to assessment and to determine any aspects of specific topics that may require more detailed investigation.

The Evidence Plan is a 'live' document that allows for input into design in order to avoid potential significant impacts on the environment.

DK noted that the Evidence Plan Steering Group terms of reference (ToR) for the project is under review and will be circulated to steering group members for sign-off in due course. This should be provided to Technical Panel members by their Steering Group representative should it be requested.

6. Proportional Approach

DK described the proportional approach to EIA being adopted by Hornsea Four. It was noted that this approach is in line with current EIA regulations and represents a general move towards more streamlined Environmental Statements. The approach takes into account all environmental effects while allowing for a focus on those that have the potential to be significant. JM noted that, for the historic environment topic, proportional EIA will be represented through the presentation of information in the Preliminary Environmental Information Report and the final Environmental statement. Presentation would take the form of a main chapter detailing any significant effects and the key sensitive receptors, while all other information would be presented in a tabular form (gazetteer, impacts and effects tables) as annexes or appendices. DK noted that this was intended to streamline the process of consultation and review by allowing stakeholders to focus on those topic areas and specific assets identified as having the potential to be affected by Hornsea Four.

7. Position Paper Discussion

DK introduced JM as the onshore historic environment specialist for the topic. JM discussed the topic through a description of the following subjects:

Status of scoping

JM noted that the scoping chapter for the historic environment had been completed and was undergoing internal review before being shared with the client. The approach to scoping, outlined in the Position Paper, had been carried through into the scoping assessment.

Status of survey

JM reported that the walkover survey would take place from the 19th to the 21st September 2018. The survey would include verification of HER data, a windscreen survey to identify key areas for geophysical survey, a setting assessment of key sensitive receptors and route familiarisation. Geophysical survey was intended for the late 2018/early 2019 survey window. The results of all survey are intended to support

ongoing desk based assessment and reporting, and the PEIR and ES phases of Hornsea Four.

Method and approach to assessment

JM reported that the method of assessment was based on guidance provided by the Design Manual for Roads and Bridges, supported by the Conservation Principles and relevant guidance available from the Chartered Institute for Archaeologists and Historic England. JM noted that the regional research framework for Yorkshire would be used where possible to support assessment. LM and KE noted that this was not complete and had not been updated so should be used and/or referred to carefully.

Discussion of key sensitive receptors and areas of interest

JM discussed the list of sensitive receptors identified at this stage of assessment. It was noted that direct, physical impacts on designated assets had been scoped out of further assessment; these impacts are avoided through design. All other potential direct and indirect impacts are scoped in for further assessment.

JM noted data sources used, including difficulty in obtaining a dataset for historic landscape characterisation (HLC). LM noted that the dataset did exist, but that this had to be specifically requested from the Local Authority.

Action 3: JM to request HLC dataset from Humber HER.

Broad discussion followed concerning the route of the onshore cables, construction activities associated with this element of Hornsea Four and the potential for setting changes as a result of the proposed 30m stack associated with the substation. Key implications of known design elements for designated and non-designated heritage assets were considered to comprise:

Potential direct physical impacts on unknown non-designated buried archaeology.

KE noted that prehistoric monuments were well represented in the region. While many of these are not currently designated, they are of designatable quality and should be considered in detail in the EIA. JM noted that geophysical survey was intended to identify key areas of interest and that secondary mitigation measures would be proposed. KE noted that intact prehistoric land surfaces had been identified under medieval deposits at Holderness.

Potential indirect impacts on designated and non-designated built heritage as a result of presence of the offshore booster station the onshore substation.

These elements of the design were thought to have the potential to impact upon the value of heritage assets where setting contributed to this value. Specific assets discussed included Skipsea Castle and Harbour (Scheduled Monument), Beverley Minster (Grade I Listed Building) and Risby Hall (Grade II Registered Park and Garden). JM noted that the substation was situated in a shallow valley in order to minimise the potential intrusive nature of the stack. KE commented that HE considered 60m or above for intrusive elements to be potentially problematic and that the substation stack was clearly below this. However, the stack presented an issue of prominence in relation to the assets listed above that could only be resolved by a clear setting assessment and a robust argument in the EIA if prominence was thought not to

present any issues. KE noted that Beverley Minster may be considered to be affected if the substation stack is prominent in views from the Yorkshire Wolds to the north-west. KE noted that visibility from Risby Hall should be considered from first floor height.

A discussion of the relevance of geoarchaeological studies followed. KE noted that work in this area would be important in determining the potential for unknown buried archaeology along the cable route. KE asked to what depth the cable trenches would be excavated. DK stated that this would be variable and, while Orsted can be clear on the likely widths of the cable corridor at this stage in the project, the depths are still under discussion. KE noted that an understanding of geology and soils for the route was of importance in identifying areas of archaeological potential and, therefore, focusing non-invasive survey. KE recommended discussion with Nicky Milner at York University to discuss geoarchaeological work undertaken in the region.

Action 4: JM to contact Nicky Milner at York University regarding geoarchaeological studies in the area.

KE noted that the World War II anti-invasion defences along the coast should be considered in regard to direct or indirect impacts.

LM noted that unpublished information relating to Iron Age activity at Creyke Beck should be considered during assessment.

Action 5: JM to request information on Iron Age activity at Creyke Beck from Humber HER

8. Any Other Business

No other business was raised.

Agreements

The following items were agreed:

- Nature of the proportionate approach to scoping
- Proposed assessment methodology
- Scoped out impacts (direct impacts on designated assets)

Action Log

Action 1	DK to share presentation
Action 2	DK to pursue pre-application charge process with HE
Action 3	JM to request HLC dataset from Humber HER.
Action 4	JM to contact Nicky Milner at York University regarding geoarchaeological studies in the area.
Action 5	JM to request information on Iron Age activity at Creyke Beck from Humber HER

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Historic Environment Technical Panel	16 January 2019
Meeting Date	16 January 2019	
Place	County Hall, Beverley	
Participants	<p>██████████ – Ørsted</p> <p>██████████ – RHDHV</p> <p>██████████ – ERYC</p> <p>██████████ Historic England</p> <p>██████████ – ERYC</p> <p>██████████ – Hull County Council (Humber HER)</p>	Our ref. Hornsea Four EP Historic Environment TP Meeting #2
Absent	██████████ – Hull County Council	
Copy	████████████████████	
Next meeting	TBC	

Agenda:

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Project Four Update
5. Review of Actions from Previous Meeting
6. Current Surveys
7. Scoping Opinion review
8. Next Steps
9. AOB

Aim:

To update stakeholders on Hornsea Project Four since the initial meeting, to provide an overview of the methodology and preliminary results for surveys currently being undertaken, and to discuss the responses received during the Scoping process, accompanied by a discussion on the next steps in relation to seeking agreement with stakeholders on the data and information to be included in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES).

Minutes and Actions

Hornsea Project Four Update

AS gave a short re-cap of the Scoping Report and the front-loaded proportionate approach to the Environmental Impact Assessment (EIA), before giving an overview of the route planning and site selection (RPSS) refinement which has taken place. Including a presentation of active measures taken to route around historic assets during the RPSS process.

SM moved on to summarise the first set of historic environment walkovers already completed. In summary, 24 sites had been identified based on the HER data within the 700m Indicative Temporary Works Area presented in the Scoping report. The intertidal zone was included, thus incorporating the World War II anti-tank cubes at Fraisthorpe Sands in the Landfall search area. This walkover also identified pillboxes close to the cliff edge as well as some archaeology in the cliff face itself. Additionally, an initial setting assessment was undertaken for the Rotsea Deserted Medieval Village (Site 4) and the Romano-British enclosure at Burton Bushes Westwood Common (Site 19). Initial views were also considered towards the cable corridor and substation area from Risby Hall (Site 23).

SM touched on the next steps which would include a full review of the HER data in order to aid identification of which heritage assets could be included in further setting assessments and condition surveys.

Review of Actions from Previous Meeting

Action - SM explained that the HLC dataset would be requested from Humber HER in the next couple of weeks and would be incorporated in to the PEIR.

JG mentioned that the acquisition of HLC data was included in their Scoping Opinion, and stated that the National Mapping Projects (NMP) data for the area may only be point data, as line data is not always available.

Action – SM similarly explained that Nicky Milner at York University would also be contacted in the next couple of months, along with a request for information on Iron Age activity at Creyke Beck from Humber HER.

Scoping Opinion

SM explained that in response to the further archaeological evaluation which would be required, the next steps would involve a desk-based assessment to include map regression work and a setting assessment, which would then inform further evaluation investigations. SM mentioned that an aerial photographic and LIDAR assessment would be undertaken to provide information on the extent of known heritage assets and to establish the presence of any new heritage assets. Any 'new' heritage assets would be considered as part of the walkover surveys.

JG responded that the Humber HER also holds a lot of historic aerial photography as well as NMP data.

Action – SM to include assessment of NMP data as part of the aerial photograph and LIDAR assessment and to contact the Humber HER re. datasets.

SM set out that a geoarchaeology desk-based review would be undertaken for the project. Additionally, the offshore geo-technical works planned for the intertidal and landfall search areas would be used to inform the geoarchaeological desk-based assessment which will cover the Onshore Substation (OnSS) including temporary works areas, the landfall search area and onshore cable corridor.

SM explained further that the geophysical assessment would be based on known HER assets and informed by aerial photography already acquired by Ørsted and the results of the aerial photographic and LIDAR assessment. SM explained that the cable corridor will be buffered to allow some room, should the cable require moving.

SD pointed out that the designated heritage data scheduled monument data in some of the Scoping Report maps were offset.

Action - AS confirmed that the georeferencing database used in identifying site surveys and route planning and site selection would be checked to ensure that the data is not offset.

SM continued that designated and non-designated heritage assets would be reviewed individually and the reasonings around whether significant direct or indirect effects are anticipated would be presented.

SD expressed that ERYC do not hold a list of non-designated sites as these would be identified through the development process. He elaborated that the Council would not have any issues with the temporary effects resulting from the cable corridor, but that the OnSS and Creyke Beck Substation area would be of greater interest to them. In particular the presence of unlisted historic farmsteads in this area.

SD also stated that the construction compound and storage areas should be investigated as to the effects of compaction on potential archaeological sites.

SM confirmed that the temporary works areas would be viewed in the same way as the permanent footprint of the cable corridor.

JG volunteered that any non-designated sites/buildings which appear of the 1st Edition OS map have been identified by Humber HER and are included on the HER dataset, which would have been acquired and incorporated in to the Scoping Report already.

KE also asked whether ZTVs would be carried out for the OnSS from the offset.

SM confirmed that this would be the case, and that any non-designated sites would look to be included as a part of this.

Scoping opinion (2)

SM explained that WWII defences around the landfall search area had already been identified, and that any future surveys would look to pick up on any other sites of military importance. The geoarchaeological desk-based assessment would look to establish the potential for buried prehistoric land surfaces, warp deposits and Mesolithic

remains. Following the geoarchaeological review, SM will liaise with the project's hydrologist to discuss the potential for drainage patterns to change as a result of development and establish how this may affect buried archaeology. Professor Nicky Milner and Dr Jim Leary would be contacted to discuss the presence of buried landsurfaces and prehistoric deposits.

Next Steps

SM continued to give further detail about the next steps which would include a review of aerial photography and LiDAR data (to include the use of NMP data). As such, new sites identified would be included in a third set of site visits where appropriate, with the potential for further geophysical survey. The drafting of the desk-based assessment would include a review of HER data and any other relevant secondary sources, including visiting the Humber HER office and local archives.

SD suggested the enclosure records which would give a historic record of how the lay of the land had changed over time are looked at.

Action – SM confirmed that this data would be useful and would contact the HER to look at the records.

SM went on to state that geophysical surveys of targeted locations would be undertaken and that there are no current plans for trial trenching to be undertaken at the pre-application stage.

KE questioned the reasoning behind the trial trenching position, as it would be in the project's best interests to confirm what may lay beneath the ground surface. KE expressed increasingly other projects in development are not committing to trial trenching pre-application as they are willing to take on the risk. However, that it can be particularly useful in down-slope environments where historic assets can be buried deeper due to soil-slip.

SM responded that geophysical surveys would be undertaken in the landfall search area and OnSS site, and at targeted areas across the cable route based on a wider corridor to allow for changes to the route alignment/micro-siting should complex archaeological remains be identified. The project team would consider trial trenching should significant archaeological remains be identified in areas of fixed infrastructure or other 'pinch points' along the cable route. Similarly, the geoarchaeological desk-based assessment would aid in identifying areas of archaeology which may be buried deeper.

JG mentioned that it would be worthwhile investigating the findings of other schemes in the area e.g. Carbon Capture and other projects have found previously unknown gas pipelines.

Action – SM to create a list of other schemes the Applicant would like information on before contacting the Humber HER team through JG in order to view these documents.

Action – JG to compile a list of other schemes which have not completed trial trenching pre-application and the geophysical surveys did not reveal the full of extent of what was found.

Any Other Business

SH mentioned that although the final site of the OnSS was not known to the Council that it may be worth considering a setting assessment from St. Mary's Church in Cottingham as Dogger Bank Creyke Beck encountered issues with viewpoints.

Action Log

Action 1	SM to request the HLC dataset from Humber HER in the next couple of weeks to incorporate in to the PEIR.
Action 2	SM to contact Nicky Milner at York University in the next couple of months, along with a request for information on Iron Age activity at Creyke Beck from Humber HER.
Action 3	SM to include assessment of NMP data as part of the aerial photograph and LIDAR assessment and to contact the Humber HER re. datasets.
Action 4	AS confirmed that the georeferencing database used in identifying site surveys and route planning and site selection would be checked to ensure that the data is not offset.
Action 5	AS confirmed that the georeferencing database used in identifying site surveys and route planning and site selection would be checked to ensure that the data is not offset.
Action 6	SM to contact the HER to look at the enclosure records.
Action 7	SM to create a list of other schemes the Applicant would like information on before contacting the Humber HER team through JG in order to view these documents.
Action 8	JG to compile a list of other schemes which have not completed trial trenching pre-application and the geophysical surveys did not reveal the full of extent of what was found.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Historic Environment Technical Panel Meeting 3 - Pre-PEIR	02 April 2019
Meeting Date	02 April 2019	
Place	County Hall, Beverley	Our ref. Hornsea Four EP Onshore Historic Environment TP Meeting #1
Participants	<p>██████████ Ørsted, Onshore Consents Manager</p> <p>██████████ Royal HaskoningDHV (RHDHV), Archaeologist</p> <p>██████████), Humber Historic Environment Record, Development Management Archaeologist</p> <p>██████████ East Riding of Yorkshire Council (ERYC), Conservation, Landscape and Archaeology</p>	
Absent	<p>██████████, Historic England, Inspector of Ancient Monuments Susan Hunt, ERYC, Case Officer</p> <p>██████████, Humber Historic Environment Record, Principal Archaeologist</p>	
Copy	██████████, Ørsted, Hornsea Four Consents Project Manager	
Next meeting	May/June 2019	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. Next Steps
8. AOB

Minutes and Actions

1. Welcome and Safety Brief

TW welcomed all participants and noted that no fire alarms were planned for the duration of the meeting. Fire exits were identified. No further safety issues were noted.

2. Introductions

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

3. Aims and Objectives of the meeting

TW outlined the purpose and process of the meeting, comprising:

- an update on Hornsea Four activities;
- discussion and alignment on Hornsea Four's approach to proportionate EIA;
- baseline and survey updates;
- reaching agreement for the scope of the EIA; and
- the next steps leading up to submission of the PEIR.

4. Hornsea Four Update

TW presented Hornsea Four design updates, detailing how the redline boundary has been refined down from the EIA scoping report to the 'interim PEIR boundary'. TW explained that the landfall search area is now more focussed on a specific area, the electrical cable corridor (ECC) is at the indicative 80m working width, which is the width that will be submitted at DCO. The onshore substation (OnSS) search area has been refined down based on a high-level appraisal and local feedback, with options being explored for a preferred site.

TW explained that feedback from local people, parish council's and East Riding of Yorkshire Council (ERYC) indicates that there is a preference to locate the OnSS close to the existing substation at Creyke Beck. SD enquired whether this was due to the existing industrial context of the area and agreed with the rationale behind this preference. SD asked whether this meant that site selection would be undertaken adjacent to Creyke Beck as a priority, before moving outwards. TW clarified that proximity to Creyke Beck formed one of many considerations during the site selection process.

TW then provided a summary of the consultation process, inclusive of a community newsletter issued in March 2019 and workshops held with parish councils. The wider consultation timeframes were discussed, leading up to DCO submission in Q1 2020.

TW explained Hornsea Four's approach to proportionality in EIA and detailed the purpose of the 'Proportionality Roadshow'. The purpose of the Impacts and Effects (I&E) Register and Commitments Register were clarified, inclusive of how stakeholders and local people can input and suggest commitments which can inform the design of the project. TW noted that the I&E register will be used at PEIR and DCO to reduce the length of technical chapters by detailing simple assessments, with the chapters focussing only on assessments with potential significant effects.

The 'primary mitigation' secured within the Commitments Register was acknowledged and identified as a key attribute of the route planning and site selection process.

5. Summary of Previous Actions

SM provided a summary of the previous action from the last two technical panel meetings. One action remains outstanding which includes contacting Nicky Milner and Jim Leary; this will be undertaken as part of the geoarchaeological desk-based review currently underway by AOC Archaeology.

6. Approach to PEIR – Previously Distributed Materials

Question 1 - Do you agree with the heritage assets included as part of the Historic Environment Walkover Survey? Are there any additional heritage assets which should form part of the walkover survey?

JG and SD confirmed that the scope of the survey is agreed and accepted. No additional specific assets were identified.

Question 2 – Do you agree with the proposed Priority Archaeological Geophysical Survey methodology?

Question 3 – Do you agree with the areas proposed for Priority Archaeological Geophysical Survey?

SM noted that confirmation has been received from both Lucie McCarthy and Keith Emerick on the acceptance of both the methodology and proposed sites. JG and SD confirmed that this feedback was sufficient, and no further input is necessary.

JG asked whether the circumstance of magnetometers not being suitable for specific areas had been considered and whether there would be an opportunity to return to affected areas to survey using alternative methods. SM noted that the use of magnetometers is the best and most suitable method used throughout the industry and that it would not be practical or viable to revisit surveys prior to the DCO submission.

SD enquired whether an archaeologist would be on-site during construction of the ECC. SM explained that whilst not uncommon, this is dependent on the specific area, the findings of the assessment and any post-consent mitigation. It was agreed that this is not a matter to be agreed at this point of the assessment process.

7. Approach to PEIR – Baseline Updates

Question 4 – Please confirm acceptance of the proposed study areas for informing the baseline of known heritage?

DM and SD confirmed acceptance of the study areas set out in the position paper.

Question 5- Please identify any locally or non-designated built heritage assets within the study areas which aren't currently recorded on the Humber HER?

SD explained the challenge experienced locally in mapping and recoding non-designated heritage assets. Specific reference was made to war memorials in villages,

concrete bridges, telephone boxes, roadside facilities (early garages, etc). SD noted that not everything is recorded on the HER, particularly above ground. There is a reliance on the development control process to pick up on unknown, un-designated assets.

SD acknowledged that these undesignated assets would not be impacted by the ECC during construction from a setting perspective and that it was unlikely that assets would be directly affected due to the route planning process. SD advised that focus should be directed on the landfall and OnSS search areas.

TW noted the challenge in identifying these assets and asked for previous projects that had used a good methodology. JG and SD could not recall specific examples of good-practice in respect of undesignated above-ground assets.

JG identified recent projects in the local area that have experienced significant below-ground heritage finds, including flood alleviation works adjacent to the A164.

SM acknowledged that more below-ground finds have come about on recent schemes within the study area, over and above what the preceding geophysical surveys predicted. This may be due to surveys being undertaken in the 1990s. Results may be improved due to technological advancements.

SM explained that within the landfall search area, there is a relatively complete Iron Age/Romano-British site. Site walkovers also identified potential archaeological features within the coast line, visible due to coastal erosion. SD identified this as a significant issue, with finds frequently falling from the cliffside.

SD identified the potential for undesignated concrete structures associated with Lissett Airfield.

SM explained that the export cable corridor (ECC) will go through a portion of the western fields associated with Ravensthorpe DMV, located to the East of Cherry Burton, noting that although there are no surviving earthworks within the western fields (as opposed to the eastern fields where earthworks do survive) there is a potential for finds at the location.

SM noted that long-distance views of Creyke Beck are achievable from Westwood Pasture, which also makes a significant contribution to the Beverley Conservation Area and Beverley Minster.

SM confirmed that the ZTVs used by the LVIA consultants have been shared and utilised by RHDHV. SM confirmed that the LVIA consultants would be obtaining photographs of the OnSS location from Beverley Minster tower, St Mary's Church tower and from Risby Hall; the results and photomontages will be shared with RHDHV for the setting assessments. SD confirmed he will liaise internally to review and ensure the LVIA methodology is reviewed.

SD enquired whether there would be effects on Skipsea Castle. SM confirmed that due to the distance from the onshore infrastructure, there are no viewpoints from the Castle that would be affected by the development.

SM identified that Air Photo Services and AOC Archaeology have been appointed to undertake the Aerial Photography and Lidar assessment, and the geoarchaeological DBA and geophysical survey respectively.

8. Approach to PEIR – Proportional EIA

SM explained that due to project commitments i.e. avoiding all designated assets, direct impacts on designated heritage assets is proposed to be scoped out and not formally assessed using the matrix-based approach. Designated heritage assets will still be presented as part of the baseline and a justification for why they are not being formally assessed within the PEIR chapter.

Question 6 and 7: Do you agree with the proposed approach for evidencing avoidance of designated heritage assets within the PEIR and ES chapters? (both during construction and decommissioning)

As KE was not in attendance from Historic England, TW is to follow up via email and phone correspondence as these questions fall within their remit.

Action 1: TW to liaise with KE at Historic England on scoping out effects on designated assets.

TW raised the matter of additional matters being previously scoped in to the assessment with respect to decommissioning activities. It was agreed that on principal, as long as the working area is largely similar to construction activities, an assessment may not be required.

Action 2: TW to provide further details on decommissioning at the next technical panel.

9. Next steps – PEIR Submission

SM detailed the challenges faced previously in obtaining land access for baseline surveys. This has significantly delayed the geophysical survey and will impact the data to be submitted at PEIR. As a worst-case, the geophysical surveys will need to be revisited post-harvest.

TW asked whether TP members would be open to receiving a more completed set of documents outside of the statutory consultation timeframes, between PEIR and DCO, to provide comments. SD and JG both confirmed this was acceptable and useful. TW will ask KE whether this is acceptable with Historic England.

TW confirmed that a greater understanding of the baseline survey situation will be available at the next technical panel. It was confirmed that a summary will be provided,

along with a summary of results obtained and confirmation of what will be submitted at PEIR.

SD noted that it would be useful to have sight of the refined landfall and OnSS sites once they are available. TW confirmed that the PEIR will be submitted with a landfall location and preferred OnSS site. TW will provide this information at the earliest opportunity.

Action 3: TW to liaise with KE at Historic England on the potential to review documents between PEIR and DCO.

Action 4: TW to provide summary of baseline survey position and the final PEIR boundary (refined landfall and OnSS areas, if possible) a week prior to the next technical panel.

10. Any Other Business

No other business was raised.

Action Log

Action 1	TW to liaise with KE at Historic England on scoping out effects on designated assets.
Action 2	TW to provide further details on decommissioning at the next technical panel.
Action 3	TW to liaise with KE at Historic England on the potential to review documents between PEIR and DCO.
Action 4	TW to provide summary of baseline survey position and the final PEIR boundary (refined landfall and OnSS areas, if possible) a week prior to the next technical panel.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Historic Environment Technical Panel Meeting 4 - Post-PEIR	14 November 2019
Meeting Date	14 November 2019	
Place	County Hall, Beverley	
Participants	<p>[REDACTED], Ørsted, Onshore Consents Manager</p> <p>[REDACTED], Royal HaskoningDHV (RHDHV), Archaeologist</p> <p>[REDACTED] Historic England, Inspector of Ancient Monuments</p> <p>[REDACTED], Humber Historic Environment Record, Development Management Archaeologist</p> <p>[REDACTED], East Riding of Yorkshire Council (ERYC), Conservation, Landscape and Archaeology</p>	Our ref. Hornsea Four EP Onshore Historic Environment TP Meeting #4
Absent	[REDACTED] ERYC, Case Officer	
Copy	[REDACTED], Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Baseline Updates
6. Key Section 42 Responses and Discussion
7. 'Impacts Register' and Proportionality
8. Key Questions for Consideration
9. AOB

Minutes and Actions

1. Welcome and Safety Brief

TW welcomed all participants, SD then identified the fire safety protocols and the designated muster point.

2. Introductions

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

3. Aims and Objectives of the meeting

TW provided a summary of the agenda and purpose of the technical panel.

- Provide an update on Hornsea Project Four activities and design evolution since PEIR
- Present updates on ongoing baseline surveys.
- Overview and discussion of key Section 42 responses received. Provision of further information or evidence, and/or Hornsea Four proposed response, for discussion.
- Seek consensus with stakeholders on the proposed approach to ES and what additional evidence or information is to be provided at ES.

4. Hornsea Four Update

TW summarised notable amendments to the Hornsea Four project, comprising:

- Landfall site selection and commitment to trenchless technology;
- Multiple amendments to the onshore ECC;
- Refinement of the OnSS site use, in addition to the access strategy and commitments regarding the application of colour; and
- Reduction of the 400kV ECC search area.

5. Baseline and design evolution updates

SM provided a detailed overview of the historic environment baseline updates, including the conclusion of the Aerial Photography and Lidar assessment, and the completion of the priority geophysical survey. It was noted that three areas previously identified for geophysical survey have not been completed, due to either access issues or flooding. These areas will not be completed prior to DCO submission.

SM also noted that further work is being undertaken for the setting assessment, which will be incorporated into the baseline section of the ES chapter.

SM informed that a separate Peat Survey is to be carried out south of Throstle Farm to establish the presence of peat for engineering purposes. The borehole logs will be provided to inform the baseline section of the ES chapter.

The key findings of the surveys were presented via printed maps and in some instances, the laptop screen. These areas comprised:

- The landfall area, of which has benefited from high quality, clear results from both the geophysical survey and aerial photography and lidar assessment. The geophysical survey has provided a clear image of a series of enclosures and field systems with the aerial photography and lidar assessment providing clearer details of the WWII anti-glider defences.
- The OnSS, which has unfortunately been subject to lower quality survey results, partly due to the surrounding electrical infrastructure. SM noted that there was evidence of enclosures, which may be related to other finds closer to the NGET Creyke Beck substation.
- Immediately north of the Hutton Cranswick/Watton Parish Boundary the aerial photography and lidar assessment identified a curving field boundary/trackway. The geophysical survey provided further imagery of possible enclosures extending from the curving boundary.
- North of Bryan Beck Mills an enclosure has been recorded through both surveys just to the north of the onshore ECC.
- North of Scarborough a possible square barrow has been identified from the aerial photography and lidar assessment; however, the results from this area are not as clear in the geophysical survey although some disturbance has been identified.
- Clearer images of the former RAF airfield at Lisset have been recorded from both surveys.
- Further supporting results for the below ground remains of an enclosure to the north of Rotsea Farm and of Raventhorpe Deserted Medieval Village.

TW then presented an example of an Onshore ECC route planning amendment, which was a result of square enclosure being identified in the aerial photograph and lidar assessment to the east of the A164. It was noted that where possible, historic environment assets have been considered within the route planning process.

TW went on to outline a potential commitment being explored at the landfall, to provide information signage detailing the wartime history of the surrounding area. TW explained that Hornsea Four is also looking to explore future opportunities to accentuate and enhance heritage assets at the landfall; however, the project is not able to fully commit to this at this time, due to unknown costs and feasibility. This matter will be discussed with local interest groups during the construction of Hornsea Four to identify suitable assets and determine feasibility and viability.

KE welcomed the above commitments and detailed the CBA Defence of Britain project, which contains a significant wealth of information for heritage around the landfall. KE explained that the coastal defence methods changed post-Dunkirk, where it was determined that rather than stopping invasions at fixed locations, defences were required on the beach itself. This explains the differing defence assets in the local area.

KE enquired whether Hornsea Four would utilise social media during construction activities, TW explained that past projects have not utilised social media much; however, there may be scope for this in the future.

KE noted that it would be positive to work with local archaeological groups, and that JG would be able to assist with identifying, based on local knowledge.

KE detailed that he has been working with the EA and NE on the coast path in the northern side of the Humber Estuary. Similar discussions had been held in respect of coastal history and KE enquired whether a collaborative approach could be coordinated between Orsted, Natural England and the Environment Agency.

Action 1: KE to provide any information currently available regarding discussions held with Natural England.

SD suggested that as the information board would be created digitally, it could also be distributed or used for other purposes, such as online. KE agreed with this and suggested that it could be printed and made available at the nearby Café (The Cow Shed Tea Shop). TW agreed with this suggestion and noted that he would investigate how this can be incorporated.

SD asked if there are any underground tunnels within close proximity to the landfall. KE noted that the Subterranea Britannica data sources would contain this information. Hornsea Four will not however review or incorporate this information into the assessment, as no underground tunnels have been identified.

SM then discussed the outline WSI, including a run through of the suggested structure. The evaluation approach and mitigation approaches were identified, and SM noted that the slide deck issued to inform the technical panel has omitted earthwork condition survey and historic building recording from the evaluation stage, and preservation in situ from the mitigation stage. It was agreed that a draft of the Outline WSI will be issued to the technical panel members in early January to ensure all is in order. It was noted that the Outline WSI will be standard, relative to other projects of a similar nature.

Post-meeting note 06/02/2020 – Due to the Hornsea Four application delay, the draft outline WSI will now be issued to historic environment stakeholders in mid-March for review and comment.

SM asked whether stakeholders were satisfied with the WSI previously agreed for the pre-application priority geophysical surveys to be appended to the Outline WSI to support the DCO application. JG confirmed he is happy with this approach.

SM indicated that the Order Limits would be reduced to a 60m wide corridor at post-consent and the evaluation stage would incorporate the full 60m wide corridor thereby allowing a small potential for opportunities to micro-site the cable corridor further prior to construction and identifying areas for preservation in situ or archaeological excavation as mitigation.

JG enquired whether site specific WSIs would be completed. SM explained that survey-specific WSIs will be produced for the evaluation stage and a single, main WSI will be

produced detailing the mitigation requirements. It was noted that Hornsea Four do not intend on creating individual site specific WSIs for the mitigation stage; however, if necessary, method statements could be produced for specific sites where archaeological excavation is required. It was also noted that if the full reporting on the evaluation stages (i.e. trail trenching report) are not available in time to inform the site-specific sampling strategies within the main WSI then site-specific Method Statements could be produced by the archaeological contractor detailing the site-specific sampling strategies.

JG asked whether all survey works would be undertaken by one contractor. TW noted that Hornsea Four is not able to confirm at this time and that it will be based on the procurement process pre-construction. SM noted that it is also dependant on available resources within the industry.

SM went on to explain that it is not always possible to monitor construction works such as the excavation of the cable trenches. SM noted that on other schemes a Protocol for Archaeological Discoveries has been adopted which follows the same procedure as set out under ORPAD (regularly used for offshore works) whereby the archaeological contractor would provide training and toolbox talks setting out the procedure to follow by the Principal Contractor in the event of an archaeological discovery, when an archaeologist is not present on site.

6. Key Section 42 Responses and Discussion

SM presented the Section 42 consultation responses received of relevance to onshore historic environment. It was noted that a response was not received from the Humber Historic Environment Record. KE stated that he had discussed the PEIR documentation with Lucie McCarthy and that no issues had been raised during the conversation. JG noted that Lucie had not distributed the documentation to him, and he had not had sight of them. TW confirmed that he would follow up with a link to the documents; however, the formal consultation period had officially closed.

Post-meeting note 06/02/2020 – TW subsequently issued the link to the PEIR to JG. JG responded on 29 November 2019 stating that he had reviewed the documents and was happy with the assessment presented.

7. 'Impacts Register' and Proportionality

TW then explained the purpose of the Impacts Register and the ambitions of Hornsea Four to produce a proportionate and concise Environmental Statement. It was explained that Hornsea Four are looking to remove impact assessments from ES chapters, where no significant effects were identified in the PEIR. It was noted that this is subject to no material changes to the project which would affect the impact assessment undertaken, and obtaining stakeholder buy-in.

SM provided a summary of all impacts within the Impacts Register, noting all 'indirect' impacts are intended to be removed from the ES chapter as the refinement to the Order Limits have no material change to the outcome of the impact assessment presented at PEIR. KE noted the difference between indirect and direct impacts, clarifying that

'significant effect' does not always align with 'not having an effect on the significance of an asset'. SM clarified that in respect of Hornsea Four, direct impacts relate to physical impacts and indirect impacts relate to non-physical impacts. SM noted that the DBA discusses the significance of the assets, and there is text within the PEIR chapter (to remain in the ES chapter) which provides a narrative on the difference between an asset's importance and the significance of an asset. As the importance/significance of the assets assessed under indirect impacts during construction and operation have not changed since PEIR, and the assessment was based on a worst-case scenario, it is considered that further assessment of indirect impacts at ES is not required.

TW requested that all attendees provide their comments and either agreement or disagreement to move assessment of indirect effects during both construction and operation out of the chapter and into the Impact Register.

Action since completed: KE, SD and JG to provide agreement or disagreement to moving of indirect impacts by close of business Friday 29th November.

Post-meeting note 06/02/2020 – KE followed up with a subsequent email on 20 November 2019, stating that *"we can only agree with the substance of the proposition if 'indirect impacts' does not directly equate to 'impacts within the setting of designated and non-designated heritage assets'. Impacts within the setting of heritage assets, especially during the operational phase, can have a direct effect on the significance of those heritage assets.*

For us the key will always be that the significance of designated and undesignated heritage assets is assessed, the contribution that setting makes to that significance is assessed and understood, and thereafter the impact of x on that significance is understood and then removed, moderated or mitigated."

An example of the Impacts Register in addition to the extract of the relevant setting assessment from the Historic Environment DBA accompanies these meeting minutes to provide further context on the discussion, and the proposed approach from Hornsea Four.

Action 2: KE, SD and JG to provide their opinion on the newly distributed material and provide a final position in respect of agreement or disagreement of removing the impacts assessment from the ES chapter.

SM summarised the technical report updates undertaken, indicating that the geophysical survey report includes areas which now sit outside of the order limits. In addition, there are also areas that would have been identified for priority survey. It was noted that these new areas would not be surveyed at this time and would be undertaken during the post-consent/pre-construction geophysical survey work. The study areas used for the Historic Environment DBA still capture the Order Limits and further key heritage assets relating to potential buried archaeology have been identified and brought forward for assessment. The Order Limits have also been reviewed against the study areas used within the Geoarchaeology DBA and no changes to the baseline have been identified. The aerial photography and lidar assessment notes that

the change to the Order Limits has not resulted in a change to the mapping and interpretations made.

Post-Meeting note 06/02/2020 – The aerial photography and lidar assessment report is now being updated, to account for small areas within the amended Order Limits that are currently not covered.

8. Any Other Business

TW confirmed a statement of common ground template will be distributed in due course for comment, and that Hornsea Four intends to develop these during the pre-application stage of the project, where possible.

KE enquired about the anticipated submission date of the Hornsea Four DCO. TW confirmed that the current plan is to submit in Q1 2020, potentially at the end of February.

Post-meeting note 06/02/2020 – As per previous email correspondence from Hornsea Four, the DCO submission date has been delayed until Q3 2020, due to the current consenting considerations within the offshore wind industry.

Action Log

Action 1	KE to provide any information currently available regarding discussions held with Natural England.
Action 2	KE, SD and JG to provide agreement or disagreement to moving of indirect impacts by close of business Friday 29th November.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk Technical Panel Meeting 1 - Pre-scoping	12 September 2018
Meeting Date	12 September 2018	
Place	Brough Business Centre	
Participants	<p>██████████ – Orsted</p> <p>██████████ – ERM Water</p> <p>██████████ – ERM Ecology</p> <p>██████████ – Yorkshire Consortium of Internal Drainage Boards</p> <p>██████████ – Environment Agency</p> <p>██████████ – East Riding (LLFA)</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk TP Meeting #1
Absent	N/A	
Copy	██████████	
Next meeting	TBC (December 2018)	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Introduction to Hornsea Four
5. Principles of the Evidence Plan Process
6. Proportional Approach
7. Position Paper Discussion
8. AOB

Aim:

Initial meeting to discuss the approach to the scoping report, the scope of any proposed surveys, scope of EIA including assessment methodology, and preliminary discussion of key issues or areas of concern.

It should be noted that as scoping is a consultation carried out by PINS, all responses are to be sent to them directly. This meeting is intended to help stakeholders understand the proposed approach to scoping and to help form their opinions by

providing a detailed overview of the content of the document and providing an opportunity to discuss any initial concerns.

Minutes and Actions

JC presented an overview of Hornsea Four, the consenting programme, route planning and site selection, proportionate EIA and tools used i.e. commitments register and impacts/effects register.

AG presented the onshore Water Resources and Flood Risk EP position paper as the basis of discussion for the first meeting.

AG explained the philosophy of the crossing schedule, and approach to the avoidance of high value watercourses.

BS requested that the colours on the mapping be changed to be considerate of people suffering from colour blindness. He also requested that the scale be improved as it was difficult to comment on individual crossings at this scale.

BS also objected to the use of the term engineered ditch, as this under values the importance of IDB maintained ditches.

BS expressed a concern regarding the depth of HDD under watercourses.

JC stated that detailed methodology for HDD would be provided at a later date upon completion of assessment on watercourse depth and profile for IDB approval.

JC made it clear that no open cutting of IDB maintained drains would be undertaken.

Action – AG to propose updated wording of the commitments register to demonstrate that all IDB maintained watercourses will be HDD'ed and update the watercourse crossing schedule to capture this change to commitments.

With regards to flood risk, AG explained that, given the avoidance measures outlined in the commitments register, an FRA for the cable route would not be undertaken, but that an FRA for the substation, based on the increase in impermeable area, would be required.

Both LG and MK agreed in principal to the approach taken in the position paper, and had no objections at this time.

AG asked LG if she agreed that, given the approach to avoidance being taken, that a WFD compliance assessment would not be necessary. LG stated that she did not see a problem in principal, but would need to discuss with colleagues and confirm.

Action – LG to discuss the approach to scoping out WFD compliance assessment with colleagues and report back at the next panel meeting.

Action – JC to ensure that the Crossing Schedule is updated to:

1. identify who is responsible for the maintenance of each watercourse (e.g. EA, ERYC or IDB)
2. categorise crossing methodology for each watercourse
3. identify construction traffic crossing requirements (e.g. Bailey Bridge or culverted)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk Technical Panel Meeting 2 – Post Scoping / Pre-PEIR	15 January 2019
Meeting Date	15 January 2019	
Place	Brough Business Centre	
Participants	<p>██████████ – Ørsted</p> <p>██████████ – Royal HaskoningDHV</p> <p>██████████ – Royal HaskoningDHV (Flood Risk)</p> <p>██████████ – Yorkshire Consortium of Internal Drainage Boards</p> <p>██████████ – Environment Agency</p> <p>██████████ – Environment Agency</p> <p>██████████ – East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA)</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk TP Meeting #2
Absent	<p>██████████ – Environment Agency</p> <p>██████████ – ERYC</p>	
Copy	██████████	
Next meeting	April 2019	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Project Four Update
5. Review of Actions from Previous Meeting
6. Current Surveys
7. Scoping Opinion review
8. Next Steps
9. AOB

Aim:

To update stakeholders on Hornsea Project Four since the initial meeting, to provide an overview of the methodology and preliminary results for surveys currently being undertaken, and to discuss the responses received during the Scoping process, accompanied by a discussion on the next steps in relation to seeking agreement with

stakeholders on the data and information to be included in both the Preliminary Environmental Information Report (PEIR) and the Environmental Statement (ES).

Minutes and Actions

Hornsea Project Four Update -

AS gave a short re-cap on the Scoping Report and the front-loaded proportionate approach to the Environmental Impact Assessment (EIA), before giving an overview of the route planning and site selection (RPSS) refinement which has been taking place and touching on the start of the baseline data collection and evaluation of the Scoping opinions.

Review of Actions from Previous Meeting –

ID confirmed that the Commitments Register and Crossing Schedule was in the process of being updated to include confirmation that all IDB maintained watercourses would be crossed using Horizontal Directional Drilling (HDD).

BS thanked the project for committing to use HDD and for identifying them in the Crossing Schedule.

ID went on to explain that the approach scoping a WFD compliance assessment would be discussed at this panel meeting.

AS confirmed that the Crossing Schedule had been updated, identifying who is responsible for the maintenance of each watercourse, along with the category of the crossing methodology and any traffic and transport requirements. AS also explained in the locations where the project had not committed to using HDD the Crossing Schedule would include both options e.g. 'open cut/ HDD' or 'Bailey bridge/ culvert' as this information has not yet been finalised.

AS asked MK whether ERYC holds any datasets on the ordinary watercourses which it is responsible for ensuring are being appropriately maintained.

Action - MK responded that the maintenance of ordinary watercourses is mainly riparian responsibility, and that he would check whether ERYC has any information available related to these watercourses.

Scoping Report Review

ID provided an overview of the main issues with relevance to water resources and flood risk identified in the Scoping Report. This included a series of commitments intended to minimise potential impacts by adopting less intrusive construction methods along the onshore export cable corridor (ECC), including trenchless techniques to cross all main rivers and IDB maintained drains and measures within the Code of Construction Practice (CoCP) to limit runoff to greenfield rates (accounting for climate change allowances).

MK pointed out that it may be good to be aware of a COPFAS project north of Cottingham, which will be completed in the next 12 to 18 months and will be discharging in to Mill Beck.

BS asked whether a list of crossings would be available, as the IDB is also responsible for ordinary watercourses in the project area.

AS replied that the Crossing Schedule was in the process of being updated and would be circulated in due course.

GW commented that permits (either permanent or temporary) may be required from ERYC and the EA to cross watercourses, and this can often take longer than the consenting process, so it would be good to identify the details of these as early as possible.

BS also mentioned that it may be worth bearing in mind that the IDB is the consenting authority for ordinary watercourses within its drainage catchments, and although using HDD to cross IDB maintained watercourses may not cause too many issues, using open cut techniques may be more difficult.

HW suggested whether packaging up the types of watercourses with the types of crossings might be helpful. For example, packaging up the ordinary watercourses which are likely to be crossed using HDD and then open cut separately.

GW agreed that the packaging crossings for permitting purposes would be appreciated. As such the EA would always do their best to accommodate the packaging of crossings according to the size of the crossing, width and utilities, for example. However, it would be good to bear in mind that there are also specific rules.

BS pointed out that permissive powers would also be required alongside working with landowners where ordinary watercourses are being crossed.

Scoping Opinion Review

ID provided an overview of the matters that, as set out in the Scoping Opinion, stakeholders had agreed to scope out of the assessment. It was agreed that potential impacts on water quality resulting from the mobilisation of soil and sediment can be scoped out provided that a commitment is made to adhere to relevant Pollution Prevention Guidance at the DCO stage. It was also agreed that impacts associated with cable decommissioning could be scoped out because the cables would be de-energised and left in situ.

BS asked whether once the onshore cables have been decommissioned whether they may be subject to deterioration and therefore potentially cause leakage / conveyance routes and subsidence.

Action – ID confirmed that this query would be fed back to the technical team for a response.

ID provided a summary of the main issues highlighted for further discussion in the Scoping Opinion with regards to the construction stage. The Scoping Opinion states that potential impacts on coastal erosion and flood risk (including existing defences) at the landfall should be considered. This would be considered in the FRA and coastal processes chapter if appropriate.

BS commented that Bailey bridges and culverts used for crossings will need to be consented, and that it should be noted that there may be as much water flowing under the rivers (i.e. sub-surface), as in the channel itself, and that this should be considered.

ID said that this would also be considered if appropriate and included in the PEIR.

ID noted that the Scoping Opinion recommended that changes to land drainage resulting from new areas of impermeable ground (including temporary construction compounds) should not be scoped out.

HW commented that the Flood Risk Assessment (FRA) would include 2 main elements – (1) the sediment being washed in to watercourses and (2) ensuring continued floodplain storage / conveyance during an event.

ID also stated that the Scoping Opinion also recommends that impacts on water quality resulting from the remobilisation of contaminated soils should not be scoped out. ID moved on to providing a summary of the main recommendations included in the Scoping Opinion with regards to impacts during the operation and decommissioning phases. The Scoping Opinion states that operational impacts cannot be scoped out because there is currently uncertainty regarding operational protocols. Furthermore, decommissioning impacts cannot be scoped out because there is currently uncertainty regarding the details of embedded mitigation measures and whether they can be satisfactorily implemented.

ID also noted the request in the Scoping Opinion that potential impacts on hydrology and water quality of designated sites (including the River Hull Headwaters SSSI) should be given due consideration across all project phases, with appropriate references to the ecology and ground conditions chapters.

GW reiterated that there would be impacts on permitting and that there would be a need to consult with NE on permitting.

Following this discussion, ID provided a summary of the next stages of the assessment process. The comments raised in the Scoping Opinion would be addressed and included within the scope of the assessment presented in the Preliminary Environmental Information Report and subsequently the Environmental Statement chapter, where appropriate.

ID outlined the proposed approach to delivering the PEIR and ES chapter. The water resources and flood risk chapter will consider potential impacts on two broad groups of receptors: i) The hydrology, geomorphology and water quality of surface and groundwater; and ii) Flood risk.

Definitions of receptor value and sensitivity will be based upon those provided in existing published guidance (e.g. DCLG and DRMB). Rather than assess potential impacts on each individual watercourse that could be affected by the proposed project, receptors will be grouped according to hydrological catchments (e.g. Water Framework Directive (WFD) river water body catchments). All watercourses within a catchment assigned the highest value and sensitivity identified in that catchment.

ID noted the cross-cutting nature of the topic and stated that the assessment would make reference to the Ecology and ground conditions chapters with regards to impacts on designated sites and contaminated land.

GW and LG agreed with the approach to the PEIR and ES as outlined by ID.

LG commented that some sort of WFD Compliance Assessment would be needed even if using HDD, regardless of whether it would be provided with the view that nothing else would be required.

ID replied that the project would review the elements which might affect the WFD. If deemed necessary this would be presented as a separate WFD compliance assessment, appended to the PEIR / ES chapter. The WFD compliance assessment would follow the methodology outlined in the Planning Inspectorate (PINS) (2017) guidance and EA internal guidance.

HW summarised the proposed approach to the submission of a Flood Risk Assessment (FRA) as an appendix to the PEIR / ES chapter utilising the National Planning Policy Framework (NPPF). Based on the experience obtained from other projects of a similar scale / type it is proposed that a proportionate approach is adopted focusing on key elements of the proposed development. The FRA will be presented focusing on three key elements: (1) Landfall, (2) onshore ECC and (3) onshore substation (OnSS) / connection to the National Grid. Along the onshore ECC there will be a preference for the packaging of watercourses into either hydrological catchments or by designation including proposed crossing type.

GW expressed the view that the watercourses should be packaged up, and that an Index Sheet should be used to show clearly that everything has been cross-referenced within the report.

Action - GW said the EA could look at packaging the watercourses to make sure they are sensitive.

HW confirmed that following initial review and the scoping process, potential flood risk to the proposed scheme is likely to be most complex along the onshore export cable corridor (ECC). Both the landfall and OnSS appear to be located in Flood Zone 1.

GW supported the sequential approach to situating the Onshore Substation in Flood Zone 1.

Next Steps –

ID outlined the next steps for the project. A desk-based assessment will be undertaken to determine impacts on hydrology, water quality and geomorphology, using freely available Ordnance Survey (OS) mapping, aerial photography, WFD status classification data and SSSI condition data. Fisheries/priority species records held by the EA would also be used to inform the definitions of receptor value if these are available. This assessment will inform the PEIR chapter and a WFD compliance assessment if required.

A desk-based assessment to determine impacts on flood risk would also be undertaken to determine impacts on flood risk, informed by EA flood risk data, historical flood incidents and local flood risk management strategy information from the LLFA, and any appropriate information held by the IDB. This assessment would be used to inform the FRA and would be cross-referenced by the PEIR where appropriate.

HW asked if there was any additional Flood Incident data or asset register data which should be used for assessment purposes, specifically in relation to the role of the LLFA.

Action - MK answered that Section 19 reports are freely available on the Council's website.

HW then asked BS whether there were any specific IDB policies and procedures which are relevant to the project.

BS answered that the IDB are generally more concerned with what is being discharged in to rivers as opposed to what is being abstracted. He directed HW to the Environment Agency for anything abstraction related. BS also indicated that the IDB has a similar byelaw in relation to the provision of a maintenance buffer / exclusion zone along a watercourse as adopted by the EA for Main Rivers.

GW asked the project to note timings when communicating to them, as early engagement is always preferred.

AOB –

LG commented that the project may want to engage with the Fisheries and Biodiversity and Groundwater and Contaminated land teams.

Action – AS to confirm either a teleconference with the Fisheries and Biodiversity and Groundwater and Contaminated land teams or to include them at the next evidence plan technical plan meeting.

Action – MK expressed that he would follow up with Susan Hunt (SH) with involvement from the Council's biodiversity officer.

GW asked whether a more detailed programme i.e. for draft chapters etc would be available.

Action – AS replied that she would look in to providing a more detailed programme.

Action – BS confirmed that his colleague John would review the route to highlight any drainage issues and other points of potential interest.

BS pointed out that if the project is consenting, construction would need to be timed with resting bird habitats as activities may be precluded. This in turn would impact on the IDBs work as they may be required to maintain flows in the same time windows as the project's construction programme.

GW questioned whether the FRA would consider the new UKCP18 climate change allowances, as the EA will be publishing new allowance in Spring 2019.

HW noted the request, however sight of the updated guidance will be required in order for it to be incorporated.

BS explained that tracked excavators are used on IDB (and EA) watercourses, and so it is preferable that a 9m margin around these watercourses should be maintained for HDD entry and exit pits as well as link boxes.

Action - AS confirmed that this would be fed back to the technical team.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk Technical Panel Meeting 3 - Post Scoping / Pre-PEIR	5 April 2019
Meeting Date	5 April 2019	
Place	Brough Business Centre, Brough	
Participants	<p>██████████ (Ørsted)</p> <p>██████████ – Royal HaskoningDHV</p> <p>██████████ – Royal HaskoningDHV (Flood Risk)</p> <p>██████████ – Yorkshire Consortium of Internal Drainage Boards (IDB)</p> <p>██████████ – Environment Agency (EA)</p> <p>██████████ – Environment Agency</p> <p>██████████ – Environment Agency</p> <p>██████████ - East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA)</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk TP Meeting #3
Absent	<p>██████████ (Yorkshire Consortium of Internal Drainage Boards),</p> <p>██████████ (East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA))</p>	
Copy	██████████ (IDB), ██████████ (ERYC LLFA)	
Next meeting	June 2019 - TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. Next Steps
8. Any other business (AOB)

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. For Ørsted to provide an update on Hornsea Project Four activities and to review the actions from the previous technical panel meeting;
2. To discuss the proportionate approach Ørsted is taking to the PEIR and ES;
3. To present the evidence base to be provided to scope out effects where complete consensus has not been achieved with key stakeholders;
4. To discuss the next steps in relation to seeking consensus with stakeholders on the proposed approach to the PEIR, including what additional evidence or information is to be provided at the next technical panel meeting in May/ June.

Specifically, in relation to the:

- a. Evidence base
- b. Baseline data
- c. Assessment methodology
- d. Mitigation/ enhancement.

Hornsea Four Update (AS)

AS presented the Interim PEIR boundary which showed a further refined OnSS search area, an 80m onshore ECC route, with access tracks and logistics compound locations, and a refined landfall search area. AS explained that this boundary was refined from Scoping and that the landfall and OnSS search area would be further refined when presented at PEIR.

AS went on to update the panel on the community newsletter which was delivered to thousands of addresses in the area in March 2019 and which updated the local community on the news about the scheme and a summary of the Local Information Events which took place in October 2018.

AS then provided an update on the projects approach to proportionality, including the Impacts and Effects and register, the Commitments Register, the Evidence Plan process, the use of innovative ways of presenting data and focussed questions, as the tools driving proportionality.

Summary of previous actions

ID provided an update on progress on previous actions agreed during the second Technical Panel meeting:

- Confirmation on whether decommissioned cable will degrade over time (Ørsted) – Ørsted to provide full response at PEIR Stage.

MF asked about the anticipated lifespan of the project.

AS answered that the lifespan is currently approximately 30 years, but that confirmation would be provided with the PEIR.

- Packaging of watercourses along the cable corridor (Ørsted) – ID confirmed that the impacts would be assessed on a catchment basis within the PEIR and FRA.

AP commented that the FRA should assess all types of flood risk and consider changes to flood risk resulting *from* the proposed development, as well as risks *to* the development (e.g. due to changes in runoff from the onshore substation (OnSS)). As such, catchments and individual watercourses would have to be used for the assessment.

HW responded that the FRA will consider all sources of potential flood risk to onshore infrastructure, including fluvial, coastal, surface water, groundwater and reservoir flooding. HW continued that the assessment would consider potential flood risks to the project (i.e. on-site flood risks) as well as potential flood risks resulting from the project (i.e. off-site flood risks). The assessment would consider risks from individual watercourses, although these may be grouped within larger drainage catchments where appropriate.

- Obtain WFD and flood risk data (Ørsted) – ID confirmed that WFD classification and species data, and flood risk model outputs had been obtained from the Environment Agency. ID confirmed that Product 4, 5 and 8 flood risk data had also been requested from the EA. HW confirmed that this data had been received on 4th April and was currently being processed for inclusion within the assessment.
- To review the cable corridor route and identify known drainage issues (IDB) – Ørsted awaiting a response.

JC confirmed that this was in progress.

Action 1 – JC/BS to provide any information from a review of the Interim PEIR boundary, to Ørsted.

Action 2 – AS to provide Interim PEIR boundary to help narrow the search area for the JC/BS.

- The project to engage with biodiversity, groundwater and contaminated land specialists (Ørsted) – Martin Fuller (EA) present at this technical panel meeting and had been invited to the next Hornsea Four Ecology and Nature Conservation Technical Panel meeting.

Action 3 – LG to arrange engagement of EA groundwater specialist as none have been available so far.

Previously distributed materials

ID explained that the meeting minutes from the first and second technical panel meetings had been distributed and asked all organisations represented at the current meeting whether they could provide any comments or confirmation of agreement on the minutes from those first two meetings.

Action 4 – LG confirmed that the EA would review and provide a response.

Action 5 – Representatives from the LLFA (MK/GF) and the IDB (JC/BS) to also provide any comments or confirm agreement with the record of meeting minutes.

MF noted that in terms of flood risk, known incidents include Beverley which flooded in 2007

Action 6 – MF to confirm details and provide guidance on the extent / severity of the flooding incident referenced above.

Approach to PEIR – Baseline updates

ID provided a summary of the baseline characterisation process currently being undertaken to inform the PEIR. This consists of two components:

- A desk-based assessment, informed by third party information on the drainage network (e.g. main rivers and IDB drains), flood risk data (e.g. Flood Map for Planning, detailed modelling reports, LLFA flood incident data), WFD water body information (e.g. status classifications and objectives) and habitat and species data (e.g. SSSI classifications and Environment Agency aquatic species data).
- A field-based assessment, which comprises a geomorphological walkover survey of all the main rivers and/or WFD water bodies along the cable route (subject to access agreements). The survey encompasses the width of the cable corridor and up to 200m upstream and downstream, and will characterise flow types, channel form, floodplain characteristics and evidence of channel modification.

GF asked whether Ørsted had information on riparian watercourses i.e. ordinary watercourses which feed in to IDB drains.

AS confirmed that the project does have a dataset which identifies watercourses as a part of the Ordnance Survey Mastermap, which can be used to identify ordinary watercourses.

HW responded added that the project does not have specific data on the characteristics of each ordinary watercourse, but that the location / characteristics of these would have been inferred based on other / adjacent ownership.

Action 7 - ID confirmed that the project would check, as part of the survey, whether any such data is available and / or whether riparian data might be obtained.

ID added that a survey of land drainage features would also be undertaken along the onshore project area (subject to landowner agreement). This would verify the location of all land drainage features, provide information on their basic physical characteristics (e.g. width, depth, bank type and profile) and identify inflows (e.g. land drains, outfalls and CSOs).

GF explained that the project might encounter issues with land owners, as it can be challenging to identify the owners. It may be that adjacent landowners own up to the half-width, or it can also just be the hedge-owners.

AS noted that this would be considered and investigated further in conjunction with the land access team.

ID then asked the following questions in relation to the baseline updates:

Question 1 - *Do you agree that the scope of the desk-based data collection exercise is sufficient? Are there any other sources of information you would recommend?*

AP commented that the ERYC holds more models including surface water and catchment data and models which may aid the flood risk mapping. Some of the data might be larger than the project needs but that we should also the LLFA, particularly in relation to the OnSS.

Action 8 – Ørsted to follow up with the LLFA and obtain any additional flood model data which might be useful for assessment purposes.

AP also mentioned that we should be using the groundwater and SPZ data for the area, as there are quite a few and they are variable.

Action 9 – Ørsted to ensure that groundwater and SPZ data is being used to inform the assessment.

MF flagged that potential impacts on historical assets should also be considered.

ID confirmed that this would be addressed separately in the Historic Environment Chapter at PEIR.

Question 2 - *Do you agree that the scope of the geomorphological walkover surveys is sufficient to characterise the baseline geomorphology of the surface drainage system?*

AP questioned what the purpose of the geomorphological surveys was when open trench techniques would not be used to cross the main rivers and IDB maintained drains.

ID answered that the purpose of the baseline walkover surveys was characterise the geomorphological form and function of the watercourses and allow the potential impacts of temporary crossings of these features to be evaluated.

Action 10 - AP said that he would also take the question away, however, it would be useful provide information on the status quo or baseline characterisation that the project should look to maintain.

JC added that there are potential flood risk implications of project activities across and adjacent to watercourses restricting access for maintenance. Temporary access tracks should avoid running alongside watercourses where possible.

HW noted that this would be considered in the FRA.

Action 11 – Ørsted to look in to access which might run along a byelaw area and provide a response.

Question 3 - *Do you agree that the proposed land drainage surveys are sufficient to characterise drainage issues along the cable route and at the proposed substation site?*

Action 12 - AP responded that it would be good for the EA to revisit this question and the scope of the land drainage surveys once they had received and reviewed the FRA.

Approach to PEIR – Proportional EIA

ID provided an overview of the proposed approach to assessing the impacts which may result from watercourse crossings during construction:

- Trenchless cable crossings will not directly interact with surface watercourses, and they will therefore be scoped out of the PEIR.
- The trenching methodology used to cross minor drainage features will be designed to avoid non-temporary impacts and will therefore also be scoped out of the PEIR.
- Temporary crossings will be avoided where possible and will be agreed with the appropriate consenting authority prior to construction.
- Flood risk implications will be considered in the FRA.

GF commented that when using trenchless techniques, ground conditions will be important. Clay ground conditions should not be problematic, however, if gravel is encountered then this tends to pose a greater technical challenge.

GF also noted that all crossings would need to be agreed with the landowners as well as the consenting authority.

JC noted that the IDB would prefer trenchless techniques such as HDD to be used for crossings of their watercourses, based on experience from other projects.

AS explained that Hornsea Four was aware of the concerns that both landowners and stakeholders had with regards to land drainage, explaining that the project was looking to get local land drainage contractors on board in order to survey the land early on in the process.

AP also explained that there are raised flood defences around some of the watercourses. Therefore, it should be noted that in order to maintain the integrity and access to the flood defences, reception pits must be a suitable distance away from the flood defences. Additionally, the working area for the crossing should allow the relevant responsible authority unrestricted access to the water where possible, for the FRA.

JC agreed that maintaining access would be critical for the entire period of construction. GF asked whether there would be over-pumping.

ID responded that temporary structures would be installed upstream and downstream of the crossing area, and flows maintained through the use of a pump, pipe or flume with sufficient capacity to prevent upstream impoundment. Following trenching, the bed and banks of the watercourse would be reinstated.

MF added that water from one river should not be transferred to another river or catchment, as this would increase the risk of spreading disease, non-native invasive species and contamination.

AP advised that timing of crossing activities will be important, and this will be a constraint which the Environment Agency and Natural England will comment on with regards to the mitigation. Disturbance to nesting birds or migrating or spawning fish should be avoided.

MF advised using mitigation, such as limiting working during nesting season, and carrying out any stripping back in the winter months, where possible.

ID discussed the proposed approach to assessing impacts on the surface drainage network related to changes in land drainage during construction. A comprehensive drainage strategy, incorporating measures to prevent changes to the volume and rate of runoff from the proposed development will be prepared and agreed in advance with the Environment Agency and LLFA. As a result, no significant effects are expected and it is therefore proposed to scope this impact out of the PEIR. Flood risk implications will, however, be considered in the FRA.

GF asked whether the project would not want to keep impacts resulting from changes to land drainage during construction scoped in until such time that we have the drainage information.

ID explained that if it becomes evident through the process that when may have a potentially significant effects, then it would be scoped in, if appropriate. However, Hornsea Four does not foresee needing to assess it at this point in time.

ID discussed the proposed approach to assessing impacts on flood risk due to coastal erosion at the landfall during construction. Potential impacts on tidal flood risk resulting from a breach of coastal defences will be considered explicitly in the FRA. However, it is proposed that they are scoped out of the PEIR on the basis that construction impacts on water resources are likely to be avoided through use of HDD at landfall, if possible. Impacts on coastal landforms and processes will be considered in the Coastal Processes chapter.

GF and MF explained that it would be good to be aware that Hornsea Four should be aware that the landfall may interact with shoreline defences, which might affect the shoreline management plan.

ID explained that if HDD were to be used then there wouldn't be any direct interaction with the shoreline.

Action 13 – Ørsted to investigate the shoreline management plan and any implications that using open cut techniques may have.

AP commented that due to the rapidly eroding nature of the Holderness coastline, it is important that impacts on physical processes are assessed in the Coastal Processes chapter

ID proposed that potential impacts on water quality due to the remobilisation of existing contaminants in soils should be scoped out of the assessment. The location of contaminated land will be identified as part of a Phase 1 Preliminary Risk Assessment (PRA), and associated risks will be considered in the Ground Conditions chapter. Furthermore, the outline Code of Construction Practice will set out measures to prevent contamination of water receptors.

MF asked whether bentonite would be used as from experience on other projects bentonite has leaked from HDD locations.

AS responded that the project does assume that bentonite would be used.

LG also commented that bentonite breakouts had occurred in projects in East Anglia when the HDD had not been carried out correctly.

Action 14 - ID explained that this would be managed via the risk assessment, however, this would also be looked in to further.

ID proposed that potential impacts associated with project operation should remain scoped out of the PIER, because there will be minimal requirements for routine maintenance of onshore infrastructure. Impacts on flood risk from the presence of operational infrastructure would be considered in the FRA, however.

GF asked whether fire risk at the OnSS had been considered.

AS explained that Hornsea Four was aware that Creyke Beck experienced a fire fairly recently, and that information relating fire safety would be provided at PEIR.

AP asked whether ground excavation has been considered, as members of the public attempt to dig up the cable in order to take the metal.

Action 15 – Ørsted to provide a response to the possibility of ground excavation by members of the public.

AP also asked whether ground excavation as a result of farming had been considered, although the cable burial depth is likely to be sufficient mitigation.

Action 16 – Ørsted to consider and provide response on whether excavation as a result of farming might be an issue.

ID proposed that potential impacts associated with project decommissioning are also planned to remain scoped out of the PEIR. The onshore cable infrastructure will be deactivated and remain in place.

AS explained that the cables are sealed in an inert plastic which would not degrade.

ID explained that the substation decommissioning is likely to be in line with construction-stage impacts and will include similar measures to prevent contamination, but that this would be confirmed at PEIR stage.

AP asked whether any permanent access would be required along the route, as the relevant responsible authorities would require unrestricted access.

Action 17 - AS responded that no permanent accesses are required for the landfall or onshore ECC. Only an operational permanent access would be required for the OnSS, and it is assumed that this would be used minimally. Information on the operational requirement for the OnSS would be provided at PEIR.

GF raised whether there might be future effects if the EA river channels need to be widened in the future.

Action 18 – Ørsted to investigate and consult with the EA in relation to the future effects should the EA need to widen any river channels.

ID noted that potential impacts on the hydrology and geomorphology of designated sites such as the River Hull Headwaters SSSI would be avoided through the use of trenchless crossing techniques. Measures to control runoff and the supply of fine sediment and other contaminants (as set out in the drainage strategy and outline CoCP, respectively) would also be provided. It is therefore proposed that this impact should be scoped out of the assessment (although impacts on SSSI receptors would be considered as an integral part of the assessment of impacts that have been scoped in).

MF commented that soil storage would be critical in relation to crossing any designated sites.

ID responded that the Outline Code of Construction Practice (CoCP) would deal with soil generation, as mitigation such as using soil capture would be used as mitigation to ensure that any soil would not leave the cable corridor, and therefore be released in to waterways.

MF asked how the soil and top soil bund would be stored.

Action 19 – Ørsted to provide further information how top soil bunds would be stored.

AP asked whether Natural England would be consulted with in relation to designated site, as potential impacts on designated sites would still need to be addressed at Stage 1 for the HRA.

AS responded that Natural England are being consulted with in relation to potential impacts on designated site, via the Hornsea Four Ecology and Nature Conservation Evidence Plan Technical Panel.

Next Steps – PEIR Submission

ID provided a summary of the next steps that will be undertaken in the lead up to the submission of the PEIR:

- Baseline data collection and analysis would continue, with the desk-based assessment and geomorphological walkover survey being completed during April and May 2019. The drainage assessment would be undertaken as soon as possible. (Both being subject to landowner access)
- The draft PEIR chapter, FRA and WFD compliance assessment would be produced during April and May 2019. These will present the baseline data and a full (rather than outline) impact assessment.
- The next technical panel would likely be held during late May or June 2019. This will be used to present the baseline data to stakeholders for comment, discuss the findings of the draft impact assessment, and provide further information on impacts where Hornsea Four may not be in alignment with stakeholders.

AS explained that as a part of the next steps, Hornsea Four intended to commission land drainage surveys early on as the project understand that this is an important issue for landowners and stakeholders alike.

AOB

ID asked if there were any other comments or questions any members wanted to raise.

MF asked about how definite and certain the Interim PEIR Boundary was at the time.

AS responded that as a lot of groundwork had already been done in relation to the route planning and site selection process, that the project is fairly confident with the onshore ECC route. If new information comes to the light as a result of the impact assessments and through consultation, the route planning and site selection process will of course accommodate this where deemed significant and appropriate, in the lead up to DCO submission.

GF also enquired as to whether the project is aware of the Cottingham and Orchard Park Flood Alleviation Scheme (COPFAS), which is being put in place to reduce flood risk in the area. However, Ørsted should be aware that the Environment Agency's flood maps will not have been updated to take COPFAS in to consideration. GF continued that the LLFA will have model data available from when the scheme was designed.

HW asked if the LLFA had any information they could share with Ørsted.

Action 20 – GF confirmed that he would contact the ERYC asset management department to find whether information or contact was available.

Action 21 – HW to contact ERYC to request information once a suitable contact name was provided.

AP pointed out that in terms of available flood risk data there is likely to be one hydraulic model for Creyke Beck and another for the COPFAS project. AP continued that although COPFAS would be downstream of the project it would still need to be considered by Hornsea Four, as runoff from the project would have the potential to interact with and affect the COPFAS project.

AP explained that if Hornsea Four would like to pursue flood risk permitting through the DCO, as part of the protected provision approach, then the project would need to start early on as it can take longer than obtaining consents via the standalone Environmental Permitting Regime (EPR) process.

MF asked for a plan of designated sites to be provided for the Interim PEIR boundary for the third Ecology and Nature Conservation Technical Panel meeting.

Action 22 - AS confirmed that a plan would be provided.

Summary of Actions:

Action Number	Action	Responsible
1	IDB to review the onshore ECC route and identify known drainage issues (2nd Technical Panel meeting)	IDB (JC/BS)
2	AS to provide Interim PEIR boundary to help narrow the search area for the JC/BS.	Ørsted (AS)
3	LG to arrange engagement of an EA groundwater specialist.	EA (LG)
4	LG confirmed that the EA would review and provide a response on the materials previously distributed to the third technical panel meeting, and to the meeting minutes from the first and second technical panel meetings.	EA (LG)
5	Representatives from the LLFA (MK/GF) and the IDB (JC/BS) to also provide any comments or confirm agreement with the record of meeting minutes and previously distributed materials.	LLFA (ERYC) & IDB
6	MF to provide further information on the 2007 Beverley flood incident.	EA (MF)
7	The project to check, as a part of the site survey whether any data on the characteristics of each ordinary watercourse or any riparian data might be obtained.	Ørsted (AS)
8	Hornsea Four to follow up with the LLFA to obtain any additional flood model data which could potentially be used for assessment purposes.	Ørsted (AS)
9	Ørsted to ensure that groundwater and SPZ data is being used to inform the assessment.	Ørsted (AS)
10	EA to comment on the appropriateness and purpose of the baseline walkover surveys.	EA

Action Number	Action	Responsible
11	Hornsea Four to look in to whether any proposed project access tracks might run along the byelaw area and to provide a response.	EA
12	EA to comment on the proposed land drainage surveys once the PEIR FRA has been received and reviewed by the EA	EA
13	Hornsea Four to investigate the shoreline management plan and any implications using open cut techniques may have.	EA
14	The project to provide response in relation to the possibility of bentonite breakouts.	Ørsted (AS)
15	Hornsea Four to provide a response to the possibility of ground excavation by members of the public.	Ørsted (AS)
16	Hornsea Four to provide a response on whether excavation as a result of farming might be an issue.	Ørsted (AS)
17	Hornsea Four to provide further information on the operational requirement of the permanent access track for the OnSS at PEIR	Ørsted (AS)
18	Hornsea Four to investigate and consult with the EA in relation to the future effects should the EA need to widen any river channels.	Ørsted (AS)
19	Hornsea Four to provide further information how top soil bunds would be stored.	Ørsted (AS)
20	GF to provide contacts for ERYC asset management department related to COPFAS.	LLFA (GF)
21	Hornsea Four to contact ERYC flood department to obtain information relating to COPFAS.	Ørsted (AS)
22	Hornsea Four to provide plan to MF showing designated sites in relation to PEIR boundary.	Ørsted (AS)

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk Technical Panel Meeting 4 - Post Scoping / Pre-PEIR	27 June 2019
Meeting Date	27 June 2019	
Place	Brough Business Centre, Brough	
Participants	<p>██████████ (Ørsted)</p> <p>██████████ – Royal HaskoningDHV</p> <p>██████████ – Royal HaskoningDHV (Flood Risk)</p> <p>██████████ – Yorkshire Consortium of Internal Drainage Boards (IDB)</p> <p>██████████ – Environment Agency (EA)</p> <p>██████████ – Environment Agency</p> <p>██████████ – Environment Agency</p> <p>██████████ - East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA)</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk TP Meeting #4
Absent	<p>██████████ (Yorkshire Consortium of Internal Drainage Boards (IDB)),</p> <p>██████████ (East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA))</p>	
Copy	██████████ (IDB), ██████████ (ERYC LLFA).	
Next meeting	Post-PEIR - TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. Alternative landfall scenario
8. Next Steps
9. Any other business (AOB)

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. Provide an update on Hornsea Project Four activities and review actions from the previous technical panel;
2. Present the evidence base to be provided to scope out effects where complete consensus has not been achieved with key stakeholders;
3. Discuss the next steps in relation to seeking consensus with stakeholders on the proposed approach to the Preliminary Environmental Information Report (PEIR) and what additional evidence or information is to be provided as part of the PEIR, specifically in relation to: Evidence base / Baseline data; Assessment methodology; Mitigation / Enhancement; and
4. Proportionality and 'How to read this PEIR.'

Hornsea Four Update (AS)

AS explained that the following main activities had taken place since Scoping to inform the PEIR:

- Evaluation of the Scoping Opinion – to inform the impacts which are to be assessed, and further mitigation which needs to be brought forward in the PEIR to provide further confidence to stakeholders;
- Project Parametres – being finalised to inform the basis of the assessments;
- Baseline data collection – for Hydrology this involved site walkovers of key watercourses being crossed by the onshore route;
- Drafting of technical reports and PEIR Chapters;
- PEIR Submission: will be 13 August 2019.

AS explained that the following activities were also taking place in relation to Site Selection and consideration of alternatives:

- Landfall – the refinement of the landfall sites to just two sites (A3 & A4);
- Onshore Substation – site is down to one site, close to Creyke Beck substation;
- Onshore export cable corridor – has been refined as a part of the Route Planning Site Selection BRAG approach, and in response to landowner feedback.

AP responded that at the onshore substation site, which is located at the upstream extent of two Environment Agency (EA) Main Rivers around Creyke Beck, the existing Environment Agency flood modelling is out of date (approximately 15 years) and not considered to be robust (based on broad-scale JFlow modelling). In addition, the flood risk in this area is significantly influenced by surface water flooding and the existing modelling does not take either the

Cottingham and Orchard Park Flood Alleviation Scheme (COPFAS) or wider surface water flood risk into consideration. AP therefore suggested that Hornsea Four may want to undertake their own modelling to reduce uncertainty. AP added that National Grid carried out some modelling approximately 3 years ago which might be helpful, however, the EA does not hold this data.

GF reinforced that flooding does occur in the area of the proposed onshore substation, as in 2007 there was flooding across the golf course, approximately 300 mm deep. He mentioned that it is often useless to use the growth of marsh grass as an indication of the ground being particularly wet. Some of the issues of flooding in these areas should be addressed upon completion of the COPFAS project.

TH asked whether the PEIR will discuss groundwater outside of the SPZ. ID stated that it can be discussed if required.

GF also asked if the onshore substation access track will be impervious and whether it would need drainage. AS responded that the permanent access track would be impervious and that it would be designed to consider drainage.

AP also noted that it would be good to understand whether the planned permanent access track is to be raised, and whether it would obstruct surface water flow.

Action 1 – AS to provide further details on the design of the onshore substation access track.

Summary of previous actions

ID listed the following action from the previous meeting, with their status:

Action	Responsible	Status Update
Review cable route and identify known drainage issues	IDB	Response Pending
Provide comments on previously distributed materials	IDB, LLFA	Response Pending
Provide comment on the appropriateness of the baseline surveys	EA	Response Pending
Provide information on Beverley flood incident in 2007	EA	Response Pending
Provide information related to COPFAS (including flood modelling)	LLFA	Information received and currently being reviewed by Hornsea Four for inclusion in the PEIR.
Provide interim PEIR boundary to stakeholders	Ørsted	Awaiting internal sign off, projected to be distributed at the end of next week.
Provide plan of designated sites in relation to project red line boundary	Ørsted	Provided after last meeting to EA.
Obtain data on watercourse and riparian characteristics	Ørsted	Completed for all main rivers which intersect the cable corridor

Action	Responsible	Status Update
Ensure that Source Protection Zone (SPZ) data is used to inform the assessment	Ørsted	Groundwater impacts considered in Chapter 1 Geology & Ground Conditions
Provide further information regarding possibility of bentonite breakouts	Ørsted	Bentonite breakout information to be provided at DCO.
Provide further information on whether excavation due to farming or members of the public could be an issue	Ørsted	Response to be provided today.
Provide further information on operational requirement for an access track at the OnSS	Ørsted	Response to be provided today.
Provide further information on topsoil storage	Ørsted	Response to be provided today.

AS stated that the Hornsea Four PEIR boundary was undergoing final quality assurance checks but that it would be provided to all stakeholders in the next couple of weeks. GF responded that it would be best to send this to Dan Martin at the LLFA.

AP noted that for the EA, topsoil storage should not be within 8 m of EA Main Rivers, and if possible, should also be located outside Flood Zones 2 and 3. However, he added that it is understood that Flood Zones 2 and 3 cover large areas of the Hornsea Four onshore cable route, and this may not always be achievable. It would be preferred that any topsoil stored in these flood zones is kept in minimal heaps and stacks with breaks in between. Furthermore, if material is stored in a groundwater SPZ, it would be necessary to determine whether this poses an additional contamination risk. If it could, then the material should be checked, covered and banded for storage.

Previously distributed materials

ID touched on the following previously distributed materials:

Distributed materials	Responses received	Outstanding questions
Onshore Water and Flood Risk Expert Technical Group Panel Meeting 1 – presentation and minutes	None	Do you agree with the record of the minutes or have any follow up comments?
Onshore Water and Flood Risk Expert Technical Group Panel Meeting 2 – presentation and minutes	None	Do you agree with the record of the minutes or have any follow up comments?
Onshore Water and Flood Risk Expert Technical Group Panel Meeting 3 – presentation and minutes	Environment Agency (advice and requests for clarification, to be addressed within PEIR)	Do you agree with the record of the minutes or have any follow up comments?

Distributed materials	Responses received	Outstanding questions
Onshore Water and Flood Risk Expert Technical Group Panel Meeting 4 – presentation and minutes	N/A	Do you agree with the record of the minutes or have any follow up comments?

The following materials were also issued in advance of the meeting:

- ‘How to read this PEIR’ – a guide intended to help the reader navigate the various documents and registers that will be provided by Hornsea Four at the point of Preliminary Environmental Information (PEI);
- the Impacts/ Effects Register for Water Resources and Flood Risk updated since Scoping – the register sets out and documents all potential impacts/ effects associated with Hornsea Four. This will be provided at the evidence plan meeting itself; and
- DCO Application Register – this provides a log of all documents, reports and drawings for Hornsea Four and includes the necessary documentation to secure the Commitments set out in the Commitments Register; and
- Hornsea Project Four Water Resources and Flood Risk Technical Panel #4 Position Paper.

AP mentioned that the EA would like to see a copy of the Commitments Register.

AS explained that it wasn’t ready yet, but that she would investigate whether it might be possible to send out a copy of the re-worked Scoping Commitments Register pre-PEIR.

Action 2 – AS to check whether it is possible to send out early copy of PEIR Commitment Register prior to PEIR Submission.

Approach to PEIR – Proportionate EIA

Disturbance of watercourses during installation as part of the construction phase

ID stated that as per Commitment 1 all EA Main Rivers and IDB-maintained Ordinary Watercourses would be crossed using HDD (or other trenchless technologies). This would avoid direct disturbance of these watercourses and it is therefore proposed that this impact is scoped out of the assessment.

The EA agreed that this approach would be appropriate, providing that the commitment is set out in sufficient detail to provide reassurance that no impact would take place.

Disturbance of minor drainage ditches during installation as part of the construction phase

ID explained that various measures would be employed to minimise impacts associated with crossing smaller Ordinary Watercourses. For example, temporary cofferdams would be installed either side of the 'open cut,' creating a dry working area in between, the substrate of the watercourse would be removed and reinstated once the cable has been installed, and measures to maintain flows and minimise upstream impoundment would be implemented. However, the details of these measures might vary depending on the characteristics of each watercourse, e.g. it would be important to remove, store and reinstate the substrate in watercourses dominated by coarse bed sediments, but less important in artificial ditches with fine bed substrates. Collectively, these measures would ensure that there would be no non-temporary effects associated with watercourse crossings.

BS asked what a non-temporary effect was. ID explained that, in this context, non-temporary effects would be changes to the hydrology or geomorphology of a watercourse that last beyond the construction period (i.e. after the bed and banks have been reinstated and the coffer dams removed). HW further explained that for example when applying for consent relating to temporary and permanent work, Hornsea Four would be seeking temporary permits, based on temporary effects.

TH asked whether there were any plans to dewater groundwater. AS and HW responded that there were not any plans to dewater groundwater.

GF asked whether there would be any barriers from the cable. ID responded that as the cables have a target burial depth of 1.2 m deep that it is thought that the chance of channel incision exposing buried cables would be minimal.

Disruption of local land drainage during construction phase

ID and HW provided a brief overview of the measures that would be implemented to minimise the effects of disruption to the existing surface drainage network, including pre-construction surveys to characterise the characteristics of affected watercourses, temporary drainage systems to manage runoff during the construction phase, and post-construction reinstatement plans informed by the pre-construction surveys. Collectively, these measures would prevent adverse impacts on surface drainage.

GF stated that surely the pre-construction and post-construction drainage system would need to be agreed with the IDB as well. AS responded that the commitment states that the pre and post construction drainage would be agreed with all relevant authorities, and so this should be covered.

AP also offered that the National Planning Policy Framework refers to betterment in terms of surface water flood risk i.e. a reduction in surface water run-off from the haul road.

HW stated that in particular, for the onshore substation, the NPPF requirements in terms of surface water discharge rates would be considered, however we would need to investigate whether a further reduction in runoff is technically feasible.

Mobilisation of pollutants in the event of disturbance of contaminated soils during the construction phase

ID stated that the planning of the onshore cable route has taken the potential for contaminated land into account, which will minimise the potential for the disturbance of existing contamination. Where high risk areas do exist, the project would mitigate by design in the first instance, and avoid these sites altogether. Furthermore, the Outline Code of Construction Practice (CoCP) includes an Outline Site Waste Management plan which will provide outline measures on the processes and protocols to be followed during construction. This has been provided in full in the Land Quality Preliminary Risk Assessment which would be provided at PEIR.

TH asked what had been scoped out. ID explained that by bringing forward the mitigation now, that it would not be assessed in the PEIR Chapter.

TH confirmed whether there would be protocols and processes in the plan to cover unexpected contaminated land on site. ID confirmed that this is the case.

Hydrological and water quality effects on designated sites during construction phase

AP asked whether the impact was going to be assessed and mitigation provided. AS explained that by providing further mitigation now, that the impacts did not need be assessed in full, and that it has been 'scoped out' out of the PEIR assessment.

ID added that the suite of mitigation measures designed to prevent impacts on non-designated Main Rivers and Ordinary Watercourses (encompassing hydrology, geomorphology and water quality) would be equally effective on the River Hull Headwaters SSSI and connected watercourses, and that it was not therefore necessary to assess impacts on these sites separately.

Impacts associated with project operation

AS provided an outline of the operation of the onshore elements of the project -

In relation to the onshore ECC:

- Operational activities would be largely corrective (because there is limited requirement for preventative maintenance on the onshore cables), accompanied by infrequent site inspections of the onshore export cables. Onshore export cables will be consistently monitored remotely.

- It is not expected that the TJBs will need to be accessed during the operation of Hornsea Four, however link boxes will require access during the operational phase. These will have been reinstated following construction but may have manhole covers for access. These visits will occur using a 4x4 vehicle.

And in relation to the onshore substation:

- monitored remotely and visits will occur in a small technicians' van via the established permanent access.
- visit the onshore substation to undertake works on a regular basis, approximately once every six months. For the EBI, preventative maintenance 10 visits per annum with a maximum of 2 persons in attendance and 2 vehicles per day.
- EBI – up to 6 offline visual inspections including testing for the 35 years operation.

ID explained that, on the basis of the nature of the activities outlined by AS, there were no mechanisms for significant effect on water receptors and the impact would therefore be scoped out of the assessment.

HT questioned whether thermal effects on surface waters, and in particular fish, would be considered. ID noted that the burial depth and cable insulation would minimise impacts but agreed to discuss this issue further with the author of the Onshore Ecology chapter.

AP responded that agreeing the depths of the HDD would be instrumental.

Action 3 – In relation to potential thermal impacts from cables affecting fish, AS is to take these to the Ecology specialists.

BS stated that there was a question around the longer-term legacy regarding what happens to the cables at decommissioning, i.e. Is it likely that people will dig it out, as well as potentially settlement and cracking to the cable over time. AS responded that as we would come to shortly, the cables are intended to be left in situ after decommissioning. However, the project has a requirement to agree the decommissioning plan with the relevant authorities and that it would be in line with relevant guidance.

Impacts associated with decommissioning of the cable route and the Hornsea Four substation

AS stated the following in relation to the decommissioning of the onshore elements of the project -

In relation to the onshore ECC:

- To minimise the environmental disturbance during Hornsea Four decommissioning the onshore export cables will be left in place in the

ground with the cable ends cut, sealed and securely buried as a precautionary measure.

- The structures of the jointing pits and link boxes will be removed only if it is feasible with minimal environmental disturbance or if their removal is required to return the land to its current agricultural use.

And in relation to the onshore substation:

- All the electrical infrastructure will be removed and any waste arising disposed of in accordance with relevant regulations. Foundations will be broken up and the site reinstated to its original condition or for an alternative use.
- For the EIA decommissioning of the onshore substation is assume do be similar to the construction and in reverse sequence.

ID explained that, on the basis of the nature of the activities outlined by AS, there were no mechanisms for significant effect on water receptors and the impact would therefore be scoped out of the assessment.

Alternative Landfall Scenario

HW explained that Hornsea Four are proposing to include the option of 'open cut' at the landfall as Hornsea Four is unable to confirm the technical feasibility of using HDD (or other trenchless technologies) until the geo-technical information has been obtained post-DCO application. However, HW stressed that the preferred option is to use HDD (or other trenchless technologies), and that retaining the option of using open cut is considered to be a fall-back option for the project at this stage. HW continued that all potential impacts will be explored in the Onshore Infrastructure Flood Risk Assessment (FRA) and Marine Geology, Oceanography and Physical Processes Chapter.

AP stated that it might be best to speak to the LLFA, Marine Management Organisation (MMO) and Natural England (NE) on their views related to the use of open cut. It would be worth noting that that section of coastline has a Shoreline Management Plan (SMP) where there is a policy for not using any protection (i.e. no active intervention) along the coastline.

GF mentioned that he would need to see a cross-section to be able to comment further. However, NE have been strict on the SMP Policy on projects further down the coast where open cut has been proposed.

Next Steps – PEIR Submission

AS explained that as a part of the Proportionate approach to the EIA Hornsea Four had adopted some tools to help stakeholders navigate the documentation and the assessments. This guidance has been provided to stakeholders in the form of the 'How to read this PEIR document':

1. How to Read this PEIR – documents the order in which the PEIR documents should be read:

2. Impacts Register
 - a. Simple vs. Detailed assessments – AS explained the difference between simple and detailed assessments;
 - b. Updated Impacts Register – sets out the following:
 - i. Magnitude, sensitivity, and significance of all potential impacts and receptors;
 - ii. Embedded mitigation measures and commitments – reduce LSE
 - iii. Sets out the scope; and
 - iv. Defines and justifies MDS – relevant for each impact.
 - c. Coding:
 - i. “Scoped out” – PINS agreement (grey)
 - ii. “Scoped in” – simple vs. detailed (yellow/ green); and
 - iii. Disagreement on LSE (red).
 - d. Impacts which are coded as red can be due to: (i) Lack of evidence; (ii) Lack of certainty; and (iii) Disagreement with PINS.
3. Commitment Register – Commitment register shows the unique IDs, relevant project element, identifies the topic they are relevant to, and the relevant documentation for securing the commitment. They can be suggested by the public, stakeholders and technical contributors to the EIA. The register is also interactive and searchable.
4. DCO Application Register – logs all documents and drawings and whether they will be submitted at PEIR and/ or DCO, includes necessary documentation to secure the Commitments set out in the Commitments Register, and is a live document.
5. PEIR chapter and technical reports – AS summarised the structure for the Chapters and technical reports.

AOB

AP asked whether Hornsea Four would like to disapply the flood risk permits through the DCO process, as it can take some time, and would need to be set up with the legal team. As such, it would be a good idea to start the process now.

Action 4 - AS responded that she would check with the project team.

ID also mentioned that the onshore substation and onshore ECC should be split out separately in the FRA. As it is considered to be essential infrastructure the specific mitigation in relation to the onshore substation should also be split out. AP responded that the EA would also like to set out any pre and post survey monitoring work, and to set up an agreement on the baseline requirements for pre and post condition survey for Main Rivers, now. The LLFA and IDB might have a similar process.

Action 5 - AS responded that we do expect to agree pre and post construction surveys with the EA for Main Rivers (Co175). However, we can start this dialogue earlier if that is what the EA would prefer.

Summary of Actions:

Action Number	Action	Responsible
1	AS to provide further details on the design of the onshore substation access track.	AS
2	AS to check whether it is possible to send out early copy of PEIR Commitment Register prior to PEIR Submission.	AS
3	In relation to potential thermal impacts from cables affecting fish, AS is to take these to the Ecology specialists.	AS
4	AS responded that she would check with the project team regarding the disapplication of the 2016 Environmental Permitting Regulations.	AS
5	Ørsted to begin conversation for agreeing pre and post construction surveys with the EA.	AS

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk Technical Panel Meeting 5 – Post-PEIR / Pre-DCO	5 November 2019
Meeting Date	5 November 2019	
Place	Environment Agency, Foss House, York	
Participants	<p>██████████ (Ørsted)</p> <p>██████████ – Royal HaskoningDHV (Hydrologist)</p> <p>██████████ – Royal HaskoningDHV (Flood Risk)</p> <p>██████████ Yorkshire Consortium of Internal Drainage Boards (IDB)</p> <p>██████████ – (IDB)</p> <p>██████████ – Environment Agency (EA)</p> <p>██████████ – EA</p> <p>██████████ – EA</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk TP Meeting #5
Absent	<p>██████████ (East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA));</p> <p>██████████ - East Riding of Yorkshire Council (ERYC), Lead Local Flood Authority (LLFA)</p>	
Copy	██████████ (IDB), ██████████ (ERYC LLFA)	
Next meeting	TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Design Evolution Updates
6. Key Section 42 Responses & Discussion
7. 'Impacts Register' and Proportionality
8. Key Questions for Consideration
9. Any other business (AOB)

Meeting Notes

Aims and Objectives (AS)

AS presented the following aims and objective for the meeting:

1. Provide an update on Hornsea Project Four with regards to the evolution of the design of the project since the Preliminary Environmental Information Report (PEIR) was submitted, and to review any outstanding actions from the last onshore ecology technical panel meeting;
2. To summarise the key Section 42 responses received from stakeholders in relation to onshore Ecology, and Hornsea Four's position in response;
3. To seek consensus with stakeholders on the proposed approach to the Environmental Statement (ES) and agree additional evidence or information which might need to be provided to accompany or inform the ES. These may be more specifically related to the:
 - a. Evidence base;
 - b. Baseline data;
 - c. Assessment methodology; and
 - d. Mitigation / Enhancement / Commitments.
4. Present a draft Impacts Register, delivering proportionality for discussion and agreement with stakeholders.

Design Evolution Updates

AS presented the following changes to the red line boundary since PEIR:

1. Landfall – The southern landfall site (A4) had been chosen in favour of A3, as a result of various technical and public consultation considerations. For example, the emergency beach access to the northern landfall, could need to use Auburn Sands, where there is an existing café and car park for beach users. Similarly the main access to site A3 would potentially be restricted by needing to taking regular construction traffic over Fraisthorpe Bridge, in order to avoid taking any construction traffic through Fraisthorpe as requested by nearby landowners and the local community. AS also explained the project had now committed to using Horizontal Directional Drilling (HDD) (or other trenchless technology), as opposed to any open cut techniques, at the landfall. This was in response to consultation comments and concerns from stakeholders.

AP asked whether the project had spoken to the Coastal Protection Agency (ERYC).

Action 1 – AS to check with the offshore team that ERYC has been contacted in relation to the HDD of the chosen landfall site.

MM provided that if the landfall is in a ~~Safeguard Zone 2 area~~ Principle aquifer and there is a possibility of borehole abstraction, then it is possible that a risk

assessment may be required for abstraction. If the project needs to dewater the cable trenches which are going to be at a target depth of 1.2 m then it is possible that the project would need to apply for an abstraction license. **This also applies to areas which are Source Protection Zones 1 to 3.** MM also noted that there are site of contamination around the landfall.

[The text above in red has been updated as a result of comments on the meeting minutes from the Environment Agency on 2nd April 2020.]

AS responded that these had been identified in the Preliminary Land Quality Risk Assessment technical report and an assessment had been undertaken in the Geology and Ground Conditions Chapter.

Action 2 – AS to send MM a copy of the PEIR materials for him to review.

2. Onshore export cable corridor (ECC) – AS explained that many changes had also taken place along the cable route, again in response to landowner, local community and stakeholder feedback.
 - a. For example, the relocation of the logistics compound and associated access track north-east of York road roundabout away from areas at higher risk from surface water flood risk.
3. Onshore Substation access track (off of the A1079) – AS explained that in response to stakeholder feedback the access track had been moved away from Birkhill Wood ancient woodland, where it was previously adjacent to it. This access track would also be used to facilitate the construction of some of the onshore ECC and would also be made permanent. These changes were also as a result of consultation feedback received from local residents, land owners, and the local community who requested that construction traffic should not pass through Park Lane (and Cottingham).
 - a. Hornsea Four has also committed to a 'new' and 'existing' landscape boundary, as well as an area for an attenuation area within the onshore substation site. AS stated that these areas will be secured via the works plan.

AP stated that it would be preferable to design the permanent access track for the onshore substation in such a way that it does not impound or reduce the floodplain storage. For example, keeping it as close to existing ground levels as much as possible, or incorporating drainage to allow the water to flow in the same way across the floodplain would be preferable.

AP also stated that the south-eastern corner of the onshore substation (where the attenuation area would be located) is partially located in Flood Zone 3. As such Hornsea Four should be considering fluvial flood risk. AP questioned whether the attenuation area would reduce the floodplain capacity and storage. Additionally, AP questioned whether National Grid had given Hornsea Four the fluvial and surface water flood risk report, as the report incorporated

watercourses to the north of the onshore substation site, on which the EA does not hold information.

AS confirmed that the project was in the process of trying to obtain the data from National Grid and would keep on chasing them.

HW asked whether the study in the National Grid report was carried out in combination with the EA.

AP responded that National Grid had asked the EA to review the model but not the outputs. As there was no statutory requirement or permitting required, there was no formal process through which the EA was able to review the report. The model included surface water flood risk which the EA does not include in their flood mapping.

HW agreed that it would be helpful if Hornsea Four could obtain the National Grid modelling data as the differences between fluvial flood risk and surface water flood risk in this area are subtle and often inter-related.

Action 3 – Ørsted to continue to pursue obtaining the flood risk modelling data from National Grid.

4. 400 kV connection area – AS explained the area had been greatly reduced to the west and south of Creyke Beck, but that the Maximum Design Scenario (MDS) within this area, is still a 40 m wide permanent and 60 m temporary cable corridor with a maximum of 4 circuits.

Hornsea Four Update (AS)

AS then presented the Hornsea Four programme to DCO, where the project was in the process of review Section 42 consultation responses received, and technical specialists were updating assessments where appropriate. The project was simultaneously in the process of holding technical panel meetings, which would largely be concluded by December 2019 with a view to submitting the DCO application in Q1 2020.

Design Focus (Carr Lane Logistics Compound)

HW explained that in the case of the Carr Lane logistics compound, although alternative sites have been explored, it has not been possible to re-site this logistics compound outside of Flood Zone 2/3. Although many of the other compounds are located in Flood Zone 1, and the project has sought to relocate logistics compound as a result of flood risk, there are no suitable alternatives for siting this compound for this section of the onshore ECC.

AP mentioned that where logistics compounds are located in Flood Zone 3 Hornsea Four should aim to limit their use to be as temporary as possible during construction. Similarly, the use of storage mounds should be avoided, and the

project team should be aware of the nature of the risks at these sites in particular, and how to alleviate them.

HW followed that there will be measures in the Outline Code of Construction Practice in relation to appropriate stockpiling mitigation comprising timescales, dimensions, spacing, maintaining flow routes, requirements for pollution control, measures to secure materials and procedures in extreme events.

JC reinforced the importance of flood mitigation measures. He mentioned he had given Andy Acum a call about the flooding in the area at the time.

AS responded that we had received the message and the project was looking to get one of the technical teams out on site to understand the conditions they could face, although Winter working would be limited as much as possible.

AP asked whether stilts or the Environment Agency's withdrawn Pollution Prevention Guidance could be used, as although it is obsolete it is has not be replaced by anything better. ID noted that the principles set out in the withdrawn PPG would be followed where appropriate.

Design Focus (York Road)

HW stated that the York Road logistics compound was reviewed for potential flood risk and a surface water flood risk route was found to run through the proposed layout. As a result of this analysis the logistics compound was moved out of the surface water flood risk area. Additionally, AP_021 was also moved further north away from the same surface water flood risk route.

AP mentioned that it would be useful to note that when putting together site plans for these compounds the EA does not provide flood warning for surface water flood risk as the EA does not hold this information.

Design Focus (Access tracks)

In relation to AP_018, HW explained that the onshore ECC had been reviewed and that access tracks had been reviewed alongside the flood risk. Where the locations of the access tracks conflicted with flood zones, or where watercourses were located within 9 m buffer zones watercourses (and where possible, drains), the access tracks were reviewed and re-located. For example, AP_018 clashed with a ditch, so it has now been moved further south. This is all part of the iterative design process, to make sure that the various sources of flooding are considered.

HW continued that the access track for the onshore substation would be reviewed and again any updates to the flood risk assessment would be incorporated. HW questioned whether 9 m from ditches/ drains is an appropriate buffer.

AP responded that an 8 m buffer is sufficient for EA Main Rivers and 16 m from tidal rivers, to allow the EA maintenance access along the banks.

JC responded that 9 m is preferred for IDB drains, measured from either side of the bank or from the back of the defence, to allow access for the IDB.

AS stated that the project has committed to a minimum 9 m HDD set-back from all Ordinary Watercourses including IDB drains and 20 m from EA Main Rivers.

Key Section 42 Responses & Discussion

Impacts: Disruption of local land drainage (construction phase) & Alteration in run-off characteristics at the onshore substation (operational phase).

Section 42 comment - IDB suggested criteria for site drainage:

- Brownfield discharge 70% existing (or 140 l/s/ha)
- Greenfield discharge 1:1 or 1.4 l/s/ha
- Storage volume should accommodate a 1:30 year event with no discharge off the site in a 1:100year event
- 30% allowance for climate change
- Suitability of soakaways as a means of surface water disposal, should be ascertained in accordance with BRE Digest 365 or other approved methodology

HW explained that construction and operational onshore drainage strategy is set out in the Outline Onshore Infrastructure Drainage Strategy which will be updated again for DCO application. HW stated that East Riding of Yorkshire Council's (ERYCs) best practice guidance, which does not diverge from the IDBs guidance, will be followed, and greenfield run-off rates will be adhered to.

BS stated the greenfield discharge rate should be equivalent to approximately the 1 in 1 year runoff rate and that the IDB will be seeking the same as that set out in the ERYC guidance. The IDB generally work closely with ERYC by sending them suggested conditions which the developer in question should adhere to, therefore allowing the IDBs conditions to be discharged.

HW noted that an initial review of the greenfield runoff rates from the OnSS using the HR Wallingford method indicates that the flow would need to be restricted to approximately 1.4 l/s/ha. However guidance is usually that < 2 l/s/ha is technically difficult to achieve a self-cleansing system.

HW noted that the 1 in 1 year greenfield runoff rate is approximately 1.4 l/s/ha but this may vary depending on parts of the project being considered. However, the appropriate runoff rates will be properly calculated and agreed with ERYC.

Impact: Disruption of local land drainage (construction phase)

Section 42 comment: "Paragraph 4.3.3.2 confirms that all onshore ECC logistics compounds are located within Flood Zone 1. We support sequential approach to

their location, but compounds should also be assessed for flood risk from other sources. The FRA makes reference to other sources of flooding, which may be relevant in the siting of infrastructure and equipment."

HW confirmed that other sources of flood risk (above and beyond the flood zone data) were considered with the Onshore Infrastructure Flood Risk Assessment (FRA) in the PEIR and the siting of the onshore ECC logistics compounds. The risk from flooding, fluvial, surface water, groundwater, reservoir, sewer and other artificial sources were considered at PEIR, and any changes made as a result of the outputs of the PRA at PEIR (and otherwise) will be updated for ES.

AS stated that the project has made a Commitment to pre-construction and post-construction consultation with landowners, the Lead Local Flood Authority (LLFA), EA and IDB, where required.

BS explained that any new outfalls would need to be agreed with the LLFA.

AS acknowledged that these would need to be agreed with the relevant authority and landowners.

Impacts: Disruption of local land drainage (construction phase) & Alteration in run-off characteristics at the onshore substation (operational phase).

Section 42 comment: The Environment Agency suggested the following wording for Co64: *"Topsoil and subsoil will be stored in separate stockpiles in line with DEFRA 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PBL3298 or the latest relevant available guidance. Any suspected or confirmed contaminated soils will be appropriately separated, contained and tested before removal (if required). No material will be stockpiled within the floodplain of any main river. The floodplain refers to areas of Flood Zone 3 or 2, identified on the Environment Agency Flood Map for Planning."*

"The substation area is not covered by a recent and robust flood risk model. You may wish to undertake your own detailed modelling. We would recommend that this considers fluvial and surface water risks. Undertaking such a model would ensure that the development, given its sensitivity to flooding, could be designed with flood risk mitigated. If not undertaking detailed modelling, we would recommend utilising a freeboard about existing modelled and observed historic flood levels to ensure suitable mitigation is incorporated."

AP stated that the EA would not want materials to be stockpiled in Flood Zone 2 and 3 where possible.

HW noted that discussion in relation to stockpiling earlier in the meeting as part of the design changes are applicable here and will be included within the Outline Code of Construction Practice.

Action 4 – Ørsted to ensure that adequate measure in relation to stockpile and pollution prevention are provided in the Outline Code of Construction Practice, in consultation with the EA.

AP noted that the EA permitting process is specific to fluvial and tidal / coastal flood risk only. Other sources of flood risk are not subject to the EA permitting process.

ID responded that stockpiling in Flood Zone 2 and 3 would be avoided wherever possible, but that the areas are large therefore the project could not necessarily commit to not stockpiling at all in these areas.

AP responded that in relation to the onshore substation, setting aside there might be other information available from National Grid on the fluvial and surface water flood risk, freeboard is a way of mitigating the flood risk. Although the substation would be considered essential infrastructure, they might still need freeboard in order to alleviate the risk, in the absence of detailed modelling at this stage.

HW responded that the modelling information provided within the report does not appear to extend across the whole of the Hornsea Four onshore substation site. Hornsea Four would welcome a dialogue on what freeboard we could add on if modelling is not possible. HW asked what the EA would find acceptable, in order to ensure that we don't struggle to meet any requirements further down the line.

AP replied that it would be up to Hornsea Four to recommend and satisfy the EA that the freeboard they recommend is sufficient. Taking into consideration that there is better modelling information out there and that the site is subject to multiple sources of flood risk, he would be pushing for higher numbers, however, is also open to pragmatism. AP said he would be happy to take the conversation offline.

Action 5 – Ørsted conduct further work on the freeboard which is likely to be required at the onshore substation, if any, and to consult further with the EA.

Impacts: Disturbance of watercourses and minor drainage ditches (construction phase) & Access across watercourses and minor drainage ditches (construction phase).

Section 42 comment: *"It would be useful to clarify if the statement made in paragraph 8.1.1.4 applies in any 'main river' locations. Commitment No. 01 in the register states that where crossings on 'ordinary watercourses' require open cut methods, the flow in the watercourse will be maintained. We have taken this to mean that 'main rivers' will not be "temporarily dammed and/or rerouted." This could be clarified."*

ID clarified that Main River and IDB maintained drains would not be dammed or re-routed. These would be crossed using HDD or alternative trenchless

techniques, and there would be no direct interaction with these watercourses. Smaller Ordinary Watercourses (excluding IDB drains) would be crossed using temporary coffer dams, and appropriate measures to maintain flows would be implemented (e.g. pumps, pipes or flumes, depending upon the required flow rate).

BS stated that the IDB may have concerns about damming any watercourses, not just IDB drains and Main Rivers, especially when water levels are high.

HW responded that the project could look into safety procedures i.e. to remove the cofferdam in an emergency. During construction there would be a process in place to over-pump or re-route excess water. These procedures will be set out within the Construction Method Statement and the measures also included within the Outline Code of Construction Practice, where appropriate.

Action 6 – Hornsea Four to ensure any appropriate measures in relation to the damming of watercourses are provided in the Outline Code of Construction Practice.

MM asked how deep the HDD would be and what the risk of a bentonite breakout would be. Would the project check the volume of bentonite being used etc?

AS responded that Hornsea Four has committed to creating a bentonite breakout plan and agreeing it with the relevant authorities. Any specific requirements would be secured via the outline plan which would be provided at DCO application.

Action 7 – Hornsea Four to ensure that provisions in relation to bentonite breakouts are included in the Outline Code of Construction Practice.

MM responded that he was not sure whether the EA has any specific requirements but he would check.

BS asked where the water for the HDDs would be supplied from.

AS said that she would take this away and provide a response.

MM also mentioned that Hornsea Four would perhaps need to speak to Yorkshire Water in relation to the need to ~~obtain a water abstraction license~~ **use mains water**.

[The text above in red has been updated as a result of comments on the meeting minutes from the Environment Agency on 2nd April 2020.]

Action 8 – AS to provide further response on where water for HDDs might need to be sourced from.

Impacts: Disturbance of watercourses and minor drainage ditches (construction) & Access across watercourses and minor drainage ditches (construction).

Section 42 comment: *"Whilst the commitment to follow CIRIA's best practise for culvert installation will help to reduce the adverse impacts of culvert installation, we maintain that it would be more beneficial to use clear span bridge crossings to temporarily cross watercourses. As such, we propose that, for all proposed temporary crossings of main rivers, a commitment to use clear span bridges should be added to the Commitment Register and included within Requirement 16 of the DCO."*

ID stated that the use of temporary culverts to allow the access track to cross watercourses would be minimised where possible, with stop ends being used where alternative access arrangements could be provided.

AS added that the project does not propose to culvert any EA Main Rivers, indeed we have tried to avoid the intended use of Bailey Bridges as much as possible. However, there do still remain two potential locations where temporary bridges (i.e. bailey or clear-span bridges) may be required during construction.

AP responded that it would be good to know where these locations are, so that he can start thinking about them.

Action 9 - AS to provide the locations of where the project may need use clear-span / bailey bridges across EA Main Rivers again. They are located in the crossing schedule provided at PEIR.

Impacts: Disturbance of watercourses and minor drainage ditches (construction) & Access across watercourses and minor drainage ditches (construction) (2)

Section 42 comment: *"We will expect to see that alternatives have been fully considered before accepting any culverts over 'main rivers.' There is currently insufficient information for us to accept the culverting of any 'main river' watercourse. Each location will need to be reviewed against flood risk and environmental concerns. These will need to be constructed to prevent obstructing flow."*

ID stated that the use of temporary culverts to allow the access track to cross watercourses would be restricted to smaller Ordinary Watercourses, with no culverts proposed for EA Main Rivers.

Action 10 - AS to provide information on the areas where the project proposes to take access tracks and where we are also intending to use HDD (or other trenchless technologies) i.e. in the crossing schedule.

Impacts: Disturbance of watercourses and minor drainage ditches (construction phase); Access across watercourses and minor drainage ditches (construction phase) & Disruption of local land drainage (Construction phase).

Section 42 comment: *"A qualifying statement, detailing that no permanent or temporary structures will be installed on water bodies that are due to be crossed by HDD techniques, should be added to Co172."*

"We have identified access concerns for the crossing of the River Hull (Ørsted ref. ECC_WA_140) and Watton Beck (Ørsted ref. ECC_WA_173), which will require specifics to be agreed during and on completion of construction works."

"We have particular concerns with respect to the plans to cross Watton Beck. The riverbank and flood defences in this location are part of an ongoing assessment. Future works will be required to repair and/or replace those flood defences, and we will require further dialogue with the applicant to understand any implications of the pipeline being installed."

ID stated that the project had committed to avoid all activities within 9 m of Ordinary Watercourses and 20 m of Main Rivers, and asked for further clarification regarding the Environment Agency's specific concerns regarding Watton Beck.

AP responded that there is a requirement to carry out maintenance and improvement works to the existing flood defences on Watton Beck near the proposed cable crossing. The Environment Agency are planning to repair and improve the earth embankment, which is affected by settlement, and may require piling to deliver maximum stability. A similar project to Hornsea Four had in the past taken control of the banks of the river, meaning that the EA were not able to access the reach where the High Voltage (HV) cable crossing was located. The Environment Agency therefore need to understand what protections they might need from Ørsted if they would like to carry out these works, particularly with regards to piling which is unlikely to be feasible adjacent to the HV cable.

AP added that a potential solution could be for Ørsted to undertake some of the works on behalf of the Environment Agency, or provide some contribution towards it, prior to cable installation. It would however, be preferable if Hornsea Four could commit to unimpeded access. AP stated that the asset and estates teams and himself were all talking to each other, but it might be best to take the conversation offline.

AS agreed to hold further discussions with the EA asset management and estates teams.

Action 11 – AS to organise separate meeting with EA to discuss their concerns around anticipated future works etc with the asset management and estates teams at the EA.

Impacts: *Impacts associated with the decommissioning of the Hornsea Four substation (decommissioning phase).*

Section 42 comment: *"The site should be restored to its pre-development condition (including ground levels), unless an up to date assessment of flood risk at*

the time of decommissioning demonstrates that an alternative is appropriate. Opportunities to contribute to the overall reduction in flood risk should be considered."

AS confirmed that all above ground infrastructure for the project would be removed, but that the cables would be left in situ unless there was a specific reason and if it made environmental sense.

JC noted that it would be preferable to remove all above ground structures during decommissioning.

HW added that being an undefended area, the surface water attenuation area could potentially be retained as a contribution towards flood risk betterment.

JC mentioned the use of HDD would hopefully remove any effects from settlement and therefore it is not anticipated, as sometimes occurs when cables are buried under roads that settlement might occur over time (e.g. as a result of collapsing ducting). However, it would still be useful for the project to bear this in mind.

BS asked that it would be useful to know whether the project is likely to use copper or aluminium. Aluminium is less desirable, but otherwise the project might find that people try and get the copper out of the ducts.

Section 42 comments: Biodiversity enhancement

Section 42 comment: *"In line with the Humber RBMP, we recommend that the proposed development is used as an opportunity to restore more natural processes to the watercourses that it crosses/impacts, via the delivery of enhancement measures. For HMWBs, the provision of biodiversity net gain (enhancement) would be best achieved through the delivery of WFD mitigation measures (we can supply these on request). This would offer a significant environmental gain."*

ID stated that, because of the nature of the Development Consent Order, direct enhancements could only be implemented within the project red line boundary. This means that any direct contributions towards the implementation of WFD mitigation measures or the enhancement of river habitats would be limited to the crossing locations, and as such may not deliver significant benefits in the longer term. Alternative mechanisms to contribute towards wider improvements may be feasible, however.

LG stated that she would take away and ask about potential enhancement opportunities.

BS mentioned that could be opportunities to create habitat for water voles and otters.

AP said that if culverts and bridges are in place for 2 – 3 years, there could be an opportunity to have enhancement in place for that period of time.

BS also mentioned that crayfish and sea lamprey are under pressure from disease and other habitat issues in the area, and therefore we might want to consider these in our biodiversity enhancement.

Action 12 - AS stated that she would follow this up with the Yorkshire Wildlife Trust to investigate whether there were any opportunities. These discussions would also be reflected in the Onshore Ecology and Nature Conservation Chapter where appropriate.

'Impacts and Effects Register' and Proportionality

Hornsea Four proposed to scoping the following impacts out of further assessment in the Environmental Statement:

Impact	Hornsea Four position at PEIR	Hornsea Four position at ES	Stakeholder response in technical panel meeting
Disturbance of watercourses Construction phase (HFR-C-1)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Access across watercourses: Construction phase (HFR-C-2)	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Disturbance of minor drainage ditches: Construction phase (HFR-C-3)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Access across minor drainage ditches: Construction phase (HFR-C-4)	Simple Assessment	Not considered in detail in the ES. No likely significant effect identified at PEIR	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Disruption of local land drainage: Construction phase (HFR-C-5)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Changes in water quality: Construction phase (HFR-C-6)	Scoped out	Not considered in detail in the ES. No likely significant	EA and IDB agreed with the 'Hornsea

Impact	Hornsea Four position at PEIR	Hornsea Four position at ES	Stakeholder response in technical panel meeting
		effect identified at Scoping	Four proposed position at ES'.
Mobilisation of pollutants in the event of disturbance of contaminated soils: Construction phase (HFR-C-8)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Hydrological and water quality effects on designated sites: Construction phase (HFR-C-12)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Alteration in run-off characteristics at substation site: Operation phase (HFR-C-7)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Thermal impacts on water resources: operational phase (HFR-C-13)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Impacts associated with operation: Operation phase (HFR-C-11)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Impacts associated with decommissioning of the cable route: Decommissioning phase (HFR-C-9)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.
Impacts associated with the decommissioning of the Hornsea Four substation: Decommissioning phase (HFR-D-10)	Scoped out	Not considered in detail in the ES. No likely significant effect identified at Scoping	EA and IDB agreed with the 'Hornsea Four proposed position at ES'.

AS explained the following:

The key tools for delivering proportionality in the EIA:

1. Impact Register;

Impacts that are judged to be not significant or of minor significance at the Scoping stage of the EIA were “Scoped Out” of further assessment (assuming agreement with stakeholders).

Impacts that were assessed within the PEIR and conclude no LSE will be updated within the Impacts Register to “Not considered in detail in the ES. No likely significant effect identified at PEIR”. It should be noted that the project has moved away from the term “Scoped Out” since it is a very loaded term. We will maintain Scoped Out for those impacts Scoped Out at the Scoping stage only as confirmed in the Secretary of State’s Scoping Opinion.

Where assessments have concluded “No LSE” at PEIR and there is:

- No change in;
- Project description affecting the assessment
- Baseline environment data affecting the assessment
- Change in assessment methodology
- No disagreement/agreement with stakeholders as per their S42 response

The impact register can be updated to state “**Not considered in detail in the ES. No likely significant effect identified at PEIR**”

2. Commitment Register – which is used to secure all the mitigation from the assessment provided in the PEIR.

To this end, AS stated that no impact assessments would be provided in the Hydrology and Flood Risk Chapter in the ES.

LG stated that she couldn’t foresee any issues with this.

(No other disagreement was expressed to this point during the meeting).

AOB

AS asked about the process by which Hornsea Four could seek to disapply the 2016 Environmental Permitting Regulations, and what information would be required.

AP responded that he would speak to legal about the timescale involved. The idea of the template for the Protective Provisions is that using these would speed up the process. The Protective Provision, for example, referred to the ‘drainage authority’ which could be considered confusing, and therefore it would be preferable for the template for the Protective Provision to be used. He stated that there are obvious advantages of going down the disapplication route rather

than relying on the DCO, as it is likely to be cheaper and easier to obtain any flood risk permits through the DCO. The Environment Agency said that it would still take 8 weeks to process the permits, however, the process was intended to make is simpler and easier for the Applicants. The idea is that the disapplication would take up to 8 weeks within the decision-making period, whereas if the permitting process were to take place after the DCO had consent, this has the potential to delay programme.

HW offered that this would probably depend on how many there were and whether there were any relevant exclusions and exemptions.

AP responded that if the project is able to fit the permits under exclusion or exemptions this would be faster. Whereas bespoke permits e.g. River Hull would likely take up to the full 8 weeks.

AP asked the following additional questions:

1. Could the HDD entry and exit pits be location a minimum of 20 m from main rivers and flood defences?

AS responded that this Commitment had now been approved by technical.

2. Could Hornsea Four commit to a minimum of 1.2 m clearance below the hard bed of EA watercourse or the landward toe of the flood defence, whatever comes first?

AS responded that this shouldn't be an issue, but these Commitments were getting signed off by the technical team. She stated that she would send them to the EA via email over the next couple of weeks.

Action 13 – AS to confirm updated Commitments to the EA once signed off internally.

AS finally asked for the panels thoughts on proportionality.

AP responded that there was still a large amount of information to get to grips with, and it was still quite hard to find some of the information. However, the Commitment Register was quite useful.

JC mentioned that the Cottingham consultation event was the day after the Section 42 response deadline, and it would be have been more useful to hold the consultation event more in advance of the end of consultation.

Summary of Actions:

Action Number	Action	Responsible
1	AS to check with the offshore team that ERYC has been contacted in relation to the HDD of the chosen landfall site.	AS
2	AS to send MM a copy of the PEIR materials for him to review.	AS
3	Ørsted to continue to pursue obtaining the flood risk modelling data from National Grid.	AS
4	Ørsted to ensure that adequate measure in relation to stockpile and pollution prevention are provided in the Outline Code of Construction Practice, in consultation with the EA.	AS
5	Ørsted conduct further work on the freeboard which is likely to be required at the onshore substation, if any, and to consult further with the EA.	AS
6	Hornsea Four to ensure any appropriate measures in relation to the damming of watercourses are provided in the Outline Code of Construction Practice.	AS
7	Hornsea Four to ensure that provisions in relation to bentonite breakouts are included in the Outline Code of Construction Practice.	AS
8	AS to provide further response on where water for HDDs might need to be sourced from.	AS
9	AS to provide the locations of where the project may need use clear-span / bailey bridges across EA Main Rivers again. They are located in the crossing schedule provided at PEIR.	AS
10	AS to provide information on the areas where the project proposes to take access tracks and where we are also intending to use HDD (or other trenchless technologies) i.e. in the crossing schedule.	AS
11	AS to organise separate meeting with EA to discuss their concerns around anticipated future works etc with the asset management and estates teams at the EA.	AS
12	AS to follow up with the Yorkshire Wildlife Trust to investigate whether there were any other opportunities for enhancement.	AS
13	AS to confirm updated Commitments to the EA once signed off internally.	AS

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk EA Technical Panel Meeting 6 – Post-PEIR / Pre-DCO	5 February 2020
Meeting Date	5 February 2020	
Place	Environment Agency, Foss House, York	
Participants	<p>██████████ (Ørsted); ██████████ (Technical) (Ørsted); ██████████ – Royal HaskoningDHV (RHDHV) (Hydrologist); ██████████ – Environment Agency (EA); ██████████ – (EA); ██████████ – (Groundwater Specialist, EA); ██████████ – (Partnerships, EA); ██████████ – (Catchment Advisor, EA); ██████████ – EA; and ██████████ (Asset Performance, EA).</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk EA TP Meeting #6
Absent	EA legal; ██████████ (RHDHV).	
Copy	██████████, Claire Smith (RHDHV); ██████████ (RHDHV).	
Next meeting	TBC	

Agenda

1. Welcome and Safety Briefing
2. Introductions
3. Programme Update
4. Watton Beck
5. Additional opportunities for enhancement
6. Updated Commitments
7. DCO – Section 42 Comments
8. Disapplication of the 2016 Environmental Permitting Regulations
9. The Rider
10. Abstraction and Dewatering
11. Statement of Common Ground (SoCG)
12. Any other business (AOB)

Meeting Notes

Aims & Objectives:

AS presented the following aims and objectives for the meeting:

1. Programme Update – update on the latest programme;
2. Watton Beck – discussion around EA Section 42 comments relating to concerns at Watton Beck;
3. Enhancement – to discuss any additional opportunities for enhancement, as raised in the EA Section 42 comments.

Programme Update

AS provided the following update on the programme:

- Since the close of consultation Hornsea Four had been reviewing and addressing the consultation responses in the assessments (where appropriate) and Chapters (and other documents, as relevant).
- A series of workshop were then held with stakeholders to discuss Section 42 comments or how and where they have been/ or haven't been addressed, as appropriate.
- An additional consultation would now be held during February, so stakeholders can expect to received documentation relating to this.
- The plan is then to spend Q1 and Q2 meeting with stakeholders to draft Statement of Common Ground (SoCG) documents;
- Lastly, DCO Submission has been extended by 6 months, with the new submission date in September 2020. This is largely due to the uncertainties in the current landscaping in relation the Hornsea Project Three derogation case, and to be able to incorporate the outcomes from the Hornsea Project Three decision.

AB asked when construction would be due to start.

AS responded that the earliest possible construction start date would be August 2024. However, this assumes that Hornsea Four obtains consent, and as well as winning a Contract for Difference in an upcoming auction round. Therefore, this is very much a best-case scenario.

AB also asked whether the construction of the project would be linear.

JB responded that the construction of the project would be very much linear. The contractor would generally take control of the whole onshore export cable corridor (ECC) and start by carrying out preparation works along the entirety. The preparation of the entire onshore area would generally take place at the beginning, and the contractors would ideally move down route excavating the trenches, and installing the ducts and backfilling.

AS also reinforced that we have committed to ducting as project which should be a better construction method, as it will be quicker and should mean that any

trenches would be open for shorter periods of time, which would be particularly helpful in Winter.

JB explained that the timescale involved in ducting would be much more compact, which shorter lengths of open trenches being left open at any one time.

AP clarified for the benefit of those not involved in the evidence plan process that all EA Main River are going to be crossed by Horizontal Directional Drilling (HDD) (or other trenchless technology), and that Hornsea Four had committed to setting back the entry and exit pits at least 20 m from EA Main Rivers.

AS said that although we will come on to it later, the project had committed to the EAs suggested consultation wording at that the 20 m would be measured from the banks of the river in question, or the landward toe of the flood defences, whatever comes first.

Watton Beck

Section 42 Comment:

- *"Would there be any constraints on size of plant that can be used to place embankment fill above or near the pipeline?"*
- *Will there be any constraints on the rate at which fill can be placed?"*
- *What distance from the cable would concerns be extended?"*
- *Would any permits, consents or permissions be required once the pipeline is in place? What consultation would be required for future works?"*

AB explained that Watton Beck, Scurf Dike, Foston Beck and West Beck all have 'formal' flood defences along the banks. In all cases the watercourses have soft embankments, which are in various states of repair, but often not in too great a state of repair. Watton Beck is particularly troublesome and is of highest concern to the Agency as the EA needs to rebuild the banks, as it has steep and high crests, which are hard to access for maintenance. The EA is considering sheet piling to improve the embankments. He therefore questioned what the situation would be if the EA hadn't already completed the works by the time Hornsea Four comes to construction, or even after construction. For instance, would there be any restrictions within cable corridor, and would this make it more expensive for the EA. Or would a certain distance/ level of cover need to be maintained over the cable. The EA would be looking to work together with Hornsea Four and develop an approach together with the project.

AB continued that under current schemes, there is no funding currently to carry out these works. Ideally the Environment Agency would like to get in first to carry out any works needed. However, if it not possible to sustain or keep up maintenance of the asset in the long term, then it would be returned to marsh and wetlands. If this was the case then, would the Hornsea Four cables be able to cope with the land returning to marshland?

JB responded that if the adjacent land were to be returned to marsh or wetland this would not be ideal for the cables. If land is flooded the land could become unstable and the cables could end up re-surfacing or floating.

EM continued that there is an ongoing study in the wider area, and a specific study is being undertaken at Watton Beck. The aim of the studies are to provide a long list of the potential options by the end of the financial year. After which the options will be appraised and ranked – this will need to include costs.

AB asked whether there would be an excess of material from construction, to remove from the site.

JB responded that there wouldn't be, as all materials would be put back in to the trenches.

AB then asked whether Hornsea Four had any site investigations along the route, as it would be good for any site investigations to be shared between the EA and the project, if either party obtain any site information.

JB responded that we do not have any site investigations information at this stage, as this would usually be obtained during the pre-construction phase of the project. For example, borehole data to understand ground conditions, would usually be obtained prior to construction to inform the detailed design of the HDD and cables. We can happily share this data with the Environment Agency when the time comes.

JB stated that the preference, if there is piling, would be for the piling to taken place first in order to reduce the risk for the EA to be piling on top of the cables. Piling would be a health and safety issue, as if it goes wrong there the fallout would be high risk and damage, when considering the high voltage nature of the cables. During construction the cable route would be under CDM regulations, and as such the contractor would have full jurisdiction over the site, largely due the health and safety around constructing with high voltage cables. Under CDM regulations the contractor would likely have a permit system in place, and the Temporary Works design would need to be signed off by the Contractor, as piling around the high voltage cables has the potential to be very dangerous. This would require forethought and advance planning for enabling access, to approve designs and Risk Assessment Method Statements. As such it would be good to understand in the early stages the estimated depth of the piles, so that the contractors can get the clearance depth they need and to design appropriately. JB went on to explain that the transmission assets i.e. the on- and offshore cables, offshore substation and onshore substation is sold to an Offshore Transmission Owner (OFTO), which is a requirement. There are four or five in the UK, which Orsted could in theory sell the transmission asset to.

AS stated that any agreements made between Hornsea Four and other parties would be transferred to the OFTO where relevant. During the handover process the OFTO usually scrutinise these agreements along with a whole host of other details, and will question the project on these.

EM questioned whether the EA would need to negotiate in the future, on any future works.

JB stated that building anything on top of the consented export cable corridor would not be permitted without the owners consent. Once the design is fixed, there could be concerns about the depth of the cables.

AA stated that the ground is generally peaty, so the piles would need to get quite deep.

AA and JB agreed that from the discussion it is becoming clear that the preference would be for the EA works to be carried out first if the construction schedules allow.

AA asked what the lifespan of the project would be.

AS responded that the project would lifespan would be for 35 years.

AA responded that 35 years does fit with the EA timescales, as the flood defences works which are conducted are built to last 50 years.

AB went on to show that the river system around Watton Beck is particularly complex, with adjacent drains and ditches which all sit at different levels. As such would be possible to maintain 1.2 m clearance for all of the watercourses and to drill under all of them at the same time.

JB explained that this may be possible as the design of an HDD would look to incorporate all existing obstacles and potential new works, where practicable.

AP suggested that in light of the discussion that Commitment 18 (Co18) is updated to specifically name 'embanked watercourses' along with 'SSSIs, groundwater SPZs etc.'

AS responded that she didn't see an issue with this and would look to get the updated wording signed-off internally.

AA explained that there would generally be a glacial till, and peat, underneath the river system.

JB responded that chalk and clay are generally best for the cable, peat is not desirable, but it is possible to HDD under peat.

Additional opportunities for enhancement

Section 42 Comment:

"For a development of this size we would not only expect embedded mitigation to offset any adverse environmental impacts, but also a commitment to environmental enhancement that is commensurate to the scale of the scheme. In line with the Humber RBMP, we recommend that the proposed development is used as an opportunity to restore more natural processes to the watercourses that it crosses/impacts, via the delivery of enhancement measures. For HMWBs, the provision of biodiversity net gain (enhancement) would be best achieved through the delivery of WFD mitigation measures (we can supply these on request). This would offer a significant environmental gain."

LG confirmed that she had a meeting the next day with the team who would be able to provide more information on any enhancement initiatives that project could get involved in. She would then feed back with any guidance which is provided, for example there might be opportunities on the River Hull Headwaters Restoration Project.

Action 1 – LG to speak to the wider team about enhancement initiatives and then feed this back to Hornsea Four for further consideration.

Abstraction and Dewatering

MM explained that the dewatering limits would be measured according to the principle aquifer and Source Protection Zones (SPZ) 3 and 1. Therefore based on the on the areas that the onshore route was crossing the EA are happy to split the onshore route in to three parts for licensing, based on this.

RB explained the following in relation to the abstraction/ dewatering licences:

- The project would need to know how much water would need to be dewatered on any given day within a zone to see whether a licence would be needed;
- Then the EA would check whether the project was below the daily limit each day, for then whether the duration of the activity is going to be more than 6 months. If the project knows that the activity will take longer than 6 months in any one of the three zones at the beginning of construction, then a licence would need to be obtained prior to construction, rather than applying at the 6 month mark;
- Abstraction licence may be required to facilitate dewatering;
- Usually a Hydrogeological Impact Assessment (HIA) (undertaken by the project) would be required to inform the licence and the licence takes 4 months, therefore pre-planning is required, and we may want to think about starting the process as soon as possible (depending on when construction is due to start);
- To abstract and dewater outside of Order Limits a transfer or full licence is likely to be required. There is a difference in price, but a transfer licence

would probably be more applicable to the project. Among other things the transfer licence is not for long term use;

- Abstraction and dewatering licences still currently sit outside of the 2016 Environmental Permitting Regulations (EPR), and so can not be disapplied and wrapped up in the DCO;
- The EA are happy to define ' the Operation' the project, split in to the three zones based on the principle aquifer and SPZ;
- Once the Hornsea Four hydrogeologist is in board, then they can state if they want to follow the three suggested areas for the licences, or whether they want to use a different approach for use in the Hydrogeological Impact Assessment. It is open to interpretation, as the EA are just looking for a sensible approach; and
- For a Transfer licence there wouldn't necessarily be an upper limit to the volume/ amount, but the licence would be apply to where the project wants to transfer water from one source to another transfer the water from one source to another.

AP explained that the asset team were concerned about Watton Beck and Scurf Dike, and whether there could be issues with getting the appropriate clearance between the piles and the Hornsea Four cables as the flood defences will be pushed down in to the groundwater which may be pushing upwards.

RB responded that the level of the groundwater could be completely site specific and would depend on the deposits. The site-specific information would information how deep the piles and cables should be. For example, if you were to clip the tom of the chalk then you could get more water than you would bargain for.

Updated Commitments

AS presented the updated wording for the Commitments that the EA commented on during the Section 42 Consultation.

AP and LG confirmed that they were both happy with the updated wording.

AS stated that the project had not incorporated the suggested "xx years' as suggested by the EA, as any decommissioning plan would be subject to the latest relevant guidance and policy at the time.

AP asked whether it would be possible to include a limit within which the project would be required to carry out any activities which might require any flood risk permits.

AS responded that this would be unlikely as we do not yet know whether any flood risk permits may be required.

AP then asked whether it might be possible to include wording in the Commitment that the decommissioning would take place in a 'timely manner' as

the 2016 EPR uses similar wording. This would just ensure that any related activities do not take an unnecessarily amount of time.

AS said that she couldn't foresee an issue with the wording, and would look to get this signed off by the project and confirm the wording with the EA.

Action 2 – Hornsea Four to consider whether 'timely manner can be included in Co127' and provide response back to the EA.

AP also responded that the red text '*There will be no loss in cross-sectional area to EA Main Rivers*' as the commitment does not relate to EA Main Rivers.

DCO – Section 42 Comments (Protective Provisions)

Section 42 Comment:

"This part of the DCO references "sea defences." It is important to distinguish that sea defences maintained by the Coastal Protection Authority and/or those that have a primary purpose of coastal erosion protection may require the consent of the Coastal Protection Authority, and not the Environment Agency. "Sea defences" can also refer to defences that have the primary purpose of preventing the inundation of land by the sea. This is particularly important, as Schedule 9 Part 5 refers to the protections afforded to "drainage authorities" including the Environment Agency. However, the consent of the Coastal Protection Authority (East Riding of Yorkshire Council) may be required for works on certain sea defences.

The following is the definition of "sea defence", taken from the 2016 Environmental Permitting Regulations:

"sea defence" includes any bank, wall, embankment (and any berm, counterwall or cross-wall connected to any such bank, wall or embankment), barrier, tidal sluice and other defence, whether natural or artificial, against the inundation of land by sea water or tidal water, including natural or artificial high ground which forms part of or makes a contribution to the efficiency of the defences of the regulator's area against flooding, but excludes any sea defence works which are for the time being maintained by a coast protection authority under the provisions of the Coast Protection Act 1949(9) or by any local authority or any navigation, harbour or conservancy authority. Under point 3 (3) (c), we suggest the addition of the word 'flooding,' after 'prevention of' and before 'pollution'.

In relation to Schedule 9, Part 5 AP highlighted that the project would need to get consent from the East Riding of Yorkshire Council as they are the Coastal Protection Authority (i.e. Neil McGoughlin) for the section of coastline the project is proposing to cross. He also confirmed that "drainage authority" means –

- (a) In relation to an Ordinary watercourses, the drainage board concerned within the meaning of Section 23 of the Land Drainage Act 1991; and

(b) In relation to a main river or any sea defence work, the EA which is under the EA jurisdiction. But the sea defence element does not apply to the EA in the case.

AP also stated that in relation to Section 3(3)(c) the suggested wording would be *"for the protection of water resources for the prevention of flooding, pollution or in the discharge of environmental duties."*

Action 3 – Hornsea Four to take APs suggestion along with any comment from the EAs legal team and provide a response to the EA on whether the updates can be included in the DCO.

Disapplication of the 2016 Environmental Permitting Regulations

AS questioned whether the EA is happy for Hornsea Four to disapply the 2016 Environmental Permitting Regulations, and whether they require any further information to information already provided, for example, the information in the onshore Crossing Schedule.

LG explained that they have a template (i.e the Protective Provision), and the template is provided to make it easier. If the project would like to make any changes to the Protective Provision template then the EAs legal team would need to see them again.

AP explained the following in relation to the disapplying the 2016 Environmental Permitting Regulations:

- Information and specific crossing points – the EA want assurance that a solution can be reached, and that they would like some security in particular for locations where they have concerns e.g. Watton Beck and Scurf Dike.
 - AP stated that he would speak to EM about any other watercourse which they might want to flag as a concern to the project;
 - Foston and West Beck are also of concern, but not at the same level as Watton Beck. AP suggested that maybe the best way the project could provide some security on these specific sites, is through the SoCG, which can then linked to the Commitments by naming the specific watercourses.

Action 4 - AS suggested that the new suggested 'embanked watercourse' wording in Co18 was surely more broad and encompassing than naming specific watercourses in the Commitment.

Action 5 - AP said he would take this away and confirm with the rest of team.

AP also confirmed that disapplication is weighted to give automatic consent if the EA do not meet their 8 week decision timeframes, rather than giving automatic refusal (as within the 2016 Environmental Permitting Regulations).

The Rider

Suggested wording for the Hornsea Four DCO:

"Application and modification of legislative provisions 6. ...

(c) the Environmental Permitting (England and Wales) Regulations 2016, to the extent that they require a permit for anything that would have required consent made under section 109 of the Water Resources Act 1991 immediately before the repeal of that section;

(d) the provisions of any byelaws made under, or having effect as if made under, paragraphs 5, 6 or 6A of Schedule 25 of the Water Resources Act 1991 that require consent or approval for the carrying out of works;

(e) section 23 of the Land Drainage Act 1991 (prohibition of obstructions etc. in watercourses); and

(f) the provisions of any byelaws made under section 66 of the Land Drainage Act 1991 (powers to make byelaws) that require consent or approval for the carrying out of works."

AS asked whether the draft Rider wording provided was satisfactory, and whether the legal team had been able to review the wording.

Action 6 - LG confirmed that the legal team had not had a chance to review the Rider, due to maternity leave, as that she would continue to ask any additional feedback.

AS asked whether the EA would like to see the updated Rider and PP prior to DCO Submission.

LG confirmed that this would be preferable, as the updated PP and Rider is likely to be all that is required to disapply the 2016 EPR. Once the EA are able to confirm the updated wording they would be able to confirm that Hornsea Four can disapply.

AP suggested that removing the last part of point 6(c) – *"to the extent that they require a permit for anything that would have required consent made under section 109 of the Water Resources Act 1991 immediately before the repeal of that section."* as the 2016 regulations supercedes the Water Resources Act 1991. Similarly point 6(e) can also be removed – *"section 23 of the Land Drainage Act 1991 (prohibition of obstructions etc. in watercourses)"*, along with any references to the Land Drainage Act 1991, as it is also superceded by the 2016 EPR.

AP explained that the Water Resources Act states that consent would be needed within 8 m of tidal watercourses, however, this would updated to 16 m when it was superceded by the 2016 EPR.

Action 7 - AS confirmed that she would relay this to legal, along with any comments from the EAs legal team, before providing an update back to the EA.

Statement of Common Ground (SoCG)

AS showed the Hornsea Four template for the SoCG and explained the process that would be taken in it's initial drafting. AS explained that she would the meeting minutes which would form the basis of the statements and/or positions which would feed in to the SoCG. AS asked how the EA would like the process to work.

AS, AP and LG agreed the following initial process for the SoCG:

- The initial draft would be sent to the EA at the beginning of April, for the first SoCG meeting to discuss comments and updates to the first draft at the end of April. This would allow the EA time to review the first draft, as one week at the beginning of April would be taken up by the Easter holidays.
- The EA would send through any tracked changes/ comments back to AS, one week prior to the meeting so that AS would have some time to review and get any responses internally, if required.
- AS confirmed that she would follow up, setting out a small programme.

Action 8 – AS to send programme for SoCG to EA.

AOB

AS stated that Hornsea Fours hydrologist was not able to attend this meeting, but that she was reviewing the flood risk modelling report from National Grid and a specific meeting could be set up with AP if needed.

AP responded that he would be happy to assist on another call if required. He reinforced that 600 m freeboard would be a good place to state and that the project could work down from there. However, Hornsea Four comes to the conclusion that a Commitment to 300 mm freeboard is sufficient then it would need to be justified.

AP stated that the eastern area of the site was covered by the National Grid report.

AS clarified that the area in question was the 400 kV National Grid Electricity Transmission connection area, rather than the substation site.

AP explained that he had conducted an exercise where he georeferenced the report with the onshore substation site, using the outputs from the National Grid report. He explained that what had jumped out was that there are some high flood depths, which would indicate that freeboard would be useful for construction.

Action 9 - ID confirmed that he would take this away to Helena and that the project would provide a response and justification back to the EA on the appropriate freeboard at the proposed onshore substation site.

Summary of Actions:

Action Number	Action	Responsible
1	LG to speak to the wider team about enhancement initiatives and then feed this back to Hornsea Four for further consideration.	LG (EA)
2	Hornsea Four to consider whether 'timely manner' can be included in Co127 and provide response back to the EA.	AS
3	Hornsea Four to take APs suggestion along with any comment from the EAs legal team and provide a response to the EA on whether the updates can be included in the DCO.	AS
4	Hornsea Four to consider whether 'embanked watercourse' can be included in Co18 and provide response back to the EA.	AS
5	AP to provide response on whether the inclusion of 'embanked watercourse' in Co18 is still considered to be sufficient.	AP (EA)
6	LG to provide response from the EA team on whether they have any further comments on the Rider and whether any more is required from the Hornsea Four to facilitate the disapplication of the 2016 Environmental Permitting Regulations.	LG (EA)
7	AS to relay APs comments on the removal of reference to the Land Drainage Action 1991 within the Rider, along with any comments from the EAs legal team, before providing the updated relevant documentation back to the EA prior to submission.	AS
8	AS to send programme for SoCG to EA.	AS
9	The project is to provide a response and justification back to the EA on the appropriate freeboard at the proposed onshore substation site.	AS

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Water and Flood Risk EA Technical Panel Meeting 7 – Post-PEIR / Pre-DCO	15 May 2020
Meeting Date	15 May 2020	
Place	via Skype	
Participants	<p>██████████ (Ørsted);</p> <p>██████████ Royal HaskoningDHV (RHDHV) (Flood Risk Specialist);</p> <p>██████████ – RHDHV (EIA chapter lead);</p> <p>██████████ – Environment Agency (EA);</p> <p>██████████ – (EA);</p> <p>██████████ – (Groundwater Specialist, EA).</p>	Our ref. Hornsea Four EP Onshore Water & Flood Risk EA TP Meeting #7
Absent	n/a	
Copy	██████████, Claire Smith (RHDHV).	
Next meeting	TBC	

Agenda

1. Welcome and Safety Briefing
2. Agenda
3. Outstanding EA Section 42 to be agreed
4. Statement of Common Ground (SoCG)
5. Meeting Minutes Agreement
6. Opportunities for enhancement - Update
7. Next Steps
8. Any other business (AOB)

Meeting Notes

Agenda:

1. Outstanding EIA Section 42 comments to be agreed (as outlined in the Hornsea Project Four EA Onshore substation (OnSS) and Commitments Position Paper (05970276_A)):
 - a. Freeboard mitigation;
 - b. Outstanding Commitment(Co) wording for agreement; and
 - c. Measures to be included in CoCP – specifically in relation to Co64 and Co197 regarding pollution prevention and maintenance of floodplain capacity.

2. Statement of Common Ground (SoCG) (Hornsea Project Four Environment Agency SoCG (06064509_A) provided prior to the meeting):
 - a. Discussion and agreement on format and structure;
 - b. Discussion on content; and
 - c. Confirmation of updates and changes to be made by Hornsea Four.

3. Meeting Minutes – confirm agreement on any other comments on the meeting minutes provided previously by Hornsea Four.

4. Updates on opportunities for enhancement and flood alleviate plans (e.g. at Watton Beck)

5. Next Steps:
 - a. Programme for second draft of the SoCG;
 - b. Programme for Hornsea Four to provide updated relevant sections of the draft Development Consent Order (dDCO) and PPs for the EA to review and agree prior to DCO application.

6. AOB:
 - a. Any queries relating to the dDCO and Protective Provisions.

Outstanding EIA Section 42 comments

1. Potential Freeboard at the OnSS

HW noted that a Position Paper has been produced and submitted to the Environment Agency to address their concerns related to freeboard allowance and potential displacement of flood storage. AP confirmed that he had received and had the opportunity to review the Position Paper.

HW provided a short summary of the contents of the Position Paper. HW explained that the Mott MacDonald modelling report and FRA undertaken for the National Grid's substation at Creyke Beck had been obtained, reviewed and used, as appropriate, to improve our understanding of flood risk at the proposed HOW04 OnSS site. Although the modelling files themselves were not available

there is sufficient information in the reports provided to carry out a comparative assessment. The model results presented in the modelling report generally concur with the Environment Agency's flood zone mapping, and a review of the flood extents with LiDAR data indicates that maximum flood levels in the south eastern corner of the OnSS site are typically between 10.4 and 10.5mAOD.

HW noted that a conservative approach has been adopted within the Position Paper when assessing these water levels and the implications this may have on the proposed design of the OnSS. HW noted that there was considerable freeboard (i.e. over 2.5m) and therefore this addresses the EA concerns in relation to freeboard. AP stated that he agreed with the summary provided and was content that there is sufficient natural freeboard within the site levels, and therefore no further consideration of additional freeboard is necessary. He followed by stating that the surface water risk runs from west to east at the south of the OnSS site, and therefore where these flow paths exist the project should avoid using these areas, if possible, or use freeboard to mitigate the surface water flood risk. AP noted that comment on this element within the DCO examination period will be provided by the LLFA rather than the EA.

AP asked whether construction in Flood Zone 3 could reduce flood storage. HW stated that there were no current plans to raise the site levels in this area, and while there is currently an area of Flood Zone 3 within the south eastern corner of the OnSS site there are no current plans to build infrastructure in this location. It is anticipated that any attenuation feature(s) in this area would be at the same level or lower.

HW stated that these design principles had been carried through to the text in the FRA. HW also noted that not all of the data and information in the Position Paper would be in the FRA, and that the FRA would provide a summary with an 'agreement reference' number which would link back to the minutes for this meeting.

HW asked whether there were any specific comments on the Flood Zone 3 area at the OnSS.

AP asked whether any construction (or attenuation feature(s)) might include any raised bunds or features which might displace flood water or whether this would be below ground structure? AP stated that it should not be a problem if the attenuation feature(s) were able to store water from the watercourse and floodplain. HW stated that the final design for the drainage as well as the discharge location from the OnSS had not yet been determined and would be agreed by Ørsted as the design process progresses. HW confirmed that the discharge rate would be restricted to the greenfield run-off rate. AS confirmed that discharge from the OnSS site would be restricted to the greenfield run-off rate both through Co19 and the Onshore Infrastructure Drainage Strategy.

AP explained that a lot of the detailed design (including design, potential for infiltration and discharge location), would be reviewed and approved by ERYC as the Lead Local Flood Authority. However, if discharge is into a Main River then

the Environment Agency will need to be consulted for the appropriate approvals. The EA are concerned with the displacement of water across the floodplain. He stated that he would be happy for agreement purposes to state the items which were agreed now and the items which would need to be agreed at a later stage (in the SoCG).

HW asked whether there were any remaining concerns or whether the EA and Hornsea Four were agreed.

AP confirmed that there was nothing further to consider. He is comfortable with how the site levels are set out with the accompanying information.

2. Updated Commitments and CoCP wording

AS provided summary from Position Paper of measures to be set out in the CoCP in relation to Co64.

AP stated that the text for the CoCP was adequate, however, would also like Hornsea Four to include that the storage mounds/ bunds would be reinstated to their previous condition.

Action – AS to add this wording to the text in the CoCP.

AP also stated that in relation to Co172 and the CoCP that he would be satisfied if Hornsea Four were to include text to state that culverts would not be used on EA Main Rivers 'unless otherwise agreed with the EA'. As the EA would generally be open to conversations on using culverts on EA Main Rivers if a strong enough justification can be provided. The EA would most likely be fairly pragmatic about the use of culverts especially where drains might be smaller (and more similar in size to Internal Drainage Board drains), and with less water.

Action – AS to update the relevant text in the CoCP to state that that culverts would not be used on EA Main Rivers 'unless otherwise agreed with the EA'.

AS asked whether the crossing schedule could also be updated to include culverts as an option at these crossings. AP stated that the crossing schedule should remain as it is and state only 'clear span/ bailey bridges' and that the text in the CoCP should only be updated with the agreed caveat.

Draft SoCG:

AS asked whether there were any comments or suggestions on the format, structure and/or content of the draft SoCG provided to the EA prior to the meeting.

LG stated she like the level of detail, and that the Flood Risk Assessment, Water Framework Directive, and groundwater elements are separated out, and it makes it easier to coordinate and get agreement internally.

AS asked what they would prefer the next steps to be. For example, as the final ES documents would not be seen until submission, it might be a good idea to use the draft Impacts Register sections to agree as much as possible prior to submission. AS proposed that she would follow up with final dates for the Impacts Register to be submitted to the EA, after which an additional email could be organised to discuss an updated draft SoCG.

LG and AP agreed to these next steps.

Action - AS to confirm delivery date for the updated Impacts Register and draft SoCG, and to organise a meeting 2-3 weeks after this date. The updated draft SoCG is to include Impacts IDs as used through the Scoping Report, Preliminary Environmental Information Report (PEIR) and Environmental Statement.

AP comment that length and layout-wise the document reads well and he supported what LG had said. He said how 'issues' which might not explicitly be agreed because the final DCO application has not been made and therefore final documents have not been reviewed.

LG followed that it might be better to use green for 'agreed', amber for 'ongoing discussions/ agreed in principle', and red for 'not agreed'.

AP also stated that it would follow that anything that isn't green is/ or could potentially be a risk to the EA, from their perspective. Therefore, it would also be good to include some commentary on the items in the SoCG where there may be 'ambers' or 'reds' to explain the reason for them not being green.

LG agreed that a little commentary would be helpful to provide a short summary of the status of discussion, and where the item is going to be secured.

Action – AS to confirm back to the EA that Hornsea Four is happy to update the colours, as it would need to be taken back for wider internal discussion. AS also to update next version of the draft SoCG with commentary for ongoing scissionon/ where items are agreed in principle, as well as including Impact number IDs.

Meeting minutes

AS asked whether the EA attendees had had a chance to review previous meeting minutes and confirm whether they had any additional comments or whether they were agreed. Hornsea Four is looking to agree all meeting minutes with the relevant stakeholders.

LG stated that she had read over them and that all previous meeting minutes were agreed.

Action - AP to review the previously distributed meeting minutes and to confirm whether he had any further comments or whether they were agreed.

Watton Beck and Opportunities for enhancement

AS asked whether the EA had had chance to provide their final ranking and costs for flood defence works the anticipate needing to carry out in the vicinity of Hornsea Four. This was discussed at the last meeting held with the EA.

AP explained that they had had particularly bad weather during the Winter, and therefore resources and efforts have been focussed on flood incident response and COVID-19. He had asked them for a response but nothing had been received by the estates team. AP confirmed that he would provide an update once it had been obtained.

LG stated she had recently been part of a catchment meeting and had asked whether there were any specific enhancement opportunities, however, had not received any responses. LG confirmed she would keep asking.

Protective Provisions (PP)

AS explained that Hornsea Fours legal team had taken a look at the details of the PPs and had some questions for the EA's legal team. AS suggested that it might be better for the respective legal teams to contact each other directly to agree the details.

LG confirmed that this would be possible, and that she would reach out to the legal team to provide their contact details with Hornsea Four.

AP explained that it would be surprising if the PPs were different to those of other projects as they are standard PPs and were created specifically to be standardised across all projects, regardless of the region.

Action – LG to provide details of EA legal team contact to Hornsea Four.

AOB

AP asked whether AS had any information on how Orsted are working to reduced carbon emissions and impacts. The EA are being encouraged to have this conversation with the organisation(s) they engage with.

AS responded that Orsted does have information on how we are working to reduce our carbon footprint at all stages in the supply chain.

Action – AS to provide materials on sustainability and reducing Orsted's carbon footprint to AP.

AP also asked whether Hornsea Four had considered potential impacts on Sea Lamprey, as they are designated in the River Hull Headwaters SSSI, and found migrating up the river. For example, noise, vibration and heat could affect Lamprey along the River Hull, although not directly in the SSSI. AP explained that

he was raising this as this can have implications for permitting as the EA would have to consult with NE.

AS explained that this had been raised in some of the Hornsea Four ecology Evidence Plan Technical Panel meetings, but that it had been scoped out of the EIA.

LG also affirmed that when this had been discussed at previous meetings there were no concerns from stakeholders including East Riding of Yorkshire Council (ERYC).

Minutes of Meeting

Meeting	Hornsea Four and Environment Agency catch up and discussion	07 September 2021
Meeting Date	07 September 2021	
Place	Microsoft Teams	
Participants	██████████ Ørsted, Onshore Consents ██████████), Ørsted, Export Cables ██████████), Ørsted, Commercial ██████████, Royal HaskoningDHV (RHDHV), Water Resources and Flood Risk ██████████, RHDHV, Water Resources and Flood Risk ██████████ Environment Agency ██████████), Environment Agency ██████████), Environment Agency ██████████), Environment Agency ██████████), Environment Agency	Our ref. Hornsea Four and Environment Agency Meeting 07.09.2021
Absent	n/a	
Copy	Julian Carolan, Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC	

Agenda

1. Introductions
2. Flood defence investment.
3. Maximum depth of onshore substation excavation.
4. Peak Flow Allowances.
5. Withdrawal of flood defences and flood defence investment
6. Statement of common ground.
7. AOB

Minutes and Actions

1. Introductions

All attendees identified themselves and their roles and responsibilities.

2. Flood defence investment

DD provided an overview of the correspondence undertaken between Hornsea Four and the Environment Agency (EA), detailing discussions held with PG and recent gaps and delays in progress. PG confirmed that discussions had been held on the flood defence asset at Watton Beck, with principal concerns raised by the EA acting as landowner. The EA require more detail on the proposed depths of the Hornsea Four cables – PG noted that to assist in more regular correspondence an external contractor may be used on behalf of the EA.

JB outlined the technical considerations regarding the depths of cables under a particular asset for the trenchless crossing – primarily influenced by soil conditions, ensuring suitable separation distance. JB asked for further details regarding the timings and methodology of the proposed flood defence works.

PG noted that timings of the flood defence works are unknown and are unlikely to be known in the short-term – funding constraints were raised as a principal factor. It was acknowledged that piling is not the only construction method available to facilitate the flood defence works; however, this is dependent on ground conditions. PG noted that at a similar location, piles were installed to approximately 0 m AOD (4 m under existing ground level).

JB and DD stated a strong preference for the flood defence piles to be installed prior to the Hornsea Four cables, to mitigate potentially significant health and safety risks. TW noted that whilst it appears unlikely that there will be detailed designs of the flood defence works and cable crossing in the short-term, the focus needs to be on ensuring the necessary provisions are in place in heads of terms and protective provisions.

It was agreed that a primary focus should be on establishing whether piles will be needed for the flood defence works. PG asked whether Hornsea Four were planning to undertake SI works in the area. TW stated that such investigations would be undertaken later in the Hornsea Four programme but agreed to investigate whether they could be brought forward in this location.

Action 1: TW to investigate the potential to undertake SI works at Watton Beck to facilitate detailed design.

3. Maximum depth of OnSS excavation

The EA noted that excavations associated with the nearby Dogger Bank A and B substations have been deeper than anticipated – requiring a substantial basement. It was noted that groundwater impacts must be considered adequately pre-construction.

TW noted that excavation depth for Hornsea Four is anticipated to be 3-6 m (for buildings, transformer sump and tanks), with a very small risk excavation would need to go deeper (to approximately 10m). This is dependent on the ground conditions – Hornsea Four are undertaking SI works in October and will be in a position to provide greater certainty once completed.

4. Peak flow allowances

HW outlined that significant discussion has been undertaken previously with associated agreements including the provision of a technical note summarising the modelling available, levels of the proposed OnSS and flood extents in proximity. HW noted the concerns raised by the Environment Agency in the recent written correspondence, in response to the data validity report, and provided clarification on a number of items.

HW confirmed that a review of the Environment Agency Flood Map for Planning has been undertaken and the flood risk around the Hornsea Four OnSS has not changed. There is still an area at risk of flooding along the southern boundary and in the south-east corner, which is in line with the information previously discussed with the Environment Agency in previous ETG meetings.

HW noted and AP confirmed that there had been no additional modelling undertaken by the EA in this area and that the 2016 Mott McDonald modelling for the Creyke Beck substation remains the most detailed modelling for this area. HW confirmed that Ørsted does not have the modelling files for the Creyke Beck substation, only the modelling report / summary (as previously advised to the EA); however, the report confirms that the climate change allowance utilised in the modelling is 20%.

HW clarified the peak flow values applicable to this location in light of the recent update to NPPF and the supporting guidance on climate change (varies between 9%, 17% and 37%, although 37% should be assessed as a sensitivity test). HW noted the 2016 Mott McDonald Creyke Beck modelling utilises a more conservative scenario than the 17% 2050s High Central allowance, which should be applied to the design.

AP agreed that the values identified above are in accordance with the guidance.

HW also noted that although the allowance used in the modelling is less than the 37% for sensitivity testing Hornsea Four OnSS is sufficiently elevated within FZ1 that it is unlikely to change the outcomes of the previous assessment.

AP confirmed that the surrounding area is very flat and low-lying such that the freeboard to the OnSS should be sufficient to ensure flood risk associated with the 37% climate change value is unlikely to affect the OnSS.

HW also confirmed that a review of the mapping for the updated East Riding of Yorkshire Council Level 1 Strategic Flood Risk Assessment (2019) has been undertaken, including a review of the layer entitled “Indicative climate change extent of areas not covered by detailed modelling”. HW confirmed that this mapping shows the flood extent relevant to the OnSS in the future is similar to the current Flood Zone 2 i.e. limited to the southern boundary and SE corner.

HW noted that on the basis of the above discussions, despite updates to the information available, there is no change to the present and future flood risk in this location.

It was agreed that as it has been demonstrated previously that the OnSS site will be elevated (with a 2-3m of freeboard allowance) (via the position paper entitled Hydrology and Flood Risk - Assessment of modelled water levels for Onshore Substation and attenuation feature Position Paper), no modelling is required. It was agreed that the position paper can be updated and appended to the FRA to support the DCO application.

5. Withdrawal of flood defences and flood defence investment

ID asked whether the EA know where defences are likely to be removed or reduced. AB explained the funding issues (notably the lack of funding for flood defences that do not protect residential properties), ID explained that once cables are installed, an increase in flood frequency should not have a negative impact on the cables. Regarding construction phase impacts, it was acknowledged that construction drainage needs to have some consideration for the current state of defences.

AB stated that it cannot be guaranteed that flood defences will not fail. HW outlined that the Hornsea Four impact assessment has been completed assuming no flood defences, so this is not considered to be a problem.

JB clarified that the location of link boxes would need to be carefully considered to be located away from areas of flood risk where possible, whilst ensuring access is retained.

AB advised the Hornsea Four team to look at recent news coverage of floods in the local area, affecting the village of Aike, near Driffield in early February 2021.

AB asked whether the withdrawal of flood defences would affect the Hornsea Four OnSS site. HW clarified that as there are no formal flood defences around the OnSS, this matter is not relevant to that aspect of the impact assessment. In addition, the OnSS is elevated.

AB noted that there are multiple abstraction points in the area surrounding the OnSS and that Hornsea Four should be cautious of springs.

TW confirmed that based on the conversations undertaken during this meeting, the matters raised by the EA in response to the Baseline Validity Position Paper had been discussed and agreed, with no change required to the impact assessment.

6. Statement of Common Ground

TW provided an overview of the Statement of Common Ground ambitions (notably to submit a draft version with the DCO application). LG agreed to work with Hornsea Four on this.

AP enquired about the draft DCO, asking whether there would be measures seeking to disapply permitting regulations. TW confirmed that such provisions were included in the draft DCO for Hornsea Four. TW agreed to send the draft DCO to the EA for review.

Action 2: TW to send draft DCO for review and comment (completed).

7. Any Other Business

No other business was raised.

Minutes of Meeting

Meeting	Hornsea Four Evidence Plan: Onshore Human Environment Technical Panel Meeting 1 - Post-scoping	07 January 2019
Meeting Date	07 January 2019	
Place	County Hall, Beverley	
Participants	<p>[Redacted] Ørsted, Onshore Consents Manager [Redacted] Royal HaskoningDHV (RHDHV), EIA Project Manager [Redacted], RHDHV, EIA Project Assistant [Redacted] RHDHV, Traffic and Transport [Redacted], RHDHV, Air Quality [Redacted], RHDHV, Noise and Vibration [Redacted] East Riding of Yorkshire Council (ERYC), Case Officer [Redacted], ERYC, Highway Development [Redacted], ERYC, Noise control [Redacted] ERYC, Contaminated land and air quality [Redacted], ERYC, Countryside access</p>	Our ref. Hornsea Four EP Onshore Human Environment TP Meeting #1
Absent	[Redacted] ERYC, Contaminated land and air quality	
Absent	Natural England, Historic England	
Copy	[Redacted], Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC. Potentially pre-PEIR Submission Q2 2019	

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Scoping Review
6. Next Steps
7. AOB

Minutes and Actions

1. Welcome and Safety Brief

TW welcomed all participants and noted that no fire alarms were planned for the duration of the meeting. Fire exits were identified. No further safety issues were noted.

2. Introductions

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

3. Aims and Objectives of the meeting

TW outlined the purpose and process of the meeting, inclusive of an update on Hornsea Four activities, review and opinion of responses received during the scoping process, and the next steps in relation to baseline data acquisition, assessment methodology and mitigation.

4. Introduction to Hornsea Four

TW summarised the activities undertaken to-date, inclusive of the submission of the Scoping Report, the receipt of the Scoping Opinion from PINS. TW proceeded to explain the route planning and site selection process undertaken since the scheme presented at Scoping and the work undertaken to achieve PEIR design freeze in February 2019. TW explained the importance of commitments to this process by embedding primary mitigation measures into the design of Hornsea Four to avoid the potential for significant environmental effects.

TW noted that informal consultation events took place in October 2018 which provided useful feedback from the public.

TW explained that a local transport consultancy (Local Transport Project Ltd (LTP)) had been appointed to appraise indicative construction access options for the landfall, Electrical Cable Corridor (ECC) and the Onshore Substation (OnSS). The outcome of the early OnSS construction access appraisal was presented, TW noted that Ørsted would like to present more detail on general scheme design development to ERYC as part of a separate meeting.

Action 1: TW to share presentation slides

Action 2: TW to arrange meeting to present Hornsea Four design development

5. Scoping Review - Transport

Transport of offshore components

AR explained the challenges in the supply chain options for offshore wind farms and the inability for Ørsted to commit to a specified port at this time in the project cycle. SH and AF acknowledged the challenges and stated their opinion on this topic will be provided in their scoping opinion.

Driver delay - Local roads

AR confirmed that PINS had agreed that driver delay on local roads can be scoped out of the assessment and explained that the feasibility of access for HGVs and abnormal loads is the key matter to focus on – inclusive of the geometric and structural capability of roads to support heavy loads. AF agreed with this.

'First principals' approach

AR detailed how the 'first principals' approach he had used on Dogger Bank Creyke Beck would be used to establish traffic demand for Hornsea Four. This entails identifying the demand for materials and resource, developing an activity schedule and a programme duration to forecast HGV and workforce traffic.

Cumulative schemes

AF raised the proposed upgrades to the A164/Jocks Lodge. SH explained that construction would likely commence in 2022 and last 4 years. AR noted two key possibilities to consider – should the upgrades be assumed and therefore used as part of the baseline for assessment or should the existing highway network be used as the basis of the assessment?

SH and AF expressed certainty that the A164/Jocks Lodge upgrades would be developed but acknowledged uncertainty regarding construction timing. AR clarified that if there are any doubts or uncertainties, the existing highway network would form the basis of assessment, with a qualitative assessment presenting effects associated with the highways upgrades. SH acknowledged this but requested that Ørsted consider the impact of associated road closures is relevant.

AF and SH identified there are additional highways improvement schemes that could also impact the construction traffic for Hornsea Four, inclusive of the Great Gutter Lane junction. SH explained the A63 junction improvements at castle street will be starting soon. Victoria dock roundabout is currently being worked on.

Action 3: SH/AR to provide details of all schemes to be considered by Hornsea Four

AR confirmed that the PEIR and ES will need to demonstrate that there would be no significant effects on key road links, notably the A164 and propose suitable mitigation if required.

Driver delay on principal roads

AR stated that at PEIR the intention is to only provide traffic flows generated by the project that would use the A164, to provide an opportunity for ERYC to provide comments. An assessment would then be included within the ES. SH and AF agreed with this approach.

AR asked whether there are other notable roads that should be considered in greater detail during the assessment. AF and SH noted the following:

- A165 north of Beverley;
- B1249 (seasonal vehicles travelling to the coast); and
- Bridlington road, north-east of Driffeld.

AF confirmed that there is existing traffic count data available and that he will ask his colleagues to provide it. AR confirmed that a specific request will be issued to AF detailing the roads and links required.

Action 4: AR to request existing traffic data from AF.

AR stated that RHDHV do not intend to submit both a PEIR/ES chapter in addition to the stand-alone or supporting Transport Assessment. All information will be provided in the PEIR/ES chapter. AF and SH agreed that this approach was acceptable.

Severance – construction

AR provided context to the PINS scoping opinion and noted that when the IEMA severance screening threshold¹ is to be used, very few if any links will require an assessment. AR explained that the IEMA thresholds will therefore be used to screen out the assessment by providing a suitable evidence base. AF agreed with this approach.

Operational Traffic

It was agreed by AF and SH that the operation of Hornsea Four would not generate enough vehicles to require an assessment – as such it was agreed that this matter could be scoped out.

Decommissioning works

AR noted agreement from PINS that traffic effects from decommissioning activities can be scoped out. AF and SH agreed with this approach.

AF went on to explain that any necessary amendments to the road network to facilitate construction traffic (such as passing points), dependant on type and location, could potentially be retained post-construction, which would facilitate future decommissioning activities. AF stated that it would be beneficial for ERYC's highway engineers to be consulted during the detailed design process.

Action 5: AF to provide contact details for ERYC highway engineers.

Baseline and potential effects – non-motorised users.

AR summarised the scoping opinion comment from PINS.

¹ The Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Management and Assessment (formally IEA) 1993.

AC requested that all proposed rerouting and disruption of public rights of way (PRoW) should be included within the DCO application. CS confirmed that information will be presented within the PEIR and ES detailing all short-term and long-term disruption of PRoWs. Necessary mitigation measures would be provided with alternatives to be agreed as part of the DCO.

AR explained that pedestrian amenity would be reviewed only where there is demand and noted that IEMA guidance would be used to undertake a qualitative approach. AR requested that ERYC provide a summary of key sensitive areas for consideration as part of this topic.

Action 6: AF/SH to provide list of sensitive sites for consideration for amenity assessment

Assessment of construction traffic

AR summarised the PINS comments and TW provided some context as to the origin of the comment to 'assess construction traffic generation'. It was confirmed that effects of construction traffic on the highway network will be assessed within the PEIR and ES.

Road Safety

AR noted that PINS did not provide any comments in respect of road safety but explained the approach that would be taken for construction activities (a review of collision rates and clusters). AR enquired whether the road safety partnership has any specific threshold for clusters to be created – AF will follow this up and provide contact details for members of the highways safety team.

AF will also provide contact details for the abnormal loads team for AH to make direct contact. AR asked whether the A164/Jocks Lodge highways improvement works would have consideration for abnormal loads that will be necessary for both Hornsea Four and Doggerbank Creyke Beck. AF confirmed that they would.

Action 7: AF to provide contact details for the highways safety and abnormal loads teams.

Action 8: AR to contact both respective teams to obtain data relevant to the PEIR Hornsea Four assessment .

Next steps

AH summarised key next steps to be undertaken, which comprise:

- Capture of traffic flows for all key links;
- Capture collision data for all links within the study area (this data set will be requested);
- Derive construction traffic demand (first principals approach);
- Establish likely traffic distribution (informed by socio-economics); and
- Finalise access strategy and prepare access concept drawings, to be presented to ERYC and future Technical Panel (date TBC).

6. Scoping Review – Noise and Vibration

AB provided a summary of the PINS scoping review comments for noise and vibration. TW clarified how Co133 and Co135 had been applied to the route planning and site selection process and confirmed that an additional clarification would be provided in PEIR and ES. This approach to embedded mitigation would aim to scope temporary noise and vibration from haul route access during construction, with a sufficient evidence base.

AB explained that the distance from the HVAC booster station (minimum of 20km offshore as per Scoping Report) would cause any noise breakout to be inaudible on-land. It was clarified that qualitative evidence to support this statement would be included within the PEIR and ES.

AB summarised the comment from PINS regarding the consideration of non-residential receptors from noise breakout. IM noted that he would not typically expect to see this assessment and would not request that it is undertaken for Hornsea Four.

Baseline Noise Survey

AB provided an overview of the proposed approach to noise surveys. Long term measurements would only be undertaken near to the proposed OnSS site and would likely comprise up to a week of surveys. A weather station will be co-located to ensure representative and accurate data is acquired.

AB advised that short-term noise surveys will only be undertaken if deemed necessary at locations in proximity to the ECC and landfall, based on the potential for significant effects to occur.

CH asked whether the baseline noise survey methodology could be agreed with ERYC without the need for a site visit. IM confirm this was appropriate.

Action 9: AB to submit baseline noise survey methodology and proposed locations to IM within the next week.

Noise from temporary construction compounds

AB stated that he would value ERYC's opinion on the approach to scope out noise from temporary construction compounds. IM confirmed that he was satisfied with this approach.

Action 10: IM to clarify the position on noise from temporary construction compounds in the ERYC scoping opinion.

Miscellaneous noise comments

IM requested that a complaints procedure will need to be implemented for Hornsea Four. AB confirmed that relevant best-practice measures will be set out within the PEIR and ES, in line with BS5228.

7. Scoping Review – Air Quality

CG provided a summary of the Scoping Report and the subsequent Scoping Opinion from PINS. It was agreed that for all potential effects associated with air quality, an improved evidence base would be developed to support the intention to scope all assessments out of the PEIR and ES.

It was agreed that operational activities would not require assessment within the PEIR or ES. PH enquired about the operational activities associated with the Energy Balancing Infrastructure (EBI) and asked whether a technology had been selected. TW stated that a final decision had not been communicated and that he would follow up on the anticipated operational activity. SH noted several cumulative EBI schemes in the locality of Creyke Beck and the potential for cumulative effects from operation.

Action 11: TW to provide further information on EBI operational activity to PH.

CG went on to clarify that if any assessment work is scoped into the PEIR and ES, it would be heavily constrained to selected sites.

8. Any Other Business

UXO

PH enquired whether Ørsted were aware of the presence of unexploded ordnance (UXO) on the coast within the southern portion of the landfall search area presented within scoping. CS asked whether ERYC hold information on the presence of UXOs – PH confirmed that no information is available, other than generalised hotspots.

Action 12: PH to provide hotspot map showing UXO risk areas.

ERYC Scoping Opinion

SH confirmed that ERYC are developing the scoping opinion and intend to issue to PINS in due course.

Communication Strategy

SH confirmed that technical consultants from the Hornsea Four team can contact technical officers at ERYC directly, if SH is copied into emails.

No further business was raised.

Action Log

Action 1	TW to share presentation slides
Action 2	TW to arrange meeting to present Hornsea Four design development
Action 3	SH/AR to provide details of all schemes to be considered by Hornsea Four
Action 4	AR to request existing traffic data from AF
Action 5	AF to provide contact details for ERYC highway engineers
Action 6	AF/SH to provide list of sensitive sites for consideration for amenity assessment
Action 7	AF to provide contact details for the highways safety and abnormal loads teams
Action 8	AR to contact both respective teams to obtain data relevant to the PEIR Hornsea Four assessment.
Action 9	AB to submit baseline noise survey methodology and proposed locations to IM within the next week
Action 10	IM to clarify the position on noise from temporary construction compounds in the ERYC scoping opinion
Action 11	TW to provide further information on EBI operational activity to PH
Action 12	PH to provide hotspot map showing UXO risk areas

Minutes of Meeting

Meeting Hornsea Four Evidence Plan: Onshore Human Environment Technical Panel
Meeting 2 - Pre-PEIR

Meeting Date 01 May 2019

Place County Hall, Beverley

Participants [REDACTED], Ørsted, Onshore Consents Manager
[REDACTED], Royal HaskoningDHV (RHDHV), EIA Project Manager
[REDACTED] RHDHV, Traffic and Transport
[REDACTED] (RHDHV), Traffic and Transport
[REDACTED], East Riding of Yorkshire Council (ERYC), Case Officer
[REDACTED] ERYC, Strategic Development Team Leader
[REDACTED] ERYC, Highway Development
[REDACTED], ERYC, Countryside Access Officer (Cottingham up to Huttons Craswick)
[REDACTED], ERYC, Countryside Access Office (from Hutton Craswick north)
[REDACTED], ERYC, Definitive Map Officer

Absent N/A

Absent N/A

Copy [REDACTED], Ørsted, Hornsea Four Consents Project Manager

Next meeting TBC

01 May 2019

Our ref. Hornsea Four EP Onshore Human Environment TP Meeting #2

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Summary of previous actions
6. Approach to PEIR
7. Next Steps
8. AOB

Minutes and Actions

1. Welcome and Safety Brief

TW welcomed all participants and SH noted that no fire alarms were planned for the duration of the meeting. Fire exits were identified. No further safety issues were identified.

2. Introductions

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

SP clarified that he is responsible for countryside access matters from Cottingham working north up to Hutton Cranswick. AC covers the rest of the Hornsea Four onshore study area, from Hutton Cranswick north to landfall.

3. Aims and Objectives of the meeting

TW outlined the purpose and process of the meeting, comprising:

- an update on Hornsea Four activities;
- presentation and alignment on Hornsea Four's approach to proportionate EIA;
- Public rights of way (PRoW) and Cycle Network discussion on approach to PEIR and baseline updates;
- Traffic and transport baseline and survey updates;
- Traffic and transport discussion on methodology; and
- the next steps leading up to submission of the PEIR.

4. Introduction to Hornsea Four

TW presented Hornsea Four design updates, detailing how the redline boundary has been refined down from the EIA scoping report to the 'interim PEIR boundary'. TW explained that the landfall search area is now more focussed on a specific area, the electrical cable corridor (ECC) is at the indicative 80m working width, which is the width that will be submitted at DCO. The onshore substation (OnSS) search area has been refined down based on a high-level appraisal and local feedback, with options being explored for a preferred site.

TW then provided a summary of the consultation process, inclusive of a community newsletter issued in March 2019 and workshops held with parish councils. The wider consultation timeframes were discussed, leading up to DCO submission in Q1 2020. This includes PEIR electronic submission on 29 July and public consultation events in early September.

TW explained Hornsea Four's approach to proportionality in EIA and detailed the purpose of the 'Proportionality Roadshow'. The purpose of the Impacts and Effects (I&E) Register and Commitments Register were clarified, inclusive of how stakeholders and local people can input and suggest commitments which can

inform the design of the project. TW noted that the I&E register will be used at DCO to reduce the length of technical chapters by detailing assessments with no significant effect within the register, with the chapters focussing only on assessments with potential significant effects.

The 'primary mitigation' secured within the Commitments Register was acknowledged and identified as a key attribute of the route planning and site selection process.

5. Summary of Previous Actions

AR provided a summary of the previous actions from the last technical panel meeting.

Provide details on all cumulative schemes to be considered by Hornsea Four

AR noted that Jocks Lodge and Castle Road junction improvement scheme in Cottingham had previously been identified and asked if additional highway schemes or developments would need to be considered.

AF and SH explained that the Brigham Road roundabout scheme on the A164 and Southern (A164 Minster Way) scheme have both commenced construction— it will be completed prior to the construction of Hornsea Four.

AF and SH noted no other scheme in addition to those identified need to be considered at this stage as part of the cumulative assessment.

Existing traffic data to be requested

Traffic data has been requested and obtained from ERYC.

Contact details for ERYC highway engineers to be provided

AF to send through details on engineer contacts, broken down into the three areas relevant to Hornsea Four within ERYC.

List of sensitive sites for consideration in amenity assessment to be provided

SH identified an area of registered common land near to Beverly Westwood, in close proximity to the A1079, to the west of Beverley. This area is an important feature.

An area was also identified to the west of Beverley near to Burton Bushes and Beverly Racecourse. It was acknowledged that Hornsea Four infrastructure does not route near to the sensitive site.

AR provided an example from recent experience of a school muster point as a sensitive site that would not be immediately obvious from a desk-based review. SH clarified that it is more suitable to discuss and obtain such information from parish councils and ERYC's area engineers.

Action 1: AF to provide ERYC highway engineer contact details.

Action 2: Hornsea Four to liaise with parish councils and ERYC highway engineers regarding sensitive sites.

6. Approach to PEIR – Previously distributed materials

SH and AF confirmed the minutes previously distributed summarising the first Human Environment Technical Panel (on 7th January 2019) are correct and as per the previous technical panel. TW requested for SH to follow up with the other previous members.

Action 3: SH to provide response from other technical panel members on previously distributed meeting minutes.

7. PRoW and cycle network: Approach to PEIR – Baseline updates

CS summarised the baseline characterisation process undertaken for PRoWs and the cycle network. Desk-based and site walkover approaches were described and an overview of the findings provided. Inset maps identified the PRoWs and cycle routes that fall within the interim PEIR boundary.

Question 1. Does the technical panel consider that all identified PRoW's and cycle routes have been shown correctly?

DS requested that larger plans are provided via email to allow for more informed commentary and input.

Action 4: Hornsea Four to follow up with plans via email.

DS identified the potential timeframes associated with permanent closure or diversion of a PRoW. The process can take anywhere between ten months and two years.

TW confirmed that Hornsea Four intends to work with stakeholders and the local community to build upon and improve and PRoWs that are permanently disrupted by Hornsea Four. ERYC and local parish councils will be engaged as part of this process.

SP identified the coastal path and enquired whether it would be considered as part of the assessment. CS explained limited information is available within the public domain other than the draft information available online from Natural England, which is dated from February 2018.. SP acknowledged this and confirmed a Habitats Regulation Assessment is delaying the process, which is currently with the Secretary of State.

AC explained that the coastal path differs from PRoWs in respect of management. It is access land, which requires consultation with Natural England.

AC confirmed that a route for the coastal path will hopefully be in the public domain in the following “few months” and that Steve Westwood is the main contact at Natural England responsible.

DS indicated that Mark Jessop (principle transport policy office at ERYC) should be consulted with in respect of the cycle network and subsequent potential disruption, particularly given his involvement with Sustrans. Consultation with other consultees such as the British Horse Society and Ramblers Association should also be undertaken once specific PRow/cycles routes have been identified as requiring diversion and/or closure.

DS explained that in addition to the PRow data, a Schedule 14 data set is available from ERYC. This data set includes all PRowS where a claim has been made for it to become a PRow route (under the Wildlife and Countryside Act 1981). These claims are for routes that have been used for 20 years or more for public use. DS will issue this along with a shapefile.

Action 5: DS to issue data set and shapefile of additional claimed routes to TW and CS.

Action 6: Hornsea Four to contact Mark Jessop for cycle network information and highway collision data (see Traffic and Transport Section).

Question 2. Does the technical panel agree with the approach that has been taken to gather the baseline data?

Action: 7: Upon receipt of plans, SP, AC and DS to provide feedback on baseline data collection methodology.

Question 3. Does the technical panel consider that any additional PRow's and/or cycle routes need to be included?

CS explained that the PRow and cycle route data which has informed the baseline comprises:

- PRow shapefile from ERYC;
- Soil classification and Environmental Stewardship Schemes from MAGIC website (which comprises DEFRA and Natural England data);
- Aerial Imagery; and
- Coast Path Routes from Natural England.

No additional routes were identified by attendees, although **Action 5, 6 and 7** identified previously during the meeting will assist and ensure not receptors have been missed.

Question 4. Does the technical panel agree with the proposed management measures for the PRow's/cycle routes at the landfall, onshore ECC and OnSS search area?

SP, AC and DS stated that management measures will need to be looked at on a case by case basis, instead of providing comment on a high-level approach.

Action 8: SP, AC, and DS to review plans once issued and annotate with thoughts and comments on specific PRowWs (including concerns, proposals and opportunities).

Question 5. Does the technical panel have any concerns about the impacts of Hornsea Four on the current land use practices?

Action 9: TW to issue (when available) the refined PEIR boundary once it is completed, showing the landfall area and OnSS site. When this information is issued, Hornsea Four will indicate whether each PRowW is to be diverted or closed.

AC highlighted that the DCO needs to include all details on proposed approaches to PRowW disruption to avoid significant post-consent work for ERYC.

TW enquired which PRowWs within the OnSS search area are most popular and experience the greatest usage.

SP noted that the cycle route 'Route 1' is used frequently and its operation should be maintained. In terms of PRowWs, 'SKID10' leading up to 'SKID11' and 'SKID12' the most popular route.

SP also indicated that, to a lesser degree, 'SKID17' leading up to 'WOODF07' is also a popular route.

Helping to upgrade from a footpath to a xxx is frequently beneficial.

8. PRowW and cycle routes – Next steps – PEIR Submission

CS detailed the approach leading up to PEIR submission, which will include continued liaison with ERYC to begin agreements on diversions and/or closures.

9. Transport – Approach to PEIR – Baseline updates

ST provided a summary of the study area and the approach to baseline data collection outlined within the previously issued supporting Position Paper. ST explained that to derive HGV flows for ERYC count sites (that do not capture vehicle classification), nearby ATCs and DfT counts will be utilised. ST also explained that to convert the ATCs flows (undertaken in March 2019) to an annual average, factors from ERYC permanent count sites would be applied.

ST identified that it is proposed to use TEMPro to factor traffic flows to future years.

ST confirmed that 5 years of collision data has been requested for all roads within the current study area and is awaited from ERYC.

Action 10: AF to ensure ERYC issue collision data to Hornsea Four.

ST then worked north to south to run through the indicative access points and to highlight key areas of interest of which local highways input would be beneficial. These comprise accesses in proximity to:

- Fraisthorpe;
- Foston on the Wolds; and
- Hutton Cranswick.

AF requested that ERYC's area engineers are contacted to comment on specific road links as they would be better placed to discuss. Contact details will be issued by AF as per **Action 1**.

Hornsea Four will issue a draft email to the area engineers setting out key area for discussion and an attempt will be made to arrange a meeting to feed into PEIR, if possible.

Action 11: Hornsea Four to distribute materials and arrange meeting with area engineers.

AF enquired about construction employee management method and referenced previous examples he has seen on other projects, including minibus transportation from main construction compounds. TW explained that Hornsea Four is not developed enough to provide detail on this, but he will follow up with some assumptions based on previous projects.

ST confirmed for the PEIR assessment, a worst-case scenario of construction employees driving directly to each individual access would be assumed and modelled.

Action 12: Hornsea Four to distribute assumptions for construction employee transport.

Question 1. Considering the proposed access locations (outlined in the previous slides), does the technical panel consider that the proposed traffic and transport study area (also outlined previously) is appropriate?

AF identified that the B1236 to the east of Beverley should be added to the traffic and transport study area as this road is often used to avoid the A164.

AF confirmed that with the exception of the addition of the B1236, the traffic and transport study area presented was appropriate.

Question 2. Does the technical panel agree with the proposed approach to gathering and factoring baseline traffic flows (detailed within the Technical Panel Position Paper)?

AF confirmed that approach presented was acceptable.

Question 3. Does the technical panel consider that any additional links require surveying, or further PIC data requires collection?

AF confirmed that the main links are covered, and no additional links are necessary.

10. Transport - Approach to PEIR – Proportional EIA

Question 4. Does the technical panel agree with the assumption of distributing all HGV traffic from the south on the A164 towards Hull?

AF confirmed that this is an appropriate assumption. It was acknowledged that a worst-case assumption for HGVs to originate from the A63 and travel north on the A165. It was also agreed that traffic movements from any local suppliers (such as quarries) within the study area would be captured within the existing permissions and would therefore not require separate assessment.

Question 5. Does the technical panel agree with the proposed approach to distributing employee traffic?

ST explained that to inform the potential distribution of construction workers, census data will be used for local employees assuming a 90minute drive time from Beverley. For those employees that would travel to the area (in-migrant) the availability of accommodation (hotels/B&Bs) within a 45minute drive of Beverly will be used to inform distribution.

AR explained that the 90-minute assumption is based on research undertaken by Warwick University for Hinkley Point C.

ST explained that a simple gravity model for distribution would be used to reflect the greater propensity for local employees and accommodation.

AF confirmed the approaches are acceptable.

Question 6. Does the technical panel consider that there are additional critical junctions (to the A165/ B1249) that require consideration for driver delay impacts?

AR raised the critical junction identified at the previous TP (7 January 2019) and asked whether any additional junctions should be considered within the driver delay assessment. ST noted that the PEIR would include details of proposed traffic flows through these junctions to inform the need for detailed junctions modelling to support the DCO submission.

The following junctions were identified as requiring consideration:

- A164/Jocks Lodge;
- All roundabout junctions along the A164 to the south towards the Humber Bridge;

- B1230 junction with Copleflat Lane to the east of Walkington; and
- A1079/ A1174 junction.

SH explained that during the peak summer season, the Fraisthorpe junction with the A165 can experience delays associated with beachfront parking and requested that this junction also be considered.

Question 7. Does the technical panel agree with the proposed approach to considering road safety impacts?

ST explained that due to the extent of the study area, the road safety review would first seek to establish those roads that have collision rates above or close to the national average for comparable road types. Where roads have collision rates above or close to the national average, a further detailed review of the collisions along these roads would then be undertaken to establish any trends that could be exacerbated by the development proposals.

AF agreed with this approach.

Question 8. Can the technical panel advise if there are any specific collision clusters/ sites that should also be considered?

AF recommended that Hornsea Four should liaise with Mark Jessop on this matter, to identify any specific hotspots of road safety issues.

This request will be submitted as part of **Action 6**.

Question 9. Does the technical panel agree with the proposed approach to managing the passing of two vehicles, in particular, the promotion of escort/ pilot vehicles?

AF confirmed that the principals of the proposed approach are appropriate.

AF highlighted that to help highlight accesses distance warnings signs were requested by ERYC for some links affected by Dogger Bank Creyke Beck. ST explained that for PEIR Hornsea Four would not be proposed to provide this level of detail.

ST explained the approach for Hornsea Four would be to provide typical priority junction layouts for all accesses at PEIR. These typical layouts would be in accordance with the DMRB but include location specific details in regard to visibility splays. More detail upon specific access designs will be specified at DCO submission. AF confirmed this is acceptable.

SP then explained that some instances of the Hornsea Four export cable corridor (ECC) crossing roads would be 'crossing only' and would not allow access from the highway network. This approach has been taken to avoid some sensitive settlements. ST explained that dependent upon the road, two options will be

presented at PEIR, including either priority crossing or crossing controlled via traffic signals. AF confirmed this is acceptable.

Question 10. Does the technical panel agree that standard details for accesses and crossings can be included within the PEIR and that detailed access and crossing layouts can be included within the final ES?

AF agreed that this approach is acceptable.

11. Next steps – Transport PEIR Submission

CS detailed the approach leading up to PEIR submission, which will include continued liaison with ERYC, analysis of the traffic flows, the next technical panel, and drafting of the PEIR chapter.

12. Any Other Business

TW asked AF to confirm that the ERYC scoping opinion on the transportation of offshore infrastructure on the highway network can be scoped out. This is due to the uncertainty around the port selection during the pre-application process. AF confirm that this was appropriate and that the scope of assessment (effects scoped in and scoped out) outlined is agreed.

No further business was raised.

Action Log

Action 1	AF to provide ERYC highway engineer contact details.
Action 2	Hornsea Four to liaise with parish councils and ERYC highway engineers regarding sensitive sites.
Action 3:	Hornsea Four to follow up with plans via email.
Action 4	SH to provide response from other technical panel members on previously distributed meeting minutes.
Action 5	DS to issue data set and shapefile of additional claimed routes to TW and CS.
Action 6	Hornsea Four to contact Mark Jessop for cycle network information and highway collision data.
Action 7	Upon receipt of plans, SP, AC and DS to provide feedback on baseline data collection methodology.
Action 8	SP, AC, and DS to review plans once issued and annotate with thoughts and comments on specific PRoWs (including concerns, proposals and opportunities).
Action 9	TW to issue (when available) the refined PEIR boundary once it is finalised, showing the landfall area and OnSS site. When this information is issued, Hornsea Four will indicate whether each PRoW is to be diverted or closed.
Action 10	AF to ensure ERYC issue collision data to Hornsea Four.

Action 11	Hornsea Four to distribute materials and arrange meeting with area engineers.
Action 12	Hornsea Four to distribute assumptions for construction employee transport.

Minutes of Meeting

Meeting Hornsea Four and Highways England Strategic Road Network and Abnormal Indivisible Loads 05 September 2019

Meeting Date 05 September 2019

Place Highways England, 8 City Walk, Leeds

Participants [REDACTED] Ørsted, Onshore Consents Manager
[REDACTED] Royal HaskoningDHV (RHDHV), Transport Planner
[REDACTED], Highways England, Planning and Development
[REDACTED] Jacobs
[REDACTED] Highways England, A63 Castle Street Improvement
[REDACTED], Balfour Beatty, A63 Castle Street Improvement Principal Contractor

Absent [REDACTED], Highways England, A63 Castle Street Improvement

Copy [REDACTED], Ørsted, Hornsea Four Consents Project Manager

Next meeting TBC

Our ref. Hornsea Four Highways England Meeting 05.09.2019

Agenda

1. Welcome and Safety Brief
2. Introductions
3. Aims and objectives of the meeting
4. Hornsea Four Update
5. Approach to PEIR
6. Castle Street / A63 Improvement Scheme
7. Approach to PEIR
8. Next Steps
9. AOB

Minutes and Actions

1. Welcome and Safety Brief

SG welcomed all participants and noted that no fire alarms were planned for the duration of the meeting. Fire exits were identified. No further safety issues were noted.

2. Introductions

All attendees identified themselves and their roles and responsibilities.

3. Aims and Objectives of the meeting

ST outlined the purpose and process of the meeting, comprising:

- an update on Hornsea Four activities;
- discussion and agreement on Hornsea Four's approach to proportionate EIA, including study area, traffic derivation and assessment methodology;
- discussion regarding the A63 Castle Street Improvement Scheme; and
- the next steps between PEIR and DCO submission.

4. Hornsea Four Update

TW presented Hornsea Four design from landfall, onshore export cable corridor (ECC) and onshore substation (OnSS) and energy balancing infrastructure (EBI). A summary of the project programme was presented, noting that the formal consultation process for Hornsea Four will conclude on 23 September, and the DCO submission will follow in Q1 2020.

The purpose of the commitment register and impacts register were discussed, and the overarching approach to proportionate EIA identified.

5. A63 Castle Street Improvement Scheme

FO provided a summary of the A63 Castle Street Improvement Scheme, noting that a decision on the DCO is expected on 26 March 2020. At present, construction is programmed to commence in 2020 and conclude in 2025, however this could be subject to change.

Phase A would comprise the enabling works, which is impacted by complexities such as the Trinity Burial Ground and multiple statutory undertakers. Phase B would comprise the remaining construction activities.

FO and DM explained that during construction works, the road width would be reduced to 6.75 m, inclusive of safety zones. Right turns would be temporarily prohibited during construction for both southbound traffic onto the A63 and from the east turning onto the A1079. This could notably impact the routing of abnormal indivisible loads (AIL) associated with Hornsea Four's construction.

ST asked if the A63 Castle Street Improvement Scheme prevented the Port of Hull being used for AIL movements, whether Highways England would be willing to relax their policy requiring the use of the nearest suitable port. SG confirmed that Highways England would be willing to consider alternative ports should alternative routes from the Port of Hull be unsuitable. The following actions were agreed:

Action 1: Highways England to issue detailed plans and any further additional details available associated with the A63 Castle Street Improvement Scheme to inform Hornsea Four's proposals.

Action 2: Highways England to make necessary formal consultation response for Hornsea Four, prior to the 23 September deadline.

Action 3: TW to investigate whether:

- the AIL can negotiate through Castle Street, based on plans provided by Highways England;
- any certainty can be provided by Hornsea Four regarding the potential timing of AILs associated with the OnSS; and
- an alternative port solution is available and suitable for construction activities.

Post Meeting Note: The current AIL study identifies two routes that are currently physically negotiable, albeit structural checks of highway structures are still required. The two routes include the A63 and A164 (which passes via Castle Street) and an alternative route via Marfleet Lane, Maybury Rd, Ings Rd, Sutton Rd, and A1079 which would avoid Castle Street.

Following discussion of the A63 Castle Street Improvement Scheme, DM and FO left the meeting.

6. Approach to PEIR

ST provided a full overview of the Hornsea Four traffic and transport assessment, detailing the study area, PEIR submission documents and an explanation of how traffic levels have been derived for both HGVs and employee movements.

ST clarified that detail regarding traffic derivation and distribution was presented in a technical annex to the ES. ST explained how the peak daily flows have been established and noted that significant contingency has been accounted for, which has resulted in a worst-case assessment. It is anticipated that through refinement to some of the worst-case engineering assumptions that these peak traffic flows will be reduced for the DCO submission. It was identified that the numbers of traffic movements via the Strategic Road Network (SRN) include a number of worst-case assumptions, including the assignment all HGV traffic to the SRN, and no reduction applied to account for consented movements (such as permitted development rights associated with existing port and quarries).

ST presented peak daily and hourly movements for links 81 and 82, which form the SRN and fall within the remit of Highways England. SG and RE stated that Hornsea Four need to be clear on how long the peak movements are likely to occur.

SG and RE advised that based upon the traffic numbers presented at PEIR, Highways England's main concern related to potential peak hour congestion impacts at the A63/A15/A164 junction and requested the avoidance of peak hours by construction traffic.

Action 4: Highways England to provide the specific timing of 'peak hours' for the A63/A15/A164 junction

ST noted that Hornsea Four would need to consider if a commitment can be made to avoiding peak hours, noting that it would be unlikely at this stage of the development process. ST noted that given the uncertainties regarding supply chain origins and scheduling of construction activities, the numbers of peak hour HGV movements through the A63/A15/A164 junction could significantly reduce once a contractor is appointed. ST therefore requested if Highways England would be willing to condition the requirement for modelling of the peak hour construction traffic impacts upon the A63/A15/A164 junction as part of the Construction Traffic Management Plan (CTMP).

RE and SG identified that this approach was acceptable, and a requirement could be drafted whereby capacity assessment for the A63/A15/A164 junction would be required if certain traffic levels (approximately 30 or more movements) are required by the contractor during peak hours.

Question 1 - Do Highways England consider that the traffic and transport study area (outlined previously) is appropriate?

RE and SG confirmed that the study area is appropriate as it covers the main A63/A15/A164 junction and anything beyond this junction would be predominantly through traffic.

Question 2 – Do Highways England consider that capacity assessments for junctions on the A63/ A1033 are required?

RE and SG identified that a capacity assessment for the A63/A15/A164 junction may be required but that these could be dealt with post consent by way of requirement.

Question 3 – Do Highways England agree with the proposed approach to considering road safety impacts?

RE and SG identified that they were content with the approach presented.

Question 4 – Do Highways England agree that the 'Transport Assessment' detail can be contained within the ES and supporting technical annex?

RE confirmed that this is appropriate, as long as the chapter includes everything typically detailed within a Transport Assessment. If Hornsea Four can share an excel sheet detailing the traffic flow derivation, it would make interpretation of the methodology and numbers easier. TW committed to issuing these spreadsheets and ST offered to provide assistance during the review process if required.

Action 5: TW to send PEIR traffic flow derivation spreadsheet to SG directly.

Question 5- Do Highways England consider that a detailed CIA is required for the ES, or could potential traffic impacts be managed through the co-ordination of activities within the respective CTMPs once greater certainty regarding the timing of construction works and supply chains are known?

RE and SG confirmed that the approach presented is acceptable and that it would be appropriate to manage the potential for cumulative impacts through the respective CTMPs.

ST queried if Highways England were content that the draft CTMP could include consideration of both HGVs and employees.

RE and SG agreed that both HGV and employee traffic during construction can be detailed in the same CTMP. ST noted that an outline CTMP will be submitted with the DCO application and committed to sharing a draft with Highways England prior to submission.

7. Next steps

ST explained that the following key areas will be progressed prior to the Hornsea Four DCO submission:

- Updated AIL assessment;
- Finalisation of the Environmental Statement accounting for consultation comments and refined peak construction movements;
- Completion of the outline CTMP; and
- Arrangement of the fourth Hornsea Four Human Environment Technical Panel, of which Highways England will be invited.

TW raised that Hornsea Four aim to progress a statement of common ground with Highways England. The intention being to develop an agreement regarding the A63 Castle Street Improvement Scheme in particular. A structure will be provided by TW.

Action 6: TW to issue statement of common ground structure to SG.

RE queried if there were any particular parts of the PEIR that Orsted would like feedback upon as part of the formal response.

ST advised that comments on the approach to deriving traffic demand and distribution and also road safety assessment would be welcome.

8. Any Other Business

No other business was raised.

Minutes of Meeting

Meeting	Hornsea Four and East Riding of Yorkshire Council Review of Access Strategy and Preliminary Environmental Information Report	02 October 2019
Meeting Date	02 October 2019	
Place	East Riding Business Centre, Beverley	Our ref. Hornsea Four and East Riding of Yorkshire Council Meeting 02.10.2019
Participants	<div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> Ørsted, Onshore Consents <div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> Royal HaskoningDHV (RHDHV), Transport Planner <div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> East Riding of Yorkshire Council (ERYC), Highway Development Management Team Leader <div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> ERYC, Area Engineer (Area 1) <div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> , ERYC, Area Engineer (Area 3) <div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> ERYC, Area Engineer (Area 5)	
Absent	n/a	
Copy	<div style="background-color: black; width: 100px; height: 1.2em; display: inline-block;"></div> , Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC	

Agenda

1. Introductions
2. Hornsea Four Update
3. Approach to PEIR
4. PEIR Findings
5. OnSS Access Strategy
6. Abnormal Loads
7. Cumulative Impacts
8. Next Steps
9. AOB

Minutes and Actions

1. Introductions

All attendees identified themselves and their roles and responsibilities.

2. Hornsea Four Update

TW presented Hornsea Four design including the landfall, onshore export cable corridor (ECC), onshore substation (OnSS) and energy balancing infrastructure (EBI). A summary of the project programme was presented and noted that the DCO submission is intended to be submitted in Q1 2020.

IS asked if the Hornsea Four proposals had taken into consideration the potential interaction with the ERYC proposals for Jocks Lodge. TW confirmed that Hornsea Four have met with the ERYC team developing Jocks Lodge and discussions are ongoing with regards to how the two projects interact and can accommodate each other.

3. Approach to PEIR

ST provided an overview of the Hornsea Four traffic and transport assessment, detailing the study area, PEIR submission documents and an explanation of how traffic levels have been derived for both HGVs and employee movements.

ST provided a summary of the approach taken to the derivation and distribution of onshore construction traffic as previously agreed with AF (second Human Environment Technical Panel of the 1 May 2019). ST clarified that detail regarding traffic derivation and distribution was presented in a technical annex to the PEIR.

ST provided a summary of how the peak daily flows have been established and noted that significant contingency has been accounted for, which has resulted in a worst-case assessment. ST advised that it is anticipated that through refinement to some of the worst-case engineering assumptions that these peak traffic flows will be reduced for the DCO submission.

AF identified that HGVs travelling from the ports in Hull could also travel via the A165 (rather than the A164) to the east of Hull to link with the A1035 near Leven. AF therefore requested that the transport study area for the ES be extended to encompass the A165 south from the A1035. ST noted that the study area had been agreed previously with AF during the technical panel process, but the option will be investigated for the DCO submission, subject to time constraints.

4. PEIR Findings

TW provided an overview of all the proposed access and crossing locations working from landfall and moving south towards the OnSS. TW identified those locations where changes to access and crossing locations are proposed for the DCO (from those included within the PEIR).

As each of the access and crossing locations was presented individually, TW asked if ERYC had any concerns or requests. No issues were raised, and it was agreed that access and crossing locations would therefore not require further amendments for the DCO submission.

ST advised that preliminary access concept drawings are provided within the PEIR and advised that it would be intended to also provide these drawings for the DCO submission. ST advised that it was proposed that detailed access designs for each access would be developed post consent and agreed with the ERYC through the development of the Construction Traffic Management Plan (CTMP). ST asked if the ERYC agreed with the approach to developing detailed designs post consent. AF confirmed this approach would be acceptable. AA advised that ERYC would be happy to see plans prior to the formal submission of plans.

ST asked if the ERYC are aware of any weight restrictions upon the bridge to the west of Brigham village. AA agreed to investigate.

Action 1: AA to investigate potential structural capacity of the existing bridge to the west of Brigham village and provide details to ST and TW.

ST identified locations where the road to the existing highway is narrow and the addition of construction traffic could require mitigation measures to allow two HGVs to pass (links 2, 10, 16, 17, 18, 19, 25, 32, 33, 34, 38, 40, 42 and 89). ST explained that for these links, a range of mitigation measures are outlined in the PEIR, including, road widening, new passing places, improvements to existing passing places and the use of a pilot/escort vehicle. ST identified that it would be proposed that the final measures would be agreed with ERYC post consent once a contractor is appointed as part of the development of the CTMP. AF agreed that this approach was acceptable.

AA asked if accesses and passing places would be left in place post construction. ST advised that the intention would be to remove all accesses and return to the original condition. Accesses may be retained however if the land owner would prefer this and ERYC agreed. AA noted that the ERYC would wish to see any new/improved passing places retained.

ST advised that the PEIR identified a number of locations where further road safety measures may be required. These include the junction of Miles Lane and the B1248 and the junction of Newbald Road and Walkington Heads. ST identified that for these junctions, a range of potential mitigation measures are highlighted in the PEIR, including, reductions in speed limits, temporary warning signs and enhanced maintenance of visibility splays. ST identified that it would be proposed that the final measures would be agreed with ERYC post consent once a contractor is appointed as part of the development of the CTMP. AF agreed that this approach was acceptable.

ST explained that the PEIR identified potentially significant severance impacts resulting from LCVs travelling along links 15, 17, 18, and 19. ST noted that to reduce impacts upon these links it would be proposed to reduce numbers of employee movements through measures such as car-sharing, or minibus transfer from site compounds. ST also noted that the PEIR identified potentially significant pedestrian amenity impacts

resulting from HGVs travelling along links 9, 12, 13, 22, 23, 24, 25, 30, 32 and 34. ST outlined the range of potential mitigation measures for each of these links, including reducing peak HGV numbers, scheduling deliveries to occur outside school start and finish times and using escort vehicles to escort HGVs. ST identified that it would be proposed that the final measures would be agreed with ERYC post consent once a contractor is appointed as part of the development of the CTMP. AF agreed that this approach was acceptable.

ST highlighted that the PEIR includes details of the numbers of construction traffic movements through each of the sensitive junctions (identified by the ERYC at the second Human Environment Technical Panel of the 1 May 2019). ST noted that the PEIR doesn't include detailed capacity assessments as it was agreed that the ERYC would provide feedback upon the requirement for junction modelling. ST noted that the ERYC had not provided comments upon this in their formal consultation response and therefore asked if the ERYC were content that junction modelling was not required or that modelling could be dealt with post consent once greater certainty regarding traffic distribution and working hours was known.

AF raised that he may ask his external consultants to review this section of the Hornsea Four PEIR documentation. TW noted that feedback received at this time would be challenging to incorporate. **Action 2:** AF to issue comments upon the requirements for junction capacity modelling to ST and TW.

IS asked how contractors would be prevented from parking on the highway. ST confirmed that the outline CTMP will include a commitment to ensuring the compounds have sufficient space for all cars to park off the highway, and space for HGVs to turn and load/unload. ST advised that the exact detail would be developed post consent once a contractor was appointed and agreed with the ERYC through the development of the CTMP. AF agreed that this approach was acceptable.

5. OnSS Access Strategy

TW advised that following consultation feedback, Hornsea Four were proposing to restrict construction traffic accessing via Park Lane further than identified in the PEIR (which included access off Park Lane for the onshore ECC and 400kv connection to Creyke Beck). TW explained that the removal of the Park Lane accesses would potentially necessitate all construction traffic instead having to access from the A1079 southern layby and traveling on a new access track.

IS asked if layby parking would be lost upon completion of construction. TW explained that the access would remain in place but would only need to be used for scheduled maintenance visits during the operational lifetime of the project. The full access junction would only be used for unplanned abnormal loads in the unlikely event of component failure at the OnSS.

6. Abnormal Loads

TW advised that an abnormal load study had been undertaken by ALE that considers the potential of moving up to six transformers from the ports at Hull to the OnSS. TW noted that the study was an initial draft that looked at physical negotiability and further work would be undertaken for the DCO submission to investigate the capacity of structures to accommodate the loads.

TW advised that the study considered two routes, namely, the A63, A164 and A1079 and a second route via Markfleet Lane, Ings road, Sutton Road and the A1079. ST noted that Highways England have raised concerns with the route via the A63 as the route may be restricted during the implementation of the improvements at Castle Street improvements. AF advised that ERYC would support the use of the second route.

7. Cumulative Impacts

ST noted that it had been discussed with the ERYC (at the second Human Environment Technical Panel of the 1 May 2019) that the cumulative impact assessment for Hornsea Four should consider Jocks Lodge and Castle Street Improvements schemes. ST noted that the impact with Castle Street Improvements have been discussed with Highways England and that it has been agreed that a formal assessment would not be required by Highways England and instead commitments within the respective CTMP to work together to avoid overlap of peak activities, etc would be appropriate. ST asked if a similar approach could be adopted for considering the potential cumulative impacts with Jocks Lodge. AF confirmed that this approach would be acceptable.

8. Next Steps

TW explained that the following key areas will be progressed prior to the Hornsea Four DCO submission:

- Updated AIL assessment;
- Finalisation of the Environmental Statement accounting for consultation comments and refined peak construction movements; and
- Completion of the outline CTMP.

TW raised that Hornsea Four aim to progress a statement of common ground with the ERYC. A structure will be provided by TW. **Action 3:** TW to issue statement of common ground structure to Andy Wainwright, case office at ERYC for Hornsea Four.

9. Any Other Business

IS advised of an ethylene pipeline that could potentially interact with the cable route. TW committed to speaking to the Hornsea Four engineering team to ensure this was accounted for.

No other business was raised.

Minutes of Meeting

Meeting	Onshore Human Environment: Public Rights of Way and Cycle Network	29 October 2019
Meeting Date	29 October 2019	
Place	County Hall, Beverley	
Participants	<p>[REDACTED] Ørsted, Onshore Consents [REDACTED] Royal HaskoningDHV (RHDHV), Technical Director [REDACTED] RHDHV, Environmental Consultant [REDACTED] ERYC, Countryside Access Officer (Cottingham up to Huttons Craswick) [REDACTED] ERYC, Countryside Access Office (from Hutton Craswick north) [REDACTED] ERYC, Definitive Map Officer</p>	Our ref. Hornsea Four EP Human Environment TP Meeting #3 PRow
Absent	N/A	
Copy	[REDACTED] Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC	

Agenda

1. Welcome, Introductions and Safety Brief
2. Aims and objectives of the meeting
3. Hornsea Four Update
4. Key Section 42 responses
5. 'Impacts register' and Proportionality
6. Onshore Substation permanent PRow diversions (WOODB30 and SKID16)
7. Onshore Export Cable Corridor temporary PRow and cycle network disruption
8. Landfall temporary PRow disruption
9. AOB

Minutes and Actions

1. Welcome and Safety Brief

TW welcomed all participants and confirmed that no fire alarms were planned for the duration of the meeting. Fire exits were identified. No further safety issues were identified.

All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

2. Aims and Objectives of the Meeting

TW outlined the purpose and process of the meeting, comprising:

- an update on Hornsea Four activities and design evolution since issue of Preliminary Environmental Impact Report (PEIR) and receipt of S42 comments;
- an overview and discussion of the key Section 42 responses received;
- to seek consensus on the proposed approach to the Environmental Statement (ES) by presenting the Impacts Register for discussion; and
- to agree on the mitigation methodologies for the PRoW and cycle networks impacted by Hornsea Four.

3. Update on Hornsea Four Activities

TW presented Hornsea Four design updates, detailing how the red line boundary has been refined from the interim PEIR boundary, including three main updates as follows:

Update 1

Based on stakeholder engagement the southern landfall site has been selected, reducing the Order Limits and selecting the A3 site, located further away from the Cow Shed Tea Shop and associated recreational usage to the north. Trenchless technology will be committed to at landfall, removing the option to utilise open cut techniques and avoiding routine closure on the beach – with only emergency access required to the beach itself during construction.

TW noted that the actual compound size would be approximately 200x200m within the wider area and so scope for micro-siting to avoid potential impacts including set back from the coast and proposed English Path line.

Update 2

Both permanent and temporary access routes to the onshore substation (OnSS) and nearby onshore Export Cable Corridor (ECC) and 400kv ECC are now from the north only, avoiding impacts to Park Lane and the National Cycle Route. Landscaping plans now include a wooded area (west) and attenuation pond (east) at the OnSS.

Update 3

The 400 kV ECC search area to Creyke Beck National Grid substation has been refined significantly, reducing the area significantly. The refinement removes the impacts to PRow to the north and east of the National Grid substation (SKIDF1, SKIDF12, SKIDB07).

TW noted there had also been some minor changes to onshore ECC, logistics compound locations as well as access roads. The changes will cause some minor changes to how some PRow are affected, however these are not substantial or additionally, adverse changes.

PS provided a summary of the work undertaken to update baseline data on PRow impacted by Hornsea Four. Site visits to all PRow crossing points were undertaken in Sept/Oct 2019 to photograph PRow and cycle routes being crossed, and to note further observations (such as signage and evidence of usage).

4. Key Section 42 Responses

TW discussed the proposed approach to key Section 42 stakeholder comments.

ERYC had commented on monitoring approach for PRow as well as diversion requirements. TW noted that specific PRow monitoring had not been undertaken for past projects of a similar nature and that it was not considered that dedicated monitoring would be appropriate. TW did confirm however that the PRow management plan would detail specific methods to ensure adequate reinstatement of PRow, and that land owner agreements would commit the Applicant to managing any adverse impacts as a result of Hornsea Four post-reinstatement. AC noted that concerns over path slumping etc could be reduced by putting a stone mix in any drainage or footings.

The use of land owner agreements and adequate detail within the PRow management plan was agreed.

Further Section 42 comments related to Joint Local Access Forum (JLAF) concerns for diversions to WOODB30/ROWB13 and BARMF04 were discussed. TW noted that with changes to the proposed OnSS access, the previous temporary diversion for WOODB30/ROWB13 will now be permanent, and selection of the southern site for landfall confirms the requirement for a diversion for BARMF04.

5. Impact Register and Proportionality

TW outlined the proposed approach to impact assessments with impacts deemed to have no Likely Significant Effect at PEIR stage to be moved from the chapter to the Impact Register. TW highlighted this would include all three PRow impacts, if ERYC are in agreement.

The purpose of the Impact Register was clarified. TW noted that this register will detail these assessments undertaken in the PEIR with no significant effects, along with relevant commentary.

TW also outlined that the DCO submission will be supported by an Outline PRoW Management Plan, which would be produced in consultation with ERYC. ERYC agreed that the three PRoW impacts set out in the PIER were suitable for removal from the ES chapter and presented in the Impact Register, as overall effects would not be significant.

PS led further discussion on the impacts to the planned route for the English Coastal Path. AC noted coastal path would likely be designated as a 4 m corridor, with the centre 6 m back from cliff area. AC highlighted an approximate 90 m inland diversion for a bridge crossing at Earl's Dyke (to the north of the Hornsea Four landfall works area). AC advised Natural England would have more information.

TW noted the project is also looking to finalise a commitment to maintain access to the beach where possible.

6. ONSS Permanent Diversions

TW led discussion on Rowley Bridleway No. 13 (which will now be permanently be impacted by the OnSS permanent access track). TW outlined the proposed rerouting, crossing the access road at a safe point and continuing alongside the road to the north. ERYC noted their preference would be to avoid the PRoW running between the access road and the A1079. ERYC advised that they would rather see the PRoW diversion to re-route the to the south of the access track before creating a crossing when the access track bends to the south. This would avoid the bridleway being located between the A1079 and the access track which would be unattractive/ for public users. TW agreed with this approach and noted that Hornsea Four would include details in the PRoW Management Plan. ERYC noted that banksmen should be used for any wide loads manoeuvring down the access road due to the proximity of the PRoW.

Action 1: Hornsea Four to map agreed diversion and issue to ERYC for comment.

It was also confirmed that the diversion would be managed through the DCO process, in consultation with ERYC.

SP highlighted safety and access considerations regarding liability for use of access track, TW confirmed installation of gates on the road to stop vehicle traffic during operation, other than occasional Hornsea Four activity.

TW led discussion on Skidby Footpath No. 16 which will require a permanent diversion. After stakeholder engagement a route has been confirmed, integrating diversion with the proposed areas of woodland and landscaping. The route then follows the permanent access road to join ROWLF12.

ERYC agreed with proposed route. SP noted the permissive route and legal routes differ, noting it would be good to update these inconsistencies within the DCO if possible. TW advised that changes outside the red line boundary would not be possible within the DCO.

Action 2: DS to send map to TW outlining permissive and legal routes for SKIDF16.

Discussion was held on diversion requirements. AC noted planting would need to allow for growth and a 2m path before trimming would be required, TW confirmed this has been accounted for in the design already. AC noted bridleway requirements would be 4 m (width).

Action 3: Hornsea Four to update landscaping plan for SKIDF16 with agreed diversion and send through to ERYC for comment.

SP queried ongoing maintenance and safety. TW noted this would either sit with the substation operator or within the land owner agreements. Suitable signage at the crossing point of the access road would be installed.

7. Onshore ECC Temporary Diversions

Landfall Temporary Diversion

Discussion confirmed a suitable diversion for Barmston Footpath No. 4 at landfall.

AC advised the footpath was heavily used in combination with the highway for beach access.

The diversion will run along the field boundary to the south and then divert along the edge of the clifftop between Earl's Dyke and the south of the landfall compound search area. Furthermore, safety considerations for the use of Sands Lane for both walking and construction traffic was discussed.

Cable Route Crossings Management

TW outlined the potential impacts from the cable route on PRow as well as the proposed approach to management of these impacts.

Impacts include disruption during ground preparation, haul road construction and then trenching. Trenching activities would cover up to approximately 700m a day, if ducting is used as the preferred construction method. TW confirmed commitment that disruption would be for no longer than three months at one point, or six months in total, will be retained from PEIR to ES.

AC noted that where the PRow would cross, it would be ideal to leave 2 m gap in bunds to avoid public access between bunds and provide a clear location for access gates to be located. SP also highlighted the need to consider ground conditions.

TW advised that Hornsea Four's generic approach across the onshore ECC would be to stop up (close) PRows, with adequate warning and not to implement specific diversions. Should PRows with heavy use be identified, a diversion could be identified. ERYC agreed the approach and a discussion took place to highlights and high use paths based on local knowledge of AC and SP.

A number of PRowS would be crossed using trenchless techniques due to proximity to roads, access tracks of field drains and so would not be stopped up (closed) at any time during construction and were not discussed further. ERYC comments regarding popularity / use levels of the remaining PRowS impacted by Hornsea Four were recorded with input from Aca and SP as follows:

PRow Name	PRow Reference	Crossing Method	ERYC Comments
Barmston Footpath No. 3	BARMF03	Open Cut	Low use, no diversion required.
Barmston Footpath No. 2	BARMF02	Open Cut	Low use, no diversion required.
Foston on the Wolds Footpath No.10	FOTWF10	HDD	N/A
Foston on the Wolds Footpath No.12	FOTWF12	Open Cut	Suspected not well used, but advised to take further guidance from Parish Council.
Foston on the Wolds Footpath No.12	FOTWF12	HDD	N/A
Foston on Wolds Bridleway No.9	FOTWB09	HDD	N/A
Foston on the Wolds Bridleway No.6	FOTWB06	Open Cut	Low use (cul-de-sac), no diversion required and stopping up is acceptable.
Hutton Cranswick Footpath No. 10	HCRAF10	HDD	N/A
Watton Footpath No. 18	WATTF18	HDD	N/A
Watton Bridleway No. 13	WATTB13	HDD	N/A
Beswick Bridleway No. 23	BESWB23	Open Cut	Suspected not well used, but advised to take further guidance from Parish Council as may be circular route for horse riding.
Lockington Footpath No. 8	LOCKF08	Open Cut	Low use, no diversion required.
Leconfield Footpath No.1	LECOF01	Open Cut	Promoted route (Minster Way) with heavy usage . Diversion required.
Leconfield Bridleway No. 2	LECOB02	Open Cut	Popular route. Diversion required.
Leconfield Footpath No. 7	LECOF07	Open Cut	Popular route, links to LECOF01 and LECOB02. Diversion required but a parallel route is available.
Leconfield Footpath No. 7	LECOF07	Open Cut	Popular route, links to LECOF01 and LECOB02. Diversion required.
Leconfield Bridleway No. 9	LECOB09	HDD	N/A
Leconfield Footpath No. 10	LECOF10	Open Cut	Low use, no diversion required.
Leconfield Footpath No. 11	LECOF11	Open Cut	Low use, no diversion required.
Leconfield Bridleway No. 12	LECOB12	Open Cut	Low use, no diversion required.
Cherry Burton Footpath No. 2	CBURF02	HDD	N/A

PRoW Name	PRoW Reference	Crossing Method	ERYC Comments
Barmston Footpath No. 3	BARMF03	Open Cut	Low use, no diversion required.
Barmston Footpath No. 2	BARMF02	Open Cut	Low use, no diversion required.
Cherry Burton Footpath No. 3	CBURF03	Open Cut	Suspected not well used, but advised to take further guidance from parish Council.
Sustrans National Route 164	N/A	HDD	N/A
Walkington Footpath No. 9 (Moor Lane)	WALKF09	Open Cut	Promoted footpath (Beverley 20) and farm access. Diversion required.

Action 4: ERYC to review recorded comments on PRoW diversions and update as required.

PS queried if ERYC had any protocols or standards that should be included in the PRoW Management Plan. SP highlighted importance of signage locations starting well in advance of any actual diversion, notably at link-points with the wider PRoW network. PS noted the management plan will include the principles of signage to be implemented.

Action 5: ERYC to forward any diversion/stoppage requirements to TW.

TW queried publication of notices. AC advised notices should predominantly be published in East Riding News.

AC advised the outline PRoW management plan should include consideration of health and safety liability.

Action 6: Hornsea Four to prepare Outline PRoW Management Plan.

8. Any Other Business

AC queried next steps in terms of the wider submission programme. TW confirmed planned DCO submission at end of February next year. The next steps include finalising technical panels and commencing the preparation of the Statements of Common Ground.

It was agreed that a further meeting would be required to review final outline PRoW Management Plan to be submitted with the DCO application. This would be held around Christmas, noting ERYC offices close between Christmas Eve and 2 January 2020.

SP raised management of PRoWs adjacent to access roads. TW noted that the permanent diversion of Rowley Footpath No. 12 accounted for permanent changes. Management would include speed limits as well as banksmen when abnormal loads were present.

TW noted the other access routes to the south of the OnSS have now been removed as part of the Order Limit changes.

No further business was raised.

Action Log

Action 1	Hornsea Four to map agreed diversion and issue to ERYC for comment.
Action 2	DS to send map to TW outlining permissive and legal routes for SKIDF16.
Action 3	Hornsea Four to update landscaping plan for SKIDF16 and sent through to ERYC to comment.
Action 4	ERYC to review recorded comments on PRow diversions and update as required.
Action 5	ERYC to forward any diversion/stoppage requirements to TW.
Action 6	Hornsea Four to prepare Outline PRow Management Plan.

Minutes of meeting

Meeting	Hornsea Four and Public Health England Meeting	17 January 2020
Meeting Date	17 January 2020	
Place	Skype	
Participants	<p>██████████ – Ørsted, Hornsea Four Onshore Environment Manager</p> <p>██████████ – Ørsted, Hornsea Four Application Coordinator</p> <p>██████████ ██████████ – Royal HaskoningDHV (RHDHV), Environment Industry Sector Director</p> <p>██████████ ██████████ – RHDHV, Environmental Consultant</p> <p>██████████ ██████████ – Public Health England (PHE), Centre for Radiation, Chemical and Environmental Hazards (CRCE)</p> <p>██████████ ██████████ – PHE, Healthy Places</p>	Our ref. Hornsea Four and Public Health England Meeting
Absent	N/A	
Copy	██████████, Ørsted, Hornsea Four Consent Manager	
Next meeting	N/A	

Agenda:

1. Introductions
2. PHE overview – An opportunity for PHE to provide a summary of their involvement in NSIPs and their expectations and aspirations regarding offshore wind development.
3. Hornsea Four project update – An overview of the project, route planning process, EIA proportionality, design vision and PRow management work.
4. Section 42 responses – Summary of comments received and Hornsea Four’s associated actions.
5. Hornsea Four HIA methodology.
6. Summary and AOB.

Aim:

To establish a common understanding of Hornsea Four’s approach to Health Impact Assessment (HIA) and provide PHE an opportunity to set out key requirements and emerging expectations from promoters of Nationally Significant Infrastructure Projects.

Minutes and Actions:

Our ref. Hornsea Four and Public Health England Meeting

All attendees detailed their respective roles in relation to Hornsea Four.

PHE Overview

AN provided an overview of PHE:

- PHE is a statutory consultee and is set up to be focussed on national health matters with eight local centres.
- PHE overlaps with the Environment Agency (EA) and HSE e.g. water access, but PHE focuses on impact to public Health.
- NSIP consultation responses are led by CRCE; however, the scope of interest is expanding from only focussing on chemicals, poisons and radiation into other 'health and wellbeing' matters.

AG explained what PHE look for in an Environmental Impact Assessment (EIA), including:

- Good description of the proposed development; emission impacts; phases of the scheme; Population Health (PHEs focus, rather than individuals); decommissioning (AG noted that assessment is required in some circumstances); cumulative impacts; control/mitigation measures.

It was noted that PHE:

- will strive to provide all consultation input from relevant teams in one response document.
- are trying to provide information earlier – want to engage pre-scoping where possible.
- will not typically engage with local authorities, as PHE will focus on national regulations rather than detailed local issues. This can occasionally result in a difference of opinion between PHE and local authorities.
- have in-house noise specialists, but the topic has been material in only a small number of applications.

AG and AN outlined how an update in 2017 to the EIA regulations have resulted in PHE commenting on wider matters. PHE developed Four Themes to underpin their Health and Wellbeing responses (Access, Traffic and Transport, Socio Economics and Land Use) which were derived from NPS. Under the four Themes, there are a total of 21 determinants of health and wellbeing in EIA. These will be published soon and will need to be considered by applicants into the future. In addition, the following points were discussed:

- PHE want to look further into inequalities (i.e. vulnerable populations). TW noted that Hornsea Three had been requested to produce a Public Sector Equality Duty Statement; however, Hornsea Four was not planning on undertaking this and had not received a consultation request to do so.
- PHE are focussed on Housing – e.g. where homeowners may need to relocate due to a proposed development:

- Look at the impact of compulsory purchase or relocation on mental health issues, especially for more vulnerable members of society.
- There are instances where tenants of properties are more vulnerable than the homeowners in instances of compulsory purchase.
- It was noted that mental health isn't specifically listed in the 21 determinants, but is embedded within all the determinants.
- PHE has a limited focus on ambient Air Quality, relying on local authorities' Local Air Quality Management duties.
- Recreational spaces are of great importance, particularly in consideration of impacts and/or benefits on mental health. It is important to consider people with disabilities when designing gates, stiles, etc. to be used on public rights of ways (PRoWs), to ensure they are accessible. Important to include both mitigation and potential benefits of improving access in HIA.
- Employment – promotion of education benefits and apprenticeships is encouraged.
- Cumulative effects are an area of focus, ensuring health and wellbeing are considered as part of the assessment.
- Comments more specific to Hornsea Four HIA – importance of listing receptors (people and assets) in the HIA; mental health needs to be considered, with “parity of esteem” being a benchmark; and baseline health data in HIA should be presented with a narrative.

JD welcomed the information provided by PHE and confirmed that:

- The methodology proposed for the Hornsea Four HIA accounts for the 21 determinants of health and wellbeing outlined by PHE;
- Both inter-related and cumulative impact assessment will be detailed in relevant technical chapters; and
- RHDHV future proofed EIA chapters in 2014 to incorporate the consideration of health and wellbeing and recognise PHE's position since the EIA Regulations were revised in 2017.

Hornsea Four Update

TW provided brief overview of Hornsea Four, including a description of the Landfall, Onshore export cable corridor (ECC), Onshore substation (OnSS) and Energy Balancing Infrastructure.

The following key matters were raised:

- Hornsea Four's submission date has been pushed back by 6 months to Q3 2020.
- The southern landfall location (of the two presented at PEIR) has been selected for DCO, with minimising impacts on recreational uses factoring into the decision.
- Hornsea Four have committed to the use of trenchless technology at landfall, reducing impact on the beach.
- Both construction and operational access removed from the south of the OnSS, due to Section 47 comments.

- Outline Design Vision statement has been produced which is of relevance to health and wellbeing.
- Overview on Hornsea Four proportionality approach, including the removal of impact assessment from ES chapters to the Impacts Register:
 - o AN queried about the impact of proportionality on cumulative effects.
 - o TW confirmed that cumulative assessment will not be removed from chapters.
 - o JD noted IEMA's 'Delivering Proportionate EIA' document, in which the growth in length of UK offshore windfarm ES's is outlined. Hornsea Four hopes to move away from this trend.
- Hornsea Four has completed a significant amount of work on PRowS and has engaged with the local authority, Ramblers and local access forum.
- A Local Community Liaison Officer is available, based in the area, to engage with local people.

Section 42 Updates

JD covered consultation responses received from PHE and queried the request for monitoring. PHE confirmed that this is included in all of their consultation responses and is not requesting specific community health monitoring. Typical monitoring activity is captured in best practice and can include the record of nuisance complaints during construction. This was welcomed by JD and it was confirmed that Hornsea Four would not be proposing specific community monitoring related to health impacts, and that justification would be provided in the HIA.

AG acknowledged that impacts during construction are transient and that PHE are satisfied with mitigation measures being secured in documents such as the Code of Construction Practice.

Hornsea Four HIA Methodology

PHE had not reviewed the previously distributed note in detail; however, JD confirmed the methodology table presented in the consultation memo (dated 20 December 2019) is an adaptation of Table 5.5 of the PEIR and just excludes the scoped out topics.

TW requested that PHE provide an official response to the methodology memo.

AN requested that a draft of the HIA is issued to PHE prior to Hornsea Four's submission. TW confirmed this was achievable and would be in touch regarding programme. AN advised that the draft should also be distributed to the local director of public health.

Actions

- PHE to respond to methodology memo.
- Hornsea Four to provide a draft HIA before DCO submission.

Minutes of Meeting

Meeting	Hornsea Four: Outline Construction Traffic Management Plan Review meeting with ERYC	29 April 2020
Meeting Date	29 April 2020	
Place	Conference Call	
Participants	[REDACTED], Ørsted, [REDACTED], Royal HaskoningDHV (RHDHV) [REDACTED] East Riding of Yorkshire Council (ERYC) [REDACTED] ERYC [REDACTED], ERYC [REDACTED] ERYC	Our ref. Hornsea Four ERYC oCTMP
Absent	N/A	
Copy	[REDACTED], Ørsted, Hornsea Four Consents Project Manager	
Next meeting	TBC	

Agenda

1. Welcome and Introductions
2. Aims and objectives of the meeting
3. Hornsea Four oCTMP discussion
4. AOB

Minutes and Actions

1. Welcome and Introductions

TW welcomed all participants. All attendees identified themselves and their roles and responsibilities in relation to Hornsea Four.

2. Aims and Objectives of the meeting

TW outlined that the aims of the meeting are to discuss the draft outline construction traffic management plan (oCTMP) provided by Hornsea Four on 15 April 2020, to obtain comments and suggestions from ERYC to ensure an agreed version is established pre-application.

3. Hornsea Four oCTMP discussion

ST offered to either lead on running through the oCTMP page by page or allow ERYC to lead with comments. The consensus was to run through the oCTMP allowing for questions and comments throughout. ST began by explaining the overall purpose of the document, noting it is a framework document that will help ensure it is clear what is expected from the appointed contractors during construction. ST outlined that it is proposed that a final CTMP would be prepared by the contractor and agreed with ERYC prior to commencement of construction.

The oCTMP is the framework to manage Hornsea Fours construction traffic.

TW noted that Dogger Bank Creyke Beck A and B have recently passed through the finalisation of the CTMP prior to construction and that the ambition is to ensure that lessons are taken from that process to ensure that ERYC have the mechanisms secured within the oCTMP

ST continued to run through the oCTMP noting that it does not cover onshore traffic movements associated with offshore construction and operational activities.

ST explained the roles and responsibilities identified for construction and noted that the contractor would be given overall responsibility for implementing the final CTMP. ST discussed each role and clarified that the day to day running is the responsibility of the contractor.

HGV Movements

ST explained Section 2 of the oCTMP – notably the measures proposed to control HGV movements on specific road links and access points. Routeing is to be secured via temporary signing, to be agreed with ERYC pre-construction. Each supplier would also be issued specific delivery instructions to avoid alternative routes being used.

An identifier (e.g. contractor logo) would be proposed in the HGV cab to clearly indicate to members of the public that the vehicles are working on Hornsea Four, to allow for direct contact with the contractor.

ST explained that the movement of abnormal loads for both the OnSS and onshore ECC have been left separated from this oCTMP process as they are covered by separate statutory (ESDAL) process.

All ERYC participants confirmed the above measures are appropriate and they have no comments.

Employee Movements

ST then went on to explain the construction employee traffic management measures set out in Section 3 of the oCTMP. This would include the promotion of car sharing as the main measure and most appropriate. Furthermore, walking and cycling will not be discouraged, and lockers, welfare facilities etc. will be supplied for these instances.

ERYC agreed with the proposed measures to manage employee traffic movements.

TWe asked where employees would park. ST noted this is addressed in Section 4.6 of the oCTMP, which states that appropriate loading and parking areas will be provided to avoid parking on the street. TWe identified that this is a key concern for ERYC and that they want to avoid parking on the street. ST explained that details of numbers of parking spaces, turning areas etc. would be shared with ERYC as part of the final CTMP once a contractor is appointed. TWe confirmed that this was an acceptable approach.

Traffic Management

AF stated that wheel washing facilities would be required, ST mentioned this is currently addressed within the outline Code of Construction Practice (oCoCP) but text can be added to the oCTMP as well. TW noted that wheel washing facilities are only proposed for specific instances.

ST then went on discuss the traffic management measures (Section 4) and explained that the package of access and road crossing designs would be provided post-consent, pre-construction of the relevant part of the construction works and noted this had been discussed and agreed previously. AF agreed that this was acceptable and appropriate.

ST identified that there will likely be a need for some road improvement works, or introduction of management measures such as the use of pilot vehicles.

AF specified that ERYC typically use Section 62 for the offsite works for highways upgrades. ST confirmed the oCTMP would be updated accordingly.

ST then provided context and a reminder of past discussions regarding driver delay, noting is had been agreed that detailed modelling would not be undertaken pre-application and would be undertaken once firmer and final traffic numbers, routes and peak hours are known, if required. AF noted this was acceptable.

Cumulative Schemes

IS noted that the A164 and Jocks Lodge Junction Improvement Scheme has an anticipated construction period between 2022 – 2025. IS also noted that once the Jocks Lodge Junction Improvement Scheme is completed constructed traffic would only be able to left turn into and out of Dunflat Road from the A164. ST noted that this aligns with the project approach to traffic routeing.

IS noted that the Hornsea Four access off the A1079 would have a potential interaction with the A164 and Jocks Lodge Junction Improvement Scheme. TW confirmed that previous engagement had occurred with ERYC on this matter and the previous attenuation pond had since been removed to facilitate the Hornsea Four access; however ongoing contact would be required to ensure the two accesses can coexist is necessary.

AF noted that the A164 and Jocks Lodge Junction Improvement Scheme's planning application has been submitted, planning number '20/01073/STPLF'.

TW explained that the A63 Castle Street Improvement Scheme DCO decision has been delayed and that Hornsea Four have been in contact with Highways England to discuss the interaction between the two projects.

All attendees confirmed acceptance of the cumulative approach set out.

Monitoring

ST explained the approach to monitoring, including the provision of contact details for a member of the construction team (to avoid contact directly to ERYC). ST explained that the condition surveys are proposed to be undertaken on roads not designed to take HGV traffic, omitting the majority of A and B roads.

AA asked whether the video capture survey could be used. ST confirmed the approach would be agreed with the ERYC pre-construction.

IS agreed that the A and Broads would be designed to cope with HGV traffic demand and would not require a survey, and that the approach outlined within the oCTMP to focus on smaller roads would be appropriate.

TWe asked that a sweeper could be added to the oCTMP. ST clarified it would be included within the wheel washing section.

4. Any Other Business

No AOB was raised and it was agreed that ERYC would respond formally with final comments on the oCTMP upon receipt of the minutes from the meeting.

Action Log

Action 1	ERYC to provide final comments on the oCTMP
-----------------	---