



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Habitats Regulations Appraisal/Habitats
Regulations Assessment RIAA

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Glossary

Term	Meaning
AC Connection Cables	Alternating current (AC) cables that will connect the proposed onshore land substation to the National Grid Hawthorn Pit Substation.
Annex I Habitat	Annex I refers to a habitat as defined under the European Union (EU) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.
Annex II Species	Annex II refers to a species as defined under the EU Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.
the Applicant	The legal entity making the applications for consent; Morven Offshore Wind Limited (MvOWL).
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Breeding Bird Survey Area	The survey area considered for breeding birds which comprises the MHPGC PEIR Red Line Boundary: Onshore, with a 100m buffer applied. Surveys were undertaken during April to July 2025 inclusive and late March to July 2026 inclusive.
Cetacean	Aquatic mammals constituting the infraorder Cetacea (whales, dolphins, porpoises).
Commitments (CoT)	Measures (embedded mitigation and secondary) to be adopted during the construction, operation and maintenance and decommissioning phases of the MHPGC Project.
Competent Authority	The term derives from the Habitats Regulations and relates to the exercise of the functions and duties under those Regulations. Competent authorities are defined in the Habitat Regulations as including "any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office". In the context of a plan or project, the Competent Authority is the authority with the power or duty to determine whether or not the proposal can proceed (Conservation of Habitats and Species Regulations 2017).
Embedded mitigation	Measures included as part of the project design. Includes both primary and tertiary mitigation.
Environmental Impact Assessment (EIA)	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.

Term	Meaning
Desk study	A desk-based research method used to collect and analyse existing information, including the review of literature, previous survey reports, databases and maps to inform the baseline environment and the need for further surveys.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent.
Expert Working Group	A topic-specific group of specialists formed under the evidence plan process (EPP) to resolve technical issues and agree approaches for environmental assessments.
Field survey	The direct on-site observation and collection of environmental data, through sampling and recording, undertaken within the Survey Area.
Habitats Directive	Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive) is the European Union Directive from which the requirement for the consideration of likely significant effects of the MHPGC Project upon European sites and sites designated within the National Site Network is derived.
Habitats Regulations Appraisal/Habitats Regulations Assessment (HRA)	The Habitats Regulations Appraisal (for Scotland)/Habitats Regulation Assessment (for England) is a process that determines whether development plans could adversely effect sites within the National Site Network and their qualifying features.
Habitats Regulations	A term commonly used to refer to the collective legislation that translates the Habitats Directive (Directive 92/43/EEC) and the Wild Birds Directive (Directive 2009/147/EC) into specific legal obligations in Scotland and England. Namely: the Conservation of Habitats and Species Regulations (as amended) 2017 (applies in England out to 12 nm and in Scotland for reserved activities), the Conservation of Offshore Marine Habitats and Species Regulations (as amended) 2017 (applies in English and Scottish waters beyond 12 nm) and the Conservation (Natural Habitats, & c,) (as amended) Regulations 1994 (applies in Scotland out to 12 nm). These Regulations provide the legal framework for the protection of European sites, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and underpin the Habitats Regulations Assessment/Appraisal (HRA) process.
In-combination Effects	Potential effects to a National site resulting from MHPGC Project assessed together with effects from one or more different projects and plans with the potential to contribute to a likely significant effect on or adverse effect on the integrity of the National

Term	Meaning
	site. The term is specific to assessments undertaken under the Habitats Regulations.
Intertidal Area	The area between Mean High-Water Springs (MHWS) and the Mean Low Water Springs (MLWS).
Intertidal Bird Survey Area	The area between Mean High-Water Springs (MHWS) and Mean Low Water Springs (MLWS) within the MHPGC Project PEIR Red Line Boundary, including a 1.5km viewshed from the coast (to cover subtidal/marine habitat) and a buffer of up to 650m where Intertidal Bird Surveys were undertaken during the winters of 2023/2024 and 2025/2026.
Intertidal Ornithology Study Area	Coterminous with the Intertidal Bird Survey Area and identified to inform desk-based assessment of European sites and their features prior to the commencement of fieldwork.
Landfall	The point where the offshore export cables transition from the offshore marine environment to the onshore terrestrial environment.
Likely Significant Effect	Effects from the Proposed Development that have a pathway for effect to the National site that could affect the conservation objectives for the site's qualifying features. If the Proposed Development 'would be likely to have significant effect on a 'National site' as per the Habitat Regulations, then then an appropriate assessment of the plan or project must be carried out by the Competent Authority.
MHPGC Project Marine Protected Area (MPA) and Marine Conservation Zone (MCZ) Assessment	The MPA and MCZ Assessment is a process used to evaluate whether a proposed activity could have a significant impact on designated nature conservation MPAs (in Scotland) or MCZs and Highly Protected Marine Areas (HPMA) (in England). It ensures that the development does not hinder the conservation objectives of the protected features of these sites, as required under the Marine (Scotland) Act 2010 (Scotland) and the Marine and Coastal Access Act 2009 (England). The MCZ and MPA Assessment for the MHPGC Project will consider whether the activities subject to the relevant application (i.e. activities subject to a marine licence application and DCO consent) can hinder the conservation objectives of a protected feature in a nature conservation MPA, MCZ or HPMA.
Marine Directorate Licensing Operations Team (MD-LOT)	The part of the Scottish Government's Marine Directorate responsible for assessing and administering applications for marine licences for

Term	Meaning
	Scottish waters and Section 36 consent (offshore) in Scotland.
Marine Licence	A marine licence permits the undertaking of different activities in the marine environment, including construction, the deposition or removal of substances or objects from the seabed and dredging. The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities within the Scottish offshore region (12nm – 200nm) and in English offshore and inshore regions (noting that deemed marine licences will be included within the Development Consent Order application).
Marine Management Organisation (MMO)	The MMO, as a UK government body, is responsible for licensing, regulating and overseeing activities in the marine environment for English waters. For a DCO and deemed marine licence, the MMO acts as a statutory consultee, advising on marine planning, environmental impacts, habitats and compliance with marine licensing regulations.
Mean High Water Springs	The most inshore level location reached by the sea at high tide during mean high water spring tide. This is defined as the average tidal height throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Mean Low Water Springs	The average height of the low water levels of each pair of successive low waters during the periods of about 24 hours when the tidal range is at its greatest.
MHPGC Project Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the PEIR, Environmental Statement (ES) and Habitats Regulations Assessment processes for certain topics.
MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment (HRA) Screening Report	A HRA Screening Report is Stage 1 of the HRA process and screens in sites within the National Site Network, and qualifying features, for consideration within Stage 2 of the HRA process. The HRA Screening Report for the MHPGC Project will be submitted to the Planning Inspectorate and MD-LOT to obtain an opinion on which sites within the National Site Network, and qualifying features, should be screened in for consideration within the MHPGC Project Report to Inform the Appropriate Assessment.
MHPGC Project PEIR Red Line Boundary	Spatial extent used to define the environmental assessment within the PEIR. The area within which all components of the MHPGC Project will be located, including areas required on a temporary

Term	Meaning
	basis during construction and/or decommissioning (such as construction compounds).
MHPGC Project PEIR Red Line Boundary: Onshore	Spatial extent used to define the environmental assessment within the PEIR. The area within which all onshore components of the MHPGC Project will be located landward of MHWS, including areas required on a temporary basis during construction and/or decommissioning (e.g. construction compounds).
MHPGC Project Preliminary Environmental Information Report (PEIR)	Report that provides a preliminary assessment of likely significant environmental effects of the MHPGC Project on the physical, biological, and human environment during construction, operation and maintenance and decommissioning phases. The PEIR is published prior to the preparation of the ES and is based on currently available information and is used to inform statutory consultation under section 42 of the Planning Act 2008.
MHPGC Project Report to Inform Appropriate Assessment (RIAA)	A report prepared by the Applicant containing information that the Competent Authority needs to inform an Appropriate Assessment at Stage 2 of the HRA process. The MHPGC Project will consider whether the MHPGC Project could have adverse effects, either alone or in-combination with other plans or projects, on the integrity of the National Site Network for which the likely significant effects has been previously established.
MHPGC Project Scoping Boundary	The spatial extent of the area used to define the environmental baseline to inform impact assessments at the time the Scoping Report was submitted.
MHPGC Project Scoping Opinions	Separate scoping opinions received from the Planning Inspectorate (on behalf of the Secretary of State) and MD-LOT (on behalf of the Scottish Ministers) in response to the MHPGC Project Scoping Report. The MHPGC Scoping Opinions contain the range of issues that the PINS, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the Environmental Impact Assessment process.
MHPGC Project Scoping Report	Report dated February 2025 scoping the likely significant effects of the MHPGC Project on the environment, submitted to the Scottish Ministers via the Marine Directorate: Licencing Operations Team (MD-LOT) and the Secretary of State via the Planning Inspectorate in England.
Morven Hawthorn Pit Grid Connection Project	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore

Term	Meaning
	export cables, the onshore land substation (LSS) and AC connection cables. Also referred to in this report as the MHPGC Project, for ease of reading.
Morven North Offshore Wind Array Project and Morven South Offshore Wind Array Project ('Morven North and Morven South')	The Morven North Offshore Wind Array Project (Morven North) and the Morven South Offshore Wind Array Project (Morven South), entirely in Scottish waters, which includes the wind turbines and foundations, offshore substation platforms and foundations, inter-array and inter-connector cables and associated infrastructure located within the Morven North and Morven South Boundary.
National Grid Hawthorn Pit Substation	The National Grid substation at Hawthorn Pit, County Durham, which the AC connection cables will connect into from the onshore land substation.
National Policy Statement	Policy statements published by the Department for Energy Security and Net Zero and designated under the Planning Act 2008, setting out national policy for Nationally Significant Infrastructure Projects.
Nationally Significant Infrastructure Project (NSIP)	Large scale development which requires development consent under the Planning Act 2008.
National Site Network	The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 have created a National Site Network on land and at sea, including both the inshore and offshore marine areas in the UK. The National Site Network includes existing Special Areas of Conservation and Special Protection Areas alongside new Special Areas of Conservation and Special Protection Areas designated under these Regulations.
Natural England	Natural England is the UK Government's statutory adviser on the natural environment in England, focusing on conserving biodiversity, landscapes, and access to nature. For a DCO and marine licence, NE provides statutory and technical advice to competent authorities on potential effects on designated sites, habitats and protected species, supporting environmental assessment and decision-making.
NatureScot	NatureScot is the Scottish Government's nature agency responsible for protecting and promoting Scotland's natural heritage. For a marine licence in Scottish waters, NS advises on impacts to Scottish habitats, species and designated sites.
Offshore export cables	High voltage direct current (HVDC) cables which bring electricity from either the Morven North OSP or

Term	Meaning
	the Morven South OSP to the transition joint bay (TJB) at landfall.
Offshore export cable corridor	The proposed offshore area in which the offshore export cables will be laid, from either the Morven North offshore substation platform or Morven South offshore substation platform to the transition joint bay at landfall.
Onshore export cables	HVDC cables which bring electricity from the TJB to the onshore land substation.
Onshore land substation (LSS)	A purpose-built site comprising a compound containing the electrical components for converting the HVDC to HVAC power. The LSS site associated with the MHPGC Project adjusts the power quality and power factor to meet the requirements of power supply being fed to the National Grid Hawthorn Pit Substation.
Operations and Maintenance phase (O&M)	The operational and maintenance phase of the MHPGC Project.
Ornithology	The study of birds, their behaviour, physiology and taxonomy.
Passage	In ornithological terms, birds on passage are undertaking migration and which have temporarily stopped during part of their migratory journey in order to forage, roost or otherwise rest. Passage birds are typically surveyed during the autumn and spring when migration is at its peak.
Pinnipeds	Infraorder of Marine Mammals including true and eared seals, sealions and walrus.
Planning Inspectorate (PINS)	The Planning Inspectorate is an executive agency of the UK Government responsible for administering and examining DCO applications for NSIPs in England. PINS manages the application process, oversees consultation and examination, and makes a recommendation to the relevant Secretary of State on whether consent should be granted.
Primary mitigation	Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken.
Ramsar Site	A wetland site designated to be of international importance under the Ramsar Convention.
Secondary mitigation	Actions that will require further activity to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management

Term	Meaning
	plan. For secondary mitigation measures, both pre-mitigation and residual effects are presented.
Special Area of Conservation	A site designation specified in the Habitats Directive (Council Directive 92/43/EEC) and protected in the UK under the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 in England. Each site is designated for one or more of the habitats and species listed in the Directive. The Directive requires that a management plan be prepared and implemented for each SAC to ensure the Favourable Conservation Status of the habitats or species for which it was designated.
Special Protection Area	Locations within the UK protected for birds, as classified by the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 in England.
The Study Area	For each environmental topic, the baseline environment will be characterised, and the likely significant effect is described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which likely significant effects of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence).
Survey Area	The area within which field surveys for the environmental topic are undertaken. This would include all areas for which impacts from the MHPGC Project may occur on relevant receptors. Three bird survey areas were used (comprising wintering, intertidal and breeding), defined separately.
Terrestrial Ornithology Study Area	The area within a 20km buffer of the MHPGC Project PEIR Red Line Boundary subject to a desk study to identify relevant European sites and their features (i.e., species) which may potentially be impacted by the Project.
Tertiary mitigation	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.
Transition joint bay (TJB)	An underground bay housing a joint which connects the offshore export cables to the onshore export cables. The TJB will be located in the vicinity of the onshore side of the landfall.
Trenchless Techniques	Construction methods used to install underground or sub-surface infrastructure without the need for

Term	Meaning
	continuous open trench excavation, thereby avoiding or minimising disturbance to surface features, habitats and existing land users.
Underwater Sound	Sound that travels through water, made by natural sources like animals or by human activities like vessels and construction activities.
Unexploded Ordnance	Unexploded ordnance are explosive weapons (bombs, shells, grenades, land mines, naval mines, etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.
Wintering Bird Survey Area	The survey area considered for wintering and passage birds during October 2023 to March 2024 and October 2025 and March 2026 which comprises the MHPGC PEIR Red Line Boundary: Onshore, with a 250m buffer applied. Where appropriate, this was extended up to 650m based upon recommendations in Goodship and Furness (2022). This size of the buffer for the Wintering Bird Survey Area is considered to represent the area within which potential impacts on birds could occur, including potential indirect effects from visual disturbance and noise. Further surveys will take place in the autumn-winter of 2026/2027. Passage birds (i.e. birds which are in the process of migrating) are typically surveyed in autumn/early spring and is the reason for commencing surveys in October and ending them in March unlike the typical November–February inclusive time window for wintering-only bird surveys.

Acronyms

Acronym	Meaning
AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AC	Alternating Current
ADD	Acoustic Deterrent Device
AEoI	Adverse Effect on Site Integrity
AIS	Air Insulated Substation
AUD INJ	Auditory Injury
BERR	Department for Business, Enterprise and Regulatory Reform
BoCC	Birds of Conservation Concern
BS	British Standard
BTO	British Trust for Ornithology

CBRA	Cable Burial Risk Assessment
CES	Coastal East Scotland
CFE	Controlled Flow Extraction
CI	Confidence Interval
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
CLV	Cable Lay Vessel
CMS	Construction Method Statement
CoCP	Code of Construction Practice
CO	Conservation Objective
COLREGs	International Regulations for Preventing Collisions at Sea
CPS	Cable Protection System
CPT	Cone Penetration Tests
CSIP	Cable Specification and Installation Plan
CSV	Construction Support Vessel
CTV	Crew Transfer Vessel
DAS	Digital Aerial Surveys
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Deptment for Energy Security and Net Zero
dML	Deemed Marine Licence
DMP	Outline Dust Management Plan
DSFB	District Salmon Fishery Board
DSV	Dive Support Vessel
EC	European Commission
ECC	Electricity Cable Corridor
EEC	European Economin Community
ECoW	Ecological Clerk of Works
EDR	Effective Deterrent Range
EDP	Environment Delivery Plan
EEA	European Economic Area
EGL1	Eastern Green Link 1
EGL3	Eastern Green Link 3
EGL4	Eastern Green Link 4
EIA	Environmental Impact Assessment

EPS	European Protected Species
EPP	Evidence Plan Process
ES	Environmental Statement
EU	European Union
EWG	Expert Working Group
FCS	Favourable Conservation Status
FLL	Functionally Linked Land
FHG	Functional Hearing Group
GB	Great Britain
GIS	Gas Insulated Substation
GV	Guard Vessel
HDD	Horizontal Directional Drilling
HF	High Frequency
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitat Regulations Appraisal/ Assessment
HPMA	Highly Protected Marine Area
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IAMMWG	Inter-Agency Marine Mammal Working Group
IAQM	Institute of Air Quality Management
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
ISV	Installation Support Vessel
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LEMP	Outline Landscape and Ecological Management Plan
LSE	Likely Significant Effects
LSS	Land Substation
MAG	Magnetometer
MBAGC	Morven Branxton Area Grid Connection
MBES	Multibeam Echosounder
MCZ	Marine Conservation Zone
MD-LOT	Marine Directorate – Licensing Operations Team
MDS	Maximum Design Scenario
MFE	Mass Flow Excavation

MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMFR	Mean Maximum Foraging Range
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MMOb	Marine Mammal Observer
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
MU	Management Unit
MvOWL	Morven Offshore Wind Limited
NcMPA	Nature Conservation Marine Protected Area
NE	Natural England
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRF	Nature Recovery Fund
NS	NatureScot
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
OEMP	Offshore Environmental Management Plan
OIPMP	Offshore In-Principle Monitoring Plan
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PLGR	Pre-Lay Grapple Run
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
PTS	Permanent Threshold Shift
PW	Phocid pinnipeds in Water
RIAA	Report to Inform Appropriate Assessment
ROV	Remotely Operated Vehicle
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBES	Single Beam Echosounder

SBP	Sub-Bottom Profilers
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SCOS	Special Committee on Seals
SD	Standard Deviation
SEL	Sound Exposure Level
SEL _{cum}	Cumulative Sound Exposure Level
SMU	Seal Monitoring Units
SNCB	Statutory Nature Conservation Bodies
SOLAS	Safety of Life at Sea
SoS	Secretary of State
SOV	Service Operation Vessels
SPA	Special Protection Area
SPL	Sound Pressure Level
SPL _{pk}	Peak Sound Pressure Level
SPL _{rms}	Root-mean square Sound Pressure Level
SSC	Suspended Sediment Concentrations
SSS	Side Scan Sonar
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable drainage system
SWGMP	Surface Water and Groundwater Management Plan
TJB	Transition Joint Bay
TSV	Trenching Support Vessel
TTS	Temporary Threshold Shift
UHRs	Ultra-High-Resolution Seismic
UKHab	UK Habitat Classification
USBL	Ultra-Short Baseline
USV	Uncrewed Surface Vessel
UXO	Unexploded Ordnance
VC	Vibrocoring
VTMP	Vessel Traffic Management Plan
WeBS	Wetland Bird Survey
ZoI	Zone of Influence

Units

Unit	Meaning
%	Percent
dB	Decibels
Hz	Hertz
kg	Kilogram
kHz	KiloHertz
km	Kilometre
km ²	Kilometre squared
kV	Kilovolts
nm	Nautical mile

1 Introduction

1.1 Overview

- 1.1.1.1 This report presents the Habitats Regulations Appraisal/Assessment (HRA) Report to Inform Appropriate Assessment (RIAA) for the Morven Hawthorn Pit Grid Connection Project (hereafter 'the MHPGC Project'). The MHPGC Project RIAA has been prepared to support the relevant consent applications for the MHPGC Project (outlined below) and will accompany the Preliminary Environmental Information Report (PEIR) in support of these applications. It has been prepared on behalf of Morven Offshore Wind Limited (a joint venture between JERA Nex bp and Energie Baden-Württemberg AG, hereafter ('The Applicant')).
- 1.1.1.2 The MHPGC Project RIAA provides information to inform the Competent Authorities' HRA, including, where required, the Appropriate Assessment (AA) stage of the HRA process. The MHPGC Project RIAA supports separate consent applications to both the Scottish and English administrations. The HRA, including any AA, will be undertaken by the relevant competent authorities for each jurisdiction. This RIAA has been produced as a combined report to ensure that potential cross-border effects are fully considered within the HRA process.
- 1.1.1.3 In Scotland, the MHPGC Project RIAA will support the Marine Licence application submitted to the Marine Directorate – Licensing Operations Team (MD-LOT), which acts as the Competent Authority, with advice from NatureScot, in accordance with the Marine (Scotland) Act 2010 (as amended) (Scottish Government, 2010) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (HM Government, 2017a).
- 1.1.1.4 In England, the MHPGC Project RIAA will support the Development Consent Order (DCO) application examined by the Planning Inspectorate (PINS), with the Secretary of State (SoS) acting as the Competent Authority for HRA, advised by Natural England, pursuant to the Planning Act 2008 (HM Government, 2008) and the Conservation of Habitats and Species Regulations 2017 (as amended) (HM Government, 2017b) and Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (HM Government, 2017a).
- 1.1.1.5 Furthermore, the MHPGC Project RIAA supports the Section 35 direction issued by the SoS under the Planning Act 2008. This direction confirms that the section of the MHPGC Project located in England and English waters is to be treated as a development for which development consent is required for the purposes of the Planning Act 2008, and therefore requires a DCO, notwithstanding that the Project does not fall within the typical categories of NSIP defined under Part 3 of the Planning Act 2008 (HM Government, 2008).
- 1.1.1.6 The report presented is informed by the following technical chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 2, Chapter 1: Physical Processes, of the PEIR;**
 - **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology, of the PEIR;**
 - **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR;**
 - **Volume 2, Chapter 5: Marine Mammals, of the PEIR;**
 - **Volume 2, Chapter 6: Marine Ornithology, of the PEIR;**
 - **Volume 3, Chapter 2: Water Resources and Flood Risk, of the PEIR;**
 - **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR;**
 - **Volume 3, Chapter 5: Traffic and Transport, of the PEIR;**
 - **Volume 3, Chapter 7: Air Quality, of the PEIR.**
- 1.1.1.7 The report also draws on information contained within the following annexes:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 1, Annex 4.2: Transboundary Screening Annex, of the PEIR;**
 - **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR;**
 - **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR;**
 - **Volume 3, Annex 3.2: UK Habitat Classification, National Vegetation Classification, River Condition Assessment and Hedgerow Surveys Technical Report, of the PEIR;**

- **Volume 3, Annex 3.12: Interim Breeding Birds Survey Technical Report, of the PEIR;**
- **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Bird Surveys Technical Report, of the PEIR.**

1.2 Project background

- 1.2.1.1 The MHPGC Project aims to connect the offshore substation platform(s) (OSP) of Morven North Offshore Wind Array Project or Morven South Offshore Wind Array Project (hereafter 'Morven North and Morven South') located approximately 61 kilometres (km) at its closest point from the Aberdeenshire coast in Scottish waters, to the National Grid Hawthorn Pit Substation in England. The offshore export cables will traverse Scottish offshore, English offshore, and English inshore waters. The onshore components consisting of the onshore export cables, Onshore Land Substation (LSS) and Alternating Current (AC) connection cables from the LSS to National Grid Hawthorn Pit Substation are located wholly within the local authority area of Durham County Council in North East England in England. At the time of writing the MHPGC Project RIAA, one landfall location has been identified as the preferred option, which is located at Blast Beach, to the south of Seaham, England. The generation assets of Morven North and Morven South and OSPs do not form part of the MHPGC Project and are subject to separate Section 36 (s36) and Marine Licence applications to the Scottish Ministers.

1.3 Project overview

- 1.3.1.1 The MHPGC Project is described in detail in **Volume 1, Chapter 2: Project Description, of the PEIR**. This section provides an overview of the key MHPGC Project components, activities and design parameters relevant to the assessment presented in the MHPGC RIAA.
- 1.3.1.2 The MHPGC Project boundary has been refined several times during the Projects development. The **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** was based on the MHPGC Project Interim Red Line Boundary, which represented a refinement of the MHPGC Project Scoping Boundary between EIA Scoping, presented in the MHPGC Project Scoping Report (RPS, 2025) and PEIR. The MHPGC Project boundary has since been further refined through the development of the PEIR and is referred to in the MHPGC RIAA as the MHPGC Project PEIR Red Line Boundary.
- 1.3.1.3 The MHPGC Project PEIR Red Line Boundary is shown on **Figure 1.1**.
- 1.3.1.4 The MHPGC Project comprises offshore export cable infrastructure, landfall infrastructure and associated onshore infrastructure connecting the offshore export cables to the National Grid connection at Hawthorn Pit. The MHPGC Project PEIR Red Line Boundary encompasses all Project components. For the purposes of this assessment:
- the offshore component comprises all MHPGC Project infrastructure and activities located seaward of Mean High Water Springs (MHWS);
 - the landfall comprises the transition area where the offshore export cables come ashore and connect to the onshore export cables, spanning the offshore and onshore components; and
 - the onshore component comprises all MHPGC Project infrastructure and activities located landward of MHWS, within the area hereafter referred to as the MHPGC Project PEIR Red Line Boundary: Onshore.
- 1.3.1.5 References to the intertidal area within this assessment relate specifically to the area between MHWS and Mean Low Water Springs (MLWS).
- 1.3.1.6 The following sections describe the key components and activities associated with each part and phase of the MHPGC Project. The parameters presented represent the current MHPGC Project design envelope and provide the basis for the assessment undertaken within this MHPGC RIAA.

1.3.2 Construction

Offshore components of the MHPGC Project

- 1.3.2.1 The offshore components of the MHPGC Project located within the MHPGC Project PEIR Red Line Boundary comprises the export cable infrastructure extending from either the Morven North or Morven South OSP to landfall at Blast Beach, south of Seaham.
- 1.3.2.2 The offshore export cable corridor will comprise one 320 kV High Voltage Direct Current (HVDC) circuit, containing up to two power cores and two fibre optic cables in up to two trenches. Construction will include pre-construction geophysical and geotechnical surveys and, where required, seabed preparation, cable installation and burial, Unexploded Ordnance (UXO) identification and low order clearance, cable crossings, cable protection and associated vessel activity.
- 1.3.2.3 The key offshore design parameters are summarised in **Table 1.1**.

Table 1.1: Key design parameters for the offshore components of the MHPGC Project

Parameter	MHPGC Project design envelope
Pre-construction surveys	
Survey activities	Offshore geophysical and geotechnical investigations, including multibeam and single-beam echosounders, side-scan sonar, sub-bottom profiling, ultra-high-resolution seismic surveys, ultra-short baseline acoustic positioning, seismic CPTs and vibrocoring.
Offshore export cables	
Cable configuration	One 320 kV HVDC circuit comprising up to two power cores and two fibre optic cables in up to two trenches
Maximum length per cable	Up to 324.67 km (OSP to exit pit): 98 km in Scottish waters; and 226.67 km in English waters.
Maximum total cable length	Up to 649.34 km (OSP to exit pit): 196 km in Scottish waters; and 453.34 km in English waters.
Offshore export cable corridor width	Up to 1,000 m
Cable installation	
Number of cable trenches	Up to two
Maximum trench depth	Up to 3 m
Minimum target burial depth	0.5 m
Maximum trench width	Up to 8.9 m where ploughing is used
Installation/burial methods	Mechanical cutting, jet trenching, controlled flow excavation and/or ploughing
Maximum width of seabed disturbance	Up to 20 m per trench
Maximum footprint of seabed disturbance	Up to 6,493,400 m ² per trench
Boulder clearance	
Maximum route length requiring clearance	Up to 69 km: 31 km in Scottish waters; and 38 km in English waters.

Maximum clearance width	Up to 20 m per trench
Sandwave clearance	
Maximum route length requiring clearance	Up to 53 km: • 31 km in Scottish waters and • 22 km in English waters.
Maximum clearance width	Up to 28 m
Maximum clearance area	Up to 2,968,000 m ²
Maximum clearance volume	Up to 2,544,000 m ³
Pre-lay grapnel runs (PLGRs)	
Maximum area	Up to 6,493,400 m ²
UXO identification and clearance¹	
Maximum number of confirmed UXO	Up to 96
Maximum number requiring low-order clearance	Up to 22: • eight in Scottish waters; and • 14 in English waters
UXO clearance corridor	Up to 100 m
Cable protection	
Cable protection types	Concrete mattresses, rock bags, rock placement and/or other cable protection systems
Maximum protection dimensions	Up to 14 m wide and 2 m high per trench
Maximum route coverage	Up to 10.69% of the offshore export cable route
Maximum seabed area affected	Up to 770,760 m ² across up to two trenches
Maximum protection volume	Up to 874,282 m ³ across up to two trenches
Cable crossings	
Maximum number	Up to 16
Protection types	Rock placement and/or concrete mattresses
Maximum dimensions per crossing	Up to 200 m long, 18 m wide and 2 m high
Maximum total footprint	Up to 57,600 m ²
Maximum total protection volume	Up to 64,000 m ³
Construction vessels	
Maximum vessel movements	Up to 550 return trips during construction
Maximum vessels operating concurrently	Up to 33

Landfall components of the MHPGC Project

- 1.3.2.4 The landfall will be located on the north-eastern coast of England, south of Seaham in County Durham, and provides the transition between the offshore and onshore export cables. It extends from the subtidal trenchless installation exit pits to the underground Transition Joint Bays (TJBs) located landward of MHWS and includes the associated offshore and onshore export cable corridors and landfall construction areas. The intertidal section between MHWS and MLWS will be crossed using trenchless installation techniques.
- 1.3.2.5 Landfall construction will include pre-construction geophysical and geotechnical investigations, site preparation, temporary construction compounds and associated access, trenchless installation, offshore export cable pull-in and construction of the TJBs. The offshore export

cables will be installed within the Durham Coast SAC (and Site of Special Scientific Interest (SSSI) using trenchless techniques, with the associated exit pits located at least 100 m seaward of the eastern boundary of these designated sites.

1.3.2.6 The key landfall design parameters are summarised in **Table 1.2**.

Table 1.2: Key design parameters for the landfall components of the MHPGC Project

Parameter	MHPGC Project design envelope
Pre-construction surveys	
Survey activities	Geophysical and geotechnical investigations, including boreholes, CPTs and other intrusive and non-intrusive survey techniques
Temporary landfall compounds	
Main compound	Up to one, with a maximum area of 48,000 m ²
Secondary compound	Up to one, with a maximum area of 900 m ²
Maximum duration of landfall works/compounds	Up to 42 months
Trenchless installation	
Installation method	HDD and/or other trenchless technique(s)
Maximum number of trenchless bores	Up to four
Maximum bore length	Up to 2,000 m per offshore export cable
Maximum bore external diameter	Up to 1,600 mm
Maximum duration of trenchless drilling activity	Up to 300 days
Indicative maximum bore depth below ground level	Up to 80 m
Maximum burial depth below seabed	Up to 40 m
Entry pits	
Maximum number	Up to four
Maximum area	Up to 262.5 m ² per pit
Maximum excavated volume	Up to 2,762 m ³ per pit
Exit pits	
Maximum number	Up to four
Maximum area	Up to 7,000 m ² per pit
Maximum excavated volume	Up to 18,667 m ³ per pit
Subtidal exit pit water depth	Approximately 4 to 20 m below LAT
Floatation pits	
Maximum number	Up to two
Maximum surface area	Up to 13,200 m ² per pit
Maximum depth	Up to 5 m per pit
Maximum dredge volume	Up to 39,167 m ³ per pit
Offshore export cable pull in	
Installation approach	Offshore export cables will be pulled through the pre-installed landfall conduits from the offshore installation vessel/barge to the TJB working area

Maximum vessel return trips	Up to 250 during landfall cable installation and pull-in activities
Maximum vessels operating concurrently	Up to 14
TJBs	
Maximum number	Up to two
Location	Landward of MHWS and within 150 m inland of the trenchless installation entry pits
Maximum depth	Up to 2.5 m
Reinstatement	TJBs will be backfilled following cable jointing and the surface reinstated; surface access may be retained for monitoring and maintenance

Onshore components of the MHPGC Project

- 1.3.2.7 The onshore component comprises the onshore export cables connecting the landfall TJBs to the LSS, together with the AC connection cables connecting the LSS to the National Grid connection at Hawthorn Pit. Associated infrastructure includes joint bays, monitoring boxes, link boxes, temporary construction compounds and access infrastructure.
- 1.3.2.8 The LSS will convert the 320 kV HVDC power received through the onshore export cables to 400 kV High Voltage Alternating Current (HVAC) for connection to the National Grid Hawthorn Pit Substation. Two LSS location options, referred to as the Green LSS Option and Blue LSS Option, are currently within the MHPGC Project design envelope. The selected LSS option will determine the routing and associated parameters of the onshore export cable and AC connection cable corridors.
- 1.3.2.9 Construction of the onshore infrastructure will include pre-construction investigations, establishment of temporary construction compounds and access arrangements, installation of the onshore export and AC connection cables using open-trench and, where required, trenchless techniques, construction of the LSS and works required to connect the MHPGC Project to the existing National Grid infrastructure at Hawthorn Pit.
- 1.3.2.10 The key onshore design parameters are summarised in **Table 1.3**.

Table 1.3: Key design parameters for the onshore components of the MHPGC Project

Parameter	MHPGC Project design envelope
Pre-construction surveys	
Survey activities	Onshore geophysical and geotechnical investigations, including boreholes, CPTs, trial pits, downhole logging and other intrusive and non-intrusive survey techniques, together with soil and groundwater sampling and groundwater and ground gas monitoring.
Onshore export cables	
Cable configuration	One 320 kV HVDC circuit comprising two power cores and two fibre optic cables
Maximum onshore export cable corridor length	Up to approximately 8.31 km, depending on the selected LSS option
Maximum number of cables	Up to four
Maximum number of cable trenches	Up to two
Typical permanent cable corridor width	Up to 14 m
Typical cable trench depth	1.8 m

Maximum construction corridor width	Up to 40 m
Onshore export cable joint bays and monitoring boxes	
Maximum number of joint bays	Up to 12
Maximum joint bay surface area	Up to 16 m ² per joint bay
Maximum number of monitoring boxes	Up to 12
Maximum monitoring box surface area	Up to 16 m ² per monitoring box
LSS	
Location options	Green LSS Option or Blue LSS Option
Function	HVDC converter substation converting power from 320 kV HVDC to 400 kV HVAC
Maximum permanent footprint	Up to 67,300 m ² , including landscaping
Maximum temporary construction footprint	Up to 70,000 m ²
Maximum temporary laydown and storage area	Up to 35,000 m ²
Maximum building/structure height	Up to 30 m
Indicative construction duration	Up to 54 months
AC connection cables	
Connection	LSS to the National Grid Hawthorn Pit Substation
Maximum route length	Up to 4.26 km
Maximum number of cable circuits	Up to four 400 kV AC connection cable circuits
Maximum number of cables	Up to 24
Maximum number of cable trenches	Up to four
Permanent cable corridor width	Up to 25 m
Typical cable trench depth	1.8 m
Maximum construction corridor width	Up to 100 m
AC connection cable joint bays and link boxes	
Maximum number of joint bays	Up to 32
Maximum joint bay surface area	Up to 25 m ² per joint bay
Maximum number of link boxes	Up to 32
Maximum link box surface area	Up to 6.25 m ² per link box
Temporary access and compounds	
Temporary construction access points	Up to six across the onshore export and AC connection cable corridors
Temporary haul road	One temporary haul road, up to 8 m wide excluding passing places
Main construction compounds	Up to two, with a maximum area of 70,000 m ²
Secondary construction compounds	Up to six, with a maximum area of 10,000 m ²
Maximum duration of construction compounds	Up to 42 months
Onshore cable installation	
Principal installation method	Open-trench installation, with cables installed directly or within pre-installed ducts
Trench dewatering	May be required during cable installation

Trenchless crossings	
Crossing methods	HDD, auger boring, direct pipe and/or micro-tunnelling
Features to be crossed using trenchless techniques	Roads, railway lines and designated sites, including the Durham Coast SSSI and Special Area of Conservation (SAC) and Hesledon Moor East SSSI
Maximum trenchless drill compound area	Up to 6,000 m ²
Entry pit indicative dimensions	Up to 8 m long × 5 m wide × 3.5 m deep
Exit pit indicative dimensions	Up to 8 m long × 5 m wide × 3.5 m deep
Drilling fluids	Bentonite and/or polymer fluids may be used to stabilise trenchless bores
Grid connection	
Connection location	Existing National Grid Hawthorn Pit Substation
Installation	AC connection cables may approach the final connection point using open-cut or trenchless installation techniques; temporary construction compound(s) may also be required
Reinstatement	
Temporary works	Temporary haul roads, construction compounds, access points and fencing will be removed and affected land, soils, drainage and irrigation reinstated following construction
Cable infrastructure	Joint bays will be completely buried and the land above reinstated; surface access will be retained where required for monitoring boxes and link boxes

1.3.2.11 The parameters presented in **Table 1.1** to **Table 1.3** provide a summary of the key elements of the MHPGC Project design envelope relevant to this MHPGC Project RIAA and are not intended to reproduce the full Project Description. Further details of the MHPGC Project design, construction activities and associated parameters are provided in **Volume 1, Chapter 2: Project Description, of the PEIR**. Where relevant, the specific parameters used to define the maximum design scenario for individual impact pathways are identified within the relevant assessment sections of this MHPGC Project RIAA (see **Sections 5.4.2, 6.4.2, 7.4.2, 8.4.2**, for Marine Mammals, Marine Ornithology, Terrestrial and Intertidal Ornithology and Terrestrial Ecology, respectively).

1.3.3 Operation and Maintenance

- 1.3.3.1 Operation and maintenance (O&M) activities will take place throughout the operational phase of the MHPGC Project and may include routine inspection and monitoring, surveys, remedial works and repairs.
- 1.3.3.2 Reasonably foreseeable planned and unplanned O&M activities associated with the offshore export cables include routine cable inspections and geophysical surveys; cable remediation, including reburial or rock placement; and cable repair. Where repair is required, the affected cable may need to be exposed and recovered before being subsequently reburied.
- 1.3.3.3 Reasonably foreseeable O&M activities associated with the landfall and onshore infrastructure include access to TJB monitoring boxes; routine inspection and monitoring of the onshore export and AC connection cables; corrective works, including joint re-termination, diagnostic testing and cable repair or replacement; and inspection and maintenance of the LSS.
- 1.3.3.4 Further information on O&M activities is provided in **Volume 1, Chapter 2: Project Description, of the PEIR**.

1.3.4 Decommissioning

- 1.3.4.1 At the end of the operational lifetime (assumed to be 35 years), the MHPGC Project may be decommissioned. Closer to the decommissioning date, detailed onshore and offshore decommissioning plans will be developed in line with the regulations, requirements, guidance and best practice relevant at that time (see commitment CoT44 and CoT16 of **Volume 1, Annex 4.1: Commitments Register of the PEIR**).

Offshore components of the MHPGC Project

- 1.3.4.2 The current preferred approach to the decommissioning of offshore export cables is that they would be left in situ; however, a future scenario could exist where they may be retrieved and, if retrieved, would be disposed of, or recycled, in line with latest relevant legislation and guidance at the time. This is because although the offshore export cables could technically be extracted by reversing their installation, this may not always represent the least disruptive or most environmentally beneficial option. The same principle applies to cable protection measures (e.g. rock placement, concrete mattress). These items can also be removed in theory, yet leaving them in situ could, in many cases, have a lower environmental impact.
- 1.3.4.3 At this time, it is difficult to foresee what techniques would be used to remove the offshore export cables and cable protection during decommissioning. However, it is likely that equipment similar to that which is used to install the cables and cable protection could be used to reverse the burial process. Therefore, if the offshore export cables and cable protection are to be removed during decommissioning, the area of seabed impacted is likely to be the same as the area impacted during their installation.

Landfall components of the MHPGC Project

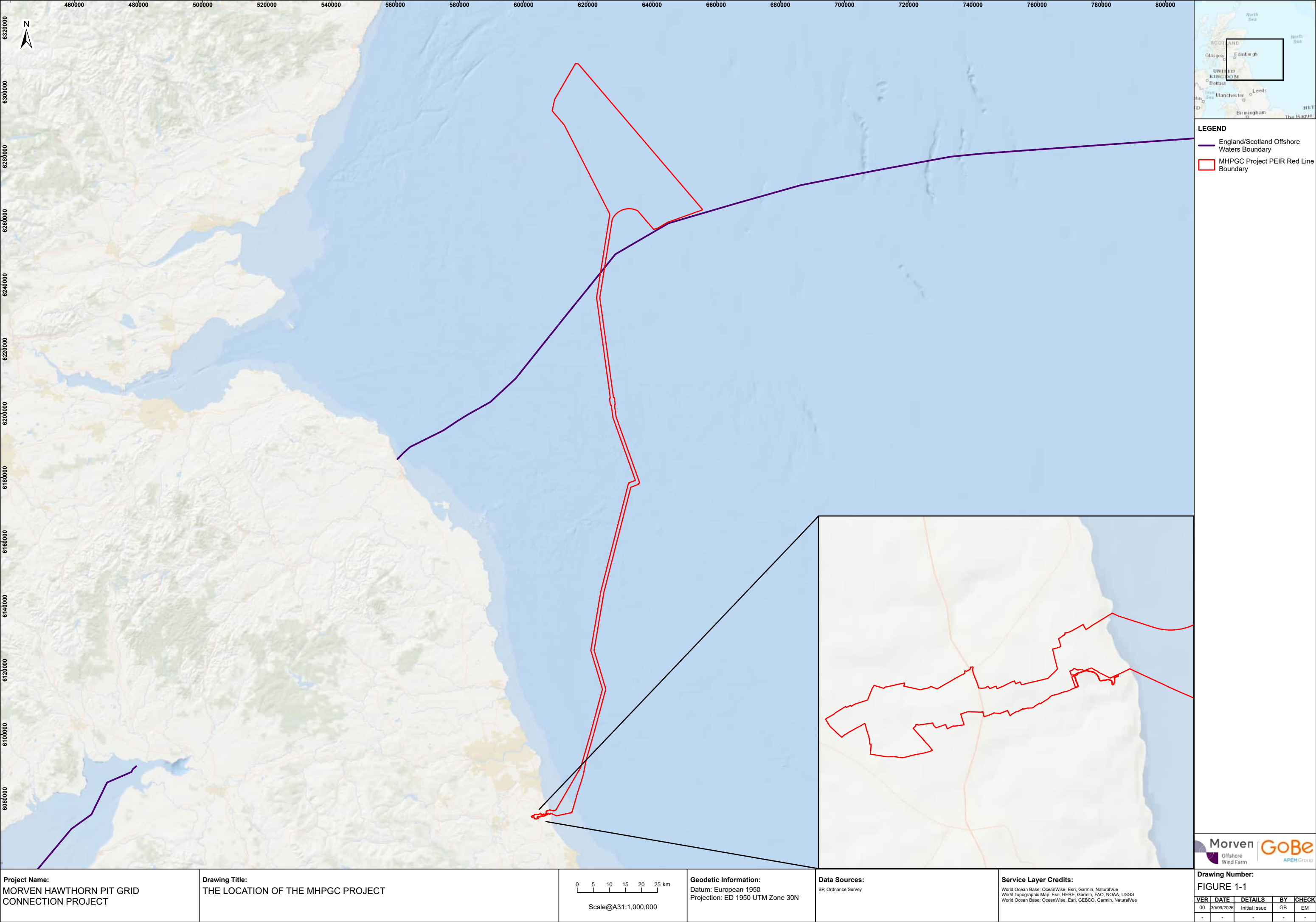
- 1.3.4.4 At this time, it is difficult to determine whether it may be best to remove the offshore export cables from the intertidal environment. To minimise environmental and other disturbance, it may be preferable to leave the offshore export cables in situ with the cable ends cut, sealed and securely buried. Alternatively, full or partial removal of the cables may be undertaken.
- 1.3.4.5 Partial removal may be undertaken by pulling the cables back out of the ducts/pipes, to recover the copper and/or aluminium and steel within them. Where recycling or disposal may be necessary, this would be undertaken in accordance with the latest guidance, legislation and policy at the time.

Onshore components of the MHPGC Project

- 1.3.4.6 The current preferred approach to the decommissioning of onshore export cables and AC connection cables is that they would be left in situ. This is because leaving the cables in place has negligible environmental impact whilst excavation and removal would disturb the local environment.
- 1.3.4.7 Joint bays, monitoring boxes (for onshore export cables) and link boxes (for AC connection cables) 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.
- 1.3.4.8 De-construction of the onshore LSS will follow the reverse order of construction, once it has been taken out of service. All electric equipment will be removed, and any waste arising disposed of in accordance with relevant regulations and where applicable any legislative requirements at the time. Foundations will be broken up and the site re-instated, or alternately re-purposed for another use. Where alternate uses may be explored, these may be subject to additional relevant consents and licenses at the time. Impacts from the decommissioning of the onshore LSS is assumed to be similar to the construction and in reverse sequence.
- 1.3.4.9 Further information on decommissioning is provided in **Volume 1, Chapter 2: Project Description, of the PEIR**.

1.3.5 Programme

- 1.3.5.1 For the purposes of assessment, it is anticipated that the earliest construction date for the MHPGC Project is 2032. The Applicant also anticipates that the MHPGC Project will be fully operational by 2038. The operational design life of the MHPGC Project is 35 years.



1.4 Purpose of report

- 1.4.1.1 This document presents the RIAA for the MHPGC Project, prepared under Section 63 of the Conservation of Habitats and Species Regulations 2017 and Section 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017.
- 1.4.1.2 This version of the MHPGC Project RIAA has been prepared to support the PEIR stage of the MHPGC Project DCO process and to inform engagement with Scottish stakeholders in relation to the Scottish Marine Licence processes. The HRA is an iterative process, and the assessment will be reviewed and, where necessary, updated throughout the DCO and Marine Licence application process to reflect consultation responses, changes to the MHPGC Project and any further information that becomes available. This will allow the final iteration of the MHPGC Project RIAA submitted in support of the DCO and Marine Licence applications to take account of feedback received throughout the consultation and engagement processes.
- 1.4.1.3 The HRA Stage 1 Screening was presented within the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, which identified European sites and qualifying features for which Likely Significant Effects (LSE) could not be excluded.
- 1.4.1.4 The purpose of this MHPGC Project RIAA is to provide an update to the screening assessment following MHPGC Project refinements and consultation (see **Section 4**), and to provide the information required by the relevant Competent Authorities to undertake an AA of the MHPGC Project and determine whether the MHPGC Project may result in an adverse effect on the integrity (AEol) of relevant European sites.
- 1.4.1.5 The scope of this report includes all European sites, Ramsar sites and qualifying features for which LSEs have been identified, taking account of potential impacts arising from the construction, O&M, and decommissioning of the MHPGC Project. The assessment considers effects both alone and in-combination with other plans and projects.
- 1.4.1.6 Qualifying features taken forward to Stage 2 AA comprise:
- Annex II Marine Mammal qualifying features;
 - Offshore, Intertidal and Terrestrial Ornithological qualifying features;
 - Annex I Terrestrial Habitat qualifying features.
- 1.4.1.7 For the purposes of this assessment, ornithological features are divided into:
- Offshore Marine Ornithology: defined as those features that use the marine environment seaward of MHWS.
 - Terrestrial and Intertidal Ornithology: defined as those features that use the terrestrial and intertidal environment landward of MLWS.
- 1.4.1.8 This distinction is applied for clarity in presenting impact pathways. Where qualifying features (e.g. tern species) may be affected by both offshore and onshore/intertidal components, effects are considered together at the qualifying feature and site level within the HRA conclusions to ensure that effects on site integrity are assessed holistically.

1.5 Structure of the RIAA

- 1.5.1.1 The MHPGC Project RIAA is structured as follows:
- **Section 1: Introduction:** Provides an overview of the MHPGC Project, the purpose of the RIAA and the structure of the report.
 - **Section 2: Habitats Regulations and Legislative Context:** Sets out the relevant legislation, policy and guidance underpinning the HRA.
 - **Section 3: HRA Methodology:** Provides an overview of the HRA process, with a focus on the Stage 2 Appropriate Assessment (Stage 2 AA) undertaken within this RIAA, including the approach to in-combination assessment.
 - **Section 4: Consultation and Engagement:** Summarises consultation and engagement undertaken to inform the HRA, including scoping and Expert Working Groups (EWGs), and how relevant comments have been addressed.

- **Section 5: Marine Mammals:** Presents the LSE screening outcomes, baseline information, information to inform AA and the AA for Marine Mammal qualifying features, including consideration of effects alone and in-combination.
- **Section 6: Offshore Marine Ornithology:** Presents the LSE screening outcomes, baseline information, information to inform AA and the AA for Offshore Marine Ornithology qualifying features, including consideration of effects alone and in-combination.
- **Section 7: Terrestrial and Intertidal Ornithology:** Presents the LSE screening outcomes, baseline information, information to inform AA and the AA for Terrestrial and Intertidal Ornithology qualifying features, including consideration of effects alone and in-combination.
- **Section 8: Terrestrial Habitats:** Presents the LSE screening outcomes, baseline information, information to inform AA and the AA for Terrestrial Habitat qualifying features, including consideration of effects alone and in-combination.
- **Section 9: Transboundary Statement:** Provides consideration of potential transboundary effects.
- **Section 10: Conclusion:** Summarises the conclusions of the AA, including the assessment of effects alone and in-combination, and provides a summary table of the assessment conclusions.
- **Section 11: References:** Provides the references cited within the RIAA.

2 Habitats Regulations and legislative context

2.1 Habitats Directive and Habitats Regulations

- 2.1.1.1 A network of protected areas for specific habitats and species of importance (commonly referred to as 'European sites') has been established by European Union (EU) member states under the Habitats Directive (Council Directive 92/43/EEC) and Birds Directives (Council Directive 2009/147/EC).
- 2.1.1.2 These Directives have been transposed into domestic legislation within the United Kingdom through a series of regulations collectively referred to as the 'Habitats Regulations'. Following the United Kingdom's (UK's) withdrawal from the EU, these requirements have been retained in domestic law (see **Section 2.1.2**), with European sites now forming part of the UK's National Site Network (see **Section 2.1.2**), while maintaining equivalent levels of protection.
- 2.1.1.3 Of note, the MHPGC Project comprises an offshore export cable corridor extending across Scottish offshore waters (greater than 12 nautical miles (nm)) and English offshore, intertidal and terrestrial environments. As such, the HRA must be undertaken with reference to multiple consenting regimes and legislative frameworks, reflecting the different jurisdictions through which the MHPGC Project passes (see **Figure 1.1**).
- 2.1.1.4 Therefore, the primary 'Habitats Regulations' relevant to the MHPGC Project RIAA are as follows:
- For the sections of cable located in Scottish and English offshore waters beyond 12nm, the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) apply (HM Government, 2017a).
 - For the sections of cable located in English waters within 12nm, and within English intertidal and terrestrial environments, the Conservation of Habitats and Species Regulations 2017 (as amended) apply (HM Government, 2017b).
- 2.1.1.5 The Habitats Regulations specify, amongst other issues, how development control decisions which could directly or indirectly affect European sites (still referred to as 'European sites' under the Regulations) are to be reached. Regulation 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 (applicable in both Scotland and England) (HM Government, 2017a) and Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended; applicable in England), (HM Government 2017b) states:
- "A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –*
- (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and*
- (b) is not directly connected with or necessary to the management of that site,*
- must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives".*
- 2.1.1.6 It is therefore necessary, in the first instance, to determine whether it is possible to conclude that there is no LSE on the site. Only where it is not possible to conclude this, does an AA need to be carried out by the Competent Authority as confirmed by case law in the European Court of Justice ruling in the case of Waddenzee (Case C-127/02) (Court of Justice of the European Union, 2004).
- 2.1.1.7 As concluded in the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, the MHPGC Project has the potential to have LSE on a European site, therefore an AA must be carried out by the Competent Authority (MD-LOT in Scottish waters and SoS in England and English waters). Following the AA, it must be determined whether there will be an AEoI of a European site, either alone or in combination with other plans or projects and with the addition of mitigation measures.

- 2.1.1.8 Relevant case law also establishes principles concerning the treatment of mitigation and the assessment of site integrity. In *People Over Wind and Sweetman v Coillte Teoranta* (Case C-323/17), the Court of Justice of the European Union confirmed that measures intended to avoid or reduce the harmful effects of a plan or project cannot be taken into account when determining LSE at Stage 1 screening. Such measures may, however, be considered as part of the Stage 2 AA. The meaning of site integrity has also been considered in *Sweetman and Others v An Bord Pleanála* (Case C-258/11), which emphasised the need to consider whether a project could undermine the ecological characteristics for which a site was designated. These principles have been taken into account in the approach adopted for the MHPGC Project RIAA.

2.1.2 Post EU-Exit

- 2.1.2.1 The UK withdrew from the EU in January 2020, and since the beginning of January 2021, the UK is no longer bound by EU legislation; however, the UK passed EU-Exit legislation, Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (HM Government, 2019) to ensure that the UK's nature remains protected. This did result in some aspects of the Habitats Regulations being amended, but these amendments were only to those necessary to ensure that the Habitats Regulations remained operable and to ensure that the requirements of the Habitats and Birds Directives continue to apply to how European sites are designated and protected. In Scotland, similar amendments were made through The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.
- 2.1.2.2 Amendments of relevance to the MHPGC Project RIAA include (but are not limited to):
- European sites in the UK are no longer part of the EU's Natura 2000 network. Instead, they form a UK-wide network of protected sites, referred to as the National Site Network and they retain the same protections.
 - Management objectives are established for the National Site Network. Ministers must work in co-operation with the other UK devolved administrations to manage, and where necessary, adapt the National Site Network to contribute to the achievement of these objectives.
 - The objectives in relation to the National Site Network are to:
 - Maintain or restore certain habitats and species listed in the Habitats Directive to Favourable Conservation Status (FCS);
 - Contribute to ensuring the survival and reproduction of certain species of wild bird in their area of distribution and to maintaining their populations at levels which correspond to ecological, scientific, and cultural requirements, while taking account of economic and recreational requirements.
- 2.1.2.3 Of note, the UK Government's "Nature Recovery Green Paper: Protected Sites and Species" (Department for Environment, Food & Rural Affairs (Defra), 2022) consulted on changes to the HRA process and the UK Planning and Infrastructure Act 2025 (HM Government, 2025). The Planning and Infrastructure Act received Royal Assent in December 2025 and introduces a framework for delivery for Environment Delivery Plans (EDPs) and the Nature Restoration Fund (NRF). This regime depends on secondary legislation being in place and the preparation of specific EDPs by Natural England. Provisions in the Planning and Infrastructure Act are also not yet fully in force. HRA continues to be undertaken as established under the Habitats Regulations.

2.1.3 European sites and qualifying features

- 2.1.3.1 For the purposes of this MHPGC Project RIAA, 'European sites' comprise sites protected under the Habitats Regulations and sites which are afforded equivalent protection as a matter of UK policy. These include:
- Special Areas of Conservation (SACs) designated for their habitats and/or species (except birds) of European importance.
 - Special Protection Areas (SPAs) designated for rare, vulnerable, and regularly occurring bird species.
 - Ramsar sites designated under the Convention on Wetlands of International Importance 1971 ("the Ramsar Convention") which provides for the listing of wetlands of international importance.

- Possible SACs (pSACs).
- Potential SPAs (pSPAs).

- 2.1.3.2 Ramsar sites (both listed and proposed) are considered within the HRA process and afforded the same level of protection as European sites in accordance with relevant UK and Scottish Government policy (see **Section 2.2**). Of note, in England, the Planning and Infrastructure Act 2025 amended the Conservation of Habitats and Species Regulations 2017 to include a provision that Ramsar sites are to be treated in the same manner as European sites for specified purposes, including the requirement for Stage 2 AA where a plan or project situated wholly in England is likely to have a significant effect on a Ramsar site. The relevant provisions came into force on 21 May 2026.
- 2.1.3.3 Similarly, potential SPAs (pSPAs) and possible SACs (pSACs) are treated in the same manner. Therefore, for the purposes of this assessment, all SACs, SPAs, Ramsar sites, pSPAs and pSACs are collectively referred to as European sites as outlined above. Sites identified, or required, as compensatory measures for adverse effects on European Sites are also considered, where relevant.
- 2.1.3.4 Designated features of the forementioned European sites, hereafter referred to as qualifying features are the specific habitats or species for which European sites are protected, and comprise:
- Annex I habitats and Annex II species listed under the Habitats Directive, including terrestrial and marine species.
 - Bird species protected under the Wild Birds Directive, including breeding, wintering and migratory populations.
 - Habitats and species identified as internationally important under the Ramsar Convention, where relevant.

2.1.4 Conservation objectives and site integrity

- 2.1.4.1 Each European site has formal Conservation Objectives (COs), which set out the conditions required to maintain or restore its qualifying features and contribute to the conservation of the site.
- 2.1.4.2 The MHPGC Project RIAA therefore considers the implications of the MHPGC Project for the relevant qualifying features in view of the COs of each European site. The assessment takes into account the attributes and ecological requirements relevant to the achievement of those objectives, including, as relevant, the extent, distribution, structure, function, supporting processes and/or population characteristics of the relevant qualifying features.
- 2.1.4.3 Site integrity is concerned with the ecological structure and functioning of the site and its ability to sustain the habitats and/or populations of species for which it was designated. The assessment therefore considers whether the effects of the MHPGC Project could undermine the COs or otherwise lead to an AEoI of the European site. Where a qualifying feature is subject to restoration objectives, consideration is also given to whether the MHPGC Project could prevent or impede achievement of those objectives.
- 2.1.4.4 In addition, qualifying species may use habitats beyond the formal boundary of a European site during different stages of their lifecycle. Such areas may provide important ecological functions, including feeding, foraging, roosting or breeding habitat. Where such areas are functionally linked to a European site and effects on those areas could affect the qualifying population or undermine the COs of the associated site, they are considered within the HRA process.
- 2.1.4.5 Consideration of functionally linked land or other supporting habitat is therefore undertaken where relevant to the qualifying features and potential impact pathways associated with the MHPGC Project.

2.2 National policy

2.2.1 National Policy Statements

- 2.2.1.1 The MHPGC Project is being considered under the DCO consenting regime for the English elements of the Project. The relevant National Policy Statements (NPSs) provide the primary national policy framework for the consideration of the DCO application, including the assessment and protection of internationally and nationally designated sites and protected species.
- 2.2.1.2 The NPSs relevant to the MHPGC Project RIAA are:
- EN-1: Overarching National Policy Statement for Energy (DESNZ, 2025a);
 - EN-3: National Policy Statement for Renewable Energy Infrastructure (DESNZ, 2025b);
 - EN-5: National Policy Statement for Electricity Networks Infrastructure (DESNZ, 2025c).
- 2.2.1.3 In relation to HRA, the NPSs establish the importance of protecting European sites and their qualifying features, taking account of the Habitats Regulations, relevant evidence and the potential for effects on functionally linked habitats. In particular, EN-1 requires consideration of effects on internationally designated sites and protected species; EN-3 provides specific requirements relating to protected sites, ecological evidence and the assessment of potential effects; and EN-5 highlights the importance of considering functionally linked habitats associated with sites designated under the National Site Network.

2.2.2 National Planning Policy Framework

- 2.2.2.1 The National Planning Policy Framework (NPPF) (Ministry for Housing, Communities & Local Government, 2026) provides the wider planning policy context relevant to the English onshore elements of the MHPGC Project.
- 2.2.2.2 The NPPF is relevant to this MHPGC Project RIAA as it supports the protection and enhancement of biodiversity, ecological networks and designated sites, including providing the same protection to proposed and potential internationally designated sites and Ramsar sites as habitats sites. These principles have been considered in the identification of relevant sites and ecological features and in the assessment presented in this RIAA.

2.2.3 Marine planning policy

- 2.2.3.1 The offshore elements of the MHPGC Project are subject to the relevant marine planning policy frameworks for Scottish and English waters. These comprise:
- UK Marine Policy Statement (HM Government, 2011);
 - Scotland's National Marine Plan (Marine Scotland, 2015);
 - North East Inshore and North East Offshore Marine Plans (HM Government, 2021).
- 2.2.3.2 These marine planning frameworks are relevant to the MHPGC Project RIAA as they provide for the sustainable use and management of the marine environment, including the protection of biodiversity and designated sites, application of the precautionary approach and consideration of cumulative effects. These principles have been taken into account in the assessment of potential effects on European sites and their qualifying features within Scottish and English waters.

2.3 Relevant guidance

- 2.3.1.1 This MHPGC Project RIAA has been carried out with consideration for the following good practice guidance:
- Department for Environment, Food & Rural Affairs (Defra), Natural England, Natural Resources Wales and Welsh Government (2023). Guidance on Habitats Regulations Assessments;
 - Marine environment: unexploded ordnance clearance Joint Position Statement (UK Government, 2025);
 - NatureScot Habitats Regulations Appraisal (NatureScot, 2026);
 - PINS NSIP: Advice on Habitats Regulations Assessments (PINS, 2026a);

- NatureScot Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges (NatureScot, 2023a);
- NatureScot Guidance Note 4: Guidance to Support Offshore Wind Applications: Ornithology - Determining Connectivity of Marine Birds with Marine Special Protection Areas and Breeding Seabirds from Colony Special Protection Areas (SPA) in the Non-Breeding Season (NatureScot, 2023b);
- Joint Nature Conservation Committee (JNCC) Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise Special Areas of Conservation (SAC) (England, Wales & Northern Ireland) (JNCC, 2020);
- JNCC Updated Effective Deterrent Ranges (EDRs) for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise Special Areas of Conservation (SACs) (England, Wales & Northern Ireland) (JNCC, 2025a);
- JNCC guidelines for minimising the risk of injury to marine mammals from unexploded ordnance (UXO) clearance in the marine environment (JNCC, 2025b);
- JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (seismic survey guidelines) (JNCC, 2017);
- The Chartered Institute of Ecology and Environmental Management (CIEEM) (2018, amended 2024) guidance on Ecological Impact Assessments (CIEEM, 2018 amended 2024);
- PINS NSIP: Advice on Cumulative Effects Assessment (PINS, 2026b);
- Statutory Nature Conservation Bodies (updated 2022). Advice on how to present assessment information on the extent and potential consequences of seabird displacement from Offshore Wind Farm developments (Statutory Nature Conservation Bodies (SNCBs), 2022).

3 HRA methodology

3.1 Overview

- 3.1.1.1 An HRA is a structured, multi-stage statutory process used to determine whether a plan or project may affect the integrity of a European site, having regard to the European sites COs. The process is precautionary and is undertaken in accordance with the requirements of the relevant Habitat Regulations (see **paragraph 2.1.1.4**).
- 3.1.1.2 The HRA process comprises up to three stages, as summarised in **Table 3.1**. The stages are sequential, with progression to the next stage only where the requirements of the preceding stage have not been met.

Table 3.1: The HRA stages and the MHPGC Project

HRA Stages	Purpose	Application to the MHPGC Project
Stage 1 – Screening	Determine whether the plan or project is likely to have a significant effect on a European site, either alone or in combination with other plans or projects.	Stage 1 has been undertaken through the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report, submitted to Natural England and MD-Lot in December 2025 and receipt of a Discretionary Advice Service from Natural England in January 2026 and MD-Lot in March 2026. The screening identified European sites for which LSE could not be excluded. Due to the time lapsed since the original screening and an amended Red Line Boundary (MHPGC Project Interim Boundary has been amended to MHPGC Project PEIR Red Line Boundary), the Stage 1 screening outcomes have been updated in this document and are presented in Section 5.2.5 for Marine Mammals, Section 6.2.5 for Marine Offshore Ornithology, Section 7.2.5 for Terrestrial and Intertidal Ornithology and Section 8.2.5 for Terrestrial and Intertidal Ecology.
Stage 2 – Appropriate Assessment	Where LSE cannot be excluded, assess the implications of the plan or project for the European site in view of its COs and determine whether an AEol can be excluded.	This MHPGC Project RIAA provides the information required by the Competent Authorities to undertake the Stage 2 AA. The assessment of potential effects on qualifying features is presented in Sections 5 to 8 , with conclusions on AEol summarised in Table 10.1 .
Stage 3 – Derogation	Where AEol cannot be excluded, consider whether the project may proceed under the derogation provisions. This requires consideration of alternative solutions, imperative reasons of overriding public interest (IROPI) and necessary compensatory measures.	Stage 3 would only become relevant if the Competent Authority cannot ascertain that the MHPGC Project would not adversely affect the integrity of a European site. Stage 3 is therefore outside the scope of this RIAA.

- 3.1.1.3 The HRA is an iterative process. Accordingly, although Stage 1 screening was undertaken separately, the conclusions have been reviewed where necessary to take account of subsequent project refinement, consultation and updated baseline or assessment information. The resulting

screening conclusions are carried forward into the Stage 2 AA presented in this MHPGC Project RIAA.

3.1.2 Stage 1 – Likely Significant Effects

- 3.1.2.1 The Stage 1 screening assessment for the MHPGC Project is presented in the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**. The screening identified the European sites and qualifying features for which LSE could not be excluded.
- 3.1.2.2 The conclusions of the original screening assessment are presented in:
- **Section 5.2.2** for Marine Mammals;
 - **Section 6.2.2** for Offshore Ornithology;
 - **Section 7.2.2** for Terrestrial and Intertidal Ornithology;
 - **Section 8.2.2** for Terrestrial Habitats.
- 3.1.2.3 The screening conclusions have subsequently been reviewed to account for project refinement, updated information and consultation responses. The revised screening conclusions underpinning this MHPGC Project RIAA are presented in:
- **Section 5.2.5** for Marine Mammals;
 - **Section 6.2.5** for Offshore Ornithology;
 - **Section 7.2.5** for Terrestrial and Intertidal Ornithology;
 - **Section 8.2.5** for Terrestrial habitats.
- 3.1.2.4 Where LSE cannot be excluded on the basis of the available evidence, the relevant European site and qualifying feature is taken forward to Stage 2 AA.
- 3.1.2.5 The Stage 1 screening conclusions are therefore used as the basis for determining the scope of the Stage 2 AA presented in this RIAA.

3.1.3 Stage 2 – Appropriate Assessment

- 3.1.3.1 The Stage 2 AA considers the implications of the MHPGC Project for the qualifying features of European sites where LSE cannot be excluded, in view of the COs of those sites.
- 3.1.3.2 The assessment takes account of the nature, magnitude, spatial extent, duration, timing and reversibility of potential effects, together with the sensitivity and ecological requirements of the relevant qualifying feature and the COs of the European site.
- 3.1.3.3 The potential for the MHPGC Project to adversely affect site integrity is assessed having regard to the COs of each European site and the ecological structure and functioning necessary to sustain its qualifying features.
- 3.1.3.4 Where relevant, mitigation and avoidance measures are considered as part of the Stage 2 AA. The assessment considers the predicted residual effects following application of those measures.
- 3.1.3.5 The assessment considers the potential for effects to arise both from the MHPGC Project alone and in combination with other plans or projects. Where a qualifying feature could be affected by more than one MHPGC Project component or impact pathway, these effects are considered together. This distinction is applied for clarity in presenting impact pathways. For example, where qualifying features (e.g. tern species) may be affected by both offshore and onshore/intertidal components, effects are considered together at the qualifying feature and site level within the HRA conclusions to ensure that effects on site integrity are assessed holistically (see **paragraph 6.5.1.24 and 7.5.1.21**).
- 3.1.3.6 Where relevant, the Stage 2 AA also considers effects on functionally linked land or supporting habitat outside the formal boundary of a European site where such effects could affect the qualifying feature or the achievement of the site's COs.

- 3.1.3.7 Conclusions are reached for each relevant European site and qualifying feature on whether it can be ascertained, on the basis of the available evidence and having regard to the precautionary principle, that the MHPGC Project would not adversely affect the integrity of the site.
- 3.1.3.8 The conclusions of the Stage 2 AA are presented in **Section 10**, including the overall conclusions on AEol summarised in **Table 10.1**.

3.2 In-combination assessment

- 3.2.1.1 Under the Habitats Regulations, it is mandatory to assess not only the LSE of the MHPGC Project alone but also any LSE in combination effects with other plans or projects (HM Government, 2017a and 2017b, respectively). This in-combination assessment is particularly relevant when an impact pathway might otherwise be screened out due to a lack of LSE.
- 3.2.1.2 Several plans or projects (both those with pending applications and those already in operation) that might interact with the MHPGC Project have been identified. Types of plans or projects, that are currently being considered for the final long list, based on their potential impact pathways to the National Site Network, are listed below.
- 3.2.1.3 A full in-combination assessment has been undertaken within this MHPGC Project RIAA. The methodology to this assessment is outlined below, based on the following steps:
- identifying other relevant developments;
 - mapping shared impact pathways;
 - evaluating the overall (combined) significance of effects;
 - determining whether mitigation is required.
- 3.2.1.4 The PINS Advice on Cumulative Effects Assessment (PINS, 2024; amended 2026) sets out a four-stage process for undertaking cumulative effects assessments for NSIPs. This staged approach has been applied to the MHPGC Project to inform the identification and assessment of potential in-combination effects for the purposes of the HRA. Key aspects of these four stages are summarised in **Table 3.2**.

Table 3.2: PINS guidance four-staged approach

Stage	Task
Stage 1	Determine a Zone of Influence (Zol) for every topic receptor using a desk-based review. Within each topic Zol, create a 'long list' of other plans or projects. Record for each scheme its location, type, status, timing, and a confidence tier that reflects how likely it is to proceed..
Stage 2	Refinement of the long list to a short list by only keeping schemes/projects whose timing, scale, nature or environmental setting could realistically overlap with the project and create significant in-combination effects. At this point, information on each retained development is kept high-level, capturing only the key details needed for further assessment. Efforts should be made to agree this shortlist with the relevant stakeholders, particularly local planning authorities.
Stage 3	For each project on the shortlist, compile the latest publicly available information (design, timeline, footprint, parameters, etc.). Document any assumptions made and note data gaps or uncertainties that could affect the assessment.
Stage 4	Topic specialists assess each shortlisted scheme/project to see if, and how, it could combine with the MHPGC Project to create in-combination effects (positive or negative). Significance will be assigned to each impact pathway. Where significant adverse effects are predicted, mitigation will be proposed, including an indication of how it would be secured.

- 3.2.1.5 Each development on the long list will be assigned a certainty tier, following the PINS guidance (PINS, 2024b (amended 2026)). The tier reflects the development's likelihood of being delivered and helps determine whether it should be taken forward into the in-combination assessment:
- Tier 1 - highest certainty:

- under construction;
- permitted applications under the Planning Act/Electricity Act or other regimes but not yet implemented;
- submitted applications under the Planning Act/Electricity Act or other regimes but not yet determined;
- all refusals subject to appeal procedures not yet determined.
- Tier 2 - moderate certainty:
 - projects on the PINS/ MD-LOT programme of projects.
- Tier 3 - lowest certainty:
 - projects on the PINS/ MD-LOT programme of projects where a scoping report has not been submitted;
 - identified in the relevant Development Plan and emerging Development Plans, with appropriate weight given as they near adoption, recognising that there will be limited information available on the relevant proposals;
 - identified in other plans and programmes, as appropriate, which set the framework for future development consents or approvals, where such development is reasonably likely to come forward.

3.2.1.6 This tiering approach aligns with the PINS guidance: NSIP: Advice on HRA (PINS, 2024, amended 2026) which advises that the following (non-exhaustive) categories should be considered in an HRA in-combination assessment:

- projects under construction;
- permitted application or applications not yet developed;
- submitted application or applications not yet decided;
- refused plans or projects subject to an appeal but not yet decided;
- projects on the Planning Inspectorate's national infrastructure programme of projects;
- projects identified in the relevant development plan (and emerging development plans - with appropriate weight being given as they move closer to adoption).

4 Consultation and engagement

4.1 Scoping and Screening

- 4.1.1.1 The Scoping Report for the MHPGC Project was issued to the PINS and the MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the SoS) and MD-LOT provided a Scoping Opinion in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 4.1.1.2 A HRA Screening Opinion was received from MD-LOT on 5 March 2026 (MD-LOT, 2026), following consultation with NatureScot and Natural England. The Screening Opinion provided comments on the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** submitted to MD-LOT in relation to the Scottish components of the MHPGC Project.
- 4.1.1.3 Natural England provided Discretionary Advice on 9 January 2026 in relation to the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** for the English components of the MHPGC Project.
- 4.1.1.4 The scoping and screening responses relevant to this MHPGC Project RIAA are summarised below, together with an indication of how the comments raised have been addressed within **Table 4.1**.

Table 4.1: Summary of consultation responses relevant to the MHPGC Project HRA

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
Scotland					
March 2025	MD-LOT	Scoping Opinion	N/A	<i>The Scottish Ministers acknowledge the Applicant's intention to carry out a detailed HRA Screening following submission of the MHPGC Project Scoping Report. The Scottish Ministers recommend that the Applicant submits an MHPGC Project HRA Screening Report at the earliest opportunity and prior to the submission of the EIA Report.</i>	The MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report was submitted to the Scottish Ministers in December 2025 for consultation prior to the publication of PEIR. Feedback received from MD-LOT is presented in this table and how and where the feedback has been considered in this RIAA is also provided in each respective response.
				<i>The Scottish Ministers strongly advise the production of an MHPGC Project HRA Screening Report for the Proposed Works and recommend that this should be submitted for comment at the earliest opportunity and in advance of the submission of the EIA Report in order to fully inform the HRA advice for the Proposed Works.</i>	
				<i>In terms of designated sites, the Scottish Ministers advise that the approach used by the Applicant to identify designated sites with offshore ornithological features within close proximity to the Proposed Works is insufficient and may omit sites and species that could be affected by the Proposed Works. The Scottish Ministers therefore advise that the NatureScot Guidance Note 3 must be used in the EIA Report for determining SPA connectivity. The Scottish Ministers also highlight the NatureScot representation regarding the Outer Firth of Forth and St Andrews Bay Complex SPA and request that this is considered by the Applicant.</i>	NatureScot Guidance Note 3 has been reviewed and followed as part of the screening for SPAs (NatureScot, 2023a). Considering the MHPGC Project is an offshore export cable project, the application of this guidance is considered precautionary. The Outer Firth of Forth and St Andrews Bay Complex SPA is a marine and estuarine site; it does not host a breeding colony, rather its waters provide foraging and wintering areas for seabirds from adjacent colonies. Although the SPA is designated for a number of species that have a large foraging range, the highest densities of foraging individuals will be present within the SPA boundary rather

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					than within the zone of potential influence from the MHPGC Project. The ZOI represents only a small proportion of the foraging ranges of birds from the SPA, and extensive alternative foraging habitat is available within the SPA itself and beyond. There is thus no potential for LSE, and the SPA was screened out from HRA RIAA. It should also be noted that the screening considered all SPAs within the Outer Firth of Forth, to which species foraging in the Outer Firth of Forth and St Andrews Bay Complex SPA are functionally linked. Further detail is within the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
			Berwickshire and North Northumberland Coast SAC, Isle of May SAC, Firth of Tay and Eden Estuary SAC, Southern North Sea SAC, Dornoch Firth and Morrich More SAC and Moray Firth SAC	<i>The Scottish Ministers are content with the two Study Areas presented in Section 7.6.3 of the MHPGC Project Scoping Report. This view is supported by the Nature representation.</i> <i>Two Study Areas have been proposed for the marine mammal assessment in Section 7.6.3. The Marine Mammal Study Area, defined as the area encompassing the MHPGC Project Scoping Boundary plus 4 kilometres (km) buffer – this was defined for aerial surveys of within the Morven North and Morven South Boundary for ornithology and marine mammal surveys. The second Study Area is defined as the marine mammal regional Study Area and extends over the northern North Sea geographic region to the European coastline as shown in Figure 7.21. We are content with both Study Areas proposed.</i>	The Marine Mammal Study Areas provided in the MHPGC Project Scoping Report have been used to inform the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report and this subsequent HRA RIAA Report.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
February 2025	NatureScot	Advice on the EIA Scoping Report	Outer Firth of Forth and St Andrew's Bay Complex SPA.	<i>Paragraph 7.7.5.3 acknowledges that species which occur within the offshore and intertidal ornithology Study Area may be qualifying features of designated sites. It goes on to state that to inform the MHPGC Project Scoping Report, a generic 50km buffer has been used to identify designated sites with offshore ornithological features (e.g. SPAs) within close proximity to the MHPGC proposal. We advise that this approach is insufficient and may omit species and sites that could be impacted by the proposal. For SPA connectivity we advise following our Guidance note 3 – identifying theoretical connectivity with breeding site SPAs using breeding season foraging ranges.</i> <i>Table 7.42 includes mention of the Outer Firth of Forth and St Andrews Bay Complex marine SPA – just to highlight that a number of the Outer Firth of Forth and St Andrews Bay Complex SPA qualifying seabird species are functionally linked to breeding colony SPAs along the east coast of Scotland – further information can be found in the Sites' Conservation and Management Advice note via SiteLink, which may be helpful when undertaking the assessment.</i>	Foraging ranges within Guidance Note 3 (NatureScot, 2023a) were used to screen in SPAs designated for breeding bird species within the MHPGC Project Habitats Regulation Assessments/Habitats Regulations Appraisal Screening Report. Guidance Note 4 (NatureScot, 2023b) was also considered for the screening of SPAs designated for non-breeding birds. SiteLink was used to inform the MHPGC Project Habitats Regulation Assessments/Habitats Regulations Appraisal Screening Report, where applicable. All three of these data sources have been used within this report.
			N/A	<i>It is noted in Paragraph 1.1.2.3 that an HRA screening exercise will be undertaken at the MHPGC Project PEIR stage. Our advice is that we generally advise submission of the MHPGC Project HRA Screening Report alongside the MHPGC Project Scoping Report as this enables us to consider and provide advice under each assessment process at the same time.</i>	The MHPGC Project Habitats Regulation Assessments/Habitats Regulations Appraisal Screening Report was submitted to the Scottish Ministers in December 2025 for consultation prior to the publication of PEIR.
March 2026	MD-LOT	Screening Opinion	N/A	<i>Offshore - Annex I Benthic Habitats:</i> <i>With regards to the identification of European sites and features, MD-LOT is content with the screening criteria and the 13.5km Zone of Influence ("Zol") used in Section</i>	The Stage 2 AA refined the Zol applied during HRA screening using the maximum tidal excursion derived from the modelling presented in Volume 2, Chapter 1: Physical Processes of the PEIR. The

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				3.1.1 of the HRA Screening Report. This is supported by the 9 February 2026 Natural England representation.	modelling identified a maximum effect range of 9km. As this represents a reduction from the precautionary 13.5km screening Zol, no additional European sites required consideration within the Stage 2 AA in relation to Annex I benthic habitats. The 9 km buffer was agreed with consultees during EWG2 and has therefore been adopted as the Annex I Benthic Habitats Zol for the PEIR. Further details of the Annex I benthic habitat screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
				Offshore - Annex I Benthic: MD-LOT is also content with the conclusion in Section 3.1.1.5 of the HRA Screening Report that no sites in Scottish waters designated for benthic habitats need to be screened into the RIAA. This is in line with both the 9 February 2026 Natural England and NatureScot representations.	No further considerations to Annex I Benthic Habitats are presented within this MHPGC Project RIAA. Further details of the Annex I benthic habitat screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
				Offshore - Annex II Fish and Shellfish: MD-LOT highlights the Dee DSFB representation that, where evidence of a negative impact on a protected species is inconclusive or impacts of the Proposed Development are uncertain, the Developer should make reasonable efforts to fill evidence gaps and advises this is considered by the Developer.	No further consideration of Annex II fish and shellfish receptors is required within the MHPGC Project RIAA. The available evidence, including the data sources and baseline information presented in Volume 2, Chapter 4: Fish and Shellfish Ecology of the PEIR , were reviewed to characterise these receptors and assess potential impacts. This review did not identify any material evidence gaps or uncertainties requiring further investigation in the RIAA.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					Further details of Annex II Fish and Shellfish receptors are provided in with details on data sources and relevant information presented to characterise the baseline environment and an assessment of potential impact in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR.
				<i>Offshore - Annex II Fish and Shellfish: With regards to the identification of European sites and features, MD-LOT is content with the sites, features, screening criteria and 13.5km Zol identified in Section 3.1.2.5. This is supported by the 9 February 2026 Natural England representation.</i>	No further considerations to Annex II Fish and Shellfish are presented within this MHPGC Project RIAA. Further details of the Annex II Fish and Shellfish screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report.
				<i>Offshore - Annex II Fish and Shellfish: MD-LOT is also content with the screening conclusions regarding designated sites which met these criteria in Table 4.2 of the HRA Screening Report. This is also supported by the 9 February 2026 Natural England and NatureScot representations.</i>	No further considerations to Annex II Fish and Shellfish are presented within this MHPGC Project RIAA. Further details of the Annex II Fish and Shellfish screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report. Responses to the Nature Scot representations and Natural England Discretionary Advice Service (9th January 2026) is also provided in this table below.
				<i>Offshore - Annex II Marine Mammals: With regards to the identification of European sites and features, MD-LOT is content with the sites, features, screening criteria and 20km Zol identified in Section 3.1.3 and Table 3.3 of the HRA Screening Report.</i>	The Annex II marine mammal screening approach, including the identification of relevant European sites, qualifying features and the 20km Zol, has been carried forward into the MHPGC Project RIAA. The 20km Zol was derived from the

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					updated JNCC (2025a) Effective Deterrent Range (EDR) for high order UXO clearance ($\leq 263\text{kg}$) without the use of a bubble curtain. The assessment has subsequently been refined using project-specific underwater noise modelling (see Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR), the outputs of which have informed the Stage 2 AA presented within this RIAA. Further details are provided in Section 5.2 and the MHPGC Project Habitats Regulations Assessment/Habitat Regulations Appraisal Screening Report .
				<i>Offshore - Annex II Marine Mammals:</i> <i>With regards to Table 4.4 of the HRA Screening Report, MD-LOT highlights the NatureScot representation, which advises that the Proposed Development will have no likely significant effect on either the harbour seal qualifying interest of the Firth of Tay and Eden Estuary Special Area of Conservation ("SAC"), or the grey seal qualifying interest of the Isle of May SAC. Consequently, these sites can be screened out of the RIAA.</i>	In accordance with NatureScot's advice, the harbour seal qualifying feature of the Firth of Tay and Eden Estuary SAC and the grey seal qualifying feature of the Isle of May SAC were screened out and are not considered further within this MHPGC Project RIAA. Further details are provided within the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report and Section 5.2.4 .
				<i>Offshore - Annex II Marine Mammals:</i> <i>MD-LOT further agrees with the NatureScot representation that, in the absence of underwater noise modelling, impacts on both the bottlenose dolphin qualifying interest of the Moray Firth SAC and the grey seal qualifying interest of the Berwickshire and North Northumberland Coast SAC should be screened into the RIAA. This latter inclusion is also supported by the 9 February 2026 Natural England representation and MD-</i>	In line with MD-LOT, NatureScot and Natural England advice, the bottlenose dolphin qualifying feature of the Moray Firth SAC and the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC have been screened into this RIAA (see Section 5.5). This Stage 2 AA has been informed by project-specific underwater noise

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				LOT notes that the Developer has been provided with the Thompson, Russell and Morris 2017 seal tracking data. MD-LOT advises this data is considered when drafting the RIAA.	modelling (see Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR), seal telemetry data (Stevens, 2025) and information presented within Thompson <i>et al.</i> (2017), where relevant, to inform the assessment of potential effects from underwater noise and disturbance
				Offshore - Annex II Marine Mammals: MD-LOT also highlights the 9 January 2026 Natural England representation that impacts on grey seal at the Berwickshire & North Northumberland Coast SAC as a result of changes in prey availability should be screened into the RIAA.	Potential impacts on the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC arising from changes in prey availability have been considered within the MHPGC Project RIAA (see Section 5.5.1).
				Offshore - Annex I Marine Ornithology: With regards to the identification of European sites and features, MD-LOT is broadly content with the screening criteria and 13.5km ZOI identified in Section 3.1.4 of the HRA Screening Report. This is supported by the 9 February 2026 Natural England representation.	Agreement is welcomed, however the MHPGC Project has also been refined since the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report was published. This included and refinement to the tidal excursion buffer, with the maximum tidal excursion distance reduced from 13.5km to 9km, based on the updated modelling presented in Volume 2, Chapter 1: Physical Processes, of the PEIR . The 9 km buffer was agreed with consultees during EWG2 and has therefore been adopted as the tidal excursion ZOI for the PEIR. Despite this, there are no changes to the European sites screened into the assessment.
				Offshore - Annex I Marine Ornithology:	The baseline description of the Teesmouth and Cleveland Coast SPA has

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				However, MD-LOT notes that the 26 January 2026 Natural England representation states the baseline description of the Teesmouth and Cleveland Coastal Special Protection Area ("SPA") in section 3.1.4.20 of the HRA Screening Report is inaccurate. The little tern population's current main nesting site is located at Seaton Carew, not Long Nanny.	been reviewed and updated. The description of the little tern qualifying feature within in Section 6.5.2 has been revised to reflect the current main nesting location at Seaton Carew, rather than Long Nanny. The Marine Ornithology assessment within the MHPGC Project RIAA has been updated accordingly.
				Offshore - Annex I Marine Ornithology: With regards to applying the aforementioned screening criteria to identify European sites and features to be screened into the test of likely significant effects, MD-LOT highlights the following qualifying interests/SPAs omitted from Table 3.6 in the HRA Screening Report, as identified in the NatureScot representation: • Razorbill qualifying interest of the Fowlsheugh SPA, Forth Islands SPA and St. Abb's Head to Fast Castle SPA; • Gannet qualifying interest of the Outer Firth of Forth and St. Andrews Bay Complex SPA, Fair Isle SPA, Hermaness, Saxa Vord & Valla Field SPA and Noss SPA; and • Leach's petrel qualifying interest of the Foula SPA.	The omission of these qualifying features and SPAs was an error in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report. This has been amended and the qualifying features and SPAs have been considered within the Marine Ornithology Screening outcomes section (Section 6.2).
				Offshore - Annex I Marine Ornithology: Similarly, with regards to conclusions from the test of likely significant effects, MD-LOT highlights the following omissions from Tables 4.6 and 4.7 of the HRA Screening Report which are noted in the NatureScot representation: • Great skua qualifying interest of the Handa SPA, Ronas Hill - North Roe & Tingon SPA and St. Kilda SPA; and	The omission of these qualifying features and their associated SPAs resulted from the application of a 50km distance criterion within the screening assessment, whereby European sites located more than 50km from the MHPGC Project Scoping Boundary were excluded from further consideration (see the MHPGC Project Habitats Regulation Assessment/Habitats Regulations

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				Fulmar qualifying interest of the Cape Wrath SPA, Handa SPA, North Rona & Sula Sgeir SPA, Flannan Isles SPA and St. Kilda SPA.	Appraisal Screening Report). This has been amended and the qualifying features and their associated SPAs have been considered within the Marine Ornithology Screening outcomes section (see Section 6.2).
				<i>Offshore - Annex I Marine Ornithology:</i> <i>In line with the NatureScot representation, MD-LOT advises that the aforementioned qualifying interests/SPAs should have been considered in the relevant Tables of the HRA Screening Report. However, MD-LOT agrees with the conclusion of no likely significant effects both for those qualifying features/SPAs that were included in Tables 4.6 and 4.7 of the HRA Screening Report and the omissions noted above. Consequently, no Annex I Marine Ornithology SPAs need to be considered further in the RIAA for the Proposed Development. This is in line with the NatureScot representation.</i>	Within the Marine Ornithology Screening outcomes section (see Section 6.2) these omitted qualifying features and SPAs have been evaluated through a Screening assessment. Conclusions of the Screening assessment remain the same as within the screening report, there are no Annex I Marine Ornithology SPAs screened into this MHPGC Project RIAA (see MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report).
				<i>Onshore - Annex I Terrestrial Habitats:</i> <i>With regards to the identification of European sites and features, MD-LOT is broadly content with the screening criteria and 250 metre ("m") Zol identified in Section 3.2.1 and Table 3.7 of the HRA Screening Report.</i>	The 250m Zol for Annex I Terrestrial Habitats has been adopted in the Stage 2 AA. (See Section 8.2)
				<i>Onshore - Annex I Terrestrial Habitats:</i> <i>However, MD-LOT highlights the 9 February 2026 Natural England representation that indicates a 0.0km Zol has been applied when assessing if invasive non-native species have the ability to spread beyond the footprint of the Proposed Development. This is inconsistent with the Zol identified in the screening criteria. In line with the aforementioned Natural England representation, MD-LOT advises the Developer to review the assessments with the</i>	The Zol for the impact pathway introduction and spread of INNS has been reviewed and amended to up to 500m from the MHPGC PEIR Red Line Boundary: Onshore for Annex I terrestrial habitats.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>appropriate Zol for this impact pathway applied. Should likely significant effects be identified originating from the portion of the Proposed Development situated in Scottish waters, the designated site(s) affected should be assessed in the RIAA. MD-LOT advises that where instances of likely significant effects originating from the English section of the Proposed Development are identified, the Developer should contact Natural England, as the Statutory Nature Conservation Body for England, for advice.</i>	
				<i>Onshore - Annex I Terrestrial Habitats: The Developer concludes on the likelihood of significant effects resulting from the Proposed Development in Table 4.9 of the HRA Screening Report. To the extent that these conclusions relate to the portion of the Proposed Development in Scottish waters, MD LOT agrees with those conclusions reached by the Developer.</i>	The Applicant notes this response.
				<i>Onshore - Annex I Terrestrial Ornithology: With regards to the identification of European sites and features, MD-LOT is content with the screening criteria and 250m Zol identified in Section 3.2.2 of the HRA Screening Report. MD-LOT is also content with the impact pathways considered in Table 4.10 of the HRA Screening Report, as supported by the 9 February 2026 Natural England representation.</i>	The Applicant notes this response.
				<i>Onshore - Annex I Terrestrial Ornithology: The Developer concludes on the likelihood of significant effects resulting from the Proposed Development in Table 4.11 of the HRA Screening Report. To the extent that these conclusions relate to the portion of the Proposed Development in Scottish waters, MD-LOT agrees with those reached by the Developer.</i>	The Applicant notes this response.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>Onshore - Annex II Terrestrial Flora:</i> <i>With regards to the identification of European sites and features, MD-LOT is content with the screening criteria and the 250m Zol used in Section 3.2.3 of the HRA Screening Report.</i>	The Applicant notes this response.
				<i>Onshore - Annex II Terrestrial Flora:</i> <i>MD-LOT notes that no sites designated for Annex II Terrestrial Flora were identified by these screening criteria. Consequently, MD-LOT is content with the conclusion in paragraph 3.2.3.5 of the HRA Screening Report that no such sites needed to be assessed for likelihood of significant effects resulting from the portion of the Proposed Development in Scottish waters. This is supported by Natural England's 9 February 2026 representation.</i>	The Applicant notes this response. Annex II Terrestrial Fauna are not considered within the scope of this MHPGC Project RIAA.
				<i>Onshore - Annex II Terrestrial Fauna:</i> <i>With regards to the identification of European sites and features, MD-LOT is content with the screening criteria, the 20km search buffer, and the 250m Zol used in Section 3.2.4 of the HRA Screening Report.</i>	The Applicant notes this response. Annex II Terrestrial Fauna are not considered within the scope of this MHPGC Project RIAA.
				<i>Onshore - Annex II Terrestrial Fauna:</i> <i>MD-LOT notes that no sites designated for Annex II Terrestrial Fauna were identified by these screening criteria. Consequently, MD-LOT is content with the conclusion in Section 3.2.4 of the HRA Screening Report that no such sites needed to be assessed for likelihood of significant effects resulting from the portion of the Proposed Development in Scottish waters.</i>	The Applicant notes this response. Annex II Terrestrial Fauna are not considered within the scope of this MHPGC Project RIAA.
				<i>In-Combination Assessment:</i> <i>MD-LOT highlights the 9 February 2026 Natural England representation, which notes that effects from the</i>	The screening outcomes presented in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>Proposed Development alone which are likely but not be deemed significant will need to be considered in-combination with any similar effects from other concurrent projects which affect the same features. This is acknowledged in Section 5.1.1.1 of the HRA Screening Report. However, as screening for in combination effects is still underway, and the HRA Screening Report only considers effects of the Proposed Development alone the Developer will need to detail the full in combination screening process in the RIAA.</i>	Appraisal Screening Report have been revisited to ensure that the potential for LSE in-combination with other plans and projects has been appropriately considered. The approach to in-combination LSE screening and the screening outcomes are summarised in the receptor-specific sections of this MHPGC Project RIAA under Section 5.2.3 for Marine Mammals, Section 6.2.3 for Marine Ornithology, Section 7.2.3 for Terrestrial and Intertidal Ornithology and Section 8.4.4 for Terrestrial Habitats. As set out in these sections, impact pathways screened out as having no LSE from the MHPGC Project alone were also considered in-combination where there was potential for effects to occur alongside other plans or projects. Where the effect of the MHPGC Project alone was considered negligible or inconsequential, it was concluded that the MHPGC Project would not make a material contribution to an in-combination effect and the pathway was therefore screened out from further in-combination consideration. The plans and projects considered as part of the in-combination screening process are identified in Section 5.4.4, Section 6.4.4, Section 7.4.4 and Section 8.4.4, respectively.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					The subsequent Stage 2 AA considered whether an AEol could arise, either alone or in-combination with other plans or projects. For all receptor groups, the effects of the MHPGC Project were assessed as negligible or inconsequential and therefore would not make a material or additive contribution to effects from other plans or projects. Consequently, no potential for AEol was identified for any European site, either alone or in-combination, and no further in-combination assessment of AEol was required.
				<i>In-Combination Assessment:</i> <i>MD-LOT is broadly content with the in-combination assessment methodology proposed in Section 5.2 of the HRA Screening Report. However, MD-LOT notes that Table 5.2 of the HRA Screening Report will require updates following the Developer's review of this HRA Screening Opinion and its associated representations. This is in line with NatureScot and Natural England representations.</i>	The screening outcomes presented in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal have been updated in response to consultation comments, project refinement and available scientific information. These updates are presented in Sections 5.2.4 for Marine Mammals, Section 6.2.4 for Marine Ornithology, Section 7.2.4 for Terrestrial and Intertidal Ornithology and Section 8.2.4 for Terrestrial Ecology, where NatureScot and Natural England representations have been taken on board and addressed. In addition, the potential for LSE in-combination with other plans and projects has been considered within the receptor-specific sections of this RIAA, as set out in the response above. Where an impact pathway was screened out as having no LSE from the MHPGC Project alone, it has

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					also been considered in-combination where there was potential for effects to occur alongside other plans or projects. Where effects from the MHPGC Project were considered negligible or inconsequential, these were considered not to make a material contribution to any in-combination effect.
England					
March 2025	Durham County Council	Scoping opinion	N/A	<i>The ES should thoroughly assess the potential for the proposal to affect nationally designated sites. The National Site Network (e.g. designated SACs and SPAs) falls within the scope of the Conservation of Habitats and Species Regulations 2017 (as amended). In addition, paragraph 194 of the NPPF requires that potential SPAs, possible SACs, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.</i>	Relevant SPAs, SACs and Ramsar sites are screened for potential impacts from Project activities within the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report . Where potential impacts have been identified, further assessment will be provided within this MHPGC Project RIAA for consideration at the PEIR stage.
March 2025	Natural England	Advice on scope of ES (Annex B: Detailed Comments)	N/A	<i>Natural England is aware that the use of HDD relies heavily on local site and environmental conditions and so cannot be guaranteed. We recommended that an alternative methodology is identified in advance and is suitably assessed for environmental impacts, to minimise disruption and environmental risks should HDD become unfeasible at short notice. Additionally, the risk of potential contamination of notified habitats, from the use of chemicals for lubrication of the HDD, will need to be considered in the ES and HRA.</i>	Trenchless techniques (including but not limited to HDD) are proposed for cable installation, completely avoiding the intertidal area. Should HDD be defined as the preferred installation option, consideration will be given for the potential contamination from HDD drilling fluids. The potential effect relates to temporary smothering or contamination of habitat should drilling fluids reach the ground surface during construction. This pathway for effect has been assessed in this Stage 2 AA in Section 8.5.1 for Durham Coast SAC.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					An Outline Bentonite Breakout Plan (CoT47) will form part of the Outline Code of Construction Practice (CoCP), which will be submitted as part of the application for the development consent.
			N/A	<i>We encourage the Applicant to use an Evidence Plan to agree what information should be provided to support the HRA, early in the process and welcome the proposal for a steering group to be set up.</i>	The MHPGC Project Evidence Plan Process (EPP) is ongoing as part of the HRA process. The Applicant has attended Expert Working Group (EWG) Meetings with the consultation responses from these to date provided in Table 4.2 .
			Northumbria Coast SPA and Ramsar site	<i>Impacts to the Northumbria Coast SPA and Ramsar site - These sites are partially within the MHPGC Project Scoping Boundary. The sites are designated for their breeding and wintering bird populations.</i> <i>Further information, including conservation advice is available here: Northumbria Coast SPA and Northumbria Coast Ramsar site.</i> <i>The ES and HRA must consider both direct impacts to SPA and Ramsar species, and supporting habitats within the designated site boundary, and those which are utilising areas outside of the site boundary which are functionally linked to the designated sites.</i>	The National Site Network has been considered as part of the MHPGC Project RIAA. This includes an assessment of adverse effects to supporting habitat and functionally linked features to the Northumbria Coast SPA and Ramsar site (see Section 6).
			Teesmouth and Cleveland Coast SPA; Teesmouth and Cleveland Coast Ramsar site	<i>The ES and HRA must examine the possibility of indirect impacts to these sites resulting from pollution, hydrological and air quality changes.</i>	These impact pathways have been considered as part of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report and the MHPGC Project RIAA (see Section 6). The PEIR has examined these pathways in Volume 2, Chapter 6: Marine Ornithology and Volume 3, Terrestrial Ecology and

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					Terrestrial and Intertidal Ornithology, of the PEIR.
			Durham Coast SAC.	<i>Impacts on Durham Coast SAC - This site is partially within the MHPGC Project Scoping Boundary. The site is designated for its vegetated sea cliffs of the Atlantic and Baltic coasts. The ES must consider the potential for direct impacts and indirect impacts during construction, operations and maintenance (O&M) and decommissioning phases to qualifying features. Any potential for impacts upon the designated site must be considered, including changes to coastal processes.</i>	Durham Coast SAC is considered as part of the MHPGC Project RIAA for direct and indirect impacts during the construction, O&M and decommissioning phases to qualifying features (see Section 8). Changes to coastal processes is considered in the MHPGC ES in Volume 2, Chapter 1: Physical Processes of the PEIR .
			Northumbria Coast SPA and Durham Coast SAC.	<i>Natural England advise that the Northumbria Coast SPA is also included due to potential impact on its supporting habitats. The Durham Coast SAC citation highlights the vulnerability of communities present on the sea cliffs. It states the communities "are largely maintained by natural processes including exposure to sea spray, erosion and slippage of the soft Magnesian Limestone bedrock and overlying glacial drifts, as well as localised flushing by calcareous water". Changes to these processes from the development should be fully explored in the ES.</i>	Northumbria Coast SPA and Durham Coast SAC are considered as part of the MHPGC Project RIAA (see Section 8). Changes to coastal processes is considered in the MHPGC PEIR in Volume 2, Chapter 1: Physical Processes of the PEIR .
			Various SACs and SPAs	<i>The development site is within or may impact on the following European/ internationally designated nature conservation sites:</i> <i>Durham Coast SAC;</i> <i>Northumbria Coast SPA;</i> <i>Northumbria Coast Ramsar site;</i> <i>Castle Eden SAC;</i> <i>Teesmouth and Cleveland Coast SPA;</i> <i>Teesmouth and Cleveland Coast Ramsar site;</i> <i>Thrislington SAC;</i> <i>Northumberland Marine SPA;</i>	The following sites have been included in the MHPGC Project RIAA: Durham Coast SAC; Northumbria Coast SPA; Northumbria Coast Ramsar; Teesmouth and Cleveland Coast SPA; Teesmouth and Cleveland Coast Ramsar. The following sites were considered in Section 3 of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				• Coquet Island SPA; • Farne Islands SPA; • Lindisfarne SPA; • Lindisfarne Ramsar.	but were screened out of the need for Screening assessment as the MHPGC Project falls beyond the foraging distance for tern species adopted at the screening distance: Lindisfarne SPA; Lindisfarne Ramsar site. The following sites were considered in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report as the project falls within the foraging range of sandwich terns (see Table 4.6 of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report) but were screened out of requiring a Stage 2 AA: Northumberland Marine SPA; Coquet Island SPA; Farne Islands SPA. The following sites designated for Annex I Terrestrial Habitats were considered in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report (see Table 1.5) but have been screened out as they fall beyond the ZOI for the MHPGC Project. Thrislington SAC; Castle Eden SAC.
			N/A	<i>Further information on site special interest features, their conservation objectives, and any relevant conservation advice packages for designated sites is available on</i>	Natural England's Access to Evidence and Designated Sites View have been used to gather information on COs and qualifying features of European sites to inform the

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>Natural England's Access to Evidence and Designated Sites View.</i>	MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report and the MHPGC Project RIAA.
			N/A	<i>The ES should thoroughly assess the potential for the proposal to affect internationally designated sites of nature conservation importance/the National Site Network, including marine sites where relevant. The National Site Network (SAC and SPA fall within the scope of the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). In addition paragraph 187 of the NPPF requires that potential SPAs, possible SAC, listed or proposed Ramsar sites, and any site identified or required as compensatory measures for adverse effects on habitat (National) sites, potential SPAs, possible SACs and listed or proposed Ramsar sites have the same protection as classified sites (sites falling within the scope of regulation 8 of the Conservation of Habitats and Species Regulations 2017 are defined as 'habitats sites' in the NPPF).</i>	All relevant sites within the National Site Network have been considered in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report and the MHPGC Project RIAA.
			N/A	<i>Under Regulation 63 of the Habitats Regulations, an appropriate assessment must be undertaken in respect of any plan or project which is (a) likely to have a significant effect on the National Site Network (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site. The consideration of LSEs should include any functionally linked land outside the designated site. These areas may provide important habitat for mobile species populations that are qualifying features of the site, for example birds, mammals and fish. This can also include areas which have a critical function to a habitat feature within a designated site, for example by being linked hydrologically or geomorphologically.</i>	Qualifying species may use habitats beyond the formal boundary of a European site during different stages of their lifecycle. Such areas may provide important ecological functions, including feeding, foraging, roosting or breeding habitat. Where such areas are functionally linked to a European site and effects on those areas could affect the qualifying population or undermine the COs of the associated site, they are considered within the HRA process. Consideration of functionally linked land or other supporting habitat is therefore

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
					undertaken where relevant to the qualifying features and potential impact pathways associated with the MHPGC Project. The RIAA provides the information necessary to support the competent authority's AA under Regulation 63, including consideration of LSEs on the National Site Network and functionally linked land.
			N/A	<i>Should an LSE on a European/internationally designated site be identified (either alone or in-combination) or be uncertain, the competent authority (in this case the SoS) may need to prepare an AA in addition to the consideration of impacts through the EIA process. Further guidance is set out in Planning Practice Guidance on appropriate assessment: https://www.gov.uk/guidance/appropriateassessment. This should also take into account any agreed strategic mitigation solution that may be being developed or implemented in the area to address recreational disturbance, nutrients, or other impacts.</i>	The Applicant confirms the use of the noted guidance and that the MHPGC Project RIAA has been prepared to assess potential adverse effects on the integrity of European sites where LSE could not be ruled out. The assessment considers effects both alone and, where relevant, in-combination with other plans and projects. Relevant mitigation measures and/or embedded measures incorporated into the MHPGC Project have been taken into account within the Stage 2 AA and are clearly signposted.
March 2025	PINS ID 3.1.4	Scoping Opinion	Northumbria Coast SPA.	<i>The Northumbria Coast SPA is not included within the identified designated sites the assessment should include this site within the assessment to determine the likely effects on this site. The applicant is directed to Natural England's response at appendix 2 of this Opinion.</i>	Northumbria Coast SPA is included in the National Site Network considered as part of the MHPGC Project RIAA (see Section 6 and 8).

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
January 2026	Natural England	Discretionary Advice Service	Teesmouth and Cleveland	<u><i>Teesmouth and Cleveland Coast Baseline</i></u> <i>The baseline environment for the Teesmouth and Cleveland Coast Special Protection Area and Ramsar is incorrect in Section 3.1.4.20 and should be updated. Seaton Carew is the current main nesting site for Little Terns for this site, not Long Nanny which is located in Northumberland.</i>	The baseline description of the Teesmouth and Cleveland Coast SPA has been reviewed and updated. The description of the little tern qualifying feature in Section 6.5.2 has been revised to reflect the current main nesting location at Seaton Carew, rather than Long Nanny. The Marine Ornithology assessment within the MHPGC Project RIAA has been updated accordingly (see Section 6.5.2.)
			Berwickshire and North Northumberland Coast	<u><i>Marine Mammals Effective Deterrent Ranges</i></u> <i>The JNCC updated their guidance on Effective Deterrent Ranges (EDR) in 2025. The guidance reduced the EDR for high-order UXO clearance, which may change the conclusion to scope in underwater sound impact for the Berwickshire and North Northumberland Coast Special Area of Conservation (SAC). The HRA Screening Report, Table 4.3, should be updated in line with this guidance.</i>	The updated JNCC (2025a) EDRs have been considered in relation to underwater sound impacts on Annex II Marine Mammal qualifying features. Project-specific underwater noise modelling has subsequently been undertaken to inform the RIAA (see Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR) and has been used to determine the spatial extent of relevant effects for screened in sites, including the Berwickshire and North Northumberland Coast SAC (see Section 5.5).
			N/A	<u><i>Invasive and Non-Native Species (INNS)</i></u> <i>The Zone of Influence (Zol) for the impact pathway Introduction and spread of INNS described in Table 4.8 should be reviewed. Table 4.8 currently states there is potential for INNS to spread beyond the footprint of the project; however, a 0.0km Zol has been applied, indicating that all impacts will be confined to the footprint of the MHPGC Project.</i>	The Zol for the impact pathway introduction and spread of INNS has been reviewed and amended to up to 500m from the MHPGC PEIR Red Line Boundary: Onshore for Annex I terrestrial habitats.
			Berwickshire and North	<u><i>Impact Pathways</i></u>	In accordance with Natural England's advice, impacts on the grey seal qualifying

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
			Northumberland and Coast SAC, Durham Coast SAC and Northumbria Coast SPA and Ramsar site .	<i>It is Natural England's advice that the following impact pathways should be additionally screened in for further assessment:</i> <i>Impacts on marine mammals due to changes in prey availability on the grey seal feature of the Berwickshire and North Northumberland Coast SAC.</i> <i>Hydrological change to the Durham Coast SAC.</i> <i>Frac-out risks to the Durham Coast SAC and the Northumbria Coast SPA and Ramsar site.</i> <i>Permanent/temporary habitat loss to the Northumbria Coast SPA and Ramsar Site should be screened in.</i> <i>Visual disturbance to features of the Northumbria Coast SPA and Ramsar Site.</i>	feature of the Berwickshire and North Northumberland Coast SAC arising from changes in prey availability have been considered within the RIAA (see Section 5.5.1). Impacts to Northumbria Coast SPA and Ramsar site arising from habitat loss and visual disturbance are addressed in Section 7.5.1. There is not likely to be a risk of frac-out within Northumbria Coast SPA due to distance. Impacts to Durham Coast SAC arising from frac out and hydrological change are addressed in Section 8.5.1
			N/A	<i>The method of screening in sites has been presented and follows a stepwise approach using three screening criteria in section 2.1.2. Natural England agrees with the approach applied.</i>	The Applicant notes this.
			N/A	<i>Section 2.1.1.6 notes that "At the time of writing the HRA Screening Report the project description has not been defined in full and is based on that provided in the MHPGC Project Scoping Report (RPS, 2025). The MHPGC Project design will be refined as part of the PEIR submission at which point the conclusions of the HRA Screening Report will be reviewed." Natural England acknowledges this and is aware that elements of the project are subject to refinement and will be presented in the Preliminary Environmental Information Report. The advice provided in this letter is therefore based on the project description provided in the MHPGC Project Scoping Report using in the HRA Screening Report.</i>	Since the MHPGC Habitat Regulations Assessment/Habitat Regulations Appraisal Screening Report was submitted, the MHPGC Interim Red Line Boundary has been refined to the MHPGC Project PEIR Red Line Boundary, The MHPGC Project PEIR Red Line Boundary has been reduced in extent but remains entirely within the MHPGC Project Interim Boundary with corresponding reductions in the associated design parameters considered in the Stage 2 AA and no increases to those assessed at the screening stage. The updated Project description is provided in Section 1.3 .

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
			N/A	<i>No sites for Annex I Benthic habitats have been screened in for further consideration. Natural England agrees with this conclusion.</i>	The Applicant notes this and in line with this acknowledgement no further considerations to Annex I Benthic Ecology are presented within this MHPGC Project RIAA. Further details of the Annex I Benthic Ecology screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
			Castle Eden Dene SAC and Thrislington SAC	<i>Both sites have been screened out of further assessment due to their location and their non-mobile features. Natural England agrees with this conclusion.</i>	The Applicant notes this and in line with this acknowledgement Castle Eden SAC and Thrislington SAC have been considered but have been screened out as they fall beyond the Zol for the MHPGC Project (see Table 1.3 of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report).
			N/A	<i>No sites for Annex II terrestrial fauna have been screened in and therefore this receptor has not been taken through to the Test of Likely Significant Effect (LSE). Natural England agrees with this conclusion.</i>	The Applicant notes this and in line with this acknowledgement no further considerations to Annex II Terrestrial Fauna are presented within this MHPGC Project RIAA.
			Teesmouth and Cleveland Coast Special Protection Area (SPA) and Ramsar site	<i>The text states "The MHPGC Project occurs within the foraging range for individuals associated with the Northumbria Coast SPA and Teesmouth and Cleveland Coast SPA. Within Northumbria Coast SPA and Ramsar site, little tern can be found nesting at the sandy beaches and feeding in the shallow inshore waters of the Long Nanny estuary, at Low Newton (Natural England, 2000). At Teesmouth and Cleveland Coast SPA, terns nest at Newton Links/Long Nanny and forage in Beadnell Bay</i>	The baseline description of the Teesmouth and Cleveland Coast SPA has been reviewed and updated with the most up-to date available scientific information. The description of the little tern qualifying feature within Section 6.5.2 has been revised to reflect the current main nesting location at Seaton Carew, rather than Long Nanny. The Marine Ornithology

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>and the surrounding coastal waters, which support a large number of sandeel (Natural England, 2017). This aligns with recent DAS surveys of Morven North and Morven South, which reported no little tern (APEM, 2025).” The baseline description in this paragraph is incorrect as the Teesmouth and Cleveland Coast SPA little tern population current main nesting site is located at Seaton Carew (not Long Nanny which is located in Northumberland). Natural England advise that the baseline description is corrected in the next version of the HRA Screening Report.</i>	assessment within the MHPGC Project RIAA has been updated accordingly.
			N/A	<i>Impacts pathways are considered and their Zol (fish and shellfish). Natural England agrees with the screening approach set out.</i>	The Applicant notes this and in line with this acknowledgement no further considerations to Annex II Fish and Shellfish are presented within this MHPGC Project RIAA. Further details of the Annex II Fish and Shellfish screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
			River Tweed SAC and Tweed Estuary SAC	<i>Both sites have been screened out for further assessment in Stage 2. Underwater sound impacts have been screened out due to the features (Atlantic salmon and lamprey) being considered of low risk of behavioural responses or auditory injury. Indirect impacts have been screened out due to the distances of the sites from the project boundary and that any migrating individuals are expected be able to avoid any areas impacted. Natural England agrees with the screening approach set out.</i>	No further considerations to Annex II Fish and Shellfish are presented within this MHPGC Project RIAA. Further details of the Annex II Fish and Shellfish screening process are provided in MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
			N/A	<i>Table 4.3 identifies impact pathways to marine mammal receptors and their Zol. Table 4.4 notes that the impact pathway Underwater sound impacts is screened in for the Berwickshire and North Northumberland Coast SAC,</i>	The updated JNCC (2025a) EDRs have been considered. In addition, project-specific underwater noise modelling has been undertaken to inform the RIAA (see

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				located 25.6km from the MHPGC Project Interim Boundary. The Zol for the impact pathway Injury and disturbance from underwater sound is stated as being 26 km and therefore the SAC is screened in as it overlaps with the Zol for underwater noise effects on marine mammals. The Effective Deterrent Range (EDR) used to set the Zol are based on the JNCC 2020 guidance (JNCC Report 654). In 2025, JNCC updated the EDRs as reported in the JNCC Report 803 Available: JNCC Report 803. Updated Effective Deterrent Ranges (EDRs) for assessing the significance of noise disturbance in harbour porpoise Special Areas of Conservation (SACs) (England, Wales & Northern Ireland)). JNCC Report 803 reduced the EDR for high-order UXO clearance (≤ 263 kg) to 20 km (without a bubble curtain) and to 10 km (with a bubble curtain). Natural England agrees with the screening approach applied to use the EDR for high order UXO Clearance to establish the Zol for the impact pathway injury and disturbance from underwater sound. We advise that the 2025 EDR guidance is applied in the HRA Screening Report as this might lead to the conclusion that this impact can be considered unlikely to result in a significant effect and can therefore be screened out of further assessment in the HRA.	Volume 2 Annex 5.1: Underwater Sound Modelling Report, of the PEIR) and provides a more refined assessment of underwater sound effects than the screening-stage EDR approach. The results of the modelling have been used to assess potential effects on the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC and the bottlenose dolphin qualifying feature of the Moray Firth SAC (see Section 5.5).
			Berwickshire and North Northumberland Coast SAC	The impact pathway Impacts to marine mammals due to changes in prey availability is proposed to be screened out as impacts to the seabed from construction phase activities are expected to be localised, small in extent, and in many cases temporary. This is considered unlikely to result in noticeable changes in prey density or distribution. The document notes that there are areas within the MHPGC Project Interim Boundary identified as spawning grounds for important prey species for grey seal. Natural England notes that Table 4.5 states that mortality, injury and/or disturbance to prey may cause	Following Natural England's advice, changes in prey availability has been assessed as a potential impact pathway for the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC (see Section 5.5.1).

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>reduced availability to marine ornithological receptors. This is comparable to the effect this impact may also have on the grey seal population of the Berwickshire and North Northumberland Coast SAC. Natural England advises that the impact from changes in prey availability for the grey seal feature of the Berwickshire and North Northumberland Coast SAC is screened in.</i>	
			Southern North Sea SAC	<i>This site was screened out of further assessment; Natural England concurs that this site can be screened out.</i>	In agreement with Natural England, the Southern North Sea SAC was screened out of LSE and is not considered further within this RIAA. Further details are provided within Section 6.2 and the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report .
			Marine Ornithology	<i>Impacts pathways considered and their Zol. (marine ornithology), Natural England agrees with the screening approach and Zol set out.</i>	The Applicant notes this and in line with this acknowledgement the impact pathways and Zols have been assessed in Section 6.5 . Noting that the tidal excursion Zol has been updated. Based on updated modelling presented in Volume 2, Chapter 1: Physical Processes, of the PEIR the maximum tidal excursion distance reduced from 13.5km to 9km. The 9 km buffer was agreed with consultees during EWG2 and has therefore been adopted as the tidal excursion Zol for the PEIR. Despite this, there are no changes to the European sites screened into the assessment.
			Northumbria Coast SPA and Ramsar Site and	<i>Sites are screened into Stage 2. Natural England agrees with the conclusion that effects on both of these sites should be considered in Stage 2.</i>	The Applicant acknowledges this, Northumbria Coast SPA and Ramsar is assessed in Section 6.5.1 for Marine Ornithology (alone and in-combination)

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
			Teesmouth and Cleveland Coast SPA and Ramsar site		and in Section 7.5.1 for Terrestrial and Intertidal Ornithology (alone and in combination).
			Northumberland and Marine, Coquet Island, Farne Islands SPAs	<i>This site is screened out, Natural England agrees with this conclusion.</i>	The Applicant acknowledges this, Northumberland and Marine, Coquet Island, Farne Islands SAC is screened out from Stage 2 AA.
			Flamborough and Filey Coast SPA	<i>This site is screened out, Natural England agrees with this conclusion.</i>	The Applicant acknowledges this, Farne Islands SPA is screened out from Stage 2 AA.-
			N/A	<i>Maximum Zol for air quality effects is given as 250m due to emissions from traffic and dust. Natural England agrees that a 250m Zol for air quality effects is appropriate and in line with the latest standing advice on how to assess applications on a protected site. Available: Air pollution and development: advice for local authorities - GOV.UK.</i>	The Applicant acknowledges this, the screening assessment considered where impact pathways could take place within the Zol of the MHPGC Project with impacts from changes to air quality localised to the vicinity of the MHPGC PEIR Red Line Boundary: Onshore with a Zol of 250m, (See Section 8.2).
			N/A	<i>The text describing the Zol notes that INNS have the potential to spread beyond the footprint of the project however, a 0.0km Zol has been applied indicating that all impacts will be confined to the footprint of the MHPGC Project. Natural England agrees that the spread of INNS could potential be beyond the development footprint. We advise the Zol for this impact pathway is reviewed.</i>	The only impact pathway for INNS with regard to terrestrial habitats is construction activities within the MHPGC PEIR Red Line Boundary NO change has been made to the Zol for terrestrial habitats
			Durham Coast SAC	<i>Impacts from hydrological change have not been considered. Natural England considers there is a risk that the cable may lead to disruption to springline feeding flushes on the vegetated cliffs of the Durham SAC which</i>	An assessment of hydrological change to Durham Coast SAC is considered in Section 8.5.1 .

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>may result in an adverse effect on the feature. Natural England advises that the impact from hydrological change on the Durham Coast SAC is screened in.</i>	
			N/A	<i>It is not clear whether frac-out is considered within the HRA Screening Report as an impact pathway likely to affect the Durham Coast SAC and the Northumbria Coast SPA and Ramsar site. Changes in water quality are screened out due to the application of best practice measures however a specific management plan is likely to be needed to control the intertidal and terrestrial risk if frac-out occurs to avoid adverse effects. We expect within the application documents for there to be a frac-out plan detailing access to the cable route along the foreshore and for the use of that route to be assessed within the HRA. Abrasion and disturbance to intertidal habitats may result from the tools and vehicles needed to respond to a frac-out incident. Although this is not a planned activity, frac-out is a high-risk environmental concern and has occurred on numerous HDD projects. Natural England advises that the impact from frac-out on the Durham Coast SAC and the Northumbria Coast SPA and Ramsar site is screened in.</i>	Impacts to Durham Coast SAC arising from frac out are assessed in Section 8.5.1 . The Applicant has provided embedded mitigation (CoT47) for an Outline Bentonite Breakout Plan that forms part of the Outline Code of Construction Practice (CoCP), which will be submitted as part of the application for the development consent. A Detailed Bentonite Breakout Plan will be developed substantially in accordance with the outline plan. It is concluded that frac-out, managed with mitigation measures embedded in the MHPGC Project commitments, will not result in an AEoI on the qualifying features of Durham Coast SAC.
			N/A	<i>Impacts pathways considered and Zol (Terrestrial Ornithology). Natural England agrees with the screening approach set out.</i>	The Applicant acknowledges this. The impact pathways and Zol is provided in Section 7.2 for Terrestrial and Intertidal Ornithology.
			Northumbria Coast SPA/Ramsar	<i>The impact pathways Permanent habitat loss, including functionally linked land and bird nests and Temporary loss of supporting habitats are screened out for further assessment for the Northumbria Coast SPA and Ramsar site. This is because of the proposed trenchless approach. Natural England welcomes the use of trenchless approaches however does not agree there is enough detail available at this stage on the potential</i>	Northumbria Coast SPA/Ramsar is located 1.7km north of the MHPGC PEIR Red Line Boundary: Onshore, at its nearest point There will be no direct effects to the Northumbria Coast SPA/Ramsar due to distance. Effects on functionally linked land for qualifying features of the

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>impacts from this activity to enable to screen out these impact pathways. Natural England advises that permanent/temporary habitat loss for the Northumbria Coast SPA and Ramsar Site is screened in.</i>	Northumbria Coast SPA/Ramsar are assessed in Section 7.5.1
			Northumbria Coast SPA/Ramsar	<i>The potential for visual disturbance is not noted within Table 4.11. The justification includes narrative around noise disturbance impacts only for the impact pathway disturbance and displacement of birds. Natural England advises that the impacts resulting from visual disturbance on the features of the Northumbria Coast SPA and Ramsar Site is assessed within the HRA.</i>	Visual disturbance to qualifying features of Northumbria Coast SPA/Ramsar has been considered within Section 7.5.1
			N/A	<i>No screening has been presented for the impact pathways which have been shown to have no likely significant effect 'alone'. Paragraph 5.1.1.1 states correctly that "The intention of this screening is to determine whether an impact pathway that has otherwise not been identified as having LSE on a designated site may have an LSE when combined with effects from other plans or projects." Paragraph 5.1.1.2 states that "For the purposes of this HRA Screening, a high-level review of other plans and projects has been undertaken to provide an initial indication of which projects might interact with the MHPGC Project. Where best available evidence indicates that there is no risk that the MHPGC Project will have LSE on specific features of a site in-combination with other plans or projects by undermining its conservation objective(s), these features will be screened out of further assessment". Effects which cannot be excluded on the basis of objective information (i.e., effects which are 'likely') but which on their own will not undermine the conservation objectives (i.e., be 'significant') need to be considered in combination with any similar effects from other relevant plans and projects also being proposed at the same time and affecting the</i>	The screening outcomes presented in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report have been revisited to ensure that the potential for LSE in-combination with other plans and projects has been appropriately considered. The approach to in-combination LSE screening and the screening outcomes are summarised in the receptor-specific sections of this MHPGC Project RIAA under Section 5.2.3 for Marine Mammals, Section 6.2.3 for Marine Ornithology, Section 7.2.3 for Terrestrial and Intertidal Ornithology and Section 8.2.3 for Terrestrial Habitats. As set out in these sections, impact pathways which were screened out as having no LSE from the MHPGC Project alone have also been considered in-combination with other plans and projects where there was potential for the

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
				<i>same site to determine if together their combined effects might be significant. The HRA Screening document does not present whether there are additional likely significant effects to be considered in the Appropriate Assessment which have been identified in combination. It is acknowledged that the document will be revised when further details are known and a long list of projects to consider is developed. Natural England advises that an in-combination screening assessment is required and should be presented in the HRA Screening Report to evidence that all effects which require further assessment have been identified.</i>	combined effects to result in LSE. Where the effect of the MHPGC Project alone was considered negligible or inconsequential, it was concluded that the MHPGC Project would not make a material contribution to an in-combination effect and the pathway was therefore screened out from further in-combination consideration. The plans and projects considered as part of the in-combination screening process are identified in Section 5.4.4, Section 6.4.4, Section 7.4.4 and Section 8.4.4, respectively. The subsequent Stage 2 AA considered whether an AEol could arise, either alone or in-combination with other plans or projects. The in-combination assessment is presented in Section 5.5 for Marine Mammals, Section 6.5 for Marine Ornithology, Section 7.5 for Terrestrial and Intertidal Ornithology and Section 8.5 for Terrestrial Habitats. For all receptor groups, the effects of the MHPGC Project were assessed as negligible or inconsequential and therefore would not make a material or additive contribution to effects from other plans or projects. Consequently, no potential for AEol was identified for any European site, either alone or in-combination, and no further in-combination assessment of AEol was required.

Date	Consultee	Consultation type	Relevant European site	Comment	How and where considered in the HRA RIAA
			N/A	<i>This section provides methods for the in-combination assessment proposed for the Report to Inform an Appropriate Assessment (RIAA) and is based on the guidance Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments. Natural England agrees with the in-combination assessment methodology set out.</i>	The Applicant acknowledges this, the in-combination assessment methodology is set out in Section 3.2 .
			N/A	<i>Table 5.2 presents the in-combination effects to be considered in the RIAA. This table will require review following the adoption of any advice provided in this letter or by others.</i>	The MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report has been reviewed following updates to the Project Description and consultation feedback. The LSE outcomes have been revisited to ensure that the LSE in-combination is considered, for the potential effects identified where there is LSE alone then the in-combination assessment is presented in this RIAA. Where there is no LSE alone the potential effects from the MHPGC Project are considered trivial or inconsequential and so will not contribute to an in-combination effect with any other plan or project.
			N/A	<i>Table 6.1 presents the Summary of National Sites screened in for Appropriate Assessment and the impact pathways to be assessed. This table will require review following the adoption of any advice provided in this letter or by others.</i>	A summary of the European sites taken forward to Stage 2 AA is provided in Sections 5.2.5 for Marine Mammals, Section 6.2.5 for Offshore Ornithology, Section 7.2.5 for Terrestrial and Intertidal Ornithology and Section 8.2.5 for Terrestrial Habitats. This summary incorporates revisions and updates following adoption of advice from the Scoping Opinion and advice from NatureScot and Natural England.

4.2 Expert Working Groups

- 4.2.1.1 As part of the MHPGC Project Evidence Plan Processes (EPP), EWG meetings have been held in November 2025 and July 2026 to engage with relevant stakeholders. These included a Marine Mammals EWG, an Marine Ornithology EWG and a Terrestrial Ecology, Intertidal and Onshore Ornithology EWG. Agreements and comments from key stakeholders have been considered within the RIAA. Feedback provided by stakeholders through these EWGs specifically limited to those in relation to the European sites present are set out in where available at the time of writing this report.
- 4.2.1.2 In particular, the scope, methodology and findings of the onshore surveys completed to date have been discussed and, where appropriate, agreed with stakeholders via regular Terrestrial Ecology, Intertidal and Onshore Ornithology EWG meetings, as part of the MHPGC Project EPP.
- 4.2.1.3 As part of the ongoing consultation with the Terrestrial Ecology, Intertidal and Onshore Ornithology EWG two technical notes have been issued for the purpose of seeking advice and agreement on the proposed MHPGC Project approach. The first technical note was issued to Natural England on 16 July 2025 and outlined the MHPGC Project's proposed scope of onshore and intertidal ecological and ornithological surveys. Natural England provided their feedback on 12 September 2025.
- 4.2.1.4 A second technical note was issued on 17 October 2025 and set out the detailed methodologies to surveys scoped in for the MHPGC Project, informed by feedback received on the first technical note. The Environment Agency and Natural England both provided their feedback on 07 November 2025. Comments received as part of this feedback, specifically limited to those in relation to the European sites present, are set out in **Table 4.2**.

Table 4.2: Summary of further consultation and engagement

Date	Consultee and response type	Comment	How and where considered in the PEIR
12 September 2025	Natural England – Response to Technical Note	Provide detail on timing of surveys. Surveys to be completed in a complete set of baseline data covering two years. Intertidal bird surveys to include a survey during high and low tide. Include rocky reef habitat known to be used by foraging waders north of scoping area in survey extent.	Wintering and intertidal bird survey methodologies are detailed in Volume 3, Annex 3.1: Terrestrial Ecology and Terrestrial and Intertidal Ornithology Survey Methodologies Technical Report, of the PEIR, including timings of surveys within the optimal survey season and following best practice methods. Surveys covered two years, and were undertaken between April 2023 and March 2024; and October 2025 to September 2026. The intertidal bird survey area for the 2025/2026 surveys has been extended to cover the rocky reef habitat north of the MHPGC Project Scoping Boundary (which has since been superseded by the MHPGC Project PEIR Red Line Boundary) and is shown in Volume 3, Annex 3.13 Interim Wintering, Passage and Intertidal Bird Surveys Technical Report Figure 2.2.
07 November 2025	Natural England – Response to Technical Note	Second year of intertidal bird survey to be extended to September 2026 to cover same period as first year (April 2023 to March 2024) to have two non-consecutive years of data available.	The second year of intertidal bird surveys has been undertaken monthly between October 2025 and September 2026.
18 December 2025	Written response from Natural England on Marine Mammal EWG1 meeting minutes	Natural England agrees with the key references proposed to establish the marine mammal baseline. However, the list might not be exhaustive, and any new, relevant data sources should be added to the list of references.	The marine mammal baseline has been informed by a comprehensive review of available data sources and relevant guidance, including those recommended by Natural England as part of the EPP, as presented in Section 5.3 . with the baseline kept under review throughout the assessment to ensure that any relevant updates are incorporated where appropriate.

13 January 2026	Written response from NatureScot on Marine Mammal EWG1 meeting minutes	Following the EWG Meeting, NatureScot provided additional advice on key considerations: • The Southern Trench ncMPA designated for minke whale should only be scoped out if there is no potential for direct noise impacts overlapping the MPA area. • Low noise alternatives to high order detonations should be prioritised in UXO clearance. • If high-order clearance is necessary, NatureScot would need to be consulted if there is potential for an impact on the Berwickshire and Northumberland SAC designated for the grey seal. This will be better understood after assessment scenario 2 is completed. • However, we do accept the use of the 5km EDR for geophysical survey activity, as this is highly precautionary. • For UXOs, we advise the use of TTS (temporary threshold shift) as a proxy for disturbance. This is because the noise is so short-term that displacement or other behavioural responses are unlikely. TTS is therefore the most likely worst case (sub-injury) consequence of this activity. • TTS should not be used as a proxy for disturbance for other noise sources (piling, geophysical survey, vessel noise, etc).	The implications for the Southern Trench ncMPA will be considered within the MHPGC Project MPA, MCZ and HPMA Screening and Assessment Approach, prepared to accompany the PEIR. The MPA/MCZ Assessment and HPMA Ecosystem Level Assessment will consider potential impacts associated with UXO clearance and other MHPGC Project activities which will be undertaken and submitted in support of the DCO application and Marine Licence application(s) to the Scottish Ministers. The MHPGC Project includes a committed to seek to minimise impacts from UXO clearance through the hierarchy set out in CoT58, which identified low order UXO clearance techniques, such as deflagration, as the preferred method where practicable and appropriate (see Table 5.8). Low order UXO clearance is intended to be consented as part of the MHPGC Project through the DCO, associated dMLs and Marine Licence application(s) to the Scottish Ministers. Should high order UXO clearance be required, this would be subject to a separate marine licence application. The marine mammal assessments present the committed low order approach together with precautionary information on high order (detonation) UXO clearance in Section 5.5. Potential impacts on Berwickshire and North Northumberland SAC are considered within this RIAA (see Section 5.5.1). The marine mammal qualifying features assessment (see Section 5.5) considers the updates JNCC (2025a) EDRs where appropriate and presents Temporary Threshold Shift (TTS) impact ranges as a proxy for disturbance from UXO clearance provided by project-specific underwater sound modelling, but not for other sources where behavioural thresholds are available (see Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR).
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Date	Consultee and response type	Comment	How and where considered in the PEIR
		For UXO clearance, a mitigation zone must be defined. This is the full extent within which auditory injury could occur or a 1km radius, whichever is larger. Ensuring the full extent of the mitigation zone is clear of marine mammals before explosive use may require multiple mitigation techniques to be applied. The full extent of the mitigation zone will be agreed during the application process. If the mitigation zone extends to distances which can't be effectively mitigated, an EPS licence for injury may be required.	Relevant MHPGC Project commitments of relevance to marine mammals are described in Section 5.4.3 , including the preparation of an Outline Marine Mammal Mitigation Protocol (MMMP; CoT36), with details of mitigation zones have been considered as part of the assessment (see Section 6.5). The full list of Project commitments is provided in Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR .
18 November 2025	Natural England Marine Ornithology EWG1 NatureScot written responses on Marine Ornithology EWG1 Meeting Minutes	The Applicant proposed scoping out (for Offshore Ornithology): the O&M phase assessment of: - Indirect impacts from underwater sound affecting prey species; - Temporary habitat loss/disturbance from increase Suspended Sediment Concentration (SSC), including indirect impacts on prey species. NE response to assessment approach: These impact pathways should be included for consideration. Based on feedback received, it was agreed that a short qualitative assessment within the PEIR, and ES, is appropriate for the O&M phase. NS in agreement that these impact pathways should be considered for the O&M phase	The RIAA and PEIR (Volume 2, Chapter 6: Marine Ornithology, of the PEIR) undertakes a qualitative assessment of these impact pathways during all phases (see Section 6).

Date	Consultee and response type	Comment	How and where considered in the PEIR
18 November 2025	Natural England Marine Ornithology EWG1	Agreement was sought on sensitivity of key receptors to impact pathways. NE response to assessment approach: Offshore ornithology receptors are to be considered for the assessment of impact of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels. NE did not agree this impact can be scoped out of the assessment as further information is required.	The RIAA has considered all marine ornithology receptors that are qualifying features of European sites with connectivity to Marine Ornithology Study Area, and as recommended by NE, have been assessed for disturbance and displacement from noise and visual disturbance in Section 6 .
16 July 2026	Marine Mammal EWG2 meeting with stakeholders: • MMO; • Natural England; • NatureScot.	The second Marine Mammal EWG meeting considered updates to the marine mammal assessment following initial topics discussed at EWG1 (held 18 November 2025), including responses to outstanding actions, MHPGC Project route planning and site selection updates and initial assessment outputs. Following the meeting, stakeholders provided further comments on points raised for discussion, which are detailed in the following rows.	The consultation outcomes have informed the marine mammal baseline, assessment methodology and Stage 2 AA presented in Section 5 (see Volume 2, Chapter 5: Marine Mammals, of the PEIR , for full list of responses).

Date	Consultee and response type	Comment	How and where considered in the PEIR
23 July 2026	Written response from NatureScot on Marine Mammal EWG2 slides	NatureScot considered the proposed Scottish designated sites to be in line with its scoping advice, but noted that the Southern Trench ncMPA appeared to be missing from the list.	The Southern Trench ncMPA has been considered within the MHPGC Project MPA, MCZ and HPMA Screening and Assessment Approach, which accompanies the PEIR . The site is screened out from further assessment based on the relevant underwater sound Zol. The MPA/MCZ Assessment and HPMA Ecosystem Level Assessment will consider potential impacts associated with UXO clearance and other MHPGC Project activities which will be undertaken and submitted in support of the DCO application and Marine Licence application(s) to the Scottish Ministers.

5 Marine Mammals

5.1 Introduction

- 5.1.1.1 This section presents the Stage 2 AA for the Annex II marine mammal qualifying features of European sites screened into the MHPGC Project RIAA.
- 5.1.1.2 All cetacean species are listed under Annex IV of the Habitats Directive and are therefore subject to strict protection provisions applicable to European Protected Species (EPS) wherever they occur. In addition, certain marine mammal species are also listed under Annex II of the Habitats Directive, under which European sites are designated for the protection of their habitats. The Annex II marine mammal species occurring in UK and Irish waters include bottlenose dolphin (*Tursiops truncatus*), harbour porpoise (*Phocoena phocoena*), grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*).
- 5.1.1.3 Section 5.2 first outlines the outcomes of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report, including the assessment of LSE from the MHPGC Project alone (see Section 5.2.2) and in-combination with other plans and projects (see Section 5.2.3). Section 5.2.4 then describes how consultation feedback and project design refinements have been incorporated into the screening conclusions, including updates such as the addition of an impact pathway and the removal of a site. An up-to-date summary of LSE taken forward to Stage 2 AA is presented in Section 5.2.5.
- 5.1.1.4 Section 5.3 presents the marine mammal baseline, including the information available across the two MHPGC Project PEIR Marine Mammal Study Areas (see Section 5.3.1), survey effort and results (see Section 5.3.2), and any constraints and limitations of the available data (see Section 5.3.3).
- 5.1.1.5 Section 5.4 sets out the information used to inform the Stage 2 AA, including details and assessment criteria of relevant impact pathways (see Section 5.4.1), design parameters (see Section 5.4.2), embedded mitigation and project commitments (see Section 5.4.3), and the plans and projects considered within the in-combination assessment (see Section 5.4.4).
- 5.1.1.6 Section 5.5 presents the Stage 2 AA of the relevant marine mammal qualifying features, considering the effects of the MHPGC Project, both alone and in-combination, and determines whether an AEoI of the relevant European sites can be excluded, in view of their COs.

5.2 Likely Significant Effect screening outcomes

- 5.2.1.1 This section summarises the European sites designated for marine mammal qualifying features that were identified through the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, (carried out in 2025), as having the potential to experience LSE from the MHPGC Project. This section presents updates to screening as a result of consultation and project refinements and defines the scope of the Stage 2 AA.

5.2.2 Screening outcomes for the MHPGC Project alone

- 5.2.2.1 European sites designated for Annex II marine mammal qualifying features were screened where they either overlapped with the MHPGC Project Interim Boundary, or where the site and MHPGC Project occurred within the same Management Unit (MU) of the qualifying marine mammal species.
- 5.2.2.2 For cetaceans, screening considered the species-specific MUs described by the Inter-Agency Marine Mammal Working Group (IAMMWG; 2023), which have been defined according to the biological population structure, movement patterns, habitat use and relevant management considerations for the seven most common cetacean species in the UK.
- 5.2.2.3 For pinnipeds, screening considered the Seal Monitoring Units (SMU), as defined by the Special Committee on Seals (SCOS; 2025), which were developed based on expert knowledge and opinion on seal ecology in the UK.

- 5.2.2.4 The MUs and SMUs relevant to the MHPGC Project Interim Boundary were identified as follows, and all European sites designated for the protection of Annex II marine mammals within these MUs and SMUs were considered as part of the screening for LSE:
- Bottlenose dolphin: Coastal East Scotland MU and Greater North Sea MU;
 - Harbour porpoise: North Sea MU;
 - Grey seal: East Scotland SMU and Northeast Scotland SMU;
 - Harbour seal: East Scotland SMU and Northeast Scotland SMU.
- 5.2.2.5 The screening assessment also considered whether the qualifying features of the European sites identified through screening could be functionally linked to the MHPGC Project Interim Boundary, based on the known distribution, movements and foraging ranges of the relevant qualifying species and populations. For example, the Moray Firth bottlenose dolphin population is known to travel widely along the east coast of Scotland, and both harbour seal and grey seal are known to have wide ranging foraging behaviour, travelling up to 273km and 448km away from a haul-out site, respectively.
- 5.2.2.6 These sites were then considered in relation to the potential for LSE where they occurred within the Zol of the following impact pathways, as identified through the MHPGC Project Scoping Report (RPS, 2025):
- injury and disturbance from underwater sound (Zol of 26km);
 - impacts on marine mammals due to changes in prey availability (Zol of 13.5km);
 - injury to marine mammals due to collision with vessels (Zol of 0km).
- 5.2.2.7 When the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** was prepared in 2025, the only impact pathway for which LSE could not be ruled out for marine mammal qualifying features of European sites was injury and disturbance from underwater sound. In the absence of project-specific underwater sound modelling at the screening stage, potential effects from underwater sound were considered possible where a European site occurred within 26km of the MHPGC Project Interim Boundary. This distance was derived using the appropriate EDR for high order UXO detonations, in accordance with JNCC (2020) guidance.
- 5.2.2.8 As a result of the screening assessment, the following European sites and associated qualifying features were concluded to have the potential for LSE from injury and disturbance arising from underwater sound during the construction, O&M, and decommissioning phases of the MHPGC Project, and were therefore identified to take forward to Stage 2 AA:
- Berwickshire and North Northumberland Coast SAC (UK0017072), designated for grey seal;
 - Isle of May SAC (UK0030172), designated for grey seal;
 - Moray Firth SAC (UK0019808), designated for bottlenose dolphin.
- 5.2.2.9 A summary of the European sites and relevant qualifying marine mammal features for which LSE was determined at the time of the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** is provided in **Table 5.1**.

Table 5.1: European sites designated for marine mammal features identified in the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report as having the potential for LSE

European site	Distance to the MHPGC Project Interim Boundary at the closest point	Relevant qualifying feature	Impact Pathway
Scottish sites in National Site Network			
Berwickshire and North Northumberland Coast SAC (UK0017072)	25.6	• (1364) Grey seal (<i>Halichoerus grypus</i>)	• Injury and disturbance from

European site	Distance to the MHPGC Project Interim Boundary at the closest point	Relevant qualifying feature	Impact Pathway
Isle of May SAC (UK0030172)	94.1	(1364) Grey seal (<i>Halichoerus grypus</i>)	underwater sound
Moray Firth SAC (UK0017072)	160.0	(1349) Bottlenose dolphin (<i>Tursiops truncatus</i>)	
English sites in National Site Network			
Berwickshire and North Northumberland Coast SAC (UK0017072)	25.6	(1364) Grey seal (<i>Halichoerus grypus</i>)	Injury and disturbance from underwater sound

5.2.3 Screening outcomes for the MHPGC Project in-combination

- 5.2.3.1 The potential for LSE was considered in-combination with other plans or projects. Any effect that could not be ruled out for the MHPGC Project alone was assumed to require in-combination screening assessment. Where an impact pathway had been discounted from having LSE on the MHPGC Project alone, it still required additional consideration in-combination with other plans or projects, depending on the potential combined effect. Where an impact had been assessed alone as resulting in a negligible or inconsequential effect from the MHPGC Project alone, it was also considered to not contribute in a material way to the in-combination effects and therefore was screened out for in-combination effects.

5.2.4 Screening outcome updates following consultation and project refinement

- 5.2.4.1 Since submission of the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, the MHPGC Project has been subject to stakeholder consultation and has undergone further design refinement. The MHPGC Project PEIR Red Line Boundary has been reduced in extent but remains entirely within the MHPGC Project Interim Boundary presented in the 2025 HRA screening stage (see **Section 5.2.2**), with corresponding reductions in the associated design parameters considered in the Stage 2 AA and no increases to those assessed at the screening stage (see **Section 1.3**). The screening outcomes have therefore been reviewed to ensure that the scope of the Stage 2 AA reflects the latest project information (see **Section 1.3**) and statutory consultee feedback (see **Section 4**).
- 5.2.4.2 When the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** was prepared in 2025, the updated JNCC (2025a) guidance on refined EDRs was not available. The updated EDR guidance recommends project-specific sound-modelling for high order UXO detonations involving UXOs greater than 263kg due to potential propagation range of underwater noise exceeding the EDR. The revised EDR for high order UXO detonations without mitigation measures is 20km, which is based on modelled and empirical data (JNCC, 2025a).
- 5.2.4.3 With respect to marine mammal qualifying features, the following updates have been made to the screening outcomes, as summarised in **Section 4**, as a result of consultation feedback:
- In response to the MD-LOT HRA Screening Opinion (05 March 2026) (MD-LOT, 2026) and in response to the Natural England Discretionary Advice Service (09 January 2026), the EDR applied to high order UXO clearance has been reduced from 26km to 20km, with this revised EDR reflected in the underwater sound Zol used for HRA Screening (see **Section 5.2.2**);

- In response to MD-LOT HRA Screening Opinion (05 March 2026) (MD-LOT, 2026) and in response to the Natural England Discretionary Advice Service (09 January 2026), impacts to marine mammals arising from changes in prey availability are now screened in for Berwickshire and North Northumberland Coast SAC as a potential impact pathway;
- In response to MD-LOT and NatureScot HRA Screening Opinion (05 March 2026) (MD-LOT, 2026), the harbour seal qualifying feature of the Firth of Tay and Eden Estuary SAC and the grey seal qualifying feature of the Isle of May SAC have now been screened out of further assessment.

5.2.4.4 Whilst the recommended EDR was used as a precautionary basis for determining LSE at the screening stage, project-specific underwater sound modelling has subsequently been undertaken to inform the Stage 2 AA (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**). The modelling provides a project-specific assessment of the potential extent of underwater sound effects and has therefore been used to refine the ZOI and determine whether the relevant qualifying features of screened in European sites could be affected by the MHPGC Project.

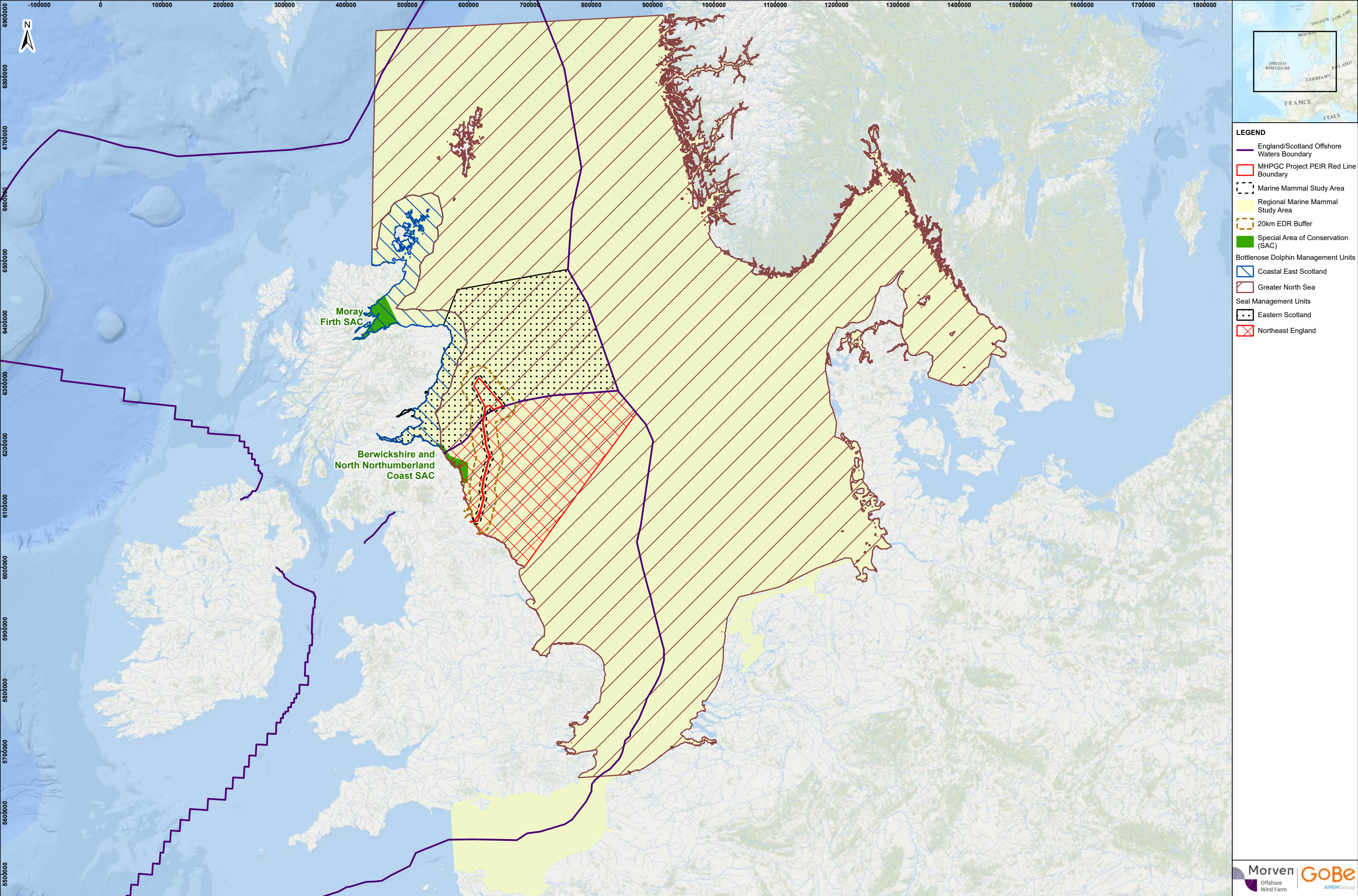
5.2.4.5 In addition, the MHPGC Project has been refined since the publication of the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, and the revised MHPGC Project PEIR Red Line Boundary, which does not extend beyond the MHPGC Project Interim Boundary, has been considered in the Stage 2 AA. For marine mammal qualifying features, these refinements have not resulted in any additional European sites being identified for assessment. The updated screening outcomes and resulting scope of the Stage 2 AA are presented in **Table 5.2**.

5.2.5 Summary of Likely Significant Effects taken forward to Appropriate Assessment

5.2.5.1 A summary of the European sites and relevant qualifying marine mammal features for which LSE has been identified through screening, including consideration of consultation responses and project refinements, is provided below. **Table 5.2** includes the current scope of the Stage 2 AA, including the European sites, qualifying features, and impact pathways taken forward for assessment. The locations of the European sites taken forward to Stage 2 AA are shown in **Figure 5.1**.

Table 5.2: Updated screening of LSE for Annex II marine mammals taken forward to Stage 2 AA

European site	Distance to the MHPGC Project PEIR Red Line Boundary at the closest point (km)	Relevant qualifying feature	Project Phase		
			Construction	O&M	Decommissioning
Berwickshire and North Northumberland Coast SAC (UK0017072)	25.59	(1364) Grey seal	- Injury and disturbance from underwater sound - Changes to prey availability	- Injury and disturbance from underwater sound - Changes to prey availability	- Injury and disturbance from underwater sound - Changes to prey availability
Moray Firth SAC (UK0019808)	168.76	(1349) Bottlenose dolphin	Injury and disturbance from underwater sound	Injury and disturbance from underwater sound	Injury and disturbance from underwater sound



Project Name: MORVEN HAWTHORN PIT GRID CONNECTION PROJECT	Drawing Title: EUROPEAN SITES SCREENED IN FOR LSE FOR ANNEX II MARINE MAMMAL QUALIFYING FEATURES	0 30 60 90 120 km Scale@A31:5,400,000	Geodetic Information: Datum: European 1950 Projection: ED 1950 UTM Zone 30N	Data Sources: BP, Ordnance Survey	Service Layer Credits: World Ocean Base: OceanWise, Esri, GEBCO, Garmin, NaturalVue World Topographic Map: Esri, HERE, FAO, NOAA	Drawing Number: FIGURE 5-1										
						<table><tr><th>VER</th><th>DATE</th><th>DETAILS</th><th>BY</th><th>CHECK</th></tr><tr><td>00</td><td>30/09/2025</td><td>Initial Issue</td><td>GB</td><td>BW</td></tr></table>	VER	DATE	DETAILS	BY	CHECK	00	30/09/2025	Initial Issue	GB	BW
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5.3 Marine Mammal baseline

5.3.1 Marine Mammal Study Areas

5.3.1.1 Two study areas have been defined for marine mammals (see **Figure 5.1**):

- MHPGC Project PEIR Marine Mammal Regional Study Area: extending across the central and northern North Sea to the European coastline, providing the regional geographical context for the assessment and reflecting the wider distribution, movements and foraging ranges of relevant marine mammals within the identified MUs (IAMMWG, 2023) and SMUs (SCOS, 2025).
- MHPGC Project PEIR Marine Mammal Study Area: The Marine Mammal Study Area is defined as the area encompassing the MHPGC Project PEIR Red Line Boundary plus a 4km buffer up to MHWS. This approach is consistent with that presented in the MHPGC Project Scoping Report (RPS, 2025), accepted through the Scoping Opinion, and further discussed and agreed with consultees through the EPP (see **Section 4**). The 4km buffer reflects established EIA practice for marine mammal baseline characterisation, is consistent with the approach adopted for aerial survey planning (SNCBs, 2017) and aligns with the approach adopted for the Morven North and Morven South ES.

5.3.1.2 The marine mammal baseline has been characterised using data from the MHPGC Project Marine Mammal Regional Study Area (see **Section 5.4.2 in Volume 2, Chapter 5: Marine Mammals of the PEIR**), accounting for the wider North Sea and relevant species-specific information on distribution, movements and foraging ranges.

5.3.1.3 The baseline evidence is considered in the context of European sites and qualifying features identified through the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** (see **Section 5.2**), including consideration of the potential for relevant marine mammal qualifying features to occur within the pathway-specific MHPGC Project Zols. For marine mammals, underwater sound represents the pathway with the largest Zol, with a 20km EDR applied to represent the potential spatial extent of effects from underwater sound in accordance with JNCC (2025a) (see **Section 5.2.4**)

5.3.2 Survey effort and results

5.3.2.1 Site-specific Digital Aerial Surveys (DAS) and seal telemetry data are available for Morven North and Morven South (APEM, 2025; Stevens, 2025), supplemented by marine mammal survey data from other offshore developments within the wider North Sea and seal telemetry data undertaken for Morven North and Morven South. These datasets provide information on marine mammal occurrence and, in the case of the telemetry data, movements of grey seals associated with haul-out sites and offshore areas in the region.

Morven North and Morven South marine mammal data

5.3.2.2 Morven North and Morven South site-specific DAS were undertaken monthly between January 2021 and September 2023 to inform the marine mammal baseline for the Morven North and Morven South Project (APEM, 2025). These surveys covered the Morven North and Morven South Red Line Boundary plus a 4km buffer, located within the northern section of the MHPGC Project PEIR Red Line Boundary and entirely within Scottish waters (see **Figure 5.1**). As such, the Morven North and Morven South Project DAS provide the most representative site-specific information available for the northern Scottish section of MHPGC Project PEIR Marine Mammal Study Area although does not cover the full MHPGC Project PEIR Marine Mammal Study Area or extend into English waters.

5.3.2.3 The remainder of the MHPGC Project PEIR Marine Mammal Study Area was not subject to DAS. Given the highly mobile nature of marine mammals and the availability of extensive regional survey information across the MHPGC Project PEIR Marine Mammal Regional Study Area, additional site-specific survey effort was not considered likely to improve the characterisation of baseline conditions for the MHPGC Project or proportionate to the scale and nature of the potential impact pathways associated with the offshore export cable installation activities. Therefore, the results from the Morven North and Morven South DAS are considered alongside

other available data sources as outlined in **Section 5.3.2.8** to provide a sufficiently robust evidence base to characterise the marine mammal baseline for the MHPGC Project and inform the assessment of potential impacts.

Grey seal

- 5.3.2.4 Of the qualifying features from European sites screened in for Stage 2 AA, only grey seal were recorded during the Morven North and Morven South DAS, although in low numbers (see **Table 5.3**). Grey seal were observed sporadically and primarily as single individuals throughout the survey period. Unidentified seal species were observed in larger groups of up to seven individuals but were recorded during approximately half of the survey period, predominantly during spring (March to May). Given the low number and frequency of observations, no clear seasonal pattern in grey seal occurrence could be identified.
- 5.3.2.5 The Morven North and Morven South Marine Mammals Shared Seal Telemetry and Haul-out Data Study Technical Report (Stevens, 2025) provides direct evidence of connectivity between grey seals associated with the relevant European sites and offshore areas in the vicinity of the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**). Of the 101 adult grey seals (tagged between 1990 and 2014) tracked within the East Scotland and Northeast England SMUs, 20 were recorded within the Morven Option Lease Agreement Site Marine Mammal Study Area. Of these, 16 individuals also showed connectivity with at least one grey seal SAC: two with the Isle of May SAC, nine with the Berwickshire and North Northumberland Coast SAC, and five with both SACs. A further 13 of the 45 grey seal pups tracked within the SMUs were recorded within the Morven Option Lease Agreement Site Marine Mammal Study Area, all of which showed connectivity with at least one of these two SACs. The majority of movements occurred within approximately 100km of the coastline, although individual grey seals were recorded undertaking substantially wider-ranging movements (Stevens, 2025).

Bottlenose dolphin

- 5.3.2.6 No bottlenose dolphin were identified during the Morven North and Morven South DAS. However, unidentified dolphin and dolphin/porpoise species were recorded (see **Table 5.3**). Harbour porpoise and white-beaked dolphin (*Lagenorhynchus albirostris*) were the most frequently identified species, with a small number of common dolphin (*Delphinus delphis*) also recorded. As such, it is likely that these unidentified individuals belong to one of these groups rather than accounting for a significant number of bottlenose dolphin.
- 5.3.2.7 These results, however, are not representative of the conditions for the entire MHPGC Project PEIR Red Line Boundary. As these surveys were undertaken offshore and therefore may not adequately represent individuals or populations which remain closer to the coastline but may still interact with the MHPGC Project. For example, bottlenose dolphin in UK waters comprise two ecotypes, including a wide-ranging offshore ecotype and a more philopatric coastal ecotype (Louis *et al.* 2014). In the North Sea, the coastal ecotype is more prevalent, with most sightings occurring within 10km of the coastline. As such, despite the lack of observations in the Morven North and Morven South DAS, bottlenose dolphin may occur within the Marine Mammal Study Area and the MHPGC Project PEIR Red Line Boundary.

Other marine mammal survey data

- 5.3.2.8 Marine mammal survey data from other offshore wind developments within the wider North Sea have also been considered within the marine mammal baseline to provide additional context on the distribution and occurrence of grey seal and bottlenose dolphin within and around the MHPGC Project PEIR Marine Mammal Study Area. These surveys do not provide complete coverage of the MHPGC Project PEIR Red Line Boundary not covered by the Morven North and Morven South DAS, but provide information on the distribution and occurrence of grey seal and bottlenose dolphin across the wider MHPGC Project PEIR Marine Mammal Regional Study Area. Other nearby offshore wind development survey datasets considered within the baseline characterisation comprise:
- Ossian Offshore Wind Farm DAS (2021 to 2023) (Ossian Offshore Wind Farm Limited (OWFL) 2024);
 - Berwick Bank Wind Farm DAS (2019 to 2021) (SSE Renewables, 2022);

- Seagreen Alpha/Bravo Project boat-based surveys (2010 to 2011) (Sparling, 2012) and incidental marine mammal records from ornithology surveys (2017) (Seagreen Wind Energy Limited, 2018);
- Neart Na Gaoithe Offshore Wind boat-based surveys (2010 to 2011) (Mainstream Renewable Power Limited, 2012);
- Forth and Tay Offshore Wind Developers Group within Scottish Territorial Waters and Round 3 sites (2009 to 2010) (Grellier and Lacey, 2012).

Grey seal

- 5.3.2.9 Grey seal were recorded across several of the other offshore developments survey areas, although generally at low densities and encounter rates. Among the available aerial survey datasets, the highest reported grey seal densities were reported at the Berwick Bank Offshore Wind Farm, where a total of 180 individuals sighted across the 25 months of data collection (SSE Renewables, 2022). The relatively high densities observed are likely associated with its proximity to important grey seal haul-out sites along the southeast coast of Scotland and northeast England.
- 5.3.2.10 Seal haul-out and telemetry data in relation to the Berwick Bank Wind Farm (Sinclair, 2022) provides further regional context on the wide-ranging movements of grey seals within and between the East Scotland and Northeast England SMUs. Individuals associated with the Berwickshire and North Northumberland Coast SAC, Isle of May SAC, Firth of Tay and Eden SAC and Humber Estuary SAC were recorded undertaking movements between these areas, with some individuals travelling as far as the Outer Hebrides and Denmark. These data demonstrate the capacity for grey seals associated with coastal haul-out sites and European sites to undertake movements over considerable distances between coastal and offshore areas.
- 5.3.2.11 Grey seal were also recorded during the boat-based surveys undertaken for Seagreen Project and Neart na Gaoithe, although density estimates were not presented (Sparling, 2012; Mainstream Renewable Power Limited, 2012). The Seagreen surveys recorded 992 individual grey seal across the survey period, with encounter rates generally lower during winter and higher during summer (Sparling, 2012). At Neart na Gaoithe, 43 grey seal were recorded during the first survey year and 57 during the second, with individuals recorded during most months of the survey period (Mainstream Renewable Power Limited, 2012).
- 5.3.2.12 Grey seal sightings during the Seagreen boat-based surveys were concentrated over shallow sandy banks, including Scalp Bank, Marr Bank, Wee Bankie and Berwick Bank. These areas are considered to provide suitable foraging habitat for grey seal, including through the availability of prey such as sandeels, which form part of the diet of grey seal in the region (Sparling, 2012).
- 5.3.2.13 During the Ossian DAS, grey seal were recorded during nine of the 24 months surveyed, with sightings recorded across all seasons. A total of 18 sightings were recorded, with the highest number observed in winter (seven sightings) and spring (six sightings), and lowest in autumn (one sighting) and summer (four sightings) (Ossian OWFL, 2024). Grey seals were not observed in sufficient numbers to support robust density surface modelling and, therefore, density estimates were only derived using design-based methods.
- 5.3.2.14 Surveys undertaken by the Forth and Tay Offshore Wind Developers Group (Grellier and Lacey, 2012) also recorded seals within the wider region. During the summer 2009 surveys, 29 sightings comprising 60 individuals were recorded within Scottish territorial waters (within 12nm), with a further 199 sightings comprising 209 individuals recorded outside 12nm. During the winter 2009 to 2010 surveys, 42 sightings comprising 42 individuals were recorded within territorial waters, with a further 78 sightings comprising 78 individuals recorded outside 12nm (Grellier and Lacey, 2012). As these records were not identified to species level, they provide supporting evidence of seal occurrence but cannot be used to characterise grey seal occurrence specifically.
- 5.3.2.15 In addition to offshore survey data, a single adult grey seal was observed ashore during an MHPGC Project intertidal ecological walkover survey undertaken on 09 April 2026 at the proposed landfall. This provides further evidence that grey seal can occur within the coastal and intertidal environment in the vicinity of the MHPGC Project landfall.

Bottlenose dolphin

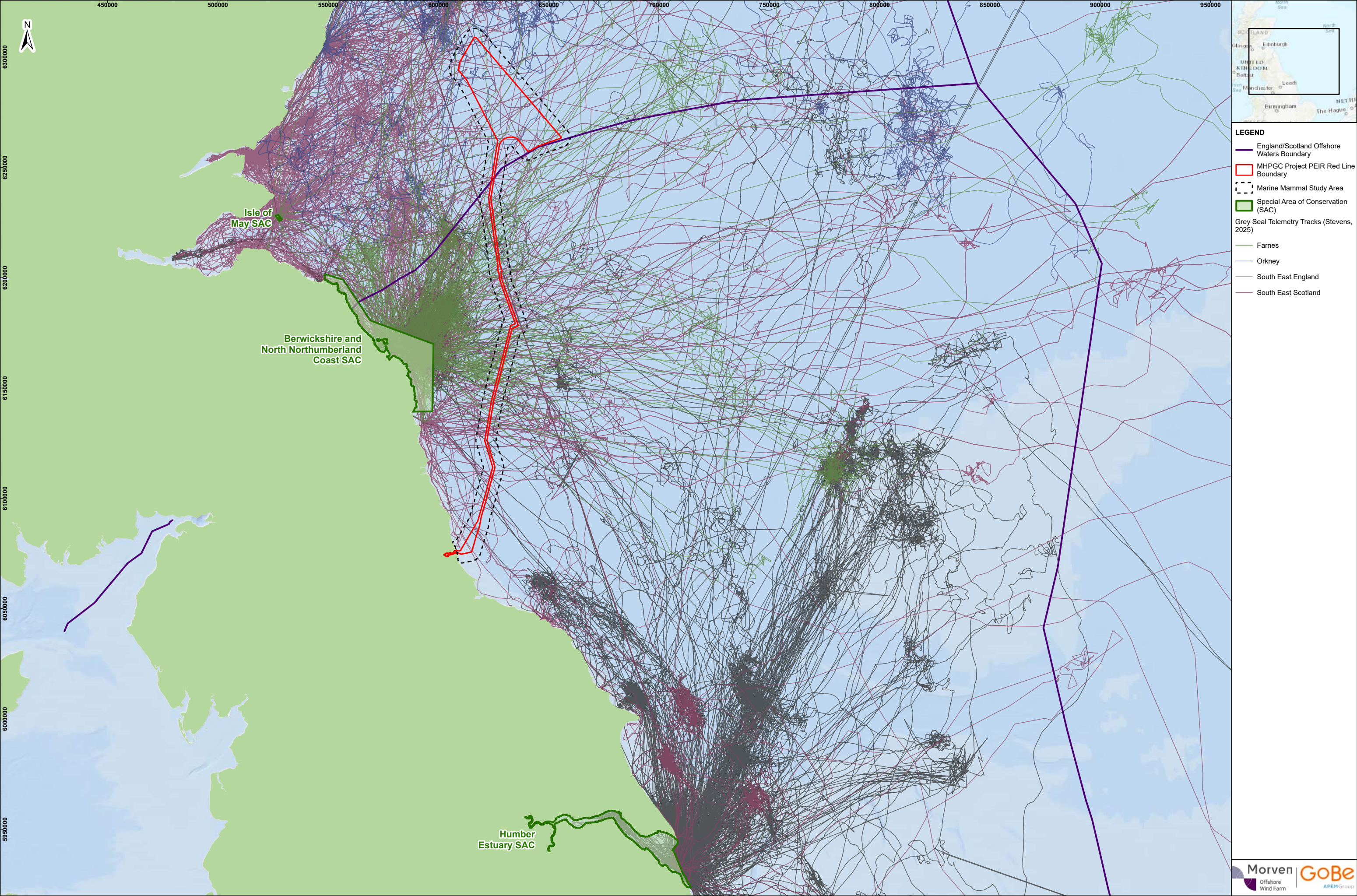
- 5.3.2.16 Bottlenose dolphin were recorded only occasionally within the available offshore survey datasets and generally in low numbers. The Berwick Bank Offshore Wind Farm DAS, which is located closer to the Coastal East Scotland MU population, observed occasional bottlenose dolphins in very low numbers (two instances of one and six individuals); however, but not in sufficient quantities to derive site-specific density estimates (SSE Renewables, 2022).
- 5.3.2.17 No bottlenose dolphin were identified during the Ossian DAS, however, a small number of unidentified dolphin records were reported during the winter and autumn surveys, but these could not be assigned to species and no density estimates were available (Ossian Offshore Wind Farm Limited, 2024).
- 5.3.2.18 During the Seagreen boat-based surveys, no bottlenose dolphin were identified, although 21 sightings comprising 56 unidentified dolphins were recorded (Sparling, 2012). Similarly, no bottlenose dolphin were recorded during the Neart na Gaoithe boat-based surveys (Mainstream Renewable Power Limited, 2012).
- 5.3.2.19 The Forth and Tay Offshore Wind Developers Group surveys recorded three bottlenose dolphin sightings comprising four individuals across the summer 2009 and winter 2009 to 2010 surveys (Grellier and Lacey, 2012). One sighting of a single individual was recorded outside 12nm during summer 2009, while two sightings comprising three individuals were recorded within 12nm during winter 2009 to 2010. No bottlenose dolphin were recorded outside 12nm during the winter surveys.
- 5.3.2.20 Overall, the additional survey datasets provide evidence of occasional bottlenose dolphin occurrence within the wider offshore area, generally involving low numbers of individuals. This supports the conclusion from the Morven North and Morven South DAS that the absence of bottlenose dolphin records should not be interpreted as evidence of absence from the wider MHPGC Project PEIR Red Line Boundary, given the distribution of the coastal ecotype in the North Sea (see **Section 5.3.2.7**).

Grey seal telemetry studies and habitat-based modelling

- 5.3.2.21 Telemetry and habitat-based modelling provide additional information on the distribution and movements of grey seal within the MHPGC Project PEIR Marine Mammal Study Area and wider region. These data are particularly relevant to understanding the potential for connectivity between the MHPGC Project and the European sites designated for grey seal.
- 5.3.2.22 Habitat-based modelling undertaken by Carter *et al.* (2020; 2022; 2025) provides additional information on the predicted spatial distribution of grey seal. The modelling used telemetry-derived habitat preference models and SCOS haul-out data to predict grey seal abundance and density at a 5km×5km grid resolution (see **Figure 5.3**). Within the MHPGC Project PEIR Red Line Boundary, the latest model (Carter *et al.*, 2025) predicts a mean abundance of 928 grey seals, corresponding to a density of 0.395 individuals/km², with predicted densities higher in English waters (0.419 individuals/km²) than in Scottish waters (0.332 individuals/km²), reflecting the relative contribution of the Northeast England and East Scotland SMUs to the local grey seal population.

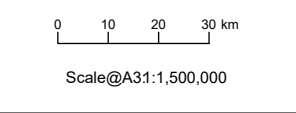
Table 5.3: Morven North and Morven South DAS survey results for qualifying features of European sites screened in for AA

Month	Grey seal	Unidentified seal	Unidentified dolphin	Unidentified dolphin/porpoise
January 2021	-	1	-	-
February 2021	-	2	-	2
March 2021	-	1	-	2
April 2021	-	7	-	2
May 2021	-	2	9	32
June 2021	1	-	1	2
July 2021	-	-	-	2
August 2021	-	-	-	-
September 2021	-	-	-	-
October 2021	-	-	-	4
November 2021	-	1	-	-
December 2021	1	-	-	-
January 2022	-	-	-	-
February 2022	1	3	-	6
March 2022	-	5	-	-
April 2022	-	1	-	1
May 2022	-	4	-	9
June 2022	-	-	-	1
July 2022	-	-	-	-
August 2022	-	-	-	-
September 2022	1	-	1	1
October 2022	-	-	-	9
November 2022	-	-	-	-
December 2022	-	-	-	1
January 2023	-	-	-	-
February 2023	-	-	-	-
March 2023	2	-	-	-
April 2023	1	2	-	3
May 2023	1	1	-	3
June 2023	-	1	-	-
July 2023	1	1	-	-
August 2023	1	-	-	1
September 2023	1	-	2	-



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
ADULT GREY SEAL TELEMETRY TRACKS IN THE EAST SCOTLAND AND NORTH
EAST ENGLAND MU (STEVENS, 2025)



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
World Ocean Base: OceanWise, Esri, GEBCO, Garmin, NaturalVue

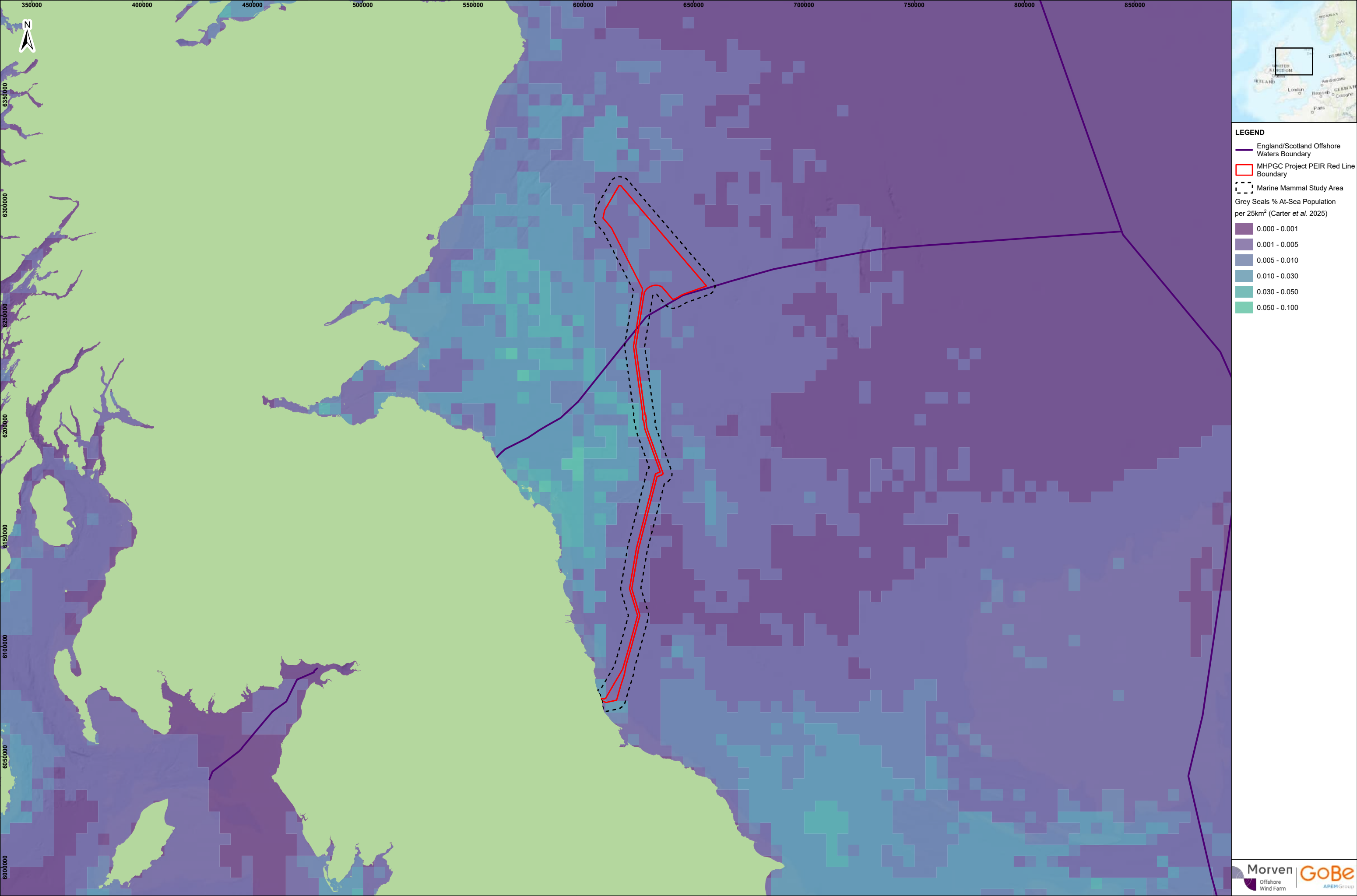
Drawing Number:
FIGURE 5-2

VER	DATE	DETAILS	BY	CHECK
00	30/09/2025	Initial Issue	GB	BW
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- LEGEND**
- England/Scotland Offshore Waters Boundary
 - MHPGC Project PEIR Red Line Boundary
 - Marine Mammal Study Area
 - Special Area of Conservation (SAC)
 - Grey Seal Telemetry Tracks (Stevens, 2025)
 - Farnes
 - Orkney
 - South East England
 - South East Scotland





5.3.3 Constraints and limitations

- 5.3.3.1 The marine mammal baseline has been characterised using the best available information relevant to the qualifying features considered in this assessment. However, there are inherent limitations associated with the available datasets, particularly in relation to their spatial and temporal coverage and the detectability of highly mobile, predominantly underwater species.
- 5.3.3.2 The site-specific DAS undertaken for Morven North and Morven South provide the most representative survey data available for the northern Scottish section of the MHPGC Project PEIR Red Line Boundary. However, these surveys do not cover the full extent of the MHPGC Project PEIR Red Line Boundary and did not extend into English waters. The absence of additional site-specific DAS therefore introduces uncertainty in the characterisation of marine mammal occurrence across the remainder of the MHPGC Project PEIR Red Line Boundary. This has been addressed through consideration of additional survey datasets from nearby offshore developments and regional information on species distribution and movements (see **Section 5.3.2.8**).
- 5.3.3.3 Visual survey data provides a snapshot of marine mammal occurrence during the survey period and are subject to uncertainty associated with animal availability at the surface, detectability, environmental conditions and species identification. These limitations are particularly relevant to bottlenose dolphin, for which no individuals were identified during the Morven North and Morven South DAS. The absence of observations cannot therefore be interpreted as evidence of absence from the wider MHPGC Project PEIR Red Line Boundary. Therefore, regional survey data and available information on the distribution and ecology of the species have also been considered.
- 5.3.3.4 The available grey seal telemetry data provide evidence of movements and connectivity between individuals associated with the relevant European sites and offshore areas overlapping the MHPGC Project PEIR Red Line Boundary. However, the underlying Morven North and Morven South telemetry dataset includes tracking data from tags deployed between 1990 and 2014 and may therefore not fully reflect current grey seal distribution or movement patterns. In addition, telemetry studies represent the movements of tagged individuals and are not intended to provide a complete representation of the distribution or abundance of the wider grey seal population. The number, tagging locations, timing and duration of available tracks may influence the areas in which movements are detected. The telemetry evidence has therefore been considered alongside habitat-based modelling and other survey data rather than in isolation.
- 5.3.3.5 The habitat-based modelling by Carter *et al.* (2020; 2022; 2025) provides predicted grey seal abundance and at-sea density at a 5km×5km resolution and therefore does not represent direct observations of animals or fine-scale distribution within the MHPGC Project PEIR Red Line Boundary. These distributions were estimates during foraging seasons, when grey seals are anticipated to spend a greater proportion of their time at sea, and therefore provide an appropriate representation of at-sea distribution during this period. However, the model does not capture seasonal variation throughout the year. Model outputs are also subject to uncertainty associated with the underlying telemetry and haul-out datasets and the habitat relationships used to generate predictions. The model nevertheless provides complementary information on the predicted spatial distribution of grey seal and helps to provide more recent regional context alongside the historical telemetry data.
- 5.3.3.6 The available survey and telemetry datasets also cover different periods, geographical areas and survey methods. Consequently, differences in reported occurrence or abundance between datasets may reflect differences in survey coverage, detectability, sampling period and methodology, as well as genuine spatial or temporal variation in marine mammal distribution. The datasets have therefore not been directly compared as measures of abundance unless they were considered sufficiently comparable for that purpose.
- 5.3.3.7 Overall, while the available marine mammal datasets are subject to inherent spatial and temporal limitations, their complementary nature provides a sufficiently robust evidence base for characterising the marine mammal qualifying features considered in the assessment. The limitations identified above have been taken into account when interpreting the baseline and in the subsequent assessment of potential effects on the relevant European sites.

5.4 Information to inform Appropriate Assessment

5.4.1 Assessment criteria

- 5.4.1.1 The assessment of potential AEoI of European sites considers the information and conclusions of **Volume 2, Chapter 5: Marine Mammals of the PEIR**, specifically in relation to the relevant marine mammal qualifying features, their supporting habitats where relevant, and the COs, site-specific advice and feature condition of the European sites identified for assessment.
- 5.4.1.2 As outlined in **Section 5.2.5**, the following impact pathways during the construction, O&M and decommissioning phases of the MHPHC Project are screened in for consideration within the marine mammal Stage 2 AA:
- Injury and disturbance from underwater sound;
 - Indirect impacts on prey species.
- 5.4.1.3 The information presented in the following sections provides the key evidence used to inform assessment of these impact pathways. The aim of this section is not to reproduce the detailed impact assessment presented within the PEIR or the underwater sound modelling methodology presented in **Volume 2, Chapter 5: Marine Mammals, of the PEIR** and **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**. Instead, the relevant outputs and assessment assumptions are summarised where necessary to inform consideration of whether the MHPGC Project could have the potential for an AEoI of the relevant European sites.

Underwater sound

- 5.4.1.4 Underwater sound is generated by a number of activities associated with the MHPGC Project across the construction, O&M and decommissioning phases. The relevant activities considered in relation to potential injury and disturbance from underwater sound in **Section 5.5** comprise:
- Cable installation activities, including associated vessel activity,
 - Site investigation surveys (during all phases),
 - Low order UXO clearance during the pre-construction phase;
 - O&M activities, including associated vessel activity;
 - Decommissioning activities, including associated vessel activity.
- 5.4.1.5 Underwater sound generated by the MHPGC Project has the potential to result in auditory injury and/or behavioural disturbance to marine mammal qualifying features. The potential for effects depends on factors including the characteristics of the sound source, including its intensity (measured in decibels (dB)), frequency, impulsivity (i.e. whether the sound is impulsive or non-impulsive) and duration, together with the hearing sensitivity, behaviour and exposure of the receptor. The potential for effects has therefore been considered in relation to the relevant marine mammal hearing groups and the characteristics of the activities undertaken during each MHPGC Project phase.
- 5.4.1.6 Marine mammal hearing capabilities vary between species and have been classified into Functional Hearing Groups (FHGs) based on their generalised hearing ranges (Southall *et al.*, 2007; 2019; National Marine Fisheries Service (NMFS), 2024), as described in **Table 5.4**.

Table 5.4: Relevant marine mammal qualifying features functional hearing groups and auditory thresholds (NMFS, 2024)

Functional Hearing Group (FHG)	Relevant marine mammal qualifying feature	Generalised hearing range*
High Frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	• Bottlenose dolphin	150 Hertz (Hz) to 160 kiloHertz (kHz)
Phocid pinnipeds in Water (PW) (true seals)	• Grey seal.	40Hz to 90kHz

Functional Hearing Group (FHG)	Relevant marine mammal qualifying feature	Generalised hearing range*
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*The generalised hearing range represents the composite range for all species within each FHG; individual species' hearing ranges may not extend across the full range. Additionally, animals are able to detect very loud sounds above and below the generalised hearing range.

5.4.1.7 The potential effects of underwater sound on marine mammals considered within **Volume 2, Chapter 5: Marine Mammals, of the PEIR**, are grouped as follows:

- Auditory injury (AUD INJ): this includes Permanent Threshold Shift in hearing (PTS), which is a permanent and irreversible increase in the threshold of audibility at a specified frequency or across a portion of an individual's hearing range above a previously established reference level. PTS may result from exposure to intense, impulsive sound sources and/or prolonged exposure to elevated sound levels;
- TTS: a recoverable and reversible increase in the threshold of audibility following exposure to elevated sound levels. TTS represents a temporary reduction in hearing sensitivity and may occur where exposure levels are insufficient to cause permanent auditory injury;
- Behavioural responses: responses are highly variable and context specific, and may include increased alertness, alteration of movement or diving behaviour, interruption of social interactions and temporary or permanent habitat displacement from an area;
- Masking: where anthropogenic underwater sound partially or completely reduces the audibility of signals of interest, including those used for communication and prey detection.

5.4.1.8 Project-specific underwater sound modelling has been undertaken using the dBSea underwater acoustics propagation model (Version 3.0) to predict the spatial extent of underwater sound associated with the relevant MHPGC Project activities. The modelling methodology, input parameters and detailed results are presented in **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**.

Auditory injury (PTS) and TTS

5.4.1.9 For determining the potential risk of auditory effects, including AUD INJ and TTS, the most up to date sound exposure criteria published by the NMFS (2024) have been applied and are presented in **Table 5.5** below. For impulsive sound sources, criteria are based on dual metrics comprising peak sound pressure level (SPL_{pk}) and M-weighted cumulative sound exposure level (SEL_{cum}), while for continuous sound sources the criteria are based on SEL_{cum} only.

Table 5.5: Threshold criteria for AUD INJ and TTS for marine mammals exposed to underwater sound (NMFS, 2024)

FHG	Impulsive sound				Continuous sound	
	SPL_{pk}		SEL_{cum}		SEL_{cum}	
	PTS	TTS	PTS	TTS	PTS	TTS
HF cetaceans	230	224	193	178	201	181
PW seals	223	217	183	168	195	175

Units: SPL dB re 1 μPa ; SEL (M-weighted): dB re 1 μPa^2s

5.4.1.10 Auditory injury (PTS) criteria are based on the best available scientific evidence but cannot be directly validated experimentally in marine mammals, as to test this would be inhumane. Consequently, AUD INJ thresholds are derived from TTS-onset data together with other available evidence (Southall *et al.*, 2019; NMFS, 2024). Predictions of PTS should therefore be regarded as precautionary estimates of the potential spatial extent over which AUD INJ thresholds may be exceeded.

5.4.1.11 TTS represents a temporary reduction in hearing sensitivity following exposure to elevated underwater sound and may temporarily affect an animal's ability to detect predators, forage or

communicate. However, there is currently no established threshold at which TTS is considered to result in biologically meaningful effects or population-level consequences. Therefore, TTS-onset thresholds represent the smallest measurable change in hearing sensitivity rather than a threshold of ecological significance (Southall *et al.*, 2007; 2019). Accordingly, TTS range predictions are presented where relevant to provide potential predicted spatial extent of temporary auditory effects, rather than being used in isolation to determine the potential for AEol. The assessment of AUD INJ therefore focuses on the potential for PTS to affect the COs of the relevant marine mammal qualifying feature.

Behavioural disturbance

- 5.4.1.12 Behavioural responses to underwater sound are highly variable and context dependent, differing between individuals and species according to factors including the characteristics of the sound source, exposure duration, behavioural state and wider ecological context (Ellison *et al.*, 2012; Gomez *et al.*, 2016; Southall *et al.*, 2019). Unlike auditory injury, there are no universally applicable quantitative thresholds for behavioural disturbance provided by NMFS (2024) or Southall *et al.* (2019). Accordingly, where the United States National Oceanic and Atmospheric Administration (NOAA, 2005) Level B harassment thresholds have been used within the MHPGC Project RIAA to indicate the potential spatial extent of behavioural responses to non-explosive impulsive and continuous noise, these have not been interpreted as definitive thresholds of effect. These thresholds are generic across marine mammal FHG and sound source types and have limited empirical support (Darias-O'Hara *et al.*, 2025).
- 5.4.1.13 Predicted disturbance ranges are therefore considered as precautionary indicators of the potential for behavioural responses and are considered alongside the spatial extent of exposure and the ecology, distribution and movements of the relevant qualifying features when determining the potential for an AEol.

Changes in prey availability (Berwickshire and North Northumberland Coast SAC only)

- 5.4.1.14 Changes in prey availability have the potential to indirectly affect the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC where MHPGC Project activities result in changes to the abundance, distribution or availability of prey species. The potential effects of the MHPGC Project on fish and shellfish receptors are assessed in **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, including effects associated with habitat loss and disturbance, increased SSC and sediment deposition, disturbance or remobilisation of sediment-bound contaminants, underwater sound (including and excluding UXO clearance), and the potential introduction or spread of invasive non-native species (INNS).
- 5.4.1.15 The potential for indirect effects on the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC depends on the extent to which these effects could result in meaningful changes to prey species that contribute to their diet. The principal prey species identified for grey seal are summarised in **Table 5.6**.

Table 5.6: Principal prey species of Annex II marine mammal qualifying features considered within the Stage 2 AA

Marine mammal qualifying feature	Key prey species	Source
Grey seal	Saithe (<i>Pollachius virens</i>), whiting (<i>Merlangius merlangus</i>), Atlantic cod (<i>Gadus morhua</i>), haddock (<i>Melanogrammus aeglefinus</i>), rockling (<i>Gadidae</i> spp.), sandeel (<i>Ammodytes</i> spp.), herring (<i>Clupea harengus</i>), sprat (<i>Sprattus sprattus</i>), mackerel (<i>Scomber scombrus</i>), flatfish, salmonids	Hammond and Wilson (2016).

- 5.4.1.16 Of the prey species identified, herring and sandeel are considered particularly relevant to the assessment of potential indirect effects, given their sensitivity to some of the MHPGC Project

activities. As described in **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, herring are sensitive to underwater sound, while sandeel are associated with specific seabed sediment characteristics for spawning and burrowing. The conclusions of the fish and shellfish assessment in relation to the potential effects on relevant prey species are considered when determining whether the MHPGC Project could result in an indirect effect on the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC.

5.4.2 Design parameters

- 5.4.2.1 The Stage 2 AA has been undertaken using a design envelope approach, whereby a Maximum Design Scenario (MDS) has been identified for each relevant impact pathway. The MDS represents the MHPGC Project parameters that could result in the greatest potential effect within the range of design options described in **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 5.4.2.2 The MDS relevant for Annex II marine mammal qualifying features considered in this Stage 2 AA are presented in **Table 5.7**. These scenarios form the basis for the assessment of potential AEol at each relevant European site.

Table 5.7: MDS relevant for the AA of potential impacts on marine mammals

Impact	MDS	Explanation
Note: The cable length measurements are for the maximum distance between the Morven North or Morven South OSP and trenchless drill exit pit unless otherwise stated. For clarity one trench length is as follows: - OSP to exit pit – up to 324.67km; - OSP to MHWS – up to 326.00km; - Scottish waters (OSP – Scottish-English offshore waters boundary) – up to 98.00km; - English waters (English offshore waters boundary – exit pit) – up to 226.67km; - English waters (English offshore waters boundary – MHWS) – up to 228.00km.		
Construction		
Injury and disturbance from underwater sound produced by offshore export cable installation activities	Construction duration: up to four years. Offshore export cable installation: - Installation of up to 324.67km of cable per trench (OSP to exit pit): - Scottish waters: maximum length (per cable) of 98km; - English waters: maximum length (per cable) of 226.67km. Export cable installation characteristics includes: - Seabed preparation: - Sandwave clearance (plough/mass flow excavator/dredging); - Pre-lay grapnel run. - Boulder/debris clearance: - Ploughing / pre-lay trenching; - Rock carpet; - Dredging (spot soil movements). - Burial techniques: - Mechanical cutting; - Jet trenching; - Controlled flow excavation; - Ploughing (during or post lay trenching). - Cable protection: - Concrete mattresses / rock bags;	Offshore export cable installation includes seabed preparation, boulder/debris clearance, burial and cable protection activities, undertaken using methods such as mechanical cutting, jet trenching, ploughing or Controlled Flow Extraction (CFE) (for localised points along the route only). The MDS for the effects of underwater sound on marine mammal receptors assumes the offshore export cable installation activities associated with the greatest spatial extent of potential acoustic impacts. For offshore export cable installation, this is represented by the Cable Lay Vessel (CLV), which has the greatest modelled spatial extent of potential underwater sound effects based on the sound source characteristics and frequency range of the activity relative to marine mammal qualifying features hearing ranges. The MDS assumes the maximum number of vessels present on site at one time during the construction phase and the greatest number of vessel movements during this phase, representing the broadest range of vessel types with the potential to interact with marine mammal qualifying features.

	– Rock installation; – Cable Protection Systems (CPS). Trenchless techniques (landfall) (English waters): • Such as Horizontal Directional Drilling (HDD) or direct pipe. Offshore vessel activity: • Up to 550 return trips during the construction phase by installation vessels (including Cable Lay Vessel (CLV), Trenching Support Vessels (TSV), Installation Support Vessel (ISV), Guard Vessels (GV), survey vessels, pre-lay grapnel run vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, Crew Transport Vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); • A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: • Up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and Dive Support Vessels (DSV)); • A maximum of 14 vessels may be operational at any one time during the construction phase.	
Injury and disturbance from underwater sound produced by pre-construction site investigation surveys	Pre-construction duration: two years site preparation activities. Pre-construction geophysical survey investigations: • High resolution Multibeam Echosounder (MBES) with an operating frequency of 200 to 400kHz; • Side Scan Sonar (SSS) with an operating frequency of 300 to 600kHz; • Single Beam Echosounder (SBES) with an operating frequency of 20 to 40kHz; • Sub-Bottom Profilers (SBP) with operating frequencies of 0.2 to 14kHz (chirp) and 85 to 115kHz (high frequency); • Ultra-High-Resolution Seismic (UHRs) (such as sparker) with an operating frequency of 0.05 to 4kHz; • Ultra-Short Baseline (USBL) acoustic positioning transponder with an operating frequency of 21 to 31kHz; • Remotely Operated Vehicle (ROV). Pre-construction geotechnical surveys investigations:	A range of geophysical and geotechnical investigation surveys prior to construction are anticipated to be undertaken, using equipment typical of the survey methods proposed. The MDS for the effects of underwater sound on marine mammal qualifying features assumes the use of survey equipment with the highest source levels and frequencies that overlap with marine mammal hearing ranges, resulting in the greatest spatial extent of potential acoustic impacts.

	- Seismic Cone Penetration Tests (CPT) with receiver frequency of approximately 28Hz; - Vibrocoring (VC) with operating frequency of 20 to 35Hz (this may depend on the type of vibrator motor unit used in the equipment). Up to two survey vessels may be present on site at any one time.	
Injury and disturbance from underwater sound produced by UXO clearance	Pre-construction duration: two years site preparation activities. UXO clearance: - Low order clearance of up to 22 UXOs, within the MHPGC Project PEIR Red Line Boundary : - Scottish waters: 8 UXOs (for funnel area out with the overlap with Morven North and Morven South); - English waters: 14 UXOs. - Low order UXO clearance: - Maximum size of donor charge: 0.08kg; - Maximum charge configuration for low yield technique: 4 x 0.75kg.	The MDS for UXO clearance includes the maximum number and maximum size of UXO anticipated to be encountered, as these represent the greatest potential number of clearance events and the largest potential source of underwater sound. Due to uncertainties in the size of UXO, the assessment presents a range which details the most likely sizes to be encountered. The most likely and maximum donor charges are assessed for low order UXO clearance, and it should be noted that only low order clearance techniques will be sought under the DCO application and Marine Licence application(s) to the Scottish Ministers.
Impacts on Marine Mammals due to changes in prey availability	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR: - Temporary habitat loss and disturbance; - Increased SSC and associated sediment deposition; - Disturbance/remobilisation of sediment bound contaminants; - Underwater sound (excluding UXO): mortality, injury, behavioural impacts and auditory masking; - Underwater sound from low order UXO clearance: mortality, injury, behavioural impacts and auditory masking; - Increased risk of introduction and spread of invasive non-native species (INNS).	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR.
O&M		
Injury and disturbance from underwater sound produced during O&M activities	Operational lifespan: 35 years. Maximum of two routine inspections of offshore export cable and cable protection per year; Estimated 41 offshore export cable repairs during operational lifespan;	Offshore export cable burial and repair activities may be undertaken during the O&M phase. The MDS for the effects of underwater sound on marine mammal qualifying features assumes the O&M offshore export cable installation activities associated with the highest underwater sound

	- Up to 4% of the offshore export cable route length, up to 13km, may require remediation per year. Remediation may occur in different locations and for varying lengths, but it is anticipated that up to 13km of export cable length per year per trench will require remediation with a maximum width of 20m. Vessel presence: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessels max at 1 time per survey. - Per year for 2 trenches: - Surveys – 4 - Return trip – $4 \times 3 = 12$ - Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (Uncrewed Surface Vessel (USV)) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) ($55 \text{ per survey} = 110$); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. - Per year for 2 trenches: - Surveys – 4 - Return trips – $4 \times 55 = 220$ - Total vessels at time – 5 - Remediation (up to 13.056km per year per trench, in different locations along route). Vessels on site for REMEDIATION activities, for up to two trenches: - Up to four O&M vessels on site at any one time, comprising a combination of Construction Support Vessel (CSV) and/or Service Operation Vessels (SOV) and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: - Up to 62 O&M vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats; - Repair (41 lifetime repairs, for up to two trenches). Vessels on site for REPAIR activities, for up to trenches:	source levels and frequencies that overlap with marine mammal hearing ranges. For export cable repair and reburial activities, this is represented by the CLV, resulting in the greatest spatial extent of potential acoustic impacts. The MDS assumes the maximum number of vessels present on site at one time during the O&M phase and the greatest number of vessel movements during this phase, representing the broadest range of vessel types with the potential to interact with marine mammal qualifying features.
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	- Up to four O&M vessels on site at any one time, comprising a combination of CLV and/or barge and/or barge handlers/tugs and/or jack-up and/or CSV and/or CTV and/or rock dump. Vessel movements (repair), for up to two trenches: - Up to 245 O&M vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or jack-up and/or barge handlers/tugs and/or CSV and/or CTV and/or rock dump.	
Injury and disturbance from underwater sound produced during site investigation surveys	Operational lifespan: 35 years. Maximum of five geophysical surveys per year; including: - Vessel(s) with SSS; - MBES, - SBP, - Magnetometer (MAG) and or Gradiometer.	A range of geophysical activities during O&M, using equipment assumed to be typical for the types of surveys anticipated. No survey methods are expected to interact with the seabed. The MDS for the effects of underwater sound on marine mammal qualifying features assumes the use of survey equipment with the highest source levels and frequencies that overlap with marine mammal hearing ranges, resulting in the greatest spatial extent of potential acoustic impacts.
Impacts on marine mammals due to changes in prey availability	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR: - Long term habitat loss; - Temporary habitat loss and disturbance; - Increased SSCs and associated deposition; - Disturbance/remobilisation of sediment bound contaminants; - Electromagnetic Field from subsea electrical cabling; - Thermal emissions from operational activities; - Increased introduction and spread of INNS; - Colonisation of hard structures; - Underwater sound (excluding UXO): mortality, injury, behavioural impacts and auditory masking.	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR.
Decommissioning		
Injury and disturbance from underwater sound from decommissioning activities	The MDS for the decommissioning phase is assumed to be as that described for the construction phase (offshore export cable installation activities).	The decommissioning methodology is not yet defined. The construction-phase MDS has therefore been used to provide a conservative basis for assessing potential underwater sound effects from decommissioning activities, recognising that the activities required for

		removal of offshore export cable infrastructure could vary depending on the decommissioning approach adopted. The decommissioning approach will be reviewed at the time of decommissioning, taking account of the most up-to-date and best available guidance.
Injury and disturbance from underwater sound produced during site investigation surveys	The MDS for the decommissioning phase is assumed to be as that described for the pre-construction phase (pre-construction site investigation surveys).	The decommissioning methodology is not yet defined. The pre-construction site investigation survey MDS has therefore been used to provide a conservative basis for assessing potential underwater sound effects from decommissioning activities, recognising that the activities required during decommissioning could vary depending on the approach adopted. The decommissioning approach will be reviewed at the time of decommissioning, taking account of the most up-to-date and best available guidance.
Impacts on marine mammals due to changes in prey availability	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR: • Temporary habitat loss and disturbance; • Increased SSCs and associated sediment deposition; • Disturbance/remobilisation of sediment bound contaminants; • Increased risk of introduction and spread of INNS; • Removal of hard substrates; • Underwater sound (excluding UXO): mortality, injury, behavioural impacts and auditory masking.	As described in Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR .

5.4.3 Marine Mammal commitments

- 5.4.3.1 As part of the MHPGC Project design process, a number of commitments have been identified to avoid or reduce potential effects on environmental receptors. These are provided in **Volume 1; Annex 4.1: Draft Commitments Register, of the PEIR**, and include avoidance, best practice and design commitments.
- 5.4.3.2 In accordance with the HRA process, these commitments have not been considered in determining LSE at Stage 1 Screening. However, the relevant commitments are assumed to be implemented for the purposes of the Stage 2 AA and have therefore been taken into account when assessing the potential for an AEol of the relevant European sites.
- 5.4.3.3 The commitments relevant to marine mammal qualifying features are presented in **Table 5.8**. These measures are considered standard industry practice for this type of development.

Table 5.8: Embedded commitment measures of relevance for marine mammal qualifying features

Commitment number	Measure adopted	How the measure will be secured via an appropriate consent condition
CoT06	An Outline Offshore Environmental Management Plan (OEMP) will be prepared and submitted with the application for development consent, and as part of the marine licence application(s) to the Scottish Ministers. A Detailed OEMP will be developed substantially in accordance with the Outline OEMP and submitted and approved by the MMO and MD-LOT. The Outline OEMP will include: • an Outline Marine Biosecurity Plan; • an Outline Marine Pollution Contingency Plan; • an Outline Marine Mammal Mitigation Plan; • an Outline Vessel Traffic Management Plan (VTMP); • an Outline Navigational Safety Plan; • a chemical risk assessment that includes information such as how chemicals will be used, stored, and transported, in line with recognised best-practice guidance; • a dropped-object protocol will be established to cover the reporting and recovery of any items lost overboard that could endanger other sea users; • a Marine Emergency Action Card outlining the steps to be followed in the case of a marine emergency; • provisions for the handling and disposal of waste.	The Outline OEMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).
CoT07	An Outline Offshore Operations and Maintenance Plan will be prepared and submitted as part of the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. A Detailed Offshore Operations and Maintenance Plan will be produced substantially in accordance with the Outline plan, prior to entering the O&M phase.	The Outline Offshore Operations and Management Plan will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).
CoT08	An Outline Offshore Cable Specification and Installation Plan (CSIP) will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. It will include cable burial to be the preferred option for cable protection, where practicable. A Detailed CSIP will be developed prior to construction that will be substantially in accordance with the Outline CSIP. The Outline CSIP will include (but is not limited to): • a Cable Burial Risk Assessment (CBRA), which will define burial depths and safeguards, based on seabed conditions and external	The Outline CSIP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).

	aggression and climate change hazards, to keep the offshore export cables protected and compliant through all project phases while upholding navigational and environmental safety; - the implementation, management and monitoring of cable protection; - details on the development of the cable installation and protection design within the Farnes Deep Nephrops ground, which will seek to maximise cable burial and minimise the requirements for external cable protection, where technically feasible, taking account of cable stability, integrity and other engineering requirements.	
CoT30	An Outline Vessel Traffic Management Plan (VTMP) will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. A Detailed VTMP will be developed pre-construction substantially in accordance with the Outline VTMP, and in line with the relevant legislation, guidance and industry best-practice. The Detailed VTMP will: - detail vessel routing to and from construction areas and ports to avoid areas of high risk, including liaison with the Port of Seaham and the Port of Sunderland; - include vessel standards and a code of conduct for vessel operators in compliance with international marine regulations as adopted by the Flag State, including the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organisation (IMO), 1972/77) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974); - detail measures to reduce disturbance to marine mammal receptors from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Outline Marine Mammal Mitigation Protocol; - detail measures to reduce disturbance to red throated diver from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Red Throated Diver Protocol.	The Outline VTMP forming part of the Outline OEMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s),
CoT36	An Outline Marine Mammal Mitigation Protocol (MMMP) will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. A Detailed MMMP will be developed substantially in accordance with the Outline MMMP, which will include measures such as: - will include use of low-order techniques for UXO clearance; - adherence to JNCC guidelines, where appropriate, regarding the minimisation of injury from underwater sound generated from known	The Outline MMMP forming part of the Outline OEMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).

	project activities of geophysical surveys (JNCC, 2017) and UXO clearance (JNCC, 2025a); • adherence to the Scottish Marine Wildlife Watching Code (NatureScot, 2023) and Defra Marine and Coastal Wildlife Code (Defra, 2023); • reporting requirements for the Marine Noise Registry and marine mammal observer sightings.	
CoT37	An Outline Marine Pollution Contingency Plan (MPCP) will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. The Outline MPCP will describe the hazards, response strategies, and step-by-step actions for handling spills, contaminant releases (including details of non-toxic, biodegradable drilling fluids), and vessel collisions during construction or operations below MHWS, and will include all essential emergency contacts and information. A Detailed MPCP will be developed substantially in accordance with the Outline MPCP.	The Outline MPCP forming part of the Outline OEMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).
CoT44	An Offshore Decommissioning Programme will be developed and submitted to the MMO and MD-LOT prior to the commencement of any offshore construction. It will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.	The Offshore Decommissioning Programme will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).
CoT56	An Offshore In-Principal Monitoring Plan (OIPMP) will be prepared and submitted as part of the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. The OIPMP will include for monitoring as part of the operational asset integrity surveys. A Detailed Offshore Monitoring Plan will be produced prior to O&M phases substantially in accordance with the OIPMP, and will be approved in consultation with statutory advisors and regulators.	The OIPMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).
CoT58	UXO hazards will be avoided where practicable and appropriate. Where avoidance is not possible, removal techniques will be considered prior to detonation. Low-order techniques, such as deflagration, will be the preferred method where practicable and appropriate. Should low order not be practicable, relocation will be considered and if no alternatives exist high order clearance may be required. If high order is required for UXO clearance works, licensing will be subject to a standalone Marine Licence application(s). The application(s) will provide details of measures to seek to minimise impacts on marine mammals where appropriate.	Will be secured through the relevant requirements and conditions of the DCO and associated dML(s) and Scottish Marine Licence(s).

5.4.4 List of plans and projects considered for the in-combination assessment

- 5.4.4.1 The potential for the MHPGC Project to contribute to effects on Annex II marine mammal qualifying features in-combination with other plans and projects has been considered as part of the Stage 2 AA. The methodology used to identify and screen plans and projects for the in-combination assessment, as well as the tiers applied, are described in **Section 3.2**. A full review of plans and projects was undertaken for the MHPGC Project, as detailed in **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR**.
- 5.4.4.2 The assessment presented here draws on the cumulative assessment presented in the **Volume 2, Chapter 5: Marine Mammals, of the PEIR**. The in-combination assessment considers whether effects arising from the MHPGC Project could combine with effects from other plans or projects in a manner that could result in AEoI of the relevant European sites. Accordingly, impact pathways that were not identified as having the potential for AEoI for the MHPGC Project alone have also been considered to determine whether effects from other plans or projects could result in an AEoI when considered in-combination (see **Section 5.2.3**).
- 5.4.4.3 A staged screening process was undertaken to identify those projects with the potential to contribute to cumulative effects with the MHPGC Project. The approach of using the MHPGC Project PEIR Marine Mammal Regional Study Area as the geographical basis for identifying plans and projects for long-list screening was discussed and agreed with relevant consultees through the Marine Mammal EWG (see **Section 4.2**), as follows:
- Long list screening:
 - Plans and Projects with no temporal overlap with any phase of the MHPGC Project were screened out;
 - Plans and projects with no potential impact-receptor pathway to marine mammals were screened out;
 - The remaining plans and projects were taken forward to short list screening.
 - Short list screening:
 - Plans and projects where construction, O&M and/or decommissioning activities had already been completed by 2025 were screened out and considered part of the baseline;
 - Plans and projects expected to begin and/or remain under construction up to one year before commencement as well as one year post-completion of the MHPGC Project construction phase were retained;
 - The remaining plans and projects were reviewed on a species-specific basis, with consideration given to the relevant MU or SMU for the qualifying feature;
 - Plans and projects located outside the relevant population unit were screened out for that species where there was no potential for an impact pathway to the relevant qualifying feature.
- 5.4.4.4 Impact pathways identified as having the potential to affect the COs of the relevant European sites for the MHPGC Project alone were also considered in-combination with other plans and projects (see **Table 5.7**). In addition, impact pathways screened out of the MHPGC Project-alone assessment were reviewed to determine whether effects arising from other plans and projects could interact with those of the MHPGC Project and result in an AEoI. Impact pathways were not taken forward where there was no credible mechanism by which the MHPGC Project and other plans and projects could combine to affect the COs of the relevant European sites.
- 5.4.4.5 The specific plans and projects identified for consideration in the marine mammal in-combination assessment are presented in **Table 5.9**, with their locations shown in **Figure 5.4**. A tiered approach has been applied to the in-combination assessment to reflect the different levels of uncertainty associated with the design and timeframes for the projects screened into the assessment.

Table 5.9: List of projects and plans identified for the marine mammals qualifying feature in-combination assessment

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
Tier 1							
Offshore wind projects and associated cables							
Morven North	Application submitted, awaiting decision	0.00	2033-2042 ¹	2038 onwards ²	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 60.8 Moray Firth SAC: • 104.1	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Morven South	Application submitted, awaiting decision	0.00	2033-2042 ¹	2038 onwards ²	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 98.08 Moray Firth SAC: • 193.47	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Ossian Offshore Wind Farm (OWF)	Application submitted, awaiting decision	5.50	2031-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC	Berwickshire and North Northumberland Coast SAC:	Overlap of construction phase or operational phase with the construction or

¹ At this stage, Morven North and Morven South could be constructed anywhere between 2033 to 2042, with both projects possibly being constructed concurrently or one after the other. As a precaution the widest possible construction phase of 10 years has been used in the in-combination assessment.

² While Morven North and Morven South could be constructed anywhere between 2033 to 2042, the O&M phase has been assumed as commencing in 2028 as a precaution in the instance that one project is constructed first and operational while the other is still in its construction phase.

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
					Moray Firth SAC	111.97 Moray Firth SAC: 175.92	operational phases of MHPGC Project.
Bowdun OWF	Application submitted, awaiting decision	10.03	2031-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: 116.21 Moray Firth SAC: 135.11	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Bowdun Electricity Cable Corridor (ECC)	Application submitted, awaiting decision	19.54	2031-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: 92.32 Moray Firth SAC: 267.72	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Bellrock ECC	Application submitted, awaiting decision	24.70	2029-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Unknown	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Bellrock OWF	Application submitted, awaiting decision	34.98	2029-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: 147.63 Moray Firth SAC: 208.73	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
Seagreen Phase 1A OWF	Consented	40.96	2030-2032	2033 onwards	Not considered further	Berwickshire and North Northumberland Coast SAC: • 65.91 Moray Firth SAC: • 149.68	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Seagreen Phase 1A Offshore ECC	Consented	48.45	2029-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 27.28 Moray Firth SAC: • 149.68	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Muir Mhòr OWF	Application submitted, awaiting decision	58.16	2029-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 183.86 Moray Firth SAC: • 155.33	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Muir Mhòr ECC	Application submitted, awaiting decision	60.80	2029-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 176.43 Moray Firth SAC: • 90.33	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
Buchan Preferred ECC	Application submitted	84.21	2029-2032	2033	Not considered further	Berwickshire and North Northumberland Coast SAC: • 183.41 Moray Firth SAC: • 87.73	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Hornsea Project 4 ECC	Consented	107.96	2028-2032	2033	Not considered further	Berwickshire and North Northumberland Coast SAC: • 204.67 Moray Firth SAC: • 472.77	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Marram ECC	Application submitted, awaiting decision	124.55	2028-2035	2036 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Unknown	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Marram OWF	Application submitted, awaiting decision	124.55	2028-2035	2036 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 244.93 Moray Firth SAC: • 150.50	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project
Buchan OWF	Application submitted	148.83	2028-2032	2033 onwards	Berwickshire and North	Berwickshire and North	Construction is anticipated to be complete a year prior to the construction or

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
					Northumberland Coast SAC Moray Firth SAC	Northumberland Coast SAC: • 261.35 Moray Firth SAC: • 128.77	operational phases of MHPGC Project.
Dogger Bank South (West) OWF	Consented	159.44	2030-2032	2033 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 194.25 Moray Firth SAC: • 440.73	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Ayre OWF	Application submitted	213.72	2029-2032	2033	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 312.33 Moray Firth SAC: • 105.72	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Ayre ECC	Application submitted	202.27	2030-2032	2033	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 285.40 Moray Firth SAC: • 50.69	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Tier 2							
Offshore wind projects and associated cables							

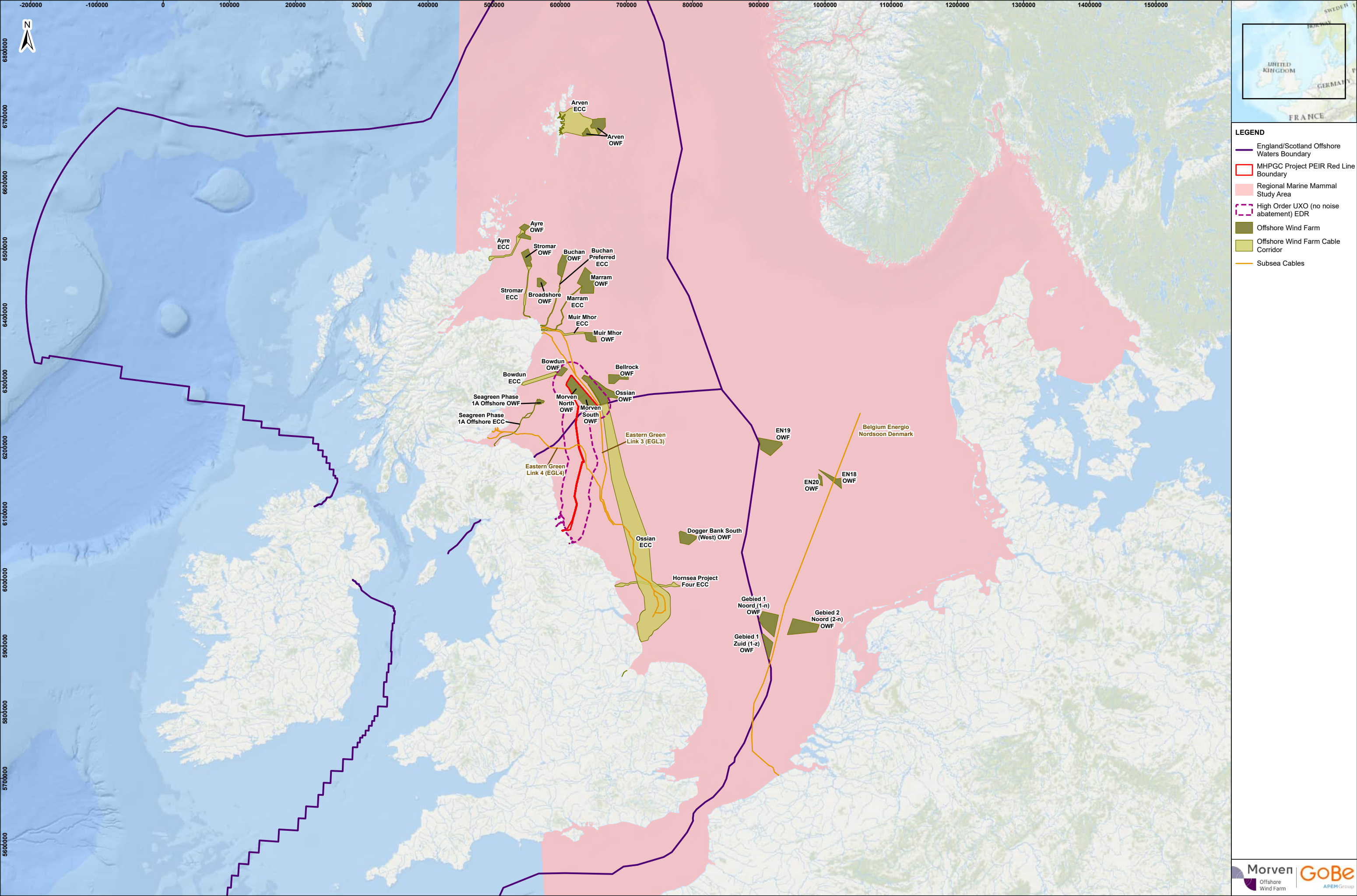
Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
Stromar ECC	Scoping report submitted	106.39	2030-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 194.24 Moray Firth SAC: • 60.65	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Broadshore OWF	Scoping report submitted	141.43	2030-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: 241.50 Moray Firth SAC: • 92.91	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Stromar OWF	Scoping report submitted	174.94	2028-2033	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 272.10 Moray Firth SAC: • 91.78	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Arven OWF	Scoping report submitted	361.87	2031-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 476.66 Moray Firth SAC: • 286.72	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
Arven ECC	Scoping report submitted	361.87	2030-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 473.18 Moray Firth SAC: • 267.72	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Other cables and pipelines							
Eastern Green Link 4 (EGL4) Scoping Route	Scoping report submitted	0.00	2029-2032	2033	Not considered further	Unknown	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Eastern Green Link 3 (EGL3) Scoping Route	Scoping report submitted	2.33	2030-2032	2033	Not considered further	Unknown	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Tier 3							
Offshore wind projects and associated cables							
Morven Branxton Area Grid Connection (MBAGC) Project	Proposed	0.00	2031 onwards	N/A	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Unknown	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Ossian ECC	Pre-planning	33.50	2031-2034	2035 onwards	Berwickshire and North	Berwickshire and North	Overlap of construction phase or operational

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
					Northumberland Coast SAC	Northumberland Coast SAC: 76.75 Moray Firth SAC: 175.88	phase with the construction or operational phases of MHPGC Project.
Broadshore ECC	Pre-planning	141.43	2030-2033	2034 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Unknown	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
EN19 OWF	Proposed	248.02	2029-2032	2033	Not considered further	Berwickshire and North Northumberland Coast SAC: 162.90 Moray Firth SAC: 454.06	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Gebied 1 Noord (1-n) OWF	Proposed	315.69	2030-2032	2033 onward	Not considered further	Berwickshire and North Northumberland Coast SAC: 121.07 Moray Firth SAC: 613.91	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Gebied 1 Zuid (1-z) OWF	Proposed	329.83	2030-2032	2033 onward	Not considered further	Berwickshire and North Northumberland Coast SAC: 137.66	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
						Moray Firth SAC: • 638.63	
EN20 OWF	Proposed	343.94	2030-2034	2035 onwards	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 392.17 Moray Firth SAC: • 559.47	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
EN18 OWF	Proposed	348.62	2027-2032	2033 onwards	Not considered further	Berwickshire and North Northumberland Coast SAC: • 209.99 Moray Firth SAC: • 557.20	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Gebied 2 Noord (2-n) OWF	Proposed	362.16	2029-2032	2033 onwards	Not considered further	Unknown	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Centre-Manche 2 OWF	Proposed	539.56	2029-2032	2033 onwards	Not considered further	Unknown	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Lovstaviken OWF	Proposed	796.09	2029-2032	2033 onwards	Not considered further	Berwickshire and North	Construction is anticipated to be complete a year prior to

Project/plan	Status	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Estimates dates of construction (if applicable)	Estimated dates of operation (if applicable)	European site considered in Assessment	Distance from European site (km)	Overlap with MHPGC Project
						Northumberland Coast SAC: • 717.08 Moray Firth SAC: • 951.32	the construction or operational phases of MHPGC Project.
V305 OWF	Proposed	786.71	2029-2032	2033 onwards	Not considered further	Berwickshire and North Northumberland Coast SAC: • 705.99 Moray Firth SAC: • 942.88	Construction is anticipated to be complete a year prior to the construction or operational phases of MHPGC Project.
Other cables and pipelines							
Belgium Energio Nordsoon Denmark	Proposed	343.94	2036	N/A	Berwickshire and North Northumberland Coast SAC Moray Firth SAC	Berwickshire and North Northumberland Coast SAC: • 383.68 Moray Firth SAC: • 583.61	Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.



5.5 Appropriate Assessment (alone and in-combination)

5.5.1 Berwickshire and North Northumberland Coast SAC

Site description

- 5.5.1.1 The Berwickshire and North Northumberland Coast SAC is located approximately 25.6km west from the MHPGC Project PEIR Red Line Boundary and occurs in both Scottish and English waters (see **Figure 5.1**). The SAC covers approximately 652.3km² and is designated for grey seal and a number of coastal and marine habitats. It encompasses a long stretch of coastline between southeast Scotland and northeast England, composed primarily of rocky shore with several sediment embayments, including important grey seal breeding and haul-out areas at Fast Castle in Scotland and the Farne Islands in England (SCOS, 2025).

Marine mammal qualifying features

- 5.5.1.2 The qualifying feature of this site considered further in this Stage 2 AA is grey seal. The Berwickshire and North Northumberland Coast SAC supports an important grey seal breeding colony, with pup production concentrated at Fast Castle at the northern end of the site (approximately 74.6km from the MHPGC PEIR Red Line Boundary) and the Farne Islands at the southern end of the site off the English coast (approximately 40km from the MHPGC PEIR Red Line Boundary). Additional haul-out areas occur along the coastline, including the sand flats at Lindisfarne National Nature Reserve, although this is not considered a primary site of pup production for the SAC (Thompson *et al.*, 2017; Berwickshire and Northumberland Marine Nature Partnership, 2019; SCOS, 2025).
- 5.5.1.3 The Berwickshire and North Northumberland Coast SAC is associated with both the East Scotland and the Northeast Scotland SMUs (Thompson *et al.*, 2017; SCOS, 2025). Within the East Scotland SMU, the Fast Castle colony has expanded substantially and now accounts for approximately 63% of pup production in the SMU. However, only approximately 57% of pups at Fast Castle occur within the SAC, and the Scottish component of the SAC does not represent a key haul-out area during the August surveys (SCOS, 2025). In contrast, the English component of the SAC represents the vast majority (>90%) of the August grey seal count and pup production in the Northeast England SMU, with 4,251 individuals recorded in August 2023 and an estimated 3,866 pups produced in 2023 (SCOS, 2025).
- 5.5.1.4 The JNCC Standard Data Form for the Berwickshire and North Northumberland Coast SAC (last updated in 2015) identifies a grey seal reference population of 501 to 1,000 individuals (JNCC, 2015). This population estimate represents the formal abundance baseline associated with the SAC designation and is therefore used as the reference population for the purposes of this Stage 2 AA. However, more recent SCOS (2025) assessments indicate increases in grey seal abundance and pup production associated with the SAC, suggesting that the Standard Data Form estimate is likely to underestimate the current size of the qualifying grey seal population.
- 5.5.1.5 Population trends indicate continued increases in pup production within Northeast England SMU, primarily associated with the expanding Fast Castle colony with the Berwickshire and North Northumberland Coast SAC. In contrast, pup production within the East Scotland SMU have remained broadly stable in recent years, following redistribution of breeding animals from the Isle of May SAC to other colonies rather than a decline in the wider East Scotland SMU population (SCOS, 2025).
- 5.5.1.6 The telemetry data provide direct evidence of connectivity between the Berwickshire and North Northumberland Coast SAC and offshore waters within the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**). Stevens (2025) recorded individuals associated with the SAC using offshore waters within Morven North and Morven South, with movements occurring predominantly within 100km of the coastline. This is consistent with telemetry studies demonstrating that grey seals associated with the east coast haul-out sites undertaken regular foraging movements offshore to the same foraging regions (Thompson *et al.*, 2017) and exhibit fidelity to their breeding sites, but some movement between sites or regions has also been observed (Thompson /

5.5.1.7 ., 2017; Carter *et al.*, 2022; SCOS, 2025).

5.5.1.8 The Morven North and Morven South DAS recorded low numbers of grey seals, with 11 individuals across the 33-month survey period, primarily as single observations (APEM, 2025). Other offshore development surveys in the region have similarly recorded generally low densities, although relatively higher densities have been reported closer to the Berwickshire and North Northumberland Coast SAC and associated haul-out sites (see **Section 5.3.2**). Habitat-based modelling provides further evidence of grey seals use of the wider area the MHPGC Project PEIR Red Line Boundary (see **Figure 5.1**), with Carter *et al.* (2025) predicting a mean abundance of 928 grey seals within the MHPGC Project PEIR Red Line Boundary plus a 4km buffer.

Conservation objectives

5.5.1.9 With regard to the Berwickshire and North Northumberland Coast SAC and the natural habitats and/or species for which the site has been designated, and subject to natural change (Natural England, 2018a):

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the favourable conservation status (FCS) of its qualifying features, by maintaining or restoring;
 - The extent and distribution of qualifying natural habitats and habitats of the qualifying species;
 - The structure and function (including typical species) of qualifying natural habitats;
 - The structure and function of the habitats of the qualifying species;
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
 - The populations of each of the qualifying species;
 - The distribution of qualifying species within the site.

Injury from underwater sound produced by offshore export cable installation and O&M activities – Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Grey seal

Assessment

5.5.1.10 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by offshore export cable installation during construction, offshore export cable remediation and repair activities during the O&M phase and decommissioning of the MHPGC Project. For decommissioning, in the absence of confirmed activities at this stage, the assessment assumes that activities generating underwater sound would be comparable to those assessed for construction. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:

- The populations of each qualifying species;
- The distribution of qualifying species within the site.

5.5.1.11 The remaining COs relate to the extent and distribution of qualifying habitats and habitats of qualifying species, their structure and function, and the supporting processes on which they rely. Potential effects on physical habitat associated with sediment disturbance during offshore export cable installation are assessed in **Volume 2, Chapter 1: Physical Processes, of the PEIR**. Updated modelling predicts a maximum tidal exclusion distance of approximately 9km, within which sediment-disturbance effects may persist following relevant activities. Beyond this distance, elevated SSCs and sediment deposition are predicted to be very limited and not measurable in practice. As the Berwickshire and North Northumberland Coast SAC is located approximately 25.6km from the MHPGC Project PEIR Red Line Boundary at the closest point,

there is no spatial overlap between the predicted tidal exclusion extent and the SAC. Accordingly, no potential for an effect on the physical habitat within the SAC has been identified through this pathway. Potential indirect effects on grey seal associated with changes to prey availability are considered separately within the assessment of effects on the qualifying feature (see **Sections 5.5.1.35 to 5.5.1.41**).

- 5.5.1.12 Offshore export cable installation during construction has the potential to generate underwater sound through a range of activities, including seabed preparation, boulder and debris clearance, offshore export cable burial and cable protection. Activities may involve techniques such as mechanical cutting, jet trenching, ploughing, CFE, sandwave clearance, pre-lay grapnel runs, localised dredging. Trenchless techniques, such as HDD or direct pipe installation, will also be used at landfall. The MDS for offshore export cable installation activities assumes the installation of up to 649.34km of offshore export cable (up to 324.67km per trench, up to two trenches) over a construction period of up to four years (see **Table 5.7**).
- 5.5.1.13 Underwater sound during the O&M phase would arise from offshore export cable remediation and repair activities. These activities are expected to be comparable in character to those assessed for construction offshore export cable installation and would involve similar vessel types and continuous, non-impulsive sound sources. However, O&M activities would be limited to localised maintenance and repair of sections of the offshore export cable, rather than installation of the full offshore export cable length. The MDS assumes remediation of up to 13km of offshore export cable per year and an estimated 41 cable repairs over the 35-year operational lifetime, with up to four vessels operating during offshore export cable remediation or repair activities (see **Table 5.7**).
- 5.5.1.14 The MHPGC Project has a lifespan of approximately 35 years. As this work is planned decades into the future, the exact methodology required for decommissioning is not known, though it will be based on the best available technology available at the time. In the years leading up to the end of the MHPGC Project's operational life, decommissioning options will be evaluated through environmental, technical, and economic assessments, with the objective being to minimise short and long-term effects on the environment, whilst ensuring the sea is safe for other users to navigate. An Offshore Decommissioning Programme will be developed and submitted to the MMO and MD-LOT prior to the commencement of any offshore construction associated with the MHPGC Project (CoT44) (see **Table 5.8**).
- 5.5.1.15 The current approach and MDS (see **Table 5.7**), which has been assessed for decommissioning, is the full removal of the offshore export cable and associated structures and cable protection where it is practicable and environmentally appropriate (see **Section 5.4.2** and **Volume 1, Chapter 2: Project Description, of the PEIR**). However, in many cases it may be more environmentally beneficial to leave the offshore export cable buried in situ.
- 5.5.1.16 In the event of the full removal of the offshore export cable and cable protection, this would likely have similar impacts as the construction phase and/or the O&M phase. Should the offshore export cable be left in situ, there would likely be no further impacts to marine mammals. Thus, as a worst-case scenario, potential impacts during decommissioning of the MHPGC Project are considered to be of a similar extent to construction phase and/or O&M phase activities, depending upon the decommissioning option selected.
- 5.5.1.17 To inform this assessment, project-specific underwater sound modelling has been undertaken for representative offshore export cable installation activities where suitable source levels were available, including rock cutting, dredging, CLV and both medium and small support vessels (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**). As the O&M offshore export cable remediation and repair activities are expected to be comparable in character to the modelled construction activities, the construction-phase modelling provides a representative basis for assessing the potential for auditory injury during O&M. **Table 5.10** presents the maximum AUD INJ and TTS ranges for each activity, specifically relating to PW, the FHG which includes grey seal.

Table 5.10: Predicted distance (m) to AUD INJ and TTS thresholds for representative offshore export cable installation activities related to grey seal qualifying feature (PW)

Functional hearing group	SEL _{cum}									
	Rock cutting		Dredging		Medium support vessel		Small support vessel		CLV	
	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS
PW	<10	60	<10	<10	<10	<10	<10	<10	<10	710
SEL (M-weighted): dB re 1 uPa ² s										

- 5.5.1.18 The maximum cumulative AUD INJ range for grey seal is predicted to be less than 10m for all modelled offshore export cable installation activities relating to the MHPGC Project, while the maximum predicted TTS range is greater but remains limited to 710m (see **Table 5.10**). Given that O&M offshore export cable remediation and repair activities would be more localised than construction offshore export cable installation, and would involve the same types of continuous, non-impulsive sound sources, the potential for AUD INJ during O&M is expected to be similarly limited.
- 5.5.1.19 Although the MDS assumes up to 33 vessels operating during the construction phase and up to four vessels during offshore export cable remediation and repair activities during O&M (see **Table 5.7**), these vessels would undertake different activities along the offshore export cable route within the MHPGC Project PEIR Red Line Boundary and are not expected to operate concurrently within the same location. Consequently, simultaneous exposure to multiple construction or O&M sound sources is unlikely to materially increase sound exposure relative to the individual activities assessed.
- 5.5.1.20 The predicted spatial extent within which auditory injury could occur is extremely limited, with the maximum AUD INJ range extending less than 10m from the relevant sound source. The potential for an individual grey seal associated with the Berwickshire and North Northumberland Coast SAC to remain within this very small area for sufficient duration to accumulate exposure at the AUD INJ threshold is considered highly unlikely. Furthermore, the SAC is located approximately 25.6km from the MHPGC Project PEIR Red Line Boundary and, therefore, the predicted AUD INJ range does not overlap the SAC itself. Given the wide-ranging movements of grey seals and the availability of extensive suitable habitat outside the predicted auditory injury (PTS) range, any potential occurrence of grey seals associated with the SAC within the MHPGC Project PEIR Red Line Boundary would not be expected to result in effects capable of affecting the population or distribution of grey seal within the SAC.
- 5.5.1.21 The MHPGC Project will implement the relevant measures for vessel movements through the VTMP (CoT30) (see **Section 5.4.3**), including measures to reduce disturbance and collision risk to marine mammals from transiting vessels during the construction phase and other measures detailed in the MMMP (CoT36). Vessels undertaking offshore export cable installation and O&M activities will generally operate at low speeds while carrying out these activities due to the nature of the equipment interacting with the seabed and operational constraints, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary. On this basis, underwater sound generated by offshore export cable installation and O&M activities is not expected to result in auditory injury to grey seals at a level that could affect the population or distribution of the qualifying feature of the Berwickshire and North Northumberland Coast SAC. The potential for the MHPGC Project alone to adversely affect the site's COs through auditory injury from offshore export cable installation and offshore export cable remediation and repair activities is considered to be very limited.

Additional mitigation

- 5.5.1.22 At this stage, as no significant impact has been concluded, additional mitigation measures or monitoring requirements are not considered necessary in relation to the effects of underwater sound associated with offshore export cable installation activities during all phases and O&M

activities to marine mammal qualifying features, taking into account the embedded mitigation measures already identified (see **Section 6.4.2**).

Conclusion

- 5.5.1.23 It is concluded that auditory injury from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.24 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on grey seal from auditory injury due to underwater sound produced by offshore export cable installation and O&M activities from other projects and plans listed in **Table 5.9** has been considered. The maximum predicted AUD INJ range for the MHPGC Project is highly localised (less than 10m), and the potential for exposure to grey seals to sound levels capable of causing auditory injury (PTS) is considered very limited. Given the spatial extent and characteristics of the predicted effect, there is no realistic potential for effects arising from other plans and projects to combine with those of the MHPGC Project in a manner that could affect the population or distribution of the grey seal qualifying feature. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.1.25 It is concluded that auditory injury from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by offshore export cable installation and O&M activities – Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.26 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by offshore export cable installation during construction, offshore export cable remediation and repair activities during the O&M phase and decommissioning of the MHPHC Project. For decommissioning, in the absence of confirmed activities at this stage, the assessment assumes that activities generating underwater sound would be comparable to those assessed for construction. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:
- The populations of each qualifying species;
 - The distribution of qualifying species within the site.
- 5.5.1.27 The MHPGC Project undertook underwater sound modelling estimate the potential spatial extent of behavioural disturbance associated with offshore export cable installation activities. The modelled distances are based on the precautionary Level B harassment threshold for continuous sound (120dB SPL_{rms}; NOAA, 2005), which is applied as a generic threshold for marine mammals rather than being specific to FHG.
- 5.5.1.28 The 120dB SPL_{rms} Level B harassment threshold is considered precautionary, particularly within the North Sea, as marine mammals are exposed to existing anthropogenic sound, including from

shipping activity. Data collected in the North Sea in 2017 demonstrated that annual median broadband sound levels (63Hz to 4kHz) exceeded 120dB SPL_{rms} across large areas of the North Sea, particularly in coastal regions and near ports (Farcas *et al.*, 2020). As a result, the modelled disturbance ranges are likely to overestimate the spatial extent of additional behavioural responses attributable to MHPGC Project activities.

- 5.5.1.29 Predicted behavioural disturbance distances extend up to 27km for the CLV, 15km for rock cutting, 10km for dredging, 12km for medium support vessels and 420m for small support vessels (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**). As the threshold is not species-specific, these distances are considered a precautionary indication of the potential spatial extent of behavioural responses rather than a prediction of biologically significant disturbance to grey seal.
- 5.5.1.30 Underwater sound generated during the O&M phase would arise from offshore export cable remediation and repair activities and would be comparable in character to the continuous, non-impulsive sound sources assessed for construction offshore export cable installation. However, O&M activities would be limited to localised maintenance and repair of sections of the offshore export cable, rather than installation along the full offshore export cable route, and would therefore be expected to have a smaller spatial and temporal extent than construction activities. The maximum construction-phase disturbance ranges presented above are therefore considered precautionary for O&M activities. On this basis, the potential for behavioural disturbance during O&M is not expected to exceed that assessed for the construction phase.
- 5.5.1.31 The maximum modelled distance for potential behavioural disturbance is approximately 27km for the CLV. The Berwickshire and North Northumberland Coast SAC is located approximately 25.6km from the MHPGC Project PEIR Red Line Boundary at its closest point. Based on these respective maximum distances, the disturbance footprint could potentially extend approximately 1.4km into the SAC; however, this represents a precautionary comparison of the maximum distances rather than a spatial overlay of the modelled disturbance footprint with the SAC boundary. Furthermore, the CLV would be moving along the offshore export cable route during installation activities and any potential disturbance within the SAC would therefore be temporary and transient. Evidence from the North Sea indicates that grey seals can exhibit temporary behavioural responses to vessel passages, with an observed change in diving behaviour returning to the previous pattern following passage of the vessel (Mikkelsen *et al.*, 2019).
- 5.5.1.32 As a precautionary screening exercise, the predicted mean and maximum grey seal densities within the MHPGC Project PEIR Marine Mammal Study Area (0.395 and 0.419 individuals/km², respectively; Carter *et al.*, 2025) were considered alongside the maximum modelled behavioural disturbance range. Given that only the outer extent of the maximum disturbance range is predicted to overlap the SAC, the number of grey seals potentially exposed within the SAC would be substantially lower than any estimate derived from the full disturbance footprint. However, any estimate of the number of grey seals potentially affected, would be highly precautionary, as it would assume uniform distribution of all animals within the disturbance footprint, that all animals within the footprint are exposed simultaneously, and that all exposed animals respond to the sound. Such estimate would also not account for the temporary and localised nature of the activities, individual variation in response, or the wider grey seal population associated with the SAC and surrounding SMUs. Consequentially, the potential extent of potential behavioural disturbance is considered to be limited.
- 5.5.1.33 The MHPGC Project will implement the relevant measures for vessel movements through the VTMP (CoT30) (see **Section 5.4.3**), including measures to reduce disturbance to marine mammal receptors from transiting vessels during the construction phase. This will include adherence to the Scottish Marine Wildlife Watching Code (NatureScot, 2025a) and the Marine and Coastal Wildlife Code (Defra, 2023), as relevant to vessel activities (as detailed in the MMMP; CoT36). Vessels undertaking offshore export cable installation and O&M activities would generally operate at low speeds while carrying out these activities, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary.
- 5.5.1.34 Evidence from offshore export cable installation activities also indicates that the modelled disturbance ranges are unlikely to represent the extent of biologically meaningful displacement. A

review of underwater sound associated with offshore export cable installation techniques, including jetting, rock cutting, ploughs, remotely operated vehicles (ROVs), and sleds, concluded that these activities were very unlikely to generate sound levels capable of triggering behavioural responses in marine mammals (Department for Business, Enterprise and Regulatory Reform (BERR) and Defra, 2008). Where avoidance occurs, this may also be associated with the presence and movements of vessels rather than underwater sound alone, with marine mammals potentially avoiding areas of increased vessel activity before noise-generating activities commence. Such avoidance of areas with heightened vessel activity has been reported for marine mammals in offshore wind farm construction areas (Brandt *et al.*, 2018). Any such response would be expected to be temporary and localised, with animals able to move into surrounding suitable habitat.

- 5.5.1.35 Grey seals associated with the Berwickshire and North Northumberland Coast SAC are known to undertake wide-ranging movements between coastal haul-out sites and offshore foraging areas, including waters within the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**). Foraging context is important when interpreting avoidance behaviour of grey seals and should be considered when predicting effects. Although grey seals typically undertake foraging movements within approximately 100km of the coastline (Thompson *et al.*, 2017; Carter *et al.*, 2022; Stevens, 2025), the MHPGC Project PEIR Red Line Boundary is located approximately 25.6km from the site at its closest point, while the closest breeding colony at Farne Island is approximately 40km from the MHPGC Project PEIR Red Line Boundary. Outside the breeding season, individuals may undertake wider-ranging movements, including into offshore waters within the MHPGC Project area.
- 5.5.1.36 Anderwald *et al.* (2013) suggested that in the study of displacement responses to construction-related vessel traffic, grey seals avoided the area due to vessel noise. Even if individuals are temporarily deterred from offshore foraging grounds, the impacts of construction activities would be highly localised and largely restricted to the boundaries of the MHPGC Project PEIR Red Line Boundary. Consequently, only a small proportion of the available foraging habitat in the northern North Sea is predicted to be affected. Avoidance rates are likely to depend on perceived level of risk relative to the value of the prey resource. Given the existing levels of vessel activity in the North Sea (Farcas *et al.*, 2020), it is expected that grey seals could tolerate temporary disturbance from vessel movements without resulting in measurable effects on reproduction and survival rates, and would be expected to return to previous activities once the impact had ceased.
- 5.5.1.37 The temporary presence of underwater sound from construction or O&M activities within a localised area of this wider range is therefore not expected to prevent movement between the SAC and surrounding foraging habitat or result in a sustained change in the distribution of the qualifying feature. Similarly, the temporary and localised nature of the activities, together with the precautionary basis of the modelled disturbance ranges, means that any behavioural responses are not expected to occur at a scale or duration that would affect reproduction or survival or result in a change to the population of grey seal associated with the SAC. The potential for disturbance from underwater sound produced by offshore export cable installation and O&M activities is therefore not expected to affect the population or distribution of the grey seal qualifying feature.

Additional mitigation

- 5.5.1.38 At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the effects of underwater sound associated with offshore export cable installation activities during all phases and O&M activities to marine mammal qualifying features, taking into account the embedded mitigation measures already identified (see **Section 6.4.2**).

Conclusion

- 5.5.1.39 It is concluded that behavioural disturbance from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.40 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on grey seal qualifying feature from behavioural disturbance produced by offshore export cable installation and O&M activities has been considered. The MHPGC Project has the potential to result in temporary and localised disturbance, with the maximum precautionary disturbance footprint potentially extending into the Berwickshire and North Northumberland Coast SAC by up to approximately 1.4km. However, the predicted disturbance does not represent a sustained change in the availability or accessibility of habitat and is not expected to affect the population or distribution of the grey seal qualifying feature.
- 5.5.1.41 Given the temporary, transient and localised nature of the predicted disturbance, and the availability of extensive alternative foraging habitat within the wider range of grey seals associated with the SAC, effects from other plans and projects are not expected to interact with those of the MHPGC Project in a manner that could affect the population or distribution of the qualifying feature. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.1.42 It is concluded that behavioural disturbance from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEol on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Injury from underwater sound produced by site investigation surveys – Pre-Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.43 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by site investigation surveys during the pre-construction, O&M and decommissioning phases of the MHPHC Project. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:
- The populations of each qualifying species;
 - The distribution of qualifying species within the site.
- 5.5.1.44 The potential for AUD INJ from site investigation surveys depends on the type of equipment used, the characteristics of the sound source and hearing sensitivity of the receptors. Geophysical surveys use acoustic equipment to characterise seabed and shallow sub-seabed conditions, while geotechnical surveys involve direct sampling and *in situ* testing of seabed sediments (see **Volume 1, Chapter 2: Project Description, of the PEIR**). Underwater sound may be generated by both survey equipment and the vessels required to undertake these activities. The potential for AUD INJ associated with vessel-related underwater sound is considered under the assessment of underwater sound from offshore export cable installation and O&M activities (see **Sections 5.5.1.10 to 5.5.1.23**) and is therefore not repeated here. This assessment focuses on the potential for AUD INJ associated with underwater sound generated by the site investigation survey equipment.
- 5.5.1.45 Geophysical and geotechnical activities include both impulsive sound sources (e.g. UHRS and seismic CPT) and continuous sources (e.g. SBES, SBP, VC). MHPGC Project-specific underwater sound modelling has been undertaken for representative geophysical and geotechnical survey

activities, including SBES, SBP (chirp), high-frequency SBP, UHRS, USBL, VC and seismic CPT (see **Volume 2, Annex 5.1. Underwater Sound Modelling Report, of the PEIR**). MBES and SSS have not been included in the assessment as the frequencies associated with these systems are outside the hearing range of the species considered relevant to the assessment and/or their source characteristics do not result in sound levels requiring further assessment for marine mammals (Crocker and Fratantonio, 2016; Crocker *et al.*, 2019; Hartley Anderson Ltd, 2020). MAG and gradiometer equipment do not generate underwater sound at levels requiring assessment for marine mammals.

- 5.5.1.46 ROV operations have not been modelled separately as the underwater sound associated with ROV operation is expected to be substantially lower than that generated by the representative acoustic survey equipment modelled and is therefore not expected to represent a material additional source of underwater sound for marine mammals.
- 5.5.1.47 The MDS for pre-construction site investigation surveys assumes the use of representative geophysical and geotechnical survey equipment with the highest source levels and the greatest overlap with marine mammal hearing ranges over a pre-construction period of up to two years (see **Table 5.7**). The MDS for O&M assumes up to five geophysical surveys per year during the 35-year operational lifetime of the MHPGC Project, including the use of SSS, MBES, SBP and MAG and/or gradiometer equipment (see **Table 5.7**). Therefore, the potential for underwater sound effects during O&M site investigation surveys relates primarily to the use of SBP equipment, which is represented within the pre-construction survey assessment. In the absence of confirmed decommissioning survey requirements, the potential effects during decommissioning are assumed to be comparable to those assessed for pre-construction surveys.
- 5.5.1.48 **Table 5.11** and **Table 5.12** present the maximum predicted distances to the AUD INJ and TTS thresholds, respectively, for the representative survey activities. The full range of predicted distances for all modelling scenarios is presented in **Volume 2, Annex 5.1: Underwater Sound Modelling Report of the PEIR**.
- 5.5.1.49 The potential for AUD INJ during site investigation surveys is highly localised. For impulsive sound sources (USBL, UHRS and seismic CPT), the SPL_{pk} and SEL_{cum} criteria were not exceeded beyond the immediate vicinity of the source (<10m) for PW FHG, which includes grey seal (see **Table 5.11**). For continuous sound sources, potential AUD INJ ranges were also limited, with all predicted distances less than 10m for PW.

Table 5.11: Predicted distance (m) to the AUD INJ (PTS) thresholds for geophysical and geotechnical survey activities for grey seals (PW)

FHG	Continuous sources (SEL_{cum})				Impulsive sources					
	SBES	SBP (chirp)	High frequency SBP	VC	USBL		UHRS		Seismic CPT	
					SPL_{pk}	SEL_{cum}	SPL_{pk}	SEL_{cum}	SPL_{pk}	SEL_{cum}
PW	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Note: For impulsive sound sources (USBL, UHRS and seismic CPT), AUD INJ thresholds are assessed against both SPL_{pk} (dB re 1 μ Pa) and SEL_{cum} (dB re 1 μ Pa²s) criteria. Continuous sound sources are assessed using SEL_{cum} only.

- 5.5.1.50 For TTS, the predicted SPL_{pk} ranges for impulsive sound sources were less than 10m for all sources relating to PW (see **Table 5.12**). As for SEL_{cum} -based TTS ranges, the greatest predicted impact ranges for PW is associated with the VC, which extends to 270m.

Table 5.12: Predicted distance (m) to the TTS threshold for geophysical and geotechnical survey activities for grey seal (PW)

	Continuous sources (SEL_{cum})	Impulsive sources
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Functional hearing Group	SBES	SBP (chirp)	High frequency SBP	VC	USBL		UHRS		Seismic CPT	
					SPL _{pk}	SEL _{cum}	SPL _{pk}	SEL _{cum}	SPL _{pk}	SEL _{cum}
PW	20	150	30	270	<10	<10	<10	<10	<10	<10

Note: For impulsive sound sources (USBL, UHRS and seismic CPT), TTS thresholds are assessed against both SPL_{pk} (dB re 1 μ Pa) and SEL_{cum} (dB re 1 μ Pa²s) criteria. Continuous sound sources are assessed using SEL_{cum} only.

- 5.5.1.51 The MHPGC Project PEIR Red Line Boundary does not overlap with the Berwickshire and North Northumberland Coast SAC, which is located approximately 25.6km from the MHPGC Project PEIR Red Line Boundary at its closest point. The predicted AUD INJ ranges for PW for all modelled site investigation survey activities are highly localised, with all predicted distances less than 10m, and therefore there is no overlap with the SAC itself. However, grey seals associated with the SAC are known to undertake movements into offshore waters within the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**). The potential for such individuals to experience exposure at levels capable of causing AUD INJ is considered highly limited, given the very small injury ranges and the temporary and mobile nature of the survey activities.
- 5.5.1.52 For directional acoustic survey systems such as SBES and SBP, the acoustic energy is concentrated within a defined beam, limiting the area within which the highest sound levels occur (Crocker *et al.*, 2019; Ruppel *et al.*, 2022). Ruppel *et al.* (2022) concluded that most high-resolution geophysical survey sources have a low likelihood of resulting in injury to marine mammals, particularly where exposure is limited spatially and temporally, with potentially injurious ranges generally restricted to relatively small areas around the sound source. Additionally, marine mammals may also exhibit avoidance behaviour in response to survey vessels and active sound sources, further reducing the likelihood of prolonged exposure to sound levels capable of causing auditory injury (Benhemma-Le Gall *et al.*, 2023).
- 5.5.1.53 The MHPGC Project will implement the relevant mitigation measures for site investigation activities through the MMMP (CoT36) (see **Section 5.4.3** and **Table 5.8**), including Marine Mammal Observer (MMOb) searches and soft-start procedures where the survey equipment has that facility. These measures are primarily intended to minimise the potential for auditory injury by reducing the likelihood of marine mammals being present in close proximity to active survey equipment. The relevant measures for vessel movements secured through the VTMP (CoT30) (see **Section 5.4.3**) will also apply during site investigation activities during the pre-construction phase. Vessels undertaking site investigation activities would generally operate at low speeds, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary, thereby reducing the likelihood of marine mammals being in close proximity to active survey equipment.
- 5.5.1.54 Any future geophysical surveys involving sound-generating equipment will be undertaken in accordance with the relevant regulatory requirements and applicable JNCC guidance in place at the time of the survey, including any appropriate marine mammal mitigation and monitoring measures (see **Section 5.4.3**). The specific mitigation requirements will be confirmed when the survey parameters, equipment and timing are known and, where relevant, implemented into the Detailed Offshore Operations and Maintenance Plan (CoT07) produced prior to entering the O&M phase (see **Table 4.8**).
- 5.5.1.55 Given the highly localised nature of the predicted AUD INJ zone (<10m), the temporary and mobile nature of the survey activities, and the very limited potential for individual grey seals to remain within the injury zone for sufficient duration to accumulate exposure at the AUD INJ threshold, auditory injury is not expected to occur at a level that could affect the population or distribution of grey seals associated with the Berwickshire and North Northumberland Coast SAC.
- Additional mitigation
- 5.5.1.56 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) and VTMP (CoT30), have been

identified in relation to the effects of underwater sound associated with site investigation activities to marine mammal qualifying features during all phases of the MHPGC Project.

Conclusion

- 5.5.1.57 It is concluded that auditory injury from underwater sound produced by site investigation survey activities during the construction, O&M and decommissioning phases will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.58 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on grey seal from auditory injury due to underwater sound produced by site investigation surveys has been considered. The predicted AUD INJ ranges for the MHPGC Project are highly localised, with all modelled ranges for the PW FHG being less than 10m. Although grey seals associated with the Berwickshire and North Northumberland Coast SAC may occur within the MHPGC Project PEIR Red Line Boundary and region, the potential for an individual to remain within the very small AUD INJ zone for sufficient duration to accumulate exposure at the AUD INJ threshold is considered highly limited.
- 5.5.1.59 The potential for site investigation activities associated with other plans and projects to result in an additional risk of auditory injury to grey seals is similarly expected to be highly localised and temporary. The potential for injury-level exposure from multiple projects and plans to overlap spatially and temporally is therefore considered limited. In addition, it is anticipated where relevant, other projects and plans will employ similar mitigation measures such as the use of MMObs and soft-start procedures that would further reduce the likelihood of marine mammals being exposed to sound levels capable of causing auditory injury. On this basis, in-combination site investigation survey activities are not expected to result in effects at a level that could affect the population or distribution of the grey seal qualifying feature. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.1.60 It is concluded that auditory injury from underwater sound produced by site investigation surveys will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by site investigation surveys – Pre-Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.61 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by site investigation surveys during the pre-construction, O&M and decommissioning phases of the MHPGC Project. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:
- The populations of each qualifying species;
 - The distribution of qualifying species within the site.
- 5.5.1.62 Behavioural disturbance is considered the most likely effect pathway associated with site investigation surveys. Responses to survey activities are expected to vary depending on the

species, behavioural state, previous exposure and the characteristics of the sound source (Southall *et al.*, 2007; Stone, 2003). Available evidence indicates that responses to geophysical survey activities are generally characterised by localised avoidance or short-term changes in behaviour, with animals typically returning following cessation of survey activities (Kavanagh *et al.*, 2019; Thompson *et al.*, 2013).

- 5.5.1.63 Project-specific underwater sound modelling has been undertaken for representative geophysical and geotechnical survey activities, including SBES, SBP (chirp), high-frequency SBP, UHRS, USBL, VC and seismic CPT (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**). The predicted behavioural disturbance ranges were derived using precautionary acoustic thresholds and therefore represent the potential spatial extent over which sound levels may exceed the relevant thresholds, rather than the extent of biologically meaningful behavioural disturbance. In the absence of confirmed decommissioning survey requirements, the potential effects during decommissioning are assumed to be comparable to those assessed for pre-construction surveys.
- 5.5.1.64 For continuous sound sources, the 120dB re 1 μ Pa SPL_{rms} threshold was applied to SBES, SBP (chirp), HF SBP and VC, while the 160dB re 1 μ Pa SPL_{rms} threshold was applied to the impulsive sources USBL, UHRS and seismic CPT. The predicted disturbance ranges are therefore precautionary indicators and should not be interpreted as definitive threshold for disturbance. These ranges do not account for differences in species sensitivity, behavioural state, previous exposure or the duration and nature of any behavioural response.
- 5.5.1.65 The greatest predicted ranges are associated with continuous sources, with high-frequency SBP resulting in the largest potential disturbance footprint of up to 16km, followed by VC (13km) and chirp SBP (12km). Predicted disturbance ranges associated with SBES are smaller (up to 2.6km), while the ranges predicted for impulsive sources (USBL, UHRS and seismic CPT) are limited to the immediate vicinity of the source (<10m).
- 5.5.1.66 Although the MHPGC Project PEIR Red Line Boundary does not overlap with the Berwickshire and North Northumberland Coast SAC, grey seals associated with the SAC are known to undertake movements into offshore waters within the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**). The predicted disturbance footprints for the modelled site investigation activities therefore have the potential to overlap temporarily with waters used by SAC-associated grey seals, with the maximum predicted extent being 16km for high-frequency SBP. However, any resulting behavioural response would be expected to be localised and short-term, with individuals able to move away from the area and continue to access surrounding foraging habitat.
- 5.5.1.67 The precautionary nature of the modelled disturbance ranges is particularly relevant when considering the potential consequences for grey seal. The 120dB re 1 μ Pa SPL_{rms} threshold used for continuous sound is a precautionary indicator of potential behavioural response rather than a definitive threshold for adverse effects. This is important when interpreting the modelled disturbance footprints, as the area within which the threshold may be exceeded should not be equated directly with the area in which biologically meaningful disturbance or displacement would occur.
- 5.5.1.68 EDRs provide an alternative evidence-based approach for considering the potential spatial extent of behavioural responses, based on observed responses of harbour porpoise to specific noise-generating activities rather than solely on predicted underwater sound levels. EDRs represent the distance within which disturbance or displacement has the potential to occur and are therefore distinct from acoustic thresholds used to define the spatial extent of sound exposure. The updated JNCC (2025a) EDRs are derived from a review of available empirical and modelled evidence (Majewska *et al.*, 2025) and remain precautionary, while providing a more robust evidence base for assessing potential disturbance footprints.
- 5.5.1.69 For SBP and USBL sources, JNCC (2025a) provides an EDR of 3km for harbour porpoise. Although this EDR is not directly applicable to grey seal, it provides useful context for interpreting the precautionary acoustic disturbance ranges. Harbour porpoise are considered to be particularly sensitive to underwater sound, and the 3km EDR for SBP and USBL is itself precautionary, with JNCC (2025a) selecting the upper end of the 2 to 3km range recommended by Majewska *et al.* (2025) in recognition of the limited evidence and remaining uncertainty. The

modelled acoustic ranges for some site investigation activities extend substantially beyond this 3km distance therefore should not be interpreted as indicating meaningful disturbance or displacement of grey seals across the full modelled footprint.

- 5.5.1.70 The implementation of MMOB searches and soft-start procedures, where applicable, in accordance with JNCC guidelines for geophysical surveys (JNCC, 2017) and as secured through the MMMP (CoT36), is primarily intended to reduce the risk of auditory injury by minimising the likelihood of marine mammals being present in close proximity to active survey equipment. However, these measures also provide a secondary benefit by reducing the potential for prolonged exposure to elevated underwater sound levels and associated behavioural responses. The MMMP will also commit the MHPGC Project to adhere to the Scottish Marine Wildlife Watching Code (NatureScot, 2025a) and the Marine and Coastal Wildlife Code (Defra, 2023), which will further minimise the potential for disturbance to marine mammals during survey activities.
- 5.5.1.71 The MHPGC Project will also implement the relevant measures for vessel movements through the VTMP (CoT30) (see **Section 5.4.3**), including measures to reduce disturbance to marine mammal receptors from transiting vessels. These measures will reduce the potential for disturbance associated with the movement and presence of survey vessels.
- 5.5.1.72 Furthermore, site investigation surveys will be temporary, mobile and spatially constrained along the offshore export cable corridor, with vessels progressing along the survey route rather than remaining within a fixed location for prolonged periods. The potential for an individual grey seal to remain within an area of elevated sound for sufficient duration to experience sustained disturbance is therefore limited. During the O&M phase, site investigation surveys would be undertaken periodically and over substantially more limited areas than the pre-construction survey programme (see **Table 5.7**), further reducing the potential for sustained or repeated disturbance. Any behavioural response, including temporary avoidance of an area, would be expected to be reversible following cessation or movement of the survey activity.
- 5.5.1.73 Consequently, although grey seals associated with the Berwickshire and North Northumberland Coast SAC may temporarily encounter underwater sound associated with site investigation surveys within the MHPGC Project PEIR Red Line Boundary and surrounding area, any resulting behavioural disturbance is expected to be temporary and localised. Such disturbance is not expected to prevent grey seals from moving between the SAC and surrounding foraging habitat or result in a sustained change in their use or distribution within the site. The scale and duration of disturbance are also not expected to affect the survival or reproduction of grey seals associated with the SAC and are therefore not expected to affect the population of the grey seal associated with the SAC.

Additional mitigation

- 5.5.1.74 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) and VTMP (CoT30), have been identified in relation to the effects of underwater sound associated with site investigation activities to marine mammal qualifying features during all phases of the MHPGC Project.

Conclusion

- 5.5.1.75 It is concluded that behavioural disturbance from underwater sound produced by site investigation survey activities during the construction, O&M and decommissioning phases will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.76 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on the grey seal qualifying feature from behavioural disturbance associated with underwater sound from site investigation surveys alongside other plans and projects has been considered. Grey seals associated with the Berwickshire and North Northumberland Coast SAC may occur within the

wider MHPGC Project PEIR Red Line Boundary and surrounding area, and there is therefore potential for temporary exposure to underwater sound from the MHPGC Project and other plans and projects undertaking site investigation activities.

- 5.5.1.77 As described for the MHPGC Project alone, the modelled disturbance ranges for site investigation surveys are precautionary acoustic threshold exceedance ranges and should not be interpreted as the extent of biologically meaningful disturbance or displacement. Site investigation surveys are also temporary and mobile, with vessels progressing along survey areas rather than remaining at fixed locations for prolonged periods. The potential for disturbance from different projects to overlap spatially and temporally and result in sustained or repeated behavioural responses affecting the same individuals is therefore limited.
- 5.5.1.78 Mitigation measures commonly applied to geophysical surveys, including MMOB searches and soft-start procedures where applicable, are primarily intended to reduce the risk of auditory injury by minimising the likelihood of marine mammals being present in close proximity to active survey equipment. These measures may also reduce the potential for prolonged exposure to elevated underwater sound levels and associated behavioural responses. Where such measures are secured for the other plans and projects considered within the in-combination assessment, they provide additional confidence that any disturbance would remain temporary and localised.
- 5.5.1.79 Consequently, although temporary behavioural responses may occur where grey seals encounter site investigation activities associated with the MHPGC Project and other plans or projects, these are not expected to occur at a scale, duration or frequency that could result in a sustained change in the distribution of grey seal within the Berwickshire and North Northumberland Coast SAC or affect the population of the qualifying feature. No potential for an in-combination effect on the population or distribution of the grey seal qualifying feature is therefore identified for this impact pathway, and no further assessment is considered necessary.

Conclusion

- 5.5.1.80 It is concluded that behavioural disturbance from underwater sound produced by site investigation surveys will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Injury from underwater sound produced by UXO clearance – Pre-Construction phase

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.81 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by UXO clearance during the pre-construction phase of the MHPGC Project. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:
- The populations of each qualifying species;
 - The distribution of qualifying species within the site.
- 5.5.1.1 Prior to construction of the MHPGC Project, UXO clearance may be required. A desk-based risk assessment identified the potential presence of UXO within the MHPGC Project PEIR Red Line Boundary, with the majority of the offshore cable route identified as a moderate risk and a smaller section of the route identified as a low-moderate risk (TetraTech RPS Energy, 2025). Potential UXO includes mines, projectiles, aerial bombs, torpedoes and depth charges, and therefore UXO clearance has been assessed on a precautionary basis.
- 5.5.1.2 In line with the current UK Joint Position Statement (UK Government, 2025) and supporting JNCC guidance (JNCC, 2025b), low-noise methods of UXO clearance are the default proposed

approach where practicable. with high order detonation considered only where low order clearance is not feasible.

- 5.5.1.3 The MHPGC Project will seek to minimise impacts from UXO clearance through the hierarchy set out in CoT58, whereby UXO hazards will be avoided where practicable and appropriate. Where avoidance is not possible, removal techniques will be considered prior to detonation, and low-order techniques, such as deflagration, will be the preferred method where practicable and appropriate (see **Section 5.4.3** and **Table 5.8**). The predicted maximum AUD INJ onset impact range for grey seal for the assessed low order UXO clearance scenario (4x0.75kg) is 40m based on SPL_{pk} , with a corresponding maximum SEL_{ss} -based ranges of 1,300m (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR** for full details). The predicted AUD INJ ranges do not overlap the Berwickshire and North Northumberland Coast SAC (25.6km away from the MHPGC Project PEIR Red Line Boundary at its closest point). Therefore, no grey seals within the SAC would be predicted to be exposed to underwater sound at levels exceeding the modelled AUD INJ thresholds.
- 5.5.1.4 High order UXO detonation has also been modelled for contextual purposes. The predicted maximum AUD INJ onset impact range for grey seal for the assessed high order UXO clearance scenario (697kg) is 700m based on SPL_{pk} and the corresponding maximum SEL_{ss} -based range is 3,900m. These ranges also do not overlap with the Berwickshire and North Northumberland Coast SAC. However, high order UXO detonation does not form part of the MHPGC Project DCO application or associated Scottish Marine Licence application(s). If high order detonation was subsequently identified as necessary, it would be subject to a separate consent and assessment process based on the confirmed UXO characteristics, charge size and location. The high order UXO clearance scenario is therefore not relied upon in determining the potential for an AEol from the MHPGC Project as applied for.
- 5.5.1.5 The predicted low order AUD INJ ranges are highly localised relative to the wider North Sea region used by grey seals associated with the Berwickshire and North Northumberland Coast SAC. Although individuals associated with the SAC are known to undertake movements into offshore waters within the MHPGC Project PEIR Red Line Boundary, the AUD INJ footprint does not overlap with the SAC. Therefore, the potential for individual grey seal to remain within the relatively small AUD INJ zone for sufficient duration to accumulate exposure at the onset of auditory injury is limited and there is no potential for auditory injury from the assessed UXO clearance activities to affect grey seal distribution within the SAC. This is further reduced by the temporary nature of UXO clearance events and the mobility of grey seals.
- 5.5.1.6 The use of low order UXO clearance techniques also substantially reduces the acoustic output compared with high order detonation. Robinson *et al.* (2020) demonstrated that low order deflagration can reduce SPL_{pk} and SEL_{ss} levels by more than 20dB compared with high order detonation of the same munition. For low order clearance, the radiated acoustic output is primarily determined by the donor charge rather than the explosive content of the UXO itself. The assessed low order scenario therefore represents a substantially reduced source level relative to high order detonation.
- 5.5.1.7 Where UXO clearance is required, the MHPGC Project will implement the relevant mitigation measures secured through the MMMP (CoT36) (see **Section 5.4.3** and **Table 5.8**) and relevant JNCC (2025b) guidance. These measures include pre-clearance observation searches and monitoring by at least two suitably qualified MMObs. These measures are intended to reduce the likelihood of marine mammals being present within the immediate vicinity of a clearance event and therefore reduce the potential exposure to sound levels capable of causing auditory injury.
- 5.5.1.8 Where the predicted AUD INJ range for low order UXO clearance event extends beyond a 1km mitigation zone, additional measures, including the use of an appropriate Acoustic Deterrent Device (ADD) will be considered in accordance with JNCC (2023; 2025b) guidance to further reduce the likelihood of marine mammals being within the AUD INJ ZoI at the time of detonation. Where required, the selection and operation of an ADD would be determined through the MHPGC-Project specific MMMP (CoT36), taking account of the predicted AUD INJ range and the effectiveness of the device in achieving the required exclusion range. The EDR of some ADD may extend beyond the 5km EDR anticipated for low order UXO clearance (JNCC, 2025a), and therefore the potential for acoustic exposure from the ADD itself will also be considered. The

potential for AUD INJ is further reduced through the implementation of mitigation measures (see **Section 5.4.3** and **Table 5.8**), taken together with the highly localised AUD INJ ranges, the temporary nature of individual clearance events and the mobility of grey seals, the potential for auditory injury (PTS) to occur at a level capable of affecting the population or distribution of grey seal associated with the Berwickshire and North Northumberland Coast SAC is considered very limited. As the predicted AUD INJ ranges do not overlap the SAC, the assessed activities would not affect the distribution of grey seals within the site or the population of the qualifying feature.

Additional Mitigation

- 5.5.1.9 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) (see **Table 5.8**) have been identified in relation to the effects of underwater sound associated with low order UXO clearance during the pre-construction phases to marine mammal qualifying features.

Conclusion

- 5.5.1.10 It is concluded that auditory injury from underwater sound produced by UXO clearance activities during the pre-construction phase will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.11 As for the MHPGC Project alone, the potential for in-combination effects on the grey seal qualifying feature from auditory injury associated with underwater sound produced by UXO clearance has been considered. UXO clearance activities associated with other plans and projects could result in underwater sound effects occurring within areas used by grey seals associated with the Berwickshire and North Northumberland Coast SAC. However, the MHPGC Project will use low order UXO clearance techniques where practicable and appropriate, with avoidance and removal considered where possible prior to detonation, thereby substantially limiting the potential for auditory injury from the MHPGC Project.
- 5.5.1.12 The potential for auditory injury from the MHPGC Project is further limited by the highly localised nature of the predicted AUD INJ ranges, the temporary nature of individual clearance events and the implementation of mitigation measures, including pre-clearance monitoring of the mitigation zone. It is also anticipated that other projects considered within the in-combination assessment would implement appropriate mitigation and, where practicable, low order UXO clearance techniques in accordance with the current UK Joint Position Statement (UK Government, 2025) and relevant guidance. Consequently, any potential for auditory injury associated with UXO clearance is expected to remain highly localised and temporary.
- 5.5.1.13 Given the limited spatial and temporal extent of potential auditory injury associated with UXO clearance, together with the implementation of mitigation measures, effects from the MHPGC Project are not expected to interact with those of other plans or projects in a manner that could affect the population or distribution of the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.1.14 It is concluded that auditory injury from underwater sound produced by UXO clearance will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by UXO clearance – Pre-Construction phase)

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.15 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance to the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC from underwater sound produced by UXO clearance during the construction phase of the MHPGC Project. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:
- The populations of each qualifying species;
 - The distribution of qualifying species within the site.
- 5.5.1.16 The MHPGC Project has committed to avoidance of UXO hazards where practicable and appropriate. Where avoidance is not possible, removal techniques will be considered prior to detonation. Where detonation is required, low-order techniques, such as deflagration, will be the preferred method where practicable and appropriate. Where low-order clearance is not practicable, relocation will be considered and, where no alternative exists, high-order clearance may be required (CoT58) (see **Table 5.8**). Any high-order UXO clearance would be subject to a standalone Marine Licence application(s) (see **Section 5.4.3**).
- 5.5.1.17 In the absence of defined behavioural disturbance thresholds for UXO detonations, TTS-onset thresholds are used as a precautionary proxy to indicate the potential spatial extent over which behavioural disturbance could occur. These are presented alongside EDR-based estimates, which provide a precautionary indication of the number of marine mammals that may occur within the area of potential behavioural disturbance associated with a single UXO clearance event. However, the presence of individuals within an EDR or TTS-onset range does not imply that all animals would exhibit a behavioural response, nor that any such response would result in biologically significant effects.
- 5.5.1.18 For low order UXO clearance, the 5km EDR indicates that up to 33 grey seals could potentially be exposed within the area where disturbance could occur. The 5km EDR represents a precautionary estimate of the spatial extent within which behavioural disturbance could potentially occur (JNCC, 2025a). The Berwickshire and North Northumberland Coast SAC is located approximately 25.6km from the MHPGC Project PEIR Red Line Boundary at its closest point and is therefore outside of the 5km EDR. However, grey seals associated with the SAC are known to undertake movements into offshore waters within the MHPGC Project PEIR Red Line Boundary (see **Figure 5.2**).
- 5.5.1.19 The maximum number of grey seals estimated to occur within the EDR represents approximately 0.14% of the combined Southwest Scotland and Northeast England SMU population of 24,418 individuals (SCOS, 2025), providing context for the scale of potential exposure within the wider area. This value does not provide an estimate of the proportion of the Berwickshire and North Northumberland Coast SAC population that may be affected, as the modelled footprint extends outside the SAC and a robust apportionment of the SMU population to the SAC is not available.
- 5.5.1.20 Larger EDRs associated with high order UXO clearance, such as the 20km EDR recommended by JNCC (2025a) for weights up to 263kg without noise mitigation, result in a greater potential number of grey seals occurring within the disturbance footprint. However, high order UXO detonation does not form part of the MHPGC Project DCO application or associated Scottish Marine Licence application(s). Any requirement for high order clearance would be subject to a separate Marine Licence application and project-specific assessment, and is therefore not relied upon in determining the potential for an AEoI from the MHPGC Project as applied for.
- 5.5.1.21 When the precautionary TTS-onset ranges are considered as an indication of potential elevated sound exposure, the estimated area within which behavioural responses could potentially occur

increases. For grey seals, the maximum predicted TTS-onset range for the assessed low order UXO clearance scenario (4x0.75kg) is 110m based on SPL_{pk} , increasing to 7,900m based on SEL_{ss} criterion. The maximum TTS-onset range also does not overlap the SAC.

- 5.5.1.22 Based on the maximum SEL_{ss} -based range, up to 83 grey seals could potentially occur within the TTS-onset impact area during low order UXO clearance, equivalent to approximately 0.34% of the combined Southwest Scotland and Northeast England SMU populations (SCOS, 2025). As with the EDR, this provides context for the scale of potential exposure within the wider area rather than an estimate of the proportion of the Berwickshire and North Northumberland Coast SAC population affected.
- 5.5.1.23 These estimates represent the maximum potential extent of sound exposure and should not be interpreted as indicating that all individuals within this area would respond behaviourally, or that any observed behavioural response would be biologically significant. In particular, the precautionary TTS-onset range is not a behavioural disturbance threshold. The actual response of grey seals would be expected to vary depending on factors including the characteristics of the sound source, received sound level, distance from the source, behavioural state and previous exposure. The temporary and intermittent nature of UXO clearance events also limits the duration over which any individual could be exposed.
- 5.5.1.24 In addition, JNCC guidance (2020) considers that UXO detonation is not expected to result in widespread or prolonged displacement of marine mammals. Any behavioural responses associated with an individual UXO clearance event are therefore expected to be short-term and reversible and, given the localised nature of the disturbance footprint, are not expected to prevent grey seals from moving between the SAC and surrounding foraging areas or result in sustained displacement from the site.
- 5.5.1.25 Where UXO clearance is required, it will be undertaken in accordance with the MHPGC Project MMMP (CoT36) and relevant JNCC (2025b) guidance (see **Section 5.4.3** and **Table 5.8**), these measures include pre-clearance observation searches and monitoring by suitably qualified MMObs. These measures are intended to reduce the likelihood of marine mammals being present within the immediate area of highest sound exposure at the time of clearance and therefore reduce the potential for both auditory injury and behavioural disturbance.
- 5.5.1.26 Overall, the temporary and localised nature of the potential disturbance, together with the relatively small proportion of the wider SMUs population potentially exposed, means that behavioural responses arising from underwater sound produced by UXO clearance are not expected to affect the population or distribution of the grey seals qualifying feature of the Berwickshire and North Northumberland Coast SAC. In particular, no sustained displacement or a change in the use of the site by grey seals is anticipated. The potential for disturbance to affect the population or distribution of the qualifying feature is therefore considered limited.

Additional Mitigation

- 5.5.1.27 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) (see **Table 5.8**) have been identified in relation to the effects of underwater sound associated with low order UXO clearance during the pre-construction phases to marine mammal qualifying features.

Conclusion

- 5.5.1.28 It is concluded that behavioural disturbance from underwater sound produced by UXO clearance activities will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature/s from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.29 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on the grey seal qualifying feature from behavioural disturbance associated with underwater sound produced

by UXO clearance alongside other plans and projects has been considered. Grey seals associated with the Berwickshire and North Northumberland Coast SAC are known to move into offshore waters within the MHPGC Project PEIR Red Line Boundary and surrounding area, and therefore may be exposed to temporary underwater sound from UXO clearance activities from the MHPGC Project and other plans and projects undertaking similar activities.

- 5.5.1.30 In accordance with the UK Joint Position Statement on UXO clearance (UK Government, 2025), low-noise methods should be the default method of UXO clearance, with high order clearance only considered where low-noise methods cannot be undertaken. The MHPGC Project has committed to the use of low-order clearance techniques where practicable and appropriate (CoT58) (see **Table 5.8**), and it is therefore anticipated that UXO clearance associated with other projects would similarly follow the Joint Position Statement (UK Government, 2025) and relevant guidelines to reduce the potential for injury (JNCC, 2025b). The resulting disturbance footprints would therefore be smaller than those associated with high order detonation (20km EDR; JNCC, 2025a).
- 5.5.1.31 Given the temporary and intermittent nature of UXO clearance, together with the precautionary basis of the disturbance assessment and the absence of evidence for widespread or prolonged displacement of marine mammals from UXO detonation (JNCC, 2020), means that cumulative disturbance is not expected to result in sustained displacement or a change in the distribution or use of the SAC by grey seals.
- 5.5.1.32 The potential for in-combination disturbance from underwater sound is also reduced by the mitigation measures expected to be applied to the activities represented within the assessment. Other projects and plans would be expected to implement appropriate measures to reduce the potential for behavioural disturbance from underwater sound, in accordance with relevant guidance and project-specific mitigation commitments (noting that these measures will be primarily to prevent injury but in turn will also aid in reducing disturbance). These may include measures associated with piling, UXO clearance and geophysical survey activities, as applicable, such as noise abatement, pre-activity marine mammal monitoring and soft-start procedures where relevant. The application of such measures, together with the temporary and intermittent nature of the activities, would reduce the potential for prolonged exposure to elevated underwater sound levels and associated behavioural responses.
- 5.5.1.33 On this basis, although the MHPGC Project has the potential to contribute to in-combination disturbance from underwater sound during construction, the scale and precautionary nature of the cumulative disturbance assessment, the relatively small contribution of the MHPGC Project and the temporary nature of the predicted disturbance indicate that it is not expected to affect the population or distribution of the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC. No in-combination effect is identified and no further assessment is considered necessary.

Conclusion

- 5.5.1.34 It is concluded that behavioural disturbance from underwater sound produced by UXO clearance will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

Changes to prey availability – Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Grey seal

Assessment

- 5.5.1.35 This section assesses the potential for the MHPGC Project, alone, to indirectly affect the grey seal qualifying feature of the Berwickshire and North Northumberland Coast SAC through changes in prey availability during all phases of development of the MHPGC Project. The assessment is undertaken with reference to the overarching CO to ensure that the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintained or restoring:

- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of each qualifying species;
- The distribution of qualifying species within the site.

- 5.5.1.36 Grey seals have a varied diet and are capable of exploiting a range of demersal and pelagic fish species (see **Table 5.6**). Key prey species include gadoids (e.g. whiting, pollock, saithe and haddock), mackerel, salmonids, flatfish and herring (Hammond and Wilson, 2016; Langley *et al.*, 2026). This dietary flexibility means that grey seals are not reliant on a single prey species or localised prey resource.
- 5.5.1.37 **Volume 2, Chapter 4 Fish and Shellfish Ecology, of the PEIR**, concludes that effects on fish and shellfish receptors arising from activities across construction, O&M and decommissioning are expected to be negligible. Seabed-disturbing activities are not expected to result in significant effects on demersal spawning species, while mobile pelagic species are capable of avoiding any temporary and localised disturbance. Any changes in fish distribution or availability are predicted to be limited in both spatial extent and duration. Although there is potential for indirect effects on prey species during construction, O&M, and decommissioning, these species are highly mobile and able to avoid disturbed areas. Any mortality or injury to prey species is expected to be limited and localised, with no potential to result in population-level effects on prey and therefore on grey seals.
- 5.5.1.38 Given the limited and localised nature of predicted effects on prey species, together with the wide-ranging and flexible foraging behaviour of grey seals, the MHPGC Project is not expected to result in reduction in prey availability at a scale that could affect grey seal survival or reproduction. Any temporary changes in the distribution or availability of prey within the MHPGC Project PEIR Red Line Boundary would not be expected to prevent grey seals associated with the Berwickshire and North Northumberland Coast SAC from accessing alternative foraging habitat or prey resources.
- 5.5.1.39 Therefore, indirect effects arising from changes in prey availability are not expected to affect the population of grey seals associated with the Berwickshire and North Northumberland Coast SAC or result in a sustained change in their distribution or use of the site. The limited scale of any effects on prey species is also not expected to affect the supporting processes on which that habitats of the grey seal qualifying feature rely in a manner that would undermine the integrity of the site or its contribution to achieving the Favourable Conservation Status of grey seal.

Additional Mitigation

- 5.5.1.40 At this stage, no additional mitigation measures or monitoring requirements, beyond those outlined in **Section 5.4.3** have been identified in relation to changes to prey availability to marine mammal qualifying features during all phases of the MHPGC Project.

Conclusion

- 5.5.1.41 It is concluded that changes to prey availability during construction, O&M and decommissioning phases will not result in an AEoI on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Grey seal

Assessment

- 5.5.1.42 As for the MHPGC Project Stage 2 AA alone, the potential for in-combination effects on the grey seal qualifying feature arising from indirect effects on prey alongside other plans and projects has been considered.
- 5.5.1.43 The MHPGC Project is not expected to result in changes to fish and shellfish populations or prey availability at a scale that could affect grey seals associated with the Berwickshire and North Northumberland Coast SAC. Effects arising from other plans and projects are similarly expected to be spatially and temporally limited, with mobile prey species able to avoid temporary areas of

disturbance. Consequently, there is no realistic potential for changes in prey availability arising from the MHPGC Project to combine with those of other plans and projects in a manner that could affect the availability of prey or supporting processes relevant to the grey seal qualifying feature.

- 5.5.1.44 On this basis, in-combination effects on prey are not expected to result in a change in prey availability or supporting processes at a scale, duration or intensity capable of affecting the population or distribution of grey seals associated with the Berwickshire and North Northumberland Coast SAC. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.1.45 It is concluded that the indirect effects to prey will not result in an AEol on the Berwickshire and North Northumberland Coast SAC, in view of the site's COs with respect to the grey seal qualifying feature from the MHPGC Project in-combination with other plans or projects.

5.5.2 Moray Firth SAC

Site description

- 5.5.2.1 The Moray Firth SAC is located 168.8km in a straight line from the MHPGC Project PEIR Red Line Boundary, and approximately 356km by coastal distance (see **Figure 5.1**). The SAC is located entirely in Scottish waters, covers approximately 1,512.7km² and is designated for bottlenose dolphin and subtidal sandbanks. The SAC encompasses the Moray, Cromarty, and Dornoch Firths and supports one of the two resident bottlenose dolphin populations in the UK (NatureScot, 2025b).

Marine mammal qualifying features

- 5.5.2.2 The qualifying feature of this site considered further in this Stage 2 AA is bottlenose dolphin. The Moray Firth SAC supports the only year-round population of bottlenose dolphin in the North Sea, with individuals demonstrating high site fidelity to the Moray Firth while also undertaking wider movements along the east coast of Scotland (Cheney *et al.*, 2013; Robinson *et al.*, 2017; Cheney *et al.*, 2018; Fernandez-Betelu *et al.*, 2019).
- 5.5.2.3 The distribution of bottlenose dolphin associated with the Moray Firth population extends beyond the SAC, with individuals recorded along the east coast of Scotland and into northeast England, including as far south as Withernsea (Hackett, 2022; Sea Watch Foundation, 2022) and the Humber Estuary (MARINELife, 2024). Passive acoustic monitoring has identified inter-annual and seasonal variation in use of the Moray Firth SAC, with greater use of other sites outside of the SAC during summer months and a concurrent increase in the number of individuals occurring in the Firth of Tay and areas to the south (Cheney *et al.*, 2024).
- 5.5.2.4 This wider distribution is particularly relevant to the assessment of potential effects outside the SAC. NatureScot (2025b) considers the population associated with the Moray Firth SAC to be equivalent to the population of the Coastal East Scotland (CES) MU, reflecting evidence from long-term photo-identification studies demonstrating that individuals regularly range beyond the SAC and along the east coast of Scotland, including as far south as Berwickshire.
- 5.5.2.5 The current abundance estimate for the CES MU is 226 individuals (95% CI: 214–239), based on a weighted mean of annual estimates for 2020 to 2022 (NatureScot, 2025b; Cheney *et al.*, 2024). The Moray Firth SAC is used by more than 50% of the CES MU population annually, and the population has remained broadly stable within the SAC over the longer term, while the wider east coast population is showing evidence of an increasing distribution and number of individuals occurring outside the SAC (Cheney *et al.*, 2024; NatureScot, 2025b). The latest IAMMWG (2023) CES MU abundance is 224 individuals representing capture-mark-recapture photo-identification and calculated using a weighted mean of annual estimates for 2015-2019 from Arso *et al.* (2019).
- 5.5.2.6 The MHPGC Project PEIR Red Line Boundary is located approximately 12km west of the CES MU (see **Figure 5.1**). Although the MHPGC Project PEIR Red Line Boundary does not overlap directly with the CES MU boundary, the wider distribution and movements of individuals associated with

the Moray Firth SAC population indicate potential connectivity with the MHPGC Project PEIR Red Line Boundary, particularly in coastal waters. This is consistent with the consideration of the CES MU in the marine mammal assessment presented in **Volume 2, Chapter 5: Marine Mammals, of the PEIR**.

- 5.5.2.7 No bottlenose dolphin were observed during the Morven North and Morven South DAS (APEM, 2025), consistent with surveys undertaken for other offshore wind developments within the region (see **Section 5.3.2**). Similarly, no bottlenose dolphins were reported within the relevant Small Cetaceans in European Atlantic waters and the North Sea (SCANS) survey block (SCANS-IV blocks NS-D and NS-C; Gilles *et al.*, 2023; Ramirez-Martinez *et al.*, 2025), and predicted distribution indicates a year-round absence of individuals in the North Sea, including near the MHPGC Project (Waggitt *et al.*, 2020; Gilles *et al.*, 2025).
- 5.5.2.8 However, these broadscale surveys are primarily representative of offshore waters and are unlikely to fully capture the distribution of the coastal bottlenose dolphin population. Given the wider movements of individuals associated with the Moray Firth SAC and their occurrence along the east coast of Scotland and northeast England, individuals associated with the SAC population have the potential to occur within the vicinity of the MHPGC Project, particularly relevant to the coastal area around the landfall in summer months.

Conservation objectives

- 5.5.2.9 The CO for the Moray Firth SAC as they pertain to bottlenose dolphin are (NatureScot, 2025b):
1. To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 2. To ensure that the integrity of Moray Firth SAC is maintained or restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature:
 - a. The population of bottlenose dolphin are a viable component of the Moray Firth SAC;
 - a. This objective seeks to minimise the risk to bottlenose dolphins from injury or killing posted by activities. It specifically protects the species from significant risk of incidental killing and injury within and out with the site. It should be interpreted to mean impacts that affect bottlenose dolphin such that recovery cannot be expected.
 - b. The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance;
 - a. This objective seeks to ensure that bottlenose dolphin can continue to use and have access to all areas of the site by avoiding significant disturbance. It should be interpreted to mean disturbance that affects the integrity of the site through alteration of the distribution of bottlenose dolphins within the SAC such that recovery cannot be expected or effects can be considered long term.
 - b. It is expected that significant disturbance will lead to more than a transient effect on the disturbance of bottlenose dolphin. It may result in the following effects:
 - i. Contributes to the long-term decline in the use of the site by bottlenose dolphin.
 - ii. Changes to the distribution of bottlenose dolphin on a continuing or sustained basis.
 - iii. Changes to bottlenose dolphin behaviour such that it reduced the ability of the species to survive, breed or rear their young.
 - c. The supporting habitats and processes relevant to bottlenose dolphin and the availability of prey for bottlenose dolphin are maintained.

- a. This objective seeks to maintain sufficient prey resources and supporting habitats and processes to support the distribution and population of bottlenose dolphin associated with the site.
- b. Supporting habitats, in this context, means the characteristics of the seabed and water column relevant to their use by bottlenose dolphin. Any consideration of supporting habitat in appraisals should be include the particular habitat requirements of bottlenose dolphin prey species.

Injury from underwater sound produced by offshore export cable installation and O&M activities – Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.10 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury from underwater sound produced by offshore export cable installation and O&M activities to the bottlenose dolphin qualifying feature of the Moray Firth SAC during construction and decommissioning, and offshore export cable remediation and repair activities during O&M. For decommissioning, in the absence of confirmed activities at this stage, the assessment assumes that activities generating underwater sound would be comparable to those assessed for the construction phase. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2a: The population of bottlenose dolphin is a viable component of the site, which includes protection from significant risk of incidental injury or mortality both within and beyond the site.
- 5.5.2.11 While UXO clearance is considered to be the greatest sources of underwater noise resulting from the MHPGC Project, offshore export cable installation activities also generate underwater noise. Offshore export cable installation has the potential to generate underwater sound through a range of activities, including seabed preparation, boulder and debris clearance, offshore export cable burial and cable protection. Activities may involve techniques such as mechanical cutting, jet trenching, ploughing, CFE, sandwave clearance, pre-lay grapnel runs, localised dredging. Trenchless techniques (e.g. HDD or direct pipe) may also be used at landfall. The MDS for offshore export cable installation activities assumes the installation of up to 649.34km of offshore export cable (up to 324.67km per trench, up to two trenches) over a construction period of up to four years (see **Table 5.7**).
- 5.5.2.12 Project-specific underwater sound modelling has been undertaken for representative offshore export cable installation activities, including the CLV, support vessels, dredging and rock cutting, where suitable source data were available (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report of the PEIR**). **Table 5.13** presents the maximum predicted AUD INJ and TTS ranges for each activity relating specifically to HF cetaceans, the FHG which includes bottlenose dolphins. The full range of predicted distances for all modelling scenarios is presented in **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**.

Table 5.13: Predicted distance (m) to AUD INJ and TTS thresholds for representative offshore export cable installation activities related to bottlenose dolphin qualifying feature (HF cetaceans)

FHG	SEL _{cum}									
	Rock cutting		Dredging		Medium support vessel		Small support vessel		CLV	
	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS
HF cetaceans	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

FHG	SEL _{cum}									
	Rock cutting		Dredging		Medium support vessel		Small support vessel		CLV	
	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS	AUD INJ	TTS
SEL (M-weighted): dB re 1 μ Pa ² s										

- 5.5.2.13 The maximum predicted AUD INJ and TTS-onset ranges for bottlenose dolphin are less than 10m for all modelled offshore export cable installation activities relating to the MHPGC Project (see **Table 5.13**). The predicted injury footprint is therefore highly localised relative to the wider area used by bottlenose dolphins associated with the Moray Firth SAC.
- 5.5.2.14 The MHPGC Project PEIR Red Line Boundary does not overlap with the Moray Firth SAC or with the CES MU. However, the offshore and wide-ranging movements of bottlenose dolphins mean that there is potential for individuals associated with the SAC to occur within the MHPGC Project PEIR Red Line Boundary and, consequently, within the predicted injury footprint.
- 5.5.2.15 The frequency characteristics of the activities also provide further context when considering the potential for auditory injury to bottlenose dolphins. The peak auditory sensitivity range of bottlenose dolphin extends from approximately 8.8kHz to 110kHz (Southall *et al.*, 2019), which is outside the frequency range associated with non-piling activities such as offshore export cable laying, that are considered to be below 1kHz according to guidance from the MMO (2015). Scientific evidence suggests such a minor hearing loss is unlikely to affect an individual's fitness or reproductive success, in either adults or calves (Kastelein *et al.*, 2017; Booth *et al.*, 2019). Therefore, the likelihood of these low-frequency noises causing auditory injury is considered to be minimal.
- 5.5.2.16 The potential for AUD INJ is further limited by the mobile nature of both the survey and construction vessels and marine mammals. For an individual bottlenose dolphin to experience sound exposure sufficient to reach PTS onset, it would need to remain within the predicted injury footprint for sufficient duration to accumulate the required exposure, rather than moving away from the active sound source. The temporary and mobile nature of the activities, together with the highly localised injury ranges, means that the potential for such prolonged exposure is considered highly limited. Vessel activity may also result in temporary avoidance of the immediate area, further reducing the potential for an individual to remain within the injury footprint during sound-generating activities.
- 5.5.2.17 In addition, the MDS assumes up to 33 vessels operating during the construction phase and up to four vessels during offshore export cable remediation and repair activities during O&M (see **Table 5.7**). These vessels would undertake different activities along the offshore MHPGC Project PEIR Red Line Boundary and are not expected to remain concentrated within the same location. Given the very small predicted injury ranges, the potential for an individual bottlenose dolphin to be simultaneously exposed to multiple construction or O&M sound sources at levels capable of causing auditory injury is therefore considered very limited.
- 5.5.2.18 The MHPGC Project will implement the relevant measures for vessel movements through the VTMP (CoT30) (see **Section 5.4.3**), including measures to reduce disturbance and collision risk to marine mammals from transiting vessels. Vessels undertaking offshore export cable installation and O&M activities will generally operate at low speeds while carrying out these activities, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary.
- 5.5.2.19 On this basis, while there is potential for individual bottlenose dolphins to experience AUD INJ under the modelled worst-case exposure conditions, the highly localised nature of the predicted injury ranges, temporary and mobile nature of the activities, and limited potential for prolonged or simultaneous exposure mean that such underwater sound produced by offshore export cable installation and O&M activities are not expected to result in auditory injury at a scale capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC or

prevent recovery. Therefore, AUD INJ is not expected to affect the population or compromise the favourable condition of the qualifying feature in the long term.

Additional Mitigation

- 5.5.2.20 At this stage, no additional mitigation measures or monitoring requirements, beyond those outlined in **Section 6.4.2** have been identified in relation to the effects of underwater sound associated with offshore export cable installation during all phases and O&M activities to marine mammal qualifying features.

Conclusion

- 5.5.2.21 It is concluded that auditory injury from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.22 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on bottlenose dolphin from auditory injury due to underwater sound produced by offshore export cable installation and O&M activities from other projects and plans has been considered. The maximum predicted AUD INJ range for the MHPGC Project is highly localised (less than 10m), and the potential for exposure to bottlenose dolphins to sound levels capable of causing auditory injury (PTS) is considered very limited. The temporary and mobile nature of the activities and the mobility of bottlenose dolphins substantially limit the potential for such exposure.
- 5.5.2.23 On this basis, there is no realistic potential for effects arising from underwater sound from offshore export cable installation and O&M activities associated with the MHPGC Project, in-combination with other plans and projects, could result in an effect of the bottlenose dolphin qualifying feature that would compromise its favourable condition or viability as a component of the site. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.2.24 It is concluded that auditory injury from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by offshore export cable installation and O&M activities – Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.25 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance from underwater sound produced by offshore export cable installation and O&M activities to the bottlenose dolphin qualifying feature of the Moray Firth SAC during all phases. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2b: The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance.
- 5.5.2.26 Project-specific underwater sound modelling has been undertaken to estimate the potential spatial extent of behavioural disturbance associated with representative offshore export cable

installation and O&M activities. The modelled ranges based on the precautionary Level B harassment threshold for continuous sound (120dB re 1µPa SPL_{rms}; NOAA, 2005) extend up to 27km for the CLV, 15km for rock cutting, 10km for dredging, 12km for medium support vessels and 420m for small support vessels (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**).

- 5.5.2.27 The 120dB Level B harassment threshold is a precautionary indicator of the potential spatial extent over which behavioural responses could occur, rather than a definitive threshold for biologically meaningful disturbance. This is particularly relevant in the North Sea, where marine mammals are exposed to existing anthropogenic sound, predominantly from vessel traffic and shipping activity. Farcas *et al.* (2020) found that annual median broadband sound levels measured across the North Sea in 2017 exceeded 120dB SPL_{rms} across large areas, particularly in coastal regions and near ports. The modelled ranges should therefore be interpreted as a conservative indication of the potential extent of additional sound exposure, rather than the area within which biologically meaningful behavioural disturbance would necessarily occur.
- 5.5.2.28 Evidence from offshore export cable installation activities also indicates that the potential for biologically meaningful behavioural responses is limited. BERR and Defra (2008) reviewed the underwater sound associated with a range of offshore export cable installation techniques, including jetting, rock cutting, ploughs, ROVs, and sleds, and concluded that the activities reviewed were very unlikely to generate sound levels capable of triggering behavioural responses in marine mammals. In addition, vessel presence associated with construction activities may contribute to temporary avoidance of an area prior to and during sound-generating activities, as observed for harbour porpoise during offshore windfarm construction (Brandt *et al.*, 2018). Such avoidance is not necessarily indicative of biologically significant disturbance and may reduce the potential for prolonged exposure to elevated underwater sound levels.
- 5.5.2.29 The MHPGC Project PEIR Red Line Boundary does not overlap with the Moray Firth SAC or the CES MU. However, the modelled disturbance ranges for some offshore export cable installation and O&M activities extend into the CES MU. Bottlenose dolphins associated with the Moray Firth SAC are wide-ranging, and the SAC population is considered in the context of the wider CES MU. Therefore, SAC-associated bottlenose dolphins have the potential to occur within the MHPGC Project PEIR Red Line Boundary and the wider disturbance footprints. Consequently, temporary behavioural responses to underwater sound or vessel activity may occur for individuals using waters outside the SAC.
- 5.5.2.30 The MHPGC Project will implement the relevant measures for vessel movements through the VTMP (CoT30) (see **Section 5.4.3**), including measures to reduce disturbance to marine mammal receptors from transiting vessels. This will include adherence to the Scottish Marine Wildlife Watching Code (NatureScot, 2023) and the Marine and Coastal Wildlife Code (Defra, 2023), as relevant to vessel activities (CoT36). Vessels undertaking offshore export cable installation and O&M activities will generally operate at low speeds while carrying out these activities, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary.
- 5.5.2.31 The offshore export cable installation and O&M activities would be temporary and mobile, with vessels progressing along the offshore export cable corridor rather than remaining within a fixed location for prolonged periods. Any behavioural response is therefore expected to be temporary and reversible. Given the precautionary nature of the modelled disturbance ranges, the existing anthropogenic sound environment, the temporary and mobile nature of the activities and the mobility of bottlenose dolphins, disturbance is not expected to result in sustained displacement of bottlenose dolphins associated with the SAC or prevent their continued use of the site.
- 5.5.2.32 Accordingly, although temporary behavioural responses may occur at an individual level, disturbance from underwater sound produced by offshore export cable installation and O&M activities is not expected to occur at a scale, duration or intensity that would result in a sustained change in the distribution of bottlenose dolphins throughout the Moray Firth SAC. It is also not expected to affect the population at a level that would compromise the favourable condition of the qualifying feature or its contribution to Favourable Conservation Status.

Additional Mitigation

5.5.2.33 The MHPGC

- 5.5.2.34 At this stage, no additional mitigation measures or monitoring requirements, beyond those outlined in **Section 6.4.2** have been identified in relation to the effects of underwater sound associated with offshore export cable installation during all phases and O&M activities to marine mammal qualifying features.

Conclusion

- 5.5.2.35 It is concluded that disturbance from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.36 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on bottlenose dolphin qualifying feature from behavioural disturbance associated with underwater sound produced by offshore export cable installation and O&M activities from other projects and plans has been considered. The MHPGC Project has the potential to result in temporary and localised disturbance, with the maximum precautionary disturbance footprint potentially extending up to approximately 27km from the active source. However, the predicted disturbance does not represent a sustained change in the availability or accessibility of habitat and is not expected to affect the viability or distribution of the bottlenose dolphin qualifying feature.
- 5.5.2.37 Given the temporary and localised nature of the predicted disturbance, the mobility of bottlenose dolphins and the availability of suitable habitat throughout the wider Moray Firth, CES MU and North Sea, effects from other plans and projects are not expected to interact with those of the MHPGC Project in a manner that could affect the viability of the bottlenose dolphin population associated with the Moray Firth SAC (CO 2a) or result in a sustained change in its distribution throughout the site (CO 2b). No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.2.38 It is concluded that disturbance from underwater sound produced by offshore export cable installation and O&M activities will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

Injury from underwater sound produced by site investigation surveys – Pre-Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.39 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury from underwater sound produced by site investigation surveys to the bottlenose dolphin qualifying feature of the Moray Firth SAC during all phases of development. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2a: The population of bottlenose dolphin is a viable component of the site, which includes protection from significant risk of incidental injury or mortality both within and beyond the site.

- 5.5.2.40 The MDS for pre-construction site investigation surveys is based on the use of representative geophysical and geotechnical survey equipment characterised by the highest source levels and the greatest degree of overlap with marine mammal hearing ranges during a pre-construction period of up to two years (see **Table 5.7**). The MDS for O&M assumes that up to five geophysical surveys may be undertaken annually throughout the 35-year operational life of the MHPGC Project, incorporating the use of SSS, MBES, SBP and MAG and/or gradiometer equipment (see **Table 5.7**). As such, the potential for underwater sound effects associated with O&M site investigation surveys is principally linked to the use of SBP equipment, the effects of which are already represented within the pre-construction survey assessment. In the absence of confirmed survey requirements for decommissioning, the potential effects arising during the decommissioning phase are assumed to be similar to those assessed for pre-construction survey activities.
- 5.5.2.41 The potential for AUD INJ from site investigation surveys depends on the type of equipment used, the characteristics of the sound source and hearing sensitivity of the receptors. Geophysical and geotechnical activities include both impulsive (e.g. UHRS and seismic CPT) and continuous (e.g. SBES, SBP, VC) sound sources. MHPGC Project-specific underwater sound modelling has been undertaken for representative geophysical and geotechnical survey activities, including SBES, SBP (chirp), high-frequency SBP, UHRS, USBL, VC and seismic CPT (see **Volume 2, Annex 5.1. Underwater Sound Modelling Report, of the PEIR**). MBES and SSS have not been considered as they operate at frequencies outside the hearing range of bottlenose dolphin (HF cetaceans; Crocker and Fratantonio, 2016, Crocker *et al.*, 2019; Hartley Anderson Ltd, 2020), while MAG and gradiometer equipment does not generate underwater sound at levels requiring assessment for marine mammals.
- 5.5.2.42 The predicted AUD INJ ranges for HF cetaceans, which includes bottlenose dolphins, are less than 10m for all modelled site investigation activities, based on both the relevant SPL_{pk} and SEL_{cum} criteria for impulsive sound sources and SEL_{cum} for continuous sound sources (see **Table 5.14**). The potential for auditory injury is therefore restricted to the immediate vicinity of the active sound source.

Table 5.14: Predicted distance (m) to the AUD INJ (PTS) thresholds for geophysical and geotechnical survey activities for bottlenose dolphins (HF cetaceans)

FHG	Continuous sources (SEL_{cum})				Impulsive sources					
	SBES	SBP (chirp)	High frequency SBP	VC	USBL		UHRS		Seismic CPT	
					SPL_{pk}	SEL_{cum}	SPL_{pk}	SEL_{cum}	SPL_{pk}	SEL_{cum}
HF cetaceans	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Note: For impulsive sound sources (USBL, UHRS and seismic CPT), AUD INJ thresholds are assessed against both SPL_{pk} (dB re 1 μ Pa) and SEL_{cum} (dB re 1 μ Pa²s) criteria. Continuous sound sources are assessed using SEL_{cum} only.

- 5.5.2.43 The predicted TTS-onset ranges are similarly high localised, with the maximum predicted range being 10m for VC based on the SEL_{cum} criterion (see **Table 1.1**).

Table 1.1: Predicted distance (m) to the TTS thresholds for geophysical and geotechnical survey activities for bottlenose dolphins (HF cetaceans)

Functional hearing Group	Continuous sources (SEL_{cum})				Impulsive sources		
	SBES			VC	USBL	UHRS	Seismic CPT

		SBP (chirp)	High frequency SBP		SPL _{pk}	SEL _{cum}	SPL _{pk}	SEL _{cum}	SPL _{pk}	SEL _{cum}
HF cetaceans	<10	<10	<10	10	<10	<10	<10	<10	<10	<10

Note: For impulsive sound sources (USBL, UHRS and seismic CPT), TTS thresholds are assessed against both SPL_{pk} (dB re 1 µPa) and SEL_{cum} (dB re 1 µPa²s) criteria. Continuous sound sources are assessed using SEL_{cum} only.

- 5.5.2.44 The predicted AUD INJ ranges relating to HF cetaceans are therefore limited spatially, and exposure is expected to be temporary due to the mobile nature of the survey activities. For an individual dolphin to experience sound exposure sufficient to result in auditory injury, it would need to remain within the very small predicted injury footprint for sufficient duration to accumulate the exposure required to reach PTS onset, rather than moving away from the active sound source. The temporary nature of individual survey activities and the mobility of bottlenose dolphins therefore substantially limit the potential for prolonged exposure to sound levels capable of causing auditory injury.
- 5.5.2.45 Survey vessel activity may provide an additional factor limiting exposure, as marine mammals may temporarily avoid areas in response to vessel presence and active survey equipment. Evidence from high-resolution geophysical surveys indicates that the potential for injury is generally low where exposure is limited spatially and temporally (Ruppel *et al.*, 2022), while avoidance of survey vessels and active sound sources may further reduce the likelihood of prolonged exposure (Benhemma-Le Gall *et al.*, 2023). These factors provide additional confidence that an individual bottlenose dolphin would be unlikely to remain within the predicted injury footprint for sufficient duration to accumulate exposure to AUD INJ levels.
- 5.5.2.46 Although the MHPGC Project PEIR Red Line Boundary does not overlap with the Moray Firth SAC or CES MU, bottlenose dolphins associated with the SAC are known to undertake wide-ranging movements and may therefore occur within the MHPGC Project PEIR Red Line Boundary. Nevertheless, given the very small predicted injury ranges, temporary nature of the activities and factors limiting prolonged exposure, auditory injury is not expected to occur at a scale capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC.
- 5.5.2.47 The MHPGC Project will implement the relevant mitigation measures for site investigation activities through the MMMP (CoT36) (see (see **Section 5.4.3** and **Table 5.8**), including MMOb searches and soft-start procedures where the survey equipment has that facility. These measures are primarily intended to minimise the potential for auditory injury by reducing the likelihood of marine mammals being within the immediate vicinity of active survey equipment. The relevant measures for vessel movements secured through the VTMP (CoT30) (see **Section 5.4.3**) will also apply during site investigation activities. Vessels undertaking site investigation activities would generally operate at low speeds, providing greater opportunity for marine mammals to be detected and for appropriate avoidance measures to be implemented where necessary, thereby reducing the likelihood of marine mammals being in close proximity to active survey equipment.
- 5.5.2.48 Any future geophysical surveys involving sound-generating equipment will be undertaken in accordance with the relevant regulatory requirements and applicable JNCC guidance in place at the time of the survey, including any appropriate marine mammal mitigation and monitoring measures (see **Section 5.4.3**). The specific mitigation requirements will be confirmed when the survey parameters, equipment and timing are known and, where relevant, implemented into the Detailed Offshore Operations and Maintenance Plan (CoT07) produced prior to entering the O&M phase (see **Table 4.8**).
- 5.5.2.49 On this basis, underwater sound produced by site investigation surveys is not expected to result in auditory injury at a scale, duration or intensity capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC or otherwise compromise the favourable condition of the qualifying feature in the long term.

Additional Mitigation

- 5.5.2.50 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) and VTMP (CoT30), have been identified in relation to the effects of underwater sound associated with site investigation activities to marine mammal qualifying features during all phases of the MHPGC Project.

Conclusion

- 5.5.2.51 It is concluded that auditory injury from underwater sound produced by site investigation surveys during the construction, O&M and decommissioning phases will not result in an AEol on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.52 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on the bottlenose dolphin qualifying feature from auditory injury associated with underwater sound produced by site investigation surveys alongside other plans and projects has been considered. The predicted auditory injury ranges for the MHPGC Project are highly localised, with all predicted AUD INJ ranges for representative geophysical and geotechnical survey activities extending less than 10m from the sound source.
- 5.5.2.53 Given the highly localised nature of the predicted injury ranges, there is limited potential for auditory injury from site investigation surveys associated with the MHPGC Project to overlap spatially and temporally with injury effects from other plans and projects. Where other projects undertake site investigation surveys, appropriate mitigation would also be expected to be applied in accordance with relevant guidance and project-specific commitments, where applicable. Such measures may include the use of MMObs and soft-start procedures where the survey equipment has that facility, further reducing the likelihood of marine mammals being present within the immediate vicinity of active sound sources.
- 5.5.2.54 On this basis, in-combination site investigation survey activities are not expected to result in effects that could affect the viability or compromise the Favourable Conservation Status of the bottlenose dolphin population associated with the Moray Firth SAC. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.2.55 It is concluded that auditory injury from underwater sound produced by site investigation surveys will not result in an AEol on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by site investigation surveys – Pre-Construction, O&M, Decommissioning

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.56 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance from underwater sound produced by site investigation surveys to the bottlenose dolphin qualifying feature of the Moray Firth SAC during all phases of development. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2b: The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance.

- 5.5.2.57 Behavioural disturbance is considered the most likely effect pathway associated with site investigation surveys. Responses to survey activities are expected to vary depending on the species, behavioural state, previous exposure and the characteristics of the sound source (Stone, 2003; Southall *et al.*, 2007). Available evidence indicates that responses to geophysical survey activities are generally characterised by localised avoidance or short-term changes in behaviour, with animals typically returning following cessation of survey activities (Thompson *et al.*, 2013; Kavanagh *et al.*, 2019).
- 5.5.2.58 Project-specific underwater sound modelling has been undertaken for representative geophysical and geotechnical survey activities, including SBES, SBP (chirp), high-frequency SBP, UHRS, USBL, VC and seismic CPT (see **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**). In the absence of confirmed decommissioning survey requirements, the potential effects during decommissioning are assumed to be comparable to those assessed for pre-construction surveys.
- 5.5.2.59 The predicted behavioural disturbance ranges vary depending on the characteristics of the sound source. The greatest predicted ranges are associated with continuous sources, with high-frequency SBP resulting in the largest potential disturbance footprint of up to 16km, followed by VC (13km) and chirp SBP (12km). Predicted disturbance ranges associated with SBES are smaller (up to 2.6km), while impulsive sources (USBL, UHRS and seismic CPT) are limited to the immediate vicinity of the source (<10m).
- 5.5.2.60 The continuous sound Level B threshold of 120dB re 1 μ Pa SPL_{rms} (NOAA, 2005) for SBES, SBP (chirp), HF SBP and VC, as well as the impulsive sound threshold of 160dB re 1 μ Pa SPL_{rms} for USBL, UHRS and seismic CPT, were used to indicate the potential spatial extent of behavioural responses. These thresholds should be interpreted with caution, as they represent precautionary indicators of the potential spatial extent over which behavioural responses could occur rather than definitive thresholds for biologically meaningful disturbance. The predicted ranges also do not account for differences in species sensitivity, behavioural state, previous exposure or the duration and nature of any response.
- 5.5.2.61 The assessment therefore also considers the updated JNCC (2025a) EDRs, which provide an evidence-based approach to estimate the potential spatial extent of behavioural responses based on available empirical and modelled evidence (Majewska *et al.*, 2025). JNCC (2025a) advises an EDR of 3km for harbour porpoise for SBP and USBL surveys. As harbour porpoise are considered a sensitive receptor to underwater sound, application of this 3km EDR to bottlenose dolphin provides a precautionary basis for considering the potential spatial extent of disturbance to the qualifying feature. The 3km JNCC (2025a) EDR is substantially smaller than the maximum modelled disturbance ranges for the continuous survey sources and therefore provides a more evidence-based basis for identifying the potential for biologically meaningful disturbance.
- 5.5.2.62 The MHPGC Project will implement relevant mitigation measures for site investigation surveys through the MMMP (CoT36) (see **Section 5.4.3** and **Table 5.8**), including MMOB searches and soft-start procedures where the survey equipment has that facility and in accordance with JNCC guidelines for geophysical surveys (e.g. JNCC, 2017). These measures are primarily intended to minimise the potential for auditory injury but will reduce the likelihood of marine mammals being present in close proximity to active survey equipment and therefore provide a secondary benefit in reducing potential disturbance. The MMMP will also commit the MHPGC Project to adhere to the Scottish Marine Wildlife Watching Code (NatureScot, 2023) and the Marine and Coastal Wildlife Code (Defra, 2023), which will further minimise the potential for disturbance to marine mammals during survey activities.
- 5.5.2.63 The MHPGC Project will also implement the relevant measures for vessel movements through the VTMP (CoT30/MM-078) (see **Section 5.4.3**), including measures to reduce disturbance to marine mammal receptors from transiting vessels. These measures will reduce the potential for disturbance associated with the movement and presence of survey vessels.
- 5.5.2.64 Site investigation surveys will be temporary, mobile and spatially constrained along the offshore export cable corridor, with survey vessels progressing along the survey route rather than remaining within a fixed location for prolonged periods. Although behavioural responses may temporarily alter bottlenose dolphin movement or behaviour in response to survey activities, any

such responses are expected to be temporary and reversible. The mobile nature of both the survey activities and bottlenose dolphins further limits the potential for prolonged exposure or sustained displacement, with no measurable consequences for individual survival, reproductive success or population trajectory (Thompson *et al.*, 2013; Hoekendijk *et al.*, 2018; Kavanagh *et al.*, 2019).

- 5.5.2.65 The Moray Firth SAC supports a wide-ranging bottlenose dolphin population, and individuals associated with the SAC are known to undertake movements beyond the site. The MHPGC Project PEIR Red Line Boundary does not overlap with the Moray Firth SAC or the CES MU, with the CES MU located approximately 12km from the closest point of the MHPGC Project PEIR Red Line Boundary. However, the modelled disturbance ranges for some continuous survey sources extend beyond 12km and therefore have the potential to overlap with the CES MU. In contrast, the 3km JNCC (2025a) EDR does not extend to the CES MU. Consequently, temporary avoidance of a localised area affected by survey activity would not prevent individuals from accessing the wider range of habitats available to the population. The temporary and spatially constrained nature of the survey activities is therefore not expected to result in sustained displacement from the SAC or a continuing change in the distribution of bottlenose dolphins throughout the site.
- 5.5.2.66 Accordingly, while temporary behavioural responses may occur at an individual level, disturbance from underwater sound produced by site investigation surveys is not expected to occur at a scale, duration or intensity that would result in significant disturbance to the bottlenose dolphin qualifying feature. In particular, it is not expected to result in a sustained change in the distribution or use of the Moray Firth SAC, affect the viability of the bottlenose dolphin population associated with the site, or otherwise compromise the favourable condition of the qualifying feature.

Additional Mitigation

- 5.5.2.67 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) and VTMP (CoT30), have been identified in relation to the effects of underwater sound associated with site investigation activities to marine mammal qualifying features during all phases of the MHPGC Project.

Conclusion

- 5.5.2.68 It is concluded that behavioural disturbance from underwater sound produced by site investigation survey activities during construction, O&M and decommissioning phases will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.69 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on the bottlenose dolphin qualifying feature as a result of behavioural disturbance from underwater sound produced alongside other plans and projects has been considered. The MHPGC Project has the potential to contribute to temporary disturbance where site investigation activities from other plans and projects overlap spatially and temporally with the MHPGC Project.
- 5.5.2.70 Site investigation surveys are generally temporary and spatially constrained, with the potential spatial extent of disturbance represented by a precautionary 3km EDR (JNCC, 2025b). The potential for prolonged or sustained exposure is further limited by the mobile nature of survey activities and bottlenose dolphins. In addition, other projects and plans would be expected to apply appropriate mitigation measures following appropriate guidelines (JNCC, 2017), where required, in accordance with relevant guidance and project-specific commitments. Such measures may include MMOB searches and soft-start procedures, where applicable, which would further reduce the potential for prolonged exposure to elevated underwater sound levels.
- 5.5.2.71 While temporary behavioural responses may occur where survey activities overlap with areas used by bottlenose dolphins, the spatially constrained and temporary nature of these activities means that any responses are not expected to result in sustained displacement from the Moray

Firth SAC or a continuing change in the distribution of bottlenose dolphins throughout the site. The potential for concurrent or successive site investigation surveys to result in cumulative disturbance at a scale capable of affecting the viability of the bottlenose dolphin population associated with the SAC is therefore considered limited.

- 5.5.2.72 On this basis, behavioural disturbance from underwater sound produced by site investigation surveys, including any contribution from other plans and projects, is not expected to affect the population or distribution of the bottlenose dolphin qualifying feature or otherwise compromise the favourable condition of the qualifying feature in the long term. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.2.73 It is concluded that behavioural disturbance from underwater sound produced by site investigation surveys will not result in an AEol on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

Injury from underwater sound produced by UXO clearance – Pre-Construction phase

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.74 This section assesses the potential for the MHPGC Project, alone, to result in auditory injury from underwater sound produced by UXO clearance to the bottlenose dolphin qualifying feature of the Moray Firth SAC during construction. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2a: The population of bottlenose dolphin is a viable component of the site, which includes protection from significant risk of incidental injury or mortality both within and beyond the site.
- 5.5.2.75 In line with the current UK Joint Position Statement (UK Government, 2025) and supporting JNCC guidance (JNCC, 2025b), low-noise methods of UXO clearance are the default proposed approach where practicable, with high order detonation considered only where low order clearance is not feasible. The MHPGC Project will seek to minimise impacts from UXO clearance through the hierarchy set out in CoT58, whereby UXO hazards will be avoided has committed to avoidance of UXO hazards where practicable and appropriate. Where avoidance is not possible, removal techniques will be considered prior to detonation, and where detonation is required, low-order techniques, such as deflagration, will be the preferred method where practicable and appropriate (see **Section 5.4.3** and **Table 5.8**).
- 5.5.2.76 Based on **Volume 2, Annex 5.1: Underwater Sound Modelling Report, of the PEIR**, the predicted maximum SPL_{pk}-based AUD INJ onset impact range for bottlenose dolphin (HF cetacean FHG) from a high order UXO clearance (697kg) is 230m, while the corresponding maximum SEL_{ss}-based ranges for the same UXO is 680m. The maximum number of bottlenose dolphins predicted to occur within the AUD INJ onset impact area, using either thresholds, is less than one animal, representing <0.01% of the CES MU of 226 individuals (NatureScot, 2025b; Cheney *et al.*, 2024). These results are presented for contextual purposes only, as high order UXO detonation does not form part of the MHPGC Project DCO application or associated Scottish Marine Licence application(s). Should high order detonation be identified as necessary, this would be subject to a separate consent and assessment process, including consideration of EPS licencing requirements, based on the confirmed UXO characteristics, charge size and location. The high order UXO clearance scenario is therefore not relied upon in determining the potential for an AEol from the MHPGC Project as applied for.
- 5.5.2.77 For the MHPGC Project, the predicted maximum SPL_{pk}-based AUD INJ onset impact range for the representative low order UXO clearance (4x0.75 kg) is 30m, while the corresponding maximum SEL_{ss}-based range is 160m. The maximum number of bottlenose dolphins predicted to be within

the AUD INJ onset impact area, using either threshold, is less than one animal (<0.01% of the CES MU population).

- 5.5.2.78 The predicted AUD INJ onset ranges are highly localised and the maximum number of bottlenose dolphins potentially exposed is less than one individual. The UXO clearance activities would be undertaken outside the Moray Firth SAC and CES MU, and there is no potential for the predicted AUD INJ onset ranges to overlap with either designated area. Consequently, any bottlenose dolphins potentially exposed to sound levels capable of causing auditory injury would be individuals occurring outside the SAC and CES MU. Given the small spatial extent and temporary nature of individual clearance events, any potential auditory injury is not expected to occur at a scale, duration or intensity capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC.
- 5.5.2.79 The potential for auditory injury is further reduced by the proposed use of low-order clearance techniques. Robinson *et al.* (2020) demonstrated that low order deflagration can reduce both SPL_{pk} and SEL_{ss} levels by more than 20dB compared with high-order detonation of the same munition. For low order clearance techniques, the radiated acoustic output is determined by the donor charge rather than the explosive content of the UXO itself. The assessment therefore represents a precautionary basis for considering the potential for auditory injury from the proposed clearance approach.
- 5.5.2.80 Further, in accordance with JNCC (2025b) guidance, low order UXO clearance will be undertaken under a MMMP (CoT36) (see **Section 5.4.3** and **Table 5.8**), including a pre-clearance observation searches and monitoring by suitably qualified MMObs. Where applicable, ADDs will also be used to encourage marine mammals to move away from the clearance location prior to the event. These measures will reduce the likelihood of marine mammals being present within the immediate vicinity of a clearance event and therefore further reduce the potential for exposure to sound levels capable of causing auditory injury.
- 5.5.2.81 Consequently, underwater sound produced by UXO clearance is not expected to result in auditory injury at a scale, duration or intensity capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC or CES MU. It is not expected to result in mortality or injury at a level that could affect the population trajectory or compromise the favourable condition of the qualifying feature in the long term.

Additional Mitigation

- 5.5.2.82 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) (see **Table 5.8**) have been identified in relation to the effects of underwater sound associated with low order UXO clearance during the pre-construction phases to marine mammal qualifying features.

Conclusion

- 5.5.2.83 It is concluded that auditory injury from underwater sound produced by UXO clearances during the pre-construction phase will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.84 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on bottlenose dolphin qualifying features from auditory injury due to underwater sound produced by UXO clearance alongside other plans and projects has been considered. The predicted AUD INJ onset ranges for the MHPGC Project are highly localised, with a maximum range of 160m for the proposed low order scenario, and less than one bottlenose dolphin is predicted to occur within the AUD INJ impact area.
- 5.5.2.85 Given the highly localised nature of the predicted injury footprint, the temporary nature of individual UXO clearance events and the proposed use of low order clearance techniques, there is limited potential for the effects of the MHPGC Project to combine with those of other plans and

projects in a manner that could result in auditory injury at a scale capable of affecting the viability of the bottlenose dolphin population associated with the Moray Firth SAC. Other projects and plans would also be expected to implement appropriate measures to reduce the risk of auditory injury, in accordance with relevant guidance and project-specific mitigation commitments, including the use of low order UXO clearance techniques in line with the UK Joint Position Statement (UK Government, 2025) and relevant JNCC (2025a; 2025b) guidelines, where practicable and appropriate.

- 5.5.2.86 On this basis, any potential contribution from UXO clearance by the MHPGC Project to cumulative auditory injury is expected to be highly localised and temporary and is not expected to result in mortality or injury at a level that could affect the population trajectory or compromise the favourable condition of the bottlenose dolphin qualifying feature. No further in-combination assessment is therefore considered necessary for this impact pathway.

Conclusion

- 5.5.2.87 It is concluded that auditory injury from underwater sound produced by UXO clearance will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

Disturbance from underwater sound produced by UXO clearance – Pre-Construction phase

Appropriate Assessment – Alone

Bottlenose dolphin

Assessment

- 5.5.2.88 This section assesses the potential for the MHPGC Project, alone, to result in behavioural disturbance from underwater sound produced by UXO clearance activities to the bottlenose dolphin qualifying feature of the Moray Firth SAC during construction. The assessment is undertaken with reference to the following site COs:
- CO 1: To ensure that the qualifying features of Moray Firth SAC are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status;
 - CO 2b: The distribution of bottlenose dolphin throughout the site is maintained by avoiding significant disturbance.
- 5.5.2.89 The MHPGC Project has committed to avoidance of UXO hazards where practicable and appropriate. Where avoidance is not possible, removal techniques will be considered prior to detonation. Where detonation is required, low-order techniques, such as deflagration, will be the preferred method where practicable and appropriate. Where low-order clearance is not practicable, relocation will be considered and, where no alternative exists, high-order clearance may be required (CoT58). Any high-order UXO clearance would be subject to a standalone Marine Licence application(s) (see **Section 5.4.3** and **Table 5.8**).
- 5.5.2.90 In the absence of established quantitative thresholds for behavioural disturbance from UXO detonation, TTS-onset threshold are presented as a precautionary indicator of the potential spatial extent of elevated sound exposure. In addition, a 5km EDR (JNCC, 2025a) has been applied to low order clearance to provide a precautionary indication of the potential number of marine mammals that could occur within an area where behavioural responses may arise. Occurrence within an EDR does not indicate that all individuals would exhibit a behavioural response, nor that any response would result in biologically significant consequences (JNCC, 2020).
- 5.5.2.91 For low order UXO clearance, application of the 5km EDR predicts that three individuals could potentially occur within the disturbance footprint, equivalent to 0.02% of the CES MU population. The larger EDRs applied to high order UXO clearance (20km; JNCC, 2025a) would result in a greater number of potentially exposed individuals. However, this does not represent an assessment conclusion for the MHPGC Project, as high order UXO detonation does not form part of the MHPGC Project DCO application or Scottish Marine Licence application(s) and would be subject to a separate post-consent Marine Licence application and project-specific assessment, including consideration of EPS licencing, if required.

- 5.5.2.92 The precautionary TTS-onset ranges provide a further precautionary indication of the potential elevated sound exposure. For the representative low order UXO clearance scenario (4x0.75kg), the maximum predicted SPL_{pk}-based TTS-onset range for bottlenose dolphin is 40m, while the corresponding SEL_{ss}-based range is 1,800m. One bottlenose dolphin predicted to potentially occur within the maximum SEL_{ss}-based TTS onset range, equivalent to 0.19% of the CES MU population. These estimates represent potential exposure rather than a prediction of behavioural response or biologically significant disturbance.
- 5.5.2.93 Where UXO clearance is required, it will be undertaken in accordance with the MHPGC Project-specific MMMP (CoT36) and relevant JNCC (2025b) guidance (see **Section 5.4.3** and **Table 5.8**), which include pre-clearance observation searches and monitoring by suitable qualified MMObs. These measures are intended to reduce the likelihood of marine mammals being present within the immediate vicinity of a clearance event and therefore further reduce the potential for exposure to elevated underwater sound levels.
- 5.5.2.94 UXO clearance would comprise discrete, short-duration events rather than continuous sound exposure. JNCC (2020) guidance considers that UXO detonations are unlikely to result in widespread or prolonged displacement of marine mammals. The MHPGC Project UXO clearance activities would take place outside the Moray Firth SAC and CES MU, with the CES MU located approximately 12km from the closest point of the PEIR Red Line Boundary. The 5km EDR and maximum predicted TTS-onset range of 1,800m would therefore not overlap with either the SAC or CES MU. Any bottlenose dolphins potentially exposed to elevated sound levels would consequently be individuals occurring outside the designated areas. The impact is short-term and intermittent in nature with temporary behavioural effects, which are very unlikely to alter survival or reproductive rate to the extent to alter the population trajectory of bottlenose dolphins. Furthermore, impacts are not expected to present themselves at levels which would compromise the distribution or use of the Moray Firth SAC by bottlenose dolphin.
- 5.5.2.95 Given the precautionary basis of the disturbance assessment, the small number of bottlenose dolphins potentially exposed, and the temporary and intermittent nature of individual clearance events, disturbance from UXO clearance is not expected to occur at a scale, duration or intensity capable of affecting the distribution or viability of the bottlenose dolphin qualifying feature of the Moray Firth SAC.

Additional Mitigation

- 5.5.2.96 At this stage, no additional mitigation measures or monitoring requirements, beyond those committed through the MHPGC Project-specific MMMP (CoT36) (see **Table 5.8**) have been identified in relation to the effects of underwater sound associated with low order UXO clearance during the pre-construction phases to marine mammal qualifying features.

Conclusion

- 5.5.2.97 It is concluded that behavioural disturbance from underwater sound produced by UXO clearance during the pre-construction phase will not result in an AEol on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project alone.

Appropriate Assessment In-combination

Bottlenose dolphin

Assessment

- 5.5.2.98 As with the MHPGC Project alone Stage 2 AA, the potential for in-combination effects on the bottlenose dolphin qualifying feature from behavioural disturbance associated with underwater sound produced by UXO clearance, alongside other plans and projects, has been considered. The MHPGC Project has committed to the use of low order UXO clearance techniques where practicable and appropriate, together with pre-clearance marine mammal monitoring and other measures set out within the MMMP (CoT36). Other projects and plans would also be expected to implement appropriate mitigation in accordance with relevant JNCC (2025a) guidelines, the UK Joint Position Statement (UK Government, 2025) and project-specific commitments. The effects

of UXO clearance from other projects would therefore be expected to be similar to those assessed for the MHPGC Project alone.

- 5.5.2.99 In addition, UXO clearance would comprise discrete, short-duration events, with any behavioural response expected to be temporary and unlikely to result in widespread or prolonged displacement of marine mammals (JNCC, 2020). The 5km EDR applied to the proposed low-order clearance does not overlap the Moray Firth SAC or CES MU, and the maximum predicted TTS-onset range of 1,800m also does not extend to either the SAC or CES MU. Given the temporary nature of the impact, the use of low order clearance techniques and embedded mitigation, there is no potential for in-combination behavioural disturbance from UXO clearance to affect the distribution or viability of the bottlenose dolphin qualifying feature of the Moray Firth SAC.
- 5.5.2.100 On this basis, the potential for in-combination behavioural disturbance is not expected to result in effects at a scale, duration or intensity capable of affecting the viability or distribution of the bottlenose dolphin qualifying feature of the Moray Firth SAC.

Conclusion

- 5.5.2.101 It is concluded that behavioural disturbance from underwater sound produced by UXO clearance will not result in an AEoI on the Moray Firth SAC, in view of the site's COs with respect to the bottlenose dolphin qualifying feature from the MHPGC Project in-combination with other plans or projects.

6 Marine Ornithology

6.1 Introduction

- 6.1.1.1 This section presents the HRA for Marine Ornithology receptors, specifically those identified as qualifying features of sites screened into the RIAA.
- 6.1.1.2 Section 6.2 first outlines the outcomes of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report carried out in 2025, considering effects both alone (Section 6.2.2) and in-combination with other plans and projects (Section 6.2.3). Section 6.2.4 then describes how consultation feedback and project design refinements have been incorporated into the screening conclusions, including updates such as the addition of an impact pathway and the removal of a site. An up-to-date summary of LSE taken forward to AA is presented in Section 6.2.5.
- 6.1.1.3 Section 6.3 presents the Marine Ornithology baseline, including the Study Area (Section 6.3.1), survey effort and results (Section 6.3.2), and any constraints and limitations of the available data (Section 6.3.3).
- 6.1.1.4 Section 6.4 sets out the information used to inform the AA, including details and assessment criteria of relevant impact pathways (Section 6.4.1), design parameters (Section 6.4.2), embedded mitigation and project commitments (Section 6.4.3), and the plans and projects considered within the in-combination assessment (Section 6.4.4).
- 6.1.1.5 Section 6.5 presents the AA for the MHPGC Project, both alone and in-combination, and determines whether the Project will result in an AEoI of the screened-in sites, in view of their COs.
- 6.1.1.6 Of note, assessment of impacts to ornithological receptors in the intertidal environment is presented in the Terrestrial and Intertidal Ornithology section of the MHPGC Project RIAA (see Section 7).

6.2 Likely Significant Effect screening outcomes

- 6.2.1.1 This section summarises the European sites designated for marine ornithology features that were identified through the **MHPGC Project Habitat Regulations Assessment/Habitat Regulations Appraisal Screening Report** (carried out in 2025) as having the potential to experience LSE from the MHPGC Project. This section presents updates to screening as a result of consultation and project refinements and defines the scope of the Stage 2 AA..

6.2.2 Screening outcomes for the MHPGC Project alone

- 6.2.2.1 The screening outcomes presented in this section reflect the outcomes of the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** submitted in December 2025. The initial screening outcomes presented below identified both intertidal and marine qualifying features designated to European sites. Updates to the screening for marine ornithology have been presented in Section 6.2.4, with screening updates for intertidal qualifying features presented in Section 7.2.
- 6.2.2.2 The screening process identified European sites that have connectivity to, at the time of writing, the MHPGC Project Interim Boundary. Screening of European sites for Marine Ornithology was informed by advice from NatureScot (e.g. NatureScot, 2023a; NatureScot, 2023b), Natural England (e.g. Natural England, 2012a-d; Natural England, 2021), and the JNCC (JNCC, 2022). Connectivity between breeding and non-breeding qualifying features (both intertidal and marine bird species) from SPAs (and Ramsar sites) and the MHPGC Project was determined through three criteria:
- European sites which overlapped with the MHPGC Project Interim Boundary;
 - Sites within mean max foraging range, based on NatureScot's Guidance Note 3 and 4 (NatureScot, 2023a; NatureScot, 2023b). This determined connectivity between the breeding and non-breeding qualifying features using species-specific foraging ranges for breeding seabirds

- (Woodward et al., 2019). For inshore non-breeding/wintering seabirds, a 15km screening distance was also applied (NatureScot, 2023b);
- Sites within a maximum Zol for Marine Ornithology based on the local tide excursion of 13.5km used at Scoping and Screening stages (as described by the MHPGC Project Scoping Report).
- 6.2.2.3 The use of the NatureScot guidance was agreed by MD-LOT in the Scoping Opinion to screening of offshore and intertidal ornithology sites (MD-LOT, 2025).
- 6.2.2.4 The following impact pathways were identified:
- Disturbance and displacement from noise and visual disturbance associated with the presence of vessels;
 - Indirect impacts from underwater sound affecting prey species ;
 - Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species .
- 6.2.2.5 Further details on the impact pathways and their Zol is provided in the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**. The maximum Zol (as used in December 2025, before MHPGC Project refinement) for the identified impact pathways is 13.5km (based on the local tide excursion). The following European sites designated for Annex I ornithological features are located within this 13.5km Zol of the MHPGC PEIR Red Line Boundary and have thus been screened into HRA Stage 2 AA:
- Northumbria Coast SPA/Ramsar (0.0km from MHPGC Project PEIR Red Line Boundary at the closest point);
 - Teesmouth and Cleveland SPA/Ramsar (4.5km from MHPGC Project PEIR Red Line Boundary at the closest point).
- 6.2.2.6 Other, more distant, European sites and their qualifying Annex I ornithological features were given consideration but were not screened in the HRA Stage 2 AA. The considered qualifying features have extensive foraging ranges (Woodward et al., 2019), with the MHPGC Project representing a small proportion of the habitat available to these species. In addition, these seabirds utilise both the coastal and offshore environment across a wide geographical area and are not reliant exclusively on the MHPGC Project PEIR Red Line Boundary to forage, rest or conduct other activities. As such the impact pathways identified above were considered inconsequential, with no LSE identified for AA. These screening outcomes were agreed with MD-LOT, NatureScot and Natural England as per the Screening Opinion (March 2026) (**Table 4.2**).
- 6.2.2.7 A summary of the European sites and relevant qualifying features for which LSE could not be ruled out at the time of the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** is presented in **Table 6.1**. Although intertidal species are identified to be qualifying features of the screened in European sites, intertidal birds are not considered further within this Marine Ornithology section of the RIAA and are discussed under Terrestrial and Intertidal Ornithology in **Section 7**. Distances from MHPGC Project PEIR Red Line Boundary were calculated as a straight line between the MHPGC Project and the European site.

Table 6.1: Summary of European sites for designated Annex I Marine Ornithology features screened in from the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report

European site	Distance from MHPGC Project PEIR Red Line Boundary at the closest point (km)	Qualifying features	Impact pathways
Northumbria Coast SPA/Ramsar (UK9020325/UK11049)	0.0	Breeding: • Arctic tern (<i>Sterna paradisaea</i>); • Little tern (<i>Sternula albifrons</i>). Non-breeding:	Disturbance and displacement from noise and visual disturbance associated with the presence of vessels;

		- Purple sandpiper (<i>Calidris maritima</i>); - Turnstone (<i>Arenaria interpres</i>).	Indirect impacts from underwater sound affecting prey species; Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species.
Teesmouth and Cleveland Coast SPA/Ramsar (UK9006061 /UK11068)	4.5	Breeding: - Avocet (<i>Recurvirostra avosetta</i>); - Common tern (<i>Sterna hirundo</i>); - Little tern (<i>Sternula albifrons</i>). Non-breeding: - Knot (<i>Calidris canutus</i>); - Redshank (<i>Tringa totanus</i>); - Ruff (<i>Calidris pugnax</i>); - Sandwich tern (<i>Thalasseus sandvicensis</i>); - Waterbird assemblage.	

6.2.3 Screening outcomes for the MHPGC Project in-combination

- 6.2.3.1 The potential for LSE on Marine Ornithology receptors was considered in combination with other plans or projects. Any effect that could not be ruled out for the MHPGC Project alone was also considered for the in-combination screening assessment. If any impact pathway was excluded due to no LSE on the MHPGC Project alone, it still required consideration for in-combination with other plans or projects. Where an impact had been assessed alone as resulting in a negligible or inconsequential effect, it was also considered to not contribute in a material way to any in-combination effects and therefore was screened out for in-combination effects.

6.2.4 Screening outcome updates following consultation and project refinement

- 6.2.4.1 It should be noted that initial screening for marine ornithology assessment included the identification of intertidal qualifying features designated at European sites. The updated screening outcomes presented below only refer to marine ornithology. For intertidal ornithology, see **Section 7**.
- 6.2.4.2 With regards to Marine Ornithology the following updates have been made to the Screening outcomes as a result of consultation feedback and refinements to the MHPGC Project, as summarised in **Section 4**:
- In response to NatureScot Advice on the EIA Scoping Report, foraging ranges within the Guidance Note 3 (NatureScot, 2023a) and screening guidance of non-breeding birds within Guidance Note 4 (NatureScot, 2023a) were used to consider European Sites for screening. This is reflected with the inclusion of initially omitted SPAs presented within the updated screening assessment below **Table 6.2**.
 - In response to MD-LOT Screening Opinion (06 March 2026) (MD-LOT, 2026), the omitted qualifying features/SPAs that MD-LOT have identified are considered within the updated screening assessment within **Table 6.2**. However, the conclusion remains (as agreed by MD-LOT and NatureScot in Screening Opinion (March 2026)) no further Annex I Marine Ornithology SPAs are to be considered in the RIAA for MHPGC Project alone.
 - In response to Natural England Discretionary Advice Service (09 January 2026), visual disturbance to features of the Northumbria Coast SPA and Ramsar Site are screened in for further assessment.
 - In response to Natural England Discretionary Advice Service (09 January 2026), permanent/temporary habitat loss to the Northumbria Coast SPA and Ramsar site should be screened in for further assessment.

- In response to Natural England Discretionary Advice Service (09 January 2026) and MD-LOT Screening Opinion (March 2026) (MD-LOT, 2026), the baseline description of the Teesmouth and Cleveland Coast SPA has been updated to reflect the most recent available information.

6.2.4.3 The MHPGC Project has also been refined since the **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**, was published and the MHPGC Project PEIR Red Line Boundary has been reduced in extent but remains entirely within the MHPGC Project Interim Boundary presented at the 2025 screening stage. The MHPGC Project PEIR Red Line Boundary is being considered in the Screening and Stage 2 Assessment. In addition, the tidal excursion buffer has also been refined since Scoping and Screening, with the maximum tidal excursion distance reduced from 13.5km to 9km, based on the updated modelling presented in **Volume 2, Chapter 1: Physical Processes, of the PEIR**. For Marine Ornithology, this has not resulted in any changes to the European sites screened into the assessment.

6.2.4.4 The updated Marine Ornithology Screening outcomes are presented in **Table 6.3**.

6.2.5 Summary of Likely Significant Effects taken forward to Appropriate Assessment

6.2.5.1 A summary of the European sites and relevant qualifying marine ornithological features for which LSE have been identified through screening and consideration of consultation responses is provided below. Therefore, **Table 6.2** includes all sites, features, and impact pathways screened in for consideration within the AA. The locations of the European sites taken forward to AA are shown in **Figure 6.1**.

Table 6.2 Updated screening for LSE of omitted (further than 50km from the MHPGC Red-Line Boundary) qualifying features/SPAs from MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report (as informed by MD-LOT Screening Opinion)

Species	Foraging distance (km)*	European site	Distance from the MHPGC Project Red-Line Boundary at the closest point (km)	Justification	Screened in
Razorbill (<i>Alca torda</i>)	122.2	Fowlsheugh SPA (UK9002271)	59.0	The MHPGC Project occurs within the foraging range for razorbill and as such, individuals associated with the European sites listed may have connectivity to the MHPGC Project. Despite their foraging range, razorbill primarily feed within a few kilometres of their colony (Natural England, 2012h), with mean foraging distances of 13km reported (Isaksson <i>et al.</i>, 2019). Therefore, although individuals may forage in proximity to the MHPGC Project, it is unlikely that a significant proportion of the population associated with these European sites will utilise the area. Furthermore, their foraging range allows the species access to alternative suitable foraging habitat beyond the MHPGC Project maximum Zol of 9km (based on tidal excursion). Overall, there is no potential for LSE on the razorbill qualifying feature of the listed European sites. Therefore razorbill associated with the listed European sites have been screened out from further assessment.	No
		Forth Islands SPA (UK9004171)	92.6		
		St Abbs Head to Fast Castle SPA (UK9004271)	71.4		
Northern gannet (<i>Morus bassanus</i>)	509.4	Outer Firth of Forth and St. Andrews Bay Complex SPA (UK9020316)	44.3	The MHPGC Project occurs within the foraging range for northern gannet and as such, individuals associated with the European sites listed may have connectivity to the MHPGC Project However, the MHPGC Project maximum Zol is 9km (based on tidal excursion), which represents only a small proportion of the species' extensive foraging range (Woodward <i>et al.</i>, 2019). Northern gannet utilise both coastal and offshore environment to forage, rest, and conduct other key life history activities. Therefore, alternative suitable foraging habitat is available to the species beyond the MHPGC Project maximum Zol. Overall, there is considered to be no potential for LSE on the northern gannet qualifying feature of the listed European sites. Therefore northern gannet	No
		Fair Isle SPA (UK9002091)	288.7		

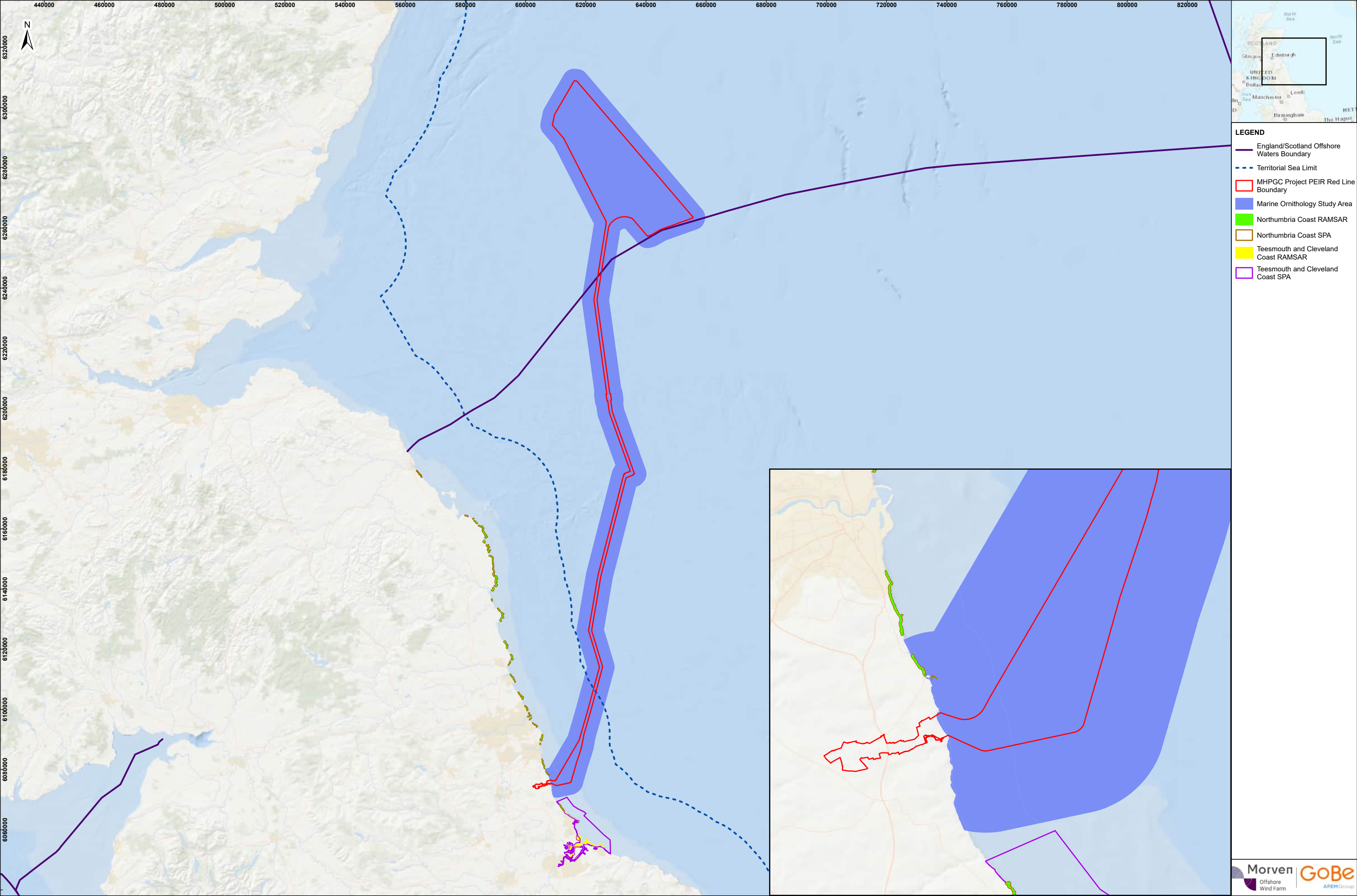
Species	Foraging distance (km)*	European site	Distance from the MHPGC Project Red-Line Boundary at the closest point (km)	Justification	Screened in
		Hermaness, Saxa Vord and Valla Field SPA (UK9002011)	424.5	associated with the listed European sites have been screened out from further assessment.	
		Noss SPA (UK9002081)	357.0		
Leach's Storm Petrel (<i>Hydrobaetes leucorho us</i>)	657.0	Foula SPA (UK9002061)	358.4	The MHPGC Project occurs within the foraging range of Leach's storm petrel and as such, individuals associated with the European sites listed may have connectivity to the MHPGC Project. However, the MHPGC Project maximum ZOI is 9km (based on tidal excursion), which represents only a small proportion of the species extensive foraging range (Woodward <i>et al.</i>, 2019). In addition, the species' large foraging range allows the species to access alternative suitable foraging habitat beyond the MHPGC Project maximum ZOI. Overall, there is no potential for LSE on the Leach's storm petrel qualifying feature of the European sites considered. Therefore, Leach's storm petrel associated with the listed European sites has been screened out from further assessment.	No
		North Rona and Sula Sgeir SPA (UK9001011)	554.0		
		Ramna Stacks and Gruney SPA (UK9002021)	580.2		
Great Skua (<i>Stercora</i>)	931.2	Handa SPA (UK9001241)	524.5	The MHPGC Project occurs within the foraging range for great skua and as such, individuals associated with the listed European sites may have connectivity to the MHPGC Project.	No

Species	Foraging distance (km)*	European site	Distance from the MHPGC Project Red-Line Boundary at the closest point (km)	Justification	Screened in
<i>rius skua</i>)		Ronas Hill – North Roe and Tingon SPA (UK9002041)	575.2	Despite their extensive maximum foraging range, their mean foraging range is 67km (Woodward <i>et al.</i> , 2019). As such, it is unlikely that a large proportion of the population associated with these sites will interact with the MHPGC Project. Furthermore, their foraging range allows the species access alternative suitable foraging habitat beyond the MHPGC Project maximum Zol of 9km (based on tidal excursion).	
		St Kilda SPA (UK9001031)	731.0	Overall, there is no potential for LSE on the great skua qualifying feature of the European sites considered. Therefore great skua associated with the listed European sites has been screened out from further assessment.	
Northern fulmar (<i>Fulmarus glacialis</i>)	1,200.2	Cape Wrath SPA (UK9001231)	493.3	The MHPGC Project occurs within the foraging range for northern fulmar and as such, individuals associated with the European sites listed may have connectivity to the MHPGC Project. However, the MHPGC Project maximum Zol is 9km (based on tidal excursion), which represents only a small proportion of the species' extensive foraging range (Woodward <i>et al.</i>, 2019). Furthermore, northern fulmar utilise both the coastal and offshore environment to forage, rest, and conduct other key life history activities. Therefore, alternative suitable foraging habitat is available to the species beyond the MHPGC Project maximum Zol. Overall, there is no potential for LSE on the northern fulmar qualifying feature of the European sites considered. Therefore, northern fulmar associated with these listed European sites has been screened out from further assessment.	No
		Handa SPA (UK9001241)	524.5		
		North Rona and Sula Sgeir SPA (UK9001011)	554.0		
		Flannan Isles SPA (UK9001021)	660.4		
		St Kilda SPA (UK9001031)	731.0		

- * Foraging ranges based on Woodward *et al.* (2019)

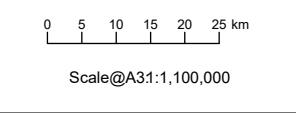
Table 6.3: Updated Screening of LSE for Marine Ornithology taken forward to Appropriate Assessment

European site	Distance to the MHPGC Project PEIR Red Line Boundary at the closest point (km)	Relevant qualifying feature	Project Phase		
			Construction	O&M	Decommissioning
English National Site Network					
Northumbria Coast SPA/Ramsar (UK9020325/UK11049)	0.0	Breeding: - Arctic tern (<i>Sterna paradisaea</i>); - Little tern (<i>Sternula albifrons</i>).	- Disturbance and displacement from noise and visual disturbance associated with the presence of vessels; - Indirect impacts from underwater sound affecting prey species;	- Disturbance and displacement from noise and visual disturbance associated with the presence of vessels; - Indirect impacts from underwater sound affecting prey species;	- Disturbance and displacement from noise and visual disturbance associated with the presence of vessels; - Indirect impacts from underwater sound affecting prey species;
Teesmouth and Cleveland Coast SPA/Ramsar (UK9006061/UK11068)	4.5	Breeding: - Common tern (<i>Sterna hirundo</i>); - Little tern (<i>Sternula albifrons</i>). Non-breeding: - Sandwich tern (<i>Thalasseus sandvicensis</i>).	Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
EUROPEAN SITES SCREENED IN FOR LSE FOR OFFSHORE MARINE
ORNITHOLOGY FEATURES



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Ocean Base: OceanWise, Esri, Garmin, NaturalVue
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
World Ocean Base: OceanWise, Esri, GEBCO, Garmin, NaturalVue

Drawing Number:				
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6.3 Marine Ornithology baseline

6.3.1 Study Area

- 6.3.1.1 The Marine Ornithology Study Area is shown in **Figure 6.1**. Within the PEIR the study area was divided into the nearshore and offshore areas. However within the RIAA the study area is defined as the Marine Ornithology Study Area, reflecting that the qualifying features of the screened in European sites occur within both the nearshore and offshore environment. Impacts affecting ornithology receptors above the MHWS are covered in Terrestrial and Intertidal Ornithology sections of this RIAA (see **Section 7**). A summary of potential impact pathways and screening results for terrestrial and intertidal ornithology are presented in **Section 7.2.5**.
- 6.3.1.2 There is no guidance or literature to support a specific distance for the consideration of ornithological receptors for offshore export cable corridor AA. However, using professional judgement and studies of wider anthropogenic disturbance in the marine environment (SNCBs, 2022; Goodship and Furness 2022; Fliessbach *et al.*, 2019) a 4km buffer zone was chosen, consistent with the MHPGC Project Scoping Report (RPS, 2025).
- 6.3.1.3 A comprehensive desk study of available literature and datasets within the North Sea (details are presented in **Volume 2, Chapter 6: Marine Ornithology, of the PEIR**) was used to inform the baseline on Annex I Marine Ornithology features of the screened in SPAs.

6.3.2 Survey Effort and Results

- 6.3.2.1 A desk study was undertaken to inform the baseline of the Marine Ornithology Study Area. For further details of desk-based sources used to inform assessments for Marine Ornithology see Table 6.6 within Volume 2, Chapter 6: Marine Ornithology, of the PEIR. Data from site-specific intertidal surveys (see Section 7.3.2) were used to provide contextual information on seabird presence and potential connectivity with nearby SPAs. Whilst offshore DAS surveys were undertaken for Morven North and Morven South from January 2021 to September 2023 (APEM, 2025), these data do not represent the full extent of the MHPGC Project PEIR Red Line Boundary, and DAS data do not identify the (SPA) site of origin of individual birds. Furthermore, the assessment takes a precautionary, qualitative approach informed by species ecology and the nature of the proposed activities rather than relying on, and requiring, estimates of bird abundance. Therefore, Morven North and Morven South DAS data has not been considered further within this RIAA, with the assessment instead using the wider evidence base, including published studies on species foraging ranges and site use.

6.3.3 Constraints and Limitations

- 6.3.3.1 The information provided in the RIAA is based on a range of relevant and publicly available data and literature. As stated above, the site-specific intertidal survey within the MHPGC Project PEIR Red Line Boundary, supplemented by a comprehensive desk study, has been used to inform the AA. These data sources are considered robust for the MHPGC Project marine ornithology assessment and are in line with other offshore transmission projects, some of which have used a desk study only to inform assessment.

6.4 Information to inform Appropriate Assessment

6.4.1 Assessment criteria

- 6.4.1.1 For the RIAA, the assessment of potential for AEoI relates to the conclusions of **Volume 2, Chapter 6: Marine Ornithology, of the PEIR**, but specifically in the context of the designated marine ornithological features (or supporting habitats), in light of the relevant COs, site-based advice and feature condition.
- 6.4.1.2 The following sections summarises the information used to estimate the magnitude of the potential impacts on the relevant qualifying features of the SPAs. The aim of this section is not to

replicate the information within the PEIR and associated appendices, but to present a summary of the key data used to inform the HRA.

- 6.4.1.3 As outlined in **Section 6.2.5**, a number of impacts were screened into the Marine Ornithology assessment. This section summarises the information used to assess the potential impacts on the relevant qualifying species of the screened in European sites. A more detailed analysis is presented in **Volume 2, Chapter 6: Marine Ornithology, of the PEIR**.

Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels (all phases)

- 6.4.1.4 During all phases of the MHPGC Project, it is expected that there will be increased airborne noise, underwater sound and vessel traffic which could potentially lead to disturbance of receptors from European sites that have connectivity to the MHPGC Project. Disturbance and displacement from noise and visual disturbance may reduce the amount of functional habitat available for foraging resting and other activities, potentially resulting in a decrease in survival rates or productivity of the birds involved.
- 6.4.1.5 As further discussed in **Volume 2, Chapter 8: Shipping and Navigation of the PEIR**, the Marine Ornithology Study Area has a baseline of frequent shipping activity. Consequently, any additional vessel presence associated with construction is not predicted to considerably increase disturbance and displacement from noise and visual disturbance in the Marine Ornithology Study Area.

Indirect impacts from underwater sound affecting prey species (all phases);

- 6.4.1.6 During all phases of the MHPGC Project, there is potential for indirect impacts to receptors from European sites that have connectivity to the MHPGC project, arising from mortality, injury or disturbance to sensitive fish and shellfish species. Impacts on prey species can be a result of underwater noise from construction activities such as pre-construction geophysical surveys and UXO clearance, as well as the presence of vessels. This may lead to reduced prey availability for qualifying features, resulting in an increase in foraging effort which can potentially affect the productivity rates or survival of qualifying features.
- 6.4.1.7 During all phases, activities will be spatially limited, not occurring along the entirety of the offshore export cable simultaneously, but rather occurring, temporarily, in a relatively contained area of the offshore export cable at any one time.

Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species (construction /decommissioning).

- 6.4.1.8 During all phases of the MHPGC Project, there is potential for temporary habitat loss impacts to receptors from European sites that have connectivity to the project, as a result of elevated turbidity levels within the water column caused by increased SSCs. The resulting impact of increased turbidity can indirectly affect the foraging efficiency of visual surface-feeding and diving birds by temporarily clouding the water column and/or smothering prey items on the seabed (Cook and Burton, 2010). Consequently, species may be displaced from these areas if increased turbidity becomes widespread in foraging areas (Cook and Burton, 2010).
- 6.4.1.9 It should be noted that increased water turbidity from SSCs occurs naturally in the North Sea. This region is a dynamic environment where wave action, tidal current and storm events frequently disturb sediment (Heath *et al.*, 2017; Wilson and Heath, 2019).

Impacts on Key Prey Species

- 6.4.1.10 The potential for LSE on statutory sites designated for fish and shellfish qualifying features was ruled out at screening stage (see **MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report** for further details). However, for completeness an assessment on the potential impacts of underwater sound affecting prey species and temporary habitat loss/disturbance from increased SSCs has been undertaken for key prey species for terns predicted to be present within the Marine Ornithology Study Area. The assessment has been

based on the information presented within **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**. A summary of findings of key prey species for tern is provided below.

Sandeel (*Ammodytes tobianus*)

- 6.4.1.11 Sandeel are an important foraging food source for tern species in the North Sea (Green, 2017). This species is generally present within the pelagic environment, but uses specific sediment compositions for spawning, burrowing and foraging. The Firth of Forth Banks Complex MPA, is designated, in part, for subtidal sand and gravel which could provide preferred habitat for sandeel and is 400m from the MHPGC Project PEIR Red Line Boundary. This species is a qualifying feature of Turbot bank MPA which is located 38km to the north of the MHPGC Project PEIR Red Line Boundary in Scottish waters. Given their ecological importance as a prey species, conservation importance (as a qualifying feature of the Turbot Bank MPA), and dependence on suitable sandy substrates, sandeel have the potential to be vulnerable to impacts arising from activities associated with the MHPGC Project.
- 6.4.1.12 The impact of underwater sound is assessed with reference to species hearing capabilities. Popper et al., (2014) categorised fish into hearing groups based on their structure and function of their auditory systems and developed sound exposure guidelines for these groups. Sandeels are classed under Group 1: species which lack a swim bladder. Therefore, sandeel are considered to have a low sensitivity to underwater sound. The potential impacts of underwater noise arising from activities associated with the MHPGC Project will be intermittent, spatially limited and highly reversible. Therefore, there is no adverse effect of underwater sound on sandeel at a population level during all phases.
- 6.4.1.13 Although sandeel rely on certain substrate to spawn, the MHPGC PEIR Red Line Boundary has a limited and isolated area of suitable habitat for the species (see **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR and Volume 2, Annex 4.1: Herring and Sandeel Assessment, of the PEIR**). Therefore, only a minor proportion of sandeel spawning is vulnerable to temporary habitat loss and disturbance from increased SSC. In addition, evidence from OWF monitoring revealed that sandeel recover rapidly following the completion of construction activities (Beatric Offshore Wind Farm, 2021; van Deurs et al., 2012). Disturbance from sandwave clearance, trenching activities and remediation will be temporary in nature, with activities expected to occur once at any given location. Therefore, there is no adverse effect of temporary habitat loss/disturbance from increase SSCs on sandeel at a population level within the MHPGC Project PEIR Red Line Boundary during all phases.

Sprat (*Sprattus sprattus*)

- 6.4.1.14 Sprat are an important prey species in the North Sea which form large schools in water depths of up to 150m (Heessen et al., 2015). Spawning occurs in coastal waters, extending up to 100km offshore. The eggs and larvae are pelagic, remaining in the water column and drifting with currents toward coastal nursery grounds in the western North Sea. Sprat spawning and nursery grounds stretch along the northeast coast of England and east coast of Scotland, overlapping with the Fish and Shellfish Ecology Study Area (defined in **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**) (Coull et al., 1998).
- 6.4.1.15 Sprat are classified under Group 3: species which possess a swim bladder connected to the auditory system and are therefore sensitive to particle motion and sound pressure. Therefore, sprat are considered of high sensitive to underwater noise. However, their wide distribution across the North Sea, and broadcast spawning nature support rapid recovery from disturbance from underwater sound arising from general construction noise, from geophysical and geotechnical surveys, vessel movements, seabed preparation works and cable installation, which generate low levels of impulsive noise (arising from a selection of geophysical surveys), and continuous noise. Furthermore, impacts from underwater noise arising from UXO clearance (associated with the highest mortality risk) will be minimal considering the highly localised (area of impact up to 20m) nature of works and limited temporal and spatial extent of works (not occurring simultaneously across the MHPGC PEIR Red Line Boundary). Therefore, there are no adverse effects on sprat at a population level during all phases.
- 6.4.1.16 Although there is an overlap between sprat spawning grounds and the MHPGC PEIR Red Line Boundary, this species does not exhibit reliance on specific sediment for spawning. Therefore,

temporary habitat loss/disturbance from increase SSCs is not considered to impact overall spawning success, considering this species spawns within the water column and are able to locate alternative suitable spawning areas. Therefore, there are no adverse effects of temporary habitat loss/disturbance from increase SSCs on sprat at a population level within the MHPGC Project PEIR Red Line Boundary during all phases.

Herring (*Clupea harengus*)

- 6.4.1.17 Herring are pelagic fish species found within depths of up to 200m. There are two major herring spawning stocks located near the MHPGC Project PEIR Red Line Boundary. The Buchan stock is located 0.3km from the nearest point of MHPGC Red Line Boundary, and the Banks stock located 6.5km from the nearest point of MHPGC Red Line Boundary.
- 6.4.1.18 Herring are classified under Group 3, and are therefore considered highly sensitive to underwater sound. However, the areas where active spawning is occurring, are located approximately 15.4km from the nearest point of the MHPGC Project PEIR Red Line Boundary, which is outside of the range of impacts from these activities. Given the localised nature of the construction noise sources and their distance from important spawning areas, significant disturbance to spawning herring is not anticipated. Furthermore, impacts from underwater sound arising from UXO clearance (associated with the highest mortality risk) will be minimal considering the highly localised (UXO clearance impact occurring up to 20m) nature of works and limited temporal and spatial extent of works (not occurring simultaneously across the MHPGC PEIR Red Line Boundary). Therefore, there are no adverse effects on herring at a population level during all phases.
- 6.4.1.19 Herring are reliant on specific suitable demersal habitat for spawning. However, the MHPGC Project PEIR Red Line Boundary is mainly comprised of habitat unsuitable for herring spawning, with only limited proportion of appropriate spawning areas identified (see **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**). Therefore, only a minor proportion of herring spawning is vulnerable to temporary habitat loss and disturbance. Furthermore, disturbance from sandwave clearance and trenching activities will be temporary in nature with activities expected to occur once at any given location. As such, this species is expected to quickly recover following temporary periods of disturbance. Therefore, there are no adverse effects of temporary habitat loss/disturbance from increase SSCs on herring at a population level within the MHPGC Project PEIR Red Line Boundary during all phases.

Saithe (*Pollachius viren*)

- 6.4.1.20 Saithe are a benthopelagic schooling fish found in depth of 200m. This species' spawning grounds are found within the northern waters, with a nursery area overlapping in with MHPGC PEIR Red Line Boundary.
- 6.4.1.21 Saithe are classified under Group 3 and are therefore considered highly sensitive to underwater sound. Therefore, saithe are considered highly sensitive to underwater sound. However, Based on their mobile nature, saithe are expected to recover quickly, returning to normal behaviours, recolonising areas shortly after potential disturbance from underwater sound arising from general construction noise, from geophysical and geotechnical surveys, vessel movements, seabed preparation works and cable installation, which generate low levels of impulsive noise (arising from a selection of geophysical surveys), and continuous noise. Furthermore, impacts from underwater noise arising from UXO clearance (highest mortality risk) will be minimal considering the highly localised (area of impact up to 20m) nature of works and limited temporally extent of works (not occurring simultaneously across the MHPGC PEIR Red Line Boundary). Therefore, there are no adverse effect on saithe at a population level during all phases.
- 6.4.1.22 Saithe do not rely on certain substrate for spawning activity, therefore, temporary habitat loss/disturbance from increase SSCs is not considered to impact overall spawning success. Furthermore, disturbance from sandwave clearance and trenching activities will be temporary in nature with activities expected to occur once at any given location. Therefore, there are no adverse effects of temporary habitat loss/disturbance from increase SSCs on saithe at a population level within the MHPGC Project PEIR Red Line Boundary during all phases.

6.4.2 Design parameters

- 6.4.2.1 In order to allow flexibility in potential design options a design envelope approach to impact assessment (also known as the MDS) has been taken, see **Chapter 3: Project Description, of the PEIR**.
- 6.4.2.2 The MDS for each Marine Ornithology impact identified in **Section 6.2.5** is shown in **Table 6.4**. This identifies the maximum design scenario for each impact pathway and European site receptor assessed. This represents the 'worst case' or highest level of potential impact from the MHPGC Project, and all other design options should lie within this limit. Parameters are set out in **Volume 1, Chapter 2: Project Description, of the PEIR** in line with the methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 6.4: MDS relevant for the Appropriate Assessment of potential impacts on Marine Ornithology

Impact	Maximum Design Scenario	Explanation
Note: Note: The cable length measurements are for the maximum distance between the Morven North or Morven South OSP and trenchless drill exit pit unless otherwise stated. For clarity one trench length is as follows: - OSP to exit pit – up to 324.67km; - OSP to MHWS – up to 326.00km; - Scottish waters (OSP – Scottish-English offshore waters boundary) - up to 98.00km; - English waters (English offshore waters boundary – exit pit) - up to 226.67km; - English waters (English offshore waters boundary – MHWS) - up to 228.00km.		
Construction		
Disturbance and displacement from noise and visual disturbance associated from the presence of vessels	Construction duration: up to four years. Offshore vessel activity: - There will be up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), TSV, installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); A maximum of 14 vessels may be operational at any one time during the construction phase.	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence.
Indirect impacts from underwater sound affecting prey species	Construction duration: up to four years. UXO Clearance:	The MDS assumes the maximum number and maximum size of UXO requiring clearance.

Impact	Maximum Design Scenario	Explanation
	• Low order clearance of up to 22 UXOs; • Scottish waters: 8 UXOs (for funnel area out with overlap with Morven North and Morven South); • English waters: 14 UXOs; Pre-construction geophysical surveys: Operating frequency of equipment: • Multibeam echosounder: 200 to 400kHz; • SSS: 300 to 600kHz; • Single beam echosounder: 20 to 40kHz; • Sub bottom profilers: 0.2 to 14kHz (chirp), and 85 to 115kHz (high frequency); • Ultra high resolution seismic (such as sparker): 0.05 to 4kHz; • USBL transponder: 21 to 31kHz; • Up to two survey vessels may be present on site at any one time. Pre-construction geotechnical surveys: • Seismic cone penetration tests (CPT) with a low frequency and low intensity sound source; • VC with operating frequency of 0.02 to 20 kHz. Offshore vessel activity: • Up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), TSV, installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge);	It should be noted that only low order detonations are being sought under the consent applications. The MDS for underwater sound (excluding unexploded ordnance) assumes all relevant sound-generating activities across the construction phase, including geophysical surveys, geotechnical surveys, cable installation activities and associated vessel movements. Cable installation may be undertaken by mechanical cutting, jet trenching, ploughing or Controlled Flow Excavation (CFE) (at localised points along the route where required). Route preparation and seabed preparation activities, including sandwave clearance (which may include mass flow excavation (MFE)), boulder clearance and pre-lay grapnel run (PLGR), are also assumed to occur. The sound associated with the CLV vessel represents the MDS for these construction phase activities associated with the installation of the export cables. A range of geophysical activities using equipment assumed to be typical for the types of surveys anticipated. Parameters have been selected to represent the highest source characteristics (e.g. operating frequencies, pulse rates and durations), thereby defining a precautionary worst-case scenario for sound generation. The MDS assumes the maximum number of vessels on site at one time and the greatest number of vessel movements during these activities. This represents the broadest range of vessel types and therefore sound signatures which may impact fish or shellfish receptors.

Impact	Maximum Design Scenario	Explanation
	- A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - Up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); A maximum of 14 vessels may be operational at any one time during the construction phase.	
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	Construction duration: up to four years. Sandwave clearance: - Sandwave clearance activities undertaken using MFE over an approximate four month duration; - Sediment disturbance rate is 1000kg/s - Surface width of up to 28m per trench and base width of up to 20m per trench; <u>Per trench = 1,484,000m²</u> - Scottish waters: 31km length × 28m width = 868,000m² - English waters: 22km length × 28m width = 616,000m² <u>Total (up to two trenches) = 2,968,000m²</u> - Scottish waters: 1,736,000m² - English waters: 1,232,000m² Cable installation (trenching): - Installation via trenching of up to 324.67km of cable, with a trench width of up to 2.1m and a depth of up to 3m; - Trenching rate is 400m/hr. <u>Per trench = 2,045,421m³</u> - Scottish waters: 98km length × 2.1m width × 3m depth = 617,400m²	The MDS is defined by the maximum spatial extent of seabed disturbance from cable installation, route preparation, sandwave clearance and landfall works. Landfall works and vessel interactions are defined by the maximum footprint of exit pits, floatation pits, anchor spreads and jack-up activities. The MDS is inherently precautionary, assuming all maximum parameters occur concurrently with no reduction for overlapping disturbance footprints. Site preparation: - Sandwave clearance activities may be undertaken using a range of techniques (plough and MFE), over an approximate four-month duration in both Scottish and English waters. Releases via both are modelled; - A conservative MFE near-bed sediment release rate of 1000 kg/s conservatively estimated based on the MDS trench cross section dimensions, the speed of progress of the tool and the bulk density of the local sediment type; - Dredge spoil release is simulated as an instantaneous release at the water surface. 10%

Impact	Maximum Design Scenario	Explanation
	- English waters: 226.67km length × 2.1m width × 3m depth = 1,428,021m³ <u>Total (up to two trenches) = 4,090,842m³</u> - Scottish waters: 1,234,800m³ - English waters: 2,856,042m³ Trenchless techniques (landfall) (English waters): - Up to four boreholes. Trenchless installation via Horizontal Directional Drilling (HDD), (conduit diameter of 1.6 m, conduit length of 2,000 m). Drilling fluid discharge up to 180m³ each and up to 1,083m³ total. - Trenchless drill punchout will be up to approximately 1660m offshore of MHWS in water depths up to 20m LAT. - Up to four exit pits (140m long × 50m wide × 5m deep). Area up to 7,000 m² each; 28,000m² total. Volume up to 18,667m³ each; 74,668m³ total. - Up to two floatation pits (240m long × 55m wide × 5m deep). Area up to 13,200m² each; 26,400m² total. Volume up to 39,167m³ each; 78,334m³ total.	of 11,000 m³ is assumed to form the passive phase of the plume; - Other seabed preparation such as sandwave clearance plough, boulder clearance and PLGR may be used but do not represent the MDS in terms of potential increases in SSC and associated deposition. Cable installation: - Trenching may be carried out by mechanical cutting, jet trenching, ploughing or CFE. Jet trenching is anticipated to generate the highest suspended sediment concentrations (SSC) and has therefore been assumed as the MDS; - Suspension of 100% of material from the trench cross section will give the MDS for sediment disturbance; - Conservatively assumes 100% fluidisation of material expelled from a U-shaped trench. In reality trenching will move a proportion of material rather than bringing it fully into suspension; - Offshore export cable corridor trenching modelling assumes sediment release along the whole offshore export cable corridor; - Cable routes cross a variety of seabed materials, and burial depth may be up to 3m in some areas. The assessment therefore considers this upper bound to define the MDS in terms of sediment disturbance; - Trenching rate will be up to 400m/hr. Trenchless techniques (landfall): - Trenchless installation methods include HDD and Direct Pipe;

Impact	Maximum Design Scenario	Explanation
		• HDD represents the maximum MDS for sediment disturbance due to the potential for drilling fluid release (frac-out); • The MDS for sediment disturbance by trenchless installation is given by applying a conservative Bentonite concentration of 100 kg/m³ in drilling mud, the volume of spoil released is equal to the maximum volume of the bore; • Other stages of drilling (pilot hole drilling and stages of reaming) may result in smaller release events separated in time. But the MDS is considered as a release of drilling mud from a single conduit; • Two drills could be operational at one time; however, the timing of drilling will be staggered meaning there will not be an occasion where punch-out occurs simultaneously (or within 6 hours of each other). • Trenchless drill punchout will be up to approximately 1,660m offshore of MHWS in water depths up to -20m LAT.
O&M		
Disturbance and displacement from noise and visual disturbance associated from the presence of vessels	O&M: Operational lifespan of 35 years. • Up to 5 geophysical surveys proposed per year. • Geophysical equipment as detailed in the construction phase MDS. Vessel activity: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches:	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence.

Impact	Maximum Design Scenario	Explanation
	• Surveys – 4 • Return trip – $4 \times 3 = 12$ • Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: • Surveys – 4 • Return trips – $4 \times 55 = 220$ • Total vessels at time – 5 • Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for remediation activities, for up to two trenches: • Up to four O&M vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: • Up to 62 O&M vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. • Repair (41 lifetime repairs, for up to two trenches) Vessels on site for repair activities, for up to two trenches: • Up to four O&M vessels on site at any one time, comprising a combination of CLV and/or	

Impact	Maximum Design Scenario	Explanation
	barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: Up to 245 O&M vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump.	
Indirect impacts from underwater sound affecting prey species	O&M: Operational lifespan of 35 years. - Up to 5 geophysical surveys proposed per year. - Geophysical equipment as detailed in the construction phase MDS. Vessel activity: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trip – $4 \times 3 = 12$ - Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trips – $4 \times 55 = 220$ - Total vessels at time – 5	The MDS for underwater sound assumes all relevant sound-generating activities across the O&M phase, including geophysical surveys, and vessel movements for O&M purposes.

Impact	Maximum Design Scenario	Explanation
	- Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for remediation activities, for up to two trenches: - Up to four O&M vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: - Up to 62 O&M vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. - Repair (41 lifetime repairs, for up to two trenches) Vessels on site for repair activities, for up to two trenches: - Up to four O&M vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: Up to 245 O&M vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump.	
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	O&M: Operational lifespan of 35 years. Cable repairs (English and Scottish waters): - Up to 41 export cable repairs, each with a length of up to 2km and a 20m width. Up to 40,000 m² of temporary disturbance each; 1,640,000 m² total; - Up to 4% of the cable route length, up to 13km, may require remediation per year. Remediation	Cable repairs (English and Scottish waters): - The greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion; - The majority of cable repairs are anticipated to be c.500-1000m. The MDS utilises the area of

Impact	Maximum Design Scenario	Explanation
	may occur in different locations and for varying lengths but it is anticipated that up to 13km of export cable length per year per trench will require remediation with a maximum width of 20m. Up to 522,240m ² of temporary disturbance per year; total 18,278,400m ² .	disturbance by repair which provides a highly conservative area; The repair of cables may be undertaken using similar techniques to those employed during installation, therefore the potential increases in SSC and deposition would be in-line with the construction phase.
Decommissioning		
Disturbance and displacement from noise and visual disturbance associated from the presence of vessels	Decommissioning Vessel presence: The MDS for vessel presence for the decommissioning phase is assumed to be as that described for the construction phase.	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence. Whilst the MDS is for all materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The actual decommissioning strategy will be defined at the time of decommissioning following the most up to date and best available guidance.
Indirect impacts from underwater sound affecting prey species	The MDS for sound from vessels for the decommissioning phase is assumed to be as that described for the construction phase, with the exception of UXO clearance, which is not included in the decommissioning phase.	A range of geophysical activities using equipment assumed to be typical for the types of surveys anticipated. Parameters have been selected to represent the highest source characteristics (e.g. operating frequencies, pulse rates and durations), thereby defining a precautionary worst-case scenario for sound generation. The MDS assumes the maximum number of vessels on site at one time and the greatest number of vessel movements during these phases. This represents the broadest range of vessel types and therefore sound signatures which may impact fish or shellfish receptors. Whilst the MDS is for all materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The decommissioning approach will be reviewed at the time of

Impact	Maximum Design Scenario	Explanation
		decommissioning following the most up to date and best available guidance
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	Cables and cable protection (English and Scottish waters): All export cables and cable protection will be removed.	Cables and cable protection (English and Scottish waters): - The removal of cables may be undertaken using similar techniques to those employed during installation, therefore the potential increases in SSC and deposition would be in-line with the construction phase. - Whilst the MDS is for all export cable materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The decommissioning approach will be reviewed at the time of decommissioning following the most up to date and best available guidance.

6.4.3 Marine Ornithology commitments

- 6.4.3.1 As part of the MHPGC Project design process, a number of commitments have been identified to avoid or reduce potential effects on environmental receptors. These are provided in **Volume 1; Annex 4.1: Draft Commitments Register, of the PEIR** and include avoidance, best practice and design commitments.
- 6.4.3.2 In accordance with the HRA process, these commitments have not been considered in determining LSE at Stage 1 Screening. They are, however, considered at Stage 2 AA, where implementation of the relevant commitments is assumed when assessing the potential for an AEol of the relevant European sites.
- 6.4.3.3 The commitments relevant to Marine Ornithology qualifying features are presented in **Table 6.5**. These measures are considered standard industry practice for this type of development.

Table 6.5: Embedded Commitments Measures of Relevance for Marine Ornithology Receptors

Code	Commitment	How Commitment is Secured
CoT06	An Outline OEMP will be prepared and submitted with the application for development consent. A Detailed OEMP will be developed in accordance with the Outline OEMP. The Outline OEMP will include: An Outline Marine Biosecurity Plan; An Outline Marine Pollution Contingency Plan; An Outline Marine Mammal Mitigation Protocol; An Outline VTMP; An Outline Navigational Safety Plan; A chemical risk assessment that includes information such as how chemicals will be used, stored, and transported, in line with recognised best-practice guidance; A dropped-object protocol will be established to cover the reporting and recovery of any items lost overboard that could endanger other sea users; A Marine Emergency Action Card outlining the steps to be followed in the case of a marine emergency; Provisions for the handling and disposal of waste.	The Outline OEMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence(s) (Scotland).
CoT30	An Outline VTMP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. A Detailed VTMP will be developed pre-construction in line with the Outline VTMP, and in accordance with the relevant legislation, guidance and industry best practice. The Detailed VTMP will: Detail vessel routing to and from construction areas and ports to avoid areas of high risk, including liaison with the Port of Seaham and the Port of Sunderland; Include vessel standards and a code of conduct for vessel operators in compliance with international marine regulations as adopted by the Flag State, including the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) and SOLAS (IMO, 1974); Detail measures to reduce disturbance to marine mammal receptors from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Outline Marine Mammal Mitigation Protocol; Detail measures to reduce disturbance to red throated diver from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Red Throated Diver Protocol;	The Outline VTMP forming part of the Outline OEMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).
CoT37	An Outline MPCP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. The Outline MPCP will describe the hazards,	The Outline MPCP forming part of the Outline OEMP will be

	response strategies, and step-by-step actions for handling spills, contaminant releases (including details of non-toxic, biodegradable drilling fluids), and vessel collisions during construction or operations below MHWS, and will include all essential emergency contacts and information. A Detailed MPCP will be developed in accordance with the Outline MPCP.	secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).
CoT56	An Offshore In-Principal Monitoring Plan (OIPMP) will be prepared and submitted as part of the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. The OIPMP will include for monitoring as part of the operational asset integrity surveys. A Detailed Offshore Monitoring Plan will be produced prior to O&M phases substantially in accordance with the OIPMP, and will be approved in consultation with statutory advisors and regulators.	The OIPMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).

6.4.4 List of plans and projects considered for the in-combination assessment

- 6.4.4.1 The Habitat Regulations require the Competent Authority to carry out an AA in respect of the LSE of a plan or project alone and in-combination with other plans or projects. For the in-combination methodology please refer to **Section 3.2**.
- 6.4.4.2 A full review of plans and projects was conducted for the MHPGC Project (**Volume 1, Annex 4.3: Cumulative Screening and Location Plan**). Those plans and projects considered in this assessment are shown in **Table 6.6**.
- 6.4.4.3 Only in-combination impact to the Northumbria Coast SPA and Ramsar and Teesmouth and Cleveland SPA and Ramsar have been considered. For all other Scottish and English European sites considered within the screening assessment in the HRA Screening Report (**MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report**), no LSE for project alone was identified and were subsequently screened out. The MHPGC Project impacts are inconsequential and would not influence these site's COs, therefore there are no LSE for these further European sites when considering in-combination. Consequently, these are screened out of the in-combination assessment.
- 6.4.4.4 Projects and plans within a precautionary 58km of Northumbria Coast SPA and Ramsar and Teesmouth and Cleveland SPA and Ramsar were screened in. This is reflective of the 57.5km mean maximum foraging range (MMFR) plus one Standard Deviation (SD) for sandwich tern, the largest foraging range of the four tern species considered. This screening distance was selected to reflect breeding terns relatively constrained foraging and habitat-use patterns compared with wider-ranging offshore seabirds, thus capturing projects with the greatest potential for spatial overlap in areas used by these receptors and therefore the greatest potential for disturbance, displacement or indirect effects via prey resources in-combination with other projects. Projects beyond 58km were considered unlikely to interact in-combination with the MHPGC Project. This includes the exclusion of Morven North and Morven South which are beyond the MMFR.
- 6.4.4.5 This MMFR has been used despite sandwich tern being a non-breeding designated feature of Northumbria Coast SPA and Ramsar. The screening range is considered appropriate as there is uncertainty regarding the extent of which this migratory species interacts with other plans and projects. In this instance, with no guidance available for in-combination screening for species designated at SPAs in a migration season only, the use of the breeding season foraging range is precautionary.
- 6.4.4.6 Of the plans and projects identified within 58km of the considered European sites (**Table 6.6**), only those with overlapping construction schedules (2033 to 2037) were screened in. Any plans and projects overlapping with construction schedules were screened in for the decommissioning phase, considering the likelihood of decommissioning schedule overlap. No significant impacts were determined in the MHPGC Project PEIR, and during the O&M phase of offshore wind farms and their associated cables, vessel and maintenance activities are infrequent, intermittent and highly localised, with activity lower compared to the construction phase. Any overlap in maintenance activities between projects would therefore result in only a small increase in disturbance and indirect effects through underwater sound and increases in SSC above the MHPGC Project alone. Vessel movements would remain transient in nature, with effects limited to the period of activity, with no UXO clearance anticipated during the O&M phase. For these reasons, projects with overlap during the O&M phase were not screened in for the in-combination impact assessment.
- 6.4.4.7 The assessment presented here draws on the cumulative assessment presented in the **Volume 2, Chapter 6: Marine Ornithology, of the PEIR**.
- 6.4.4.8 Only those projects identified in **Table 6.6** were brought forwards into the assessment in **Section 6.5** on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved. A tiered approach has been applied to the in-combination assessment to reflect the different levels of uncertainty associated with the design and timeframes for the projects screened into the assessment, the tiers applied for Marine Ornithology is described in **Section 3.2**.

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- 6.4.4.9 Given there are no projects identified that that overlap in construction schedules, no in-combination assessment has been undertaken.

Table 6.6: Projects Identified for the Marine Ornithology in-combination assessment

Development Type	Project	Tier	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Construction Dates (if relevant)	Operational by (if relevant)	European site Considered in Assessment	Distance from European Site	Pressure
Offshore Wind Farm	Teesside OWF	1	18.82	Operational	Operational	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 12.12km Teessmouth and Cleveland SPA and Ramsar: 0.00km	No overlap with construction schedules therefore not considered further
Offshore Wind Farm	Blyth Demonstration Site OWF	1	13.23	Cancelled	Cancelled	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 0.21km Teessmouth and Cleveland SPA and Ramsar: 40.73km	No overlap with construction schedules therefore not considered further
Offshore Wind Farm	Blyth Demo Phase 1 OWF	1	19.25	Operational	Operational	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 5.28km Teessmouth and Cleveland SPA and Ramsar: 39.35km	No overlap with construction schedules therefore not considered further
Offshore Wind Farm	Blyth OWF	1	26.05	Operational	Operational	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 5.29km Teessmouth and Cleveland SPA and Ramsar: 43.58km	No overlap with construction schedules therefore not considered further
Offshore Wind Farm	Berwick Bank OWF	1	18.22	2028 to 2031	2032	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 47.59km	No overlap with construction schedules therefore not considered further
Cable Project	Berwick Bank ECC (Cambois Connection - Northumberland)	1	0.25	2028 to 2031	2032	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar : 0.00km	No overlap with construction schedules therefore not considered further
Cable Project	Eastern Green Link 1 (EGL1) (indicative location)	1	0.50	2026 to 2029	2030	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar: 0.00km Teessmouth and Cleveland SPA and Ramsar: 10.50km	No overlap with construction schedules therefore not considered further
Cable Project	EGL4 Scoping Route	2	0.0	2028 to 2032	2023	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar: 36.39km	No overlap with construction schedules therefore not considered further
Offshore Wind Farm	Near Na Gaoithe OWF	1	70.41	Operational	Operational	No overlap with construction schedules therefore not considered further	Northumbria Coast SPA and Ramsar: 52.06km	No overlap with construction schedules therefore not considered further

6.5 Appropriate Assessment (alone and in-combination)

6.5.1 Northumbria Coast SPA and Ramsar

Site description

- 6.5.1.1 Northumbria Coast SPA and Ramsar site overlap with the MHPGC Project PEIR Red Line Boundary (see **Figure 6.1**). Northumbria Coast SPA and Ramsar cover an area of 1,097.45km², including the coastline between Berwick-upon-Tweed to the Tyne Estuary (Natural England, 2018). The SPA and Ramsar site comprise of primarily rocky shore, boulder/cobble beach, with a smaller section of sand beach (including dunes), intertidal mudflat and sand flats (Natural England, 2018). The rocky shore also supports high densities of marine invertebrates, an important prey for the waterfowl (Natural England, 2018).

Qualifying features (Marine Ornithology only)

- 6.5.1.2 The site is designated for Arctic tern, little tern, purple sandpiper and turnstone. Species accounts for each of the Marine Ornithology qualifying features are provided below.
- 6.5.1.3 Purple sandpiper and ruddy turnstone are intertidal birds and as such have been considered within the Terrestrial and Intertidal Ornithology Section (**Section 7**).

Arctic tern

- 6.5.1.4 Arctic tern nest on dunes, shingle spits, ridges and low offshore islands, often amongst other tern species. Their diet comprises of small fish such as sandeel, sprat, herring, and saithe, along with crustaceans and zooplankton (Natural England, 2012a). They forage in shallow inshore waters and further offshore, with a MMFR plus one SD of 40.5km (Woodward et al., 2019). This species has a preference to forage in bays, rocky shores, tidal rips, ocean fronts and upwellings (Natural England, 2012a). Since the Seabird 2000 Count, the UK breeding population has significantly declined by 54% (Burnell et al., 2023), and this species has been recently red-listed under the UK Birds of Conservation Concern (BOCC) 5 (Stanbury et al., 2024).
- 6.5.1.5 The Northumbria Coast SPA support an internationally important population of Arctic tern, which is 2.92% of the Great Britain (GB) population (Natural England, 2018). The Northumbria Coast SPA citation population estimate for Arctic tern is 3,098 breeding individuals (2010 to 2014) (Natural England, 2018). However, the recent colony count (2024) from the British Trust of Ornithology (BTO) Seabird Monitoring Programme (SMP) at Long Nanny was 2,160 breeding individuals, a decline from the 2023 estimate of 3,220 individuals (BTO, 2025a). In 2025, further declines were observed with a total count of 1,782 breeding individuals (BTO, 2025a). The causes of such declines are believed to be linked to mass mortality of chicks from the ongoing highly pathogenic avian influenza (HPAI) outbreak and the impact of climate change (National Trust, 2025).
- 6.5.1.6 Within the SPA Arctic tern nest at Newton Links / Long Nanny, a sandy beach with locations for nesting within dunes and grass (Natural England, 2018) (**Figure 6.2**). They also forage in the Beadnell Bay and surrounding waters, feeding on the supported lesser sandeel (*Ammodytes lancea*) populations (Natural England, 2018).
- 6.5.1.7 Although BTO returned historic (2020–2025) Wetland Bird Survey (WeBS) records for Arctic tern for the Chourdon Point to Seaham WeBS sector (a five-year peak monthly count of 50 individuals for August and two individuals in June), this species was not recorded during any surveys for MHPGC. For further information of the intertidal bird survey results see **Volume 3 Annex 3.13 Interim Wintering and Intertidal Birds Surveys Technical Report, of the PEIR**.

Little tern

- 6.5.1.8 Little tern is the smallest of the tern species that breed in the UK. Their breeding distribution is primarily within England, with important nesting sites in East Anglia and Humber/Lincolnshire (Pickerell, 2004; Burnell et al., 2023). Little tern nest in small colonies on sand, pebble and shingle areas near the tideline, with a strong preference to sandy beaches with vegetation cover (Ratcliff et al., 2008). Foraging involves plunge-diving or dipping for prey such as sandeel, Clupeids and

invertebrates, often in shallow waters close to the shoreline (Green, 2017). Although they have a maximum foraging distance of 5km (Woodward *et al.*, 2019), most foraging occurs within 1km of the coast (Natural England, 2012b). The UK population has significantly declined by 25% since the Seabird 2000 Count (Burnell *et al.*, 2023) and this species is listed as amber under the BoCC (Stanbury *et al.*, 2021).

- 6.5.1.9 The Northumbria Coast SPA supports an internationally important population of little tern, holding 1.7% of the GB population (Natural England, 2018). The Northumbria Coast SPA citation population estimate for little tern is 80 breeding individuals (1993 to 1997) (Natural England, 2018), but a recent colony count undertaken in 2024 shows a decline to only 48 breeding individuals, a decline from 2023 (National Trust, 2024).
- 6.5.1.10 Within the SPA little tern nest at Newton Links / Long Nanny, a sandy beach with locations for nesting within dunes and grass (Natural England, 2018) (**Figure 6.2**). Little terns are also known to forage for the supported sandeel populations within Beadnell Bay (Natural England, 2018).
- 6.5.1.11 Little terns were not reported along the Durham Coast between 2019 and 2024 in the WeBS database (BTO, 2025b), or in the 2023 to 2024 and October 2025 to March 2026 intertidal bird surveys.
- 6.5.1.12 The programme of intertidal bird surveys was completed in July 2026. The final results of all six surveys undertaken in 2026 will be reported within the Environmental Statement (ES) and used to refine the MHPGC Project RIAA, where required. The intertidal data captured within this stage of the RIAA is considered sufficiently robust for the assessment conclusion, considering this data is used to contextualise the baseline only.

Conservation Objectives

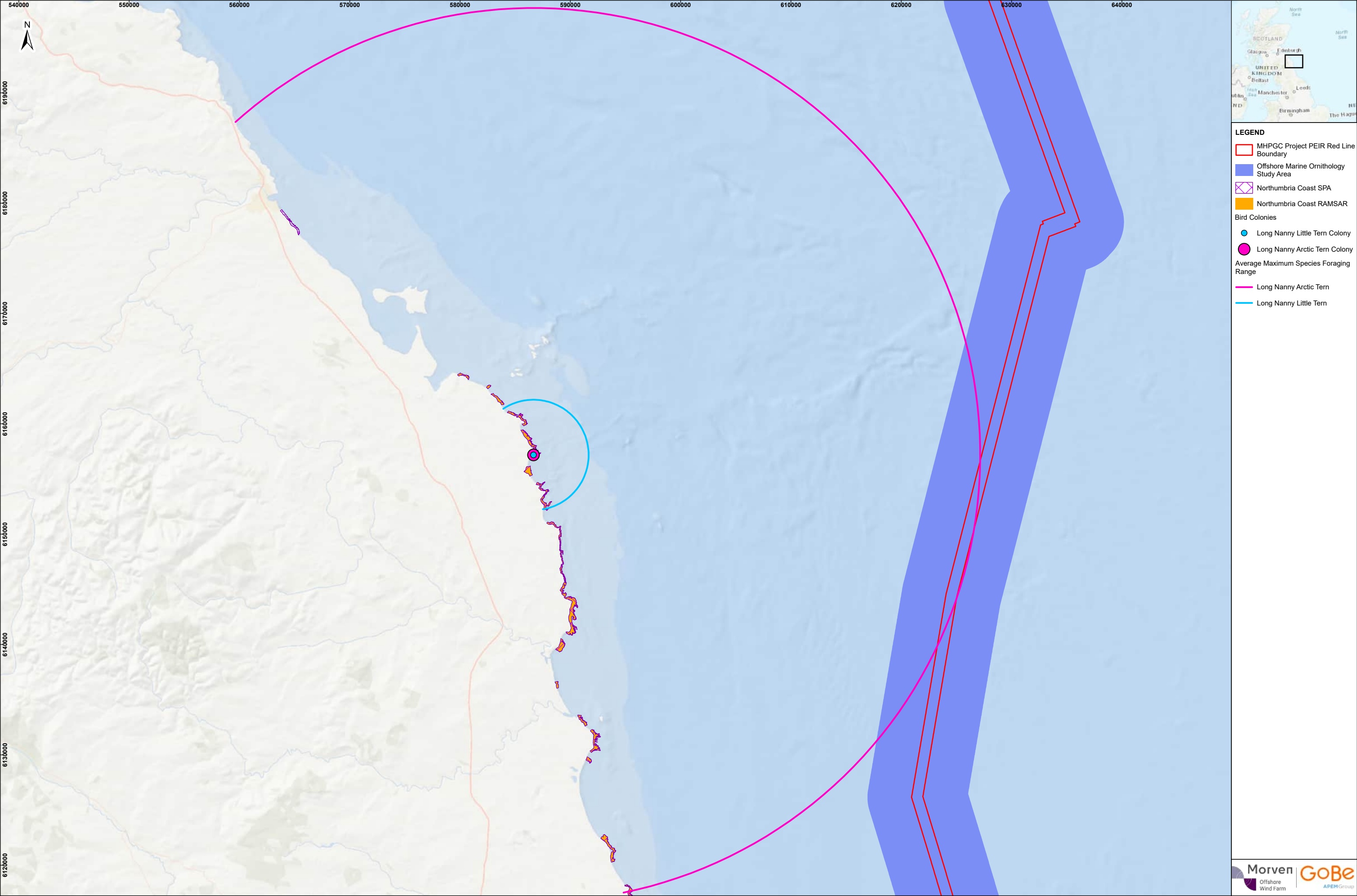
- 6.5.1.13 The COs for the qualifying features of Northumbria Coast SPA and Northumbria Coast Ramsar site are outlined below.

Northumbria Coast SPA

- 6.5.1.14 The COs (Natural England, 2019) for the qualifying features of Northumbria Coast SPA are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
- the extent and distribution of the habitats of the qualifying features;
 - the structure and function of the habitats of the qualifying features;
 - the supporting processes on which the habitats of the qualifying features rely;
 - the population of each of the qualifying features;
 - the distribution of the qualifying features within the site.

Northumbrian Coast Ramsar

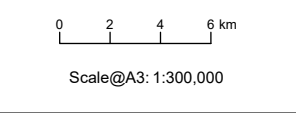
- 6.5.1.15 The COs (JNCC, 2008a) for the qualifying features of Northumbria Coast Ramsar site are to maintain and restore the ecological integrity, maintain water quality, monitor ecosystem health and the protection of designated bird populations.
- 6.5.1.16 These objectives are guided by the Ramsar Convention and the need to conserve the sites' qualifying features, including breeding and non-breeding bird species, and diverse wetland habitat.
- 6.5.1.17 Natural England clarifies that, where Ramsar sites overlap with European Marine Sites, the COs of, in this case, Northumbria Coast SPA are sufficient to support the management of the Northumbria Coast Ramsar (Natural England, n.d.).



- LEGEND**
- MHPGC Project PEIR Red Line Boundary
 - Offshore Marine Ornithology Study Area
 - Northumbria Coast SPA
 - Northumbria Coast RAMSAR
 - Bird Colonies**
 - Long Nanny Little Tern Colony
 - Long Nanny Arctic Tern Colony
 - Average Maximum Species Foraging Range**
 - Long Nanny Arctic Tern
 - Long Nanny Little Tern

Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
TERN BREEDING COLONIES WITHIN THE NORTHUMBRIA COAST SPA AND RAMSAR AND THEIR AT-SEA FORAGING RANGE AREA



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Ocean Base: OceanWise, Esri, Garmin, NaturalVue
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS



Drawing Number:
FIGURE 6-2

VER	DATE	DETAILS	BY	CHECK
00	11/08/2026	Initial Issue	GB	SZ
-	-	-	-	-

Disturbance and displacement from noise and visual disturbance associated with the presence of vessels (all phases)

Appropriate Assessment Alone

Little tern

Assessment

- 6.5.1.18 Little tern are considered to have a low sensitivity to anthropogenic disturbance within the marine environment, including in relation to vessel presence (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Wade *et al.*, 2016; Bradbury *et al.*, 2014). As such the disturbance and displacement impact arising from vessel presence is expected to be minimal.
- 6.5.1.19 Within the Northumbria Coast SPA and Ramsar, little tern breed at Newton Links and Long Nanny tern colonies which are located at least 39km from the Marine Ornithology Study Area. The Marine Ornithology Study Area is therefore significantly beyond little terns MMFR plus one SD of 5km (**Figure 6.2**) (Woodward *et al.*, 2019). Therefore, potential for disturbance and displacement impacts is highly limited on the little tern feature of Northumbria Coast SPA and Ramsar during the breeding season (May to early August) (Furness, 2015).
- 6.5.1.20 Post-breeding (late July to early September) (Furness, 2015), little tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Migratory movements are expected to be within a narrow band from 0 to 10km from shore (WWT and MacArthurGreen, 2014). Although there limited spatial overlap within the Marine Ornithology Study Area, the migratory movement of the species may overlap with the location of landfall activities. This is as assessed within **Section 7.4.4**. Comparatively to other tern species, little tern post-breeding migratory movement are rapid with UK breeding little terns already being reported as far south as Portugal in August, with no significant post breeding aggregations beyond their natal colony (Wernham *et al.*, 2002). Return migration movements are also considered to be relatively rapid with birds returning to breeding colonies in April and May. When considering the species migratory behaviour and the qualifying features low sensitivity to disturbance, the potential for disturbance and displacement impacts is highly limited during the non-breeding seasons.
- 6.5.1.21 Furthermore, the commitment to a VTMP (CoT30) (see **Table 6.5**) will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

Additional Mitigation

- 6.5.1.22 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.23 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project alone.
- 6.5.1.24 Within Terrestrial and Intertidal Ornithology AA (**Section 7.5**), the little tern feature of Northumbria Coast SPA and Ramsar site is assessed as an intertidal receptor for the same impact pathway. As little tern is assessed for the same SPA and same impact pathway, no additional effects beyond those already considered have been identified, and the conclusion of the marine ornithology assessment therefore remains unchanged.

Arctic tern

Assessment

- 6.5.1.25 Arctic tern are considered to have a low sensitivity to anthropogenic disturbance within the marine environment, including in relation to vessel presence (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Bradbury *et al.*, 2014; Wade *et al.*, 2016; Fliessbach *et al.*, 2019). As such the disturbance and displacement impact arising from vessel presence is expected to be minimal.

- 6.5.1.26 Within the Northumbria Coast SPA and Ramsar, Arctic tern breed at Newton Links and Long Nanny which are located at least 39km from the Marine Ornithology Study Area. A proportion of the Marine Ornithology Study Area is within this features MMFR plus one SD of 40.5km (Woodward *et al.*, 2019) (**Figure 6.2**). Given a minor degree of overlap between Arctic tern MMFR plus one SD foraging range and the Marine Ornithology Study Area, there is potential for disturbance to occur. Although given there is no overlap between Beadnell Bay (key foraging site) and the MHPGC Red Line Boundary, the qualifying feature's low sensitivity to disturbance and localised ZOI for disturbance effects of 2km (based on SNCBs (2022)), any potential disturbance and displacement impacts are considered to have minimal energetic costs during the breeding season (May to early August) (Furness, 2015).
- 6.5.1.27 Post-breeding (July to early September) (Furness, 2015), Arctic tern disperses widely before continuing their southward migration to their wintering grounds at the edge of the Antarctic pack ice (Wernham *et al.*, 2002). Return migration movements are relatively rapid with birds returning to breeding colonies in April and May. Arctic tern migrates further offshore compared to other tern species, up to 20km (WWT and MacArthur Green, 2014) so may be present within the Marine Ornithology Study Area. However, outside the breeding season birds originate from UK breeding colonies from a wider geographic area. This extensive mixing of populations means the proportion of birds attributable to the SPA population is expected to be low, and impacts thus limited. When considering the species migratory behaviour and nature of the works, the potential for any disturbance and displacement impacts are considered to be spatially and temporally limited during the non-breeding season.
- 6.5.1.28 Furthermore, the commitment to a VTMP (CoT30) (see **Table 6.5**) will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

Additional Mitigation

- 6.5.1.29 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.30 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to Arctic tern qualifying feature from the MHPGC Project.
- 6.5.1.31 Within Terrestrial and Intertidal Ornithology AA (Section 7.5), the Arctic tern feature of Northumbria Coast SPA and Ramsar site is assessed as an intertidal receptor for the same impact pathway. As little tern is assessed for the same SPA and same impact pathway, no additional effects beyond those already considered have been identified, and the conclusion of the assessment for marine ornithology therefore remains unchanged.

Appropriate Assessment in-combination

Little tern

Assessment

- 6.5.1.32 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional disturbance and displacement impacts to little tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.33 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.34 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Arctic tern

Assessment

- 6.5.1.35 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional disturbance and displacement impacts to Arctic tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.36 No additional mitigation measures above those presented in **Section 6.4.3** (Marine Ornithology Commitments) are required for this impact pathway.

Conclusion

- 6.5.1.37 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to Arctic tern qualifying feature from the MHPGC Project in combination with other plans or projects.

Indirect impacts from underwater sound affecting prey species (all phases)**Appropriate Assessment Alone**Little Tern

Assessment

- 6.5.1.38 Receptor sensitivity to indirect impacts from underwater sound is based on the habitat specialisation scoring from Bradbury *et al.* (2014). Habitat specialisation was scored through a range from one (tend to forage over large marine areas with little known association with particular marine features) to five (tend to feed on very specific habitat features, such as shallow banks with bivalve communities, or kelp beds), with five being classified as high sensitivity. with a habitat specialisation score of four (Bradbury *et al.*, 2014), little tern are classified as having a high sensitivity to indirect impacts to prey species.
- 6.5.1.39 During the breeding season, there is no overlap between the little tern qualifying feature's foraging range and the Marine Ornithology Study Area (**Figure 6.2**).

Marine Mammals					
Berwickshire and Northumberland Coast SAC	Grey seal	Injury from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Disturbance from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI
		Disturbance from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by UXO clearance	Construction phase	No AEoI	No AEoI

		Disturbance from underwater sound produced by UXO clearance	Construction phase	No AEol	No AEol
		Changes to prey availability	All phases	No AEol	No AEol
Moray Firth SAC	Bottlenose dolphin	Injury from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEol	No AEol
		Disturbance from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEol	No AEol
		Injury from underwater sound produced by site investigation surveys	All phases	No AEol	No AEol
		Disturbance from underwater sound produced by site investigation surveys	All phases	No AEol	No AEol
		Injury from underwater sound produced by UXO clearance	Construction phase	No AEol	No AEol
		Disturbance from underwater sound produced by UXO clearance	Construction phase	No AEol	No AEol
Marine Ornithology					
Northumbria Coast SPA and Ramsar site	Little tern, Breeding; Arctic tern, Breeding.	Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels	All phases	No AEol	No AEol
		Indirect impacts from underwater sound affecting prey species	All phases	No AEol	No AEol
		Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species	All phases	No AEol	No AEol
Teesmouth and Cleveland Coast SPA and Ramsar site	Little tern, Breeding; Common tern, Breeding; Sandwich tern, Non-breeding.	Disturbance and displacement from noise and visual disturbance associated with the presence of vessels	All phases	No AEol	No AEol
		Indirect impacts from underwater sound affecting prey species	All phases	No AEol	No AEol

		Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species	All phases	No AEol	No AEol
Terrestrial and Intertidal Ornithology					
Northumbria Coast SPA and Ramsar site	Little tern, Breeding;	Disturbance and displacement from noise and visual disturbance.	All phases	No AEol	No AEol
	Arctic tern, Breeding;				
	Turnstone, Non-breeding;	Permanent/Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species;	Construction and O&M	No AEol	No AEol
	Purple sandpiper, Non-breeding.	Water quality, sedimentation and disturbance effects associated with frac-out affecting supporting habitat.	Construction	No AEol	No AEol
Terrestrial Habitats					
Durham Coast SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts	Permanent habitat loss	All phases	No AEol	No AEol
		Temporary loss and physical disturbance to habitats	Construction and Decommissioning	No AEol	No AEol
		Changes in air quality	Construction and Decommissioning	No AEol	No AEol
		Introduction and spread of INNS	Construction and Decommissioning	No AEol	No AEol
		Hydrological change	Construction	No AEol	No AEol
		Trenchless technique frac-out	Construction	No AEol	No AEol

6.5.1.40 The Marine Ornithology Study Area is significantly beyond little tern 5km MMFR plus one SD (Woodward *et al.*, 2019). Despite this species' high sensitivity, the potential for disturbance and displacement impacts is thus highly limited on the little tern feature of Northumbria Coast SPA and Ramsar during the breeding season for all project phases.

6.5.1.41 Post-breeding (late July to early September) (Furness, 2015), little tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Migratory movements are expected to be within a narrow band from 0 to 10km from shore (WWT and MacArthurGreen, 2014). Comparatively to other tern species, little tern post-breeding migratory movement are rapid with UK breeding little terns being reported as far south as Portugal in August, with no significant post breeding aggregations beyond their natal colony (Wernham *et al.*, 2002). Return migration movements are also considered to be relatively rapid with birds returning to breeding colonies in April and May. When considering the species migratory behaviour, the potential for any connectivity with the Marine Ornithology Study Area is highly limited spatially and temporally. Despite the high sensitivity to the indirect impacts, works activities are spatially and temporally limited, with no adverse effect on key prey species concluded (see **Section 6.4.1**). Therefore, the potential for indirect impact to prey species will be highly limited for little tern during the non-breeding seasons.

Additional Mitigation

- 6.5.1.42 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.43 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project.

Arctic tern

Assessment

- 6.5.1.44 Arctic tern are classified as having a medium sensitivity to indirect impact to prey species with a habitat specialisation score of three (Bradbury *et al.*, 2014).
- 6.5.1.45 During the breeding season, there is minor overlap at most between Arctic tern qualifying features foraging ranges and the Marine Ornithology Study Area (**Figure 6.2**). Furthermore, MHPGC Project-specific works will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time Arctic tern are present foraging. Given the availability of alternative suitable foraging habitat available, combined with the conclusions of no adverse effect on key prey species arising from underwater sound in all project phases (see **Section 6.4.1**), the potential for a significant indirect impact is expected to be limited during the breeding season.
- 6.5.1.46 Post-breeding (July to early September) (Furness, 2015), Arctic tern disperses widely before continuing their southward migration to their wintering grounds at the edge of the Antarctic pack ice (Wernham *et al.*, 2002). Return migration movements are relatively rapid with birds returning to breeding colonies in April and May. Arctic tern migrates further offshore compared to other tern species, up to 20km (WWT and MacArthur Green, 2014) so may be present within the Marine Ornithology Study Area. However, outside the breeding season birds originate from UK breeding colonies from a wider geographic area. This extensive mixing of populations means the proportion of birds attributable to the SPA population is expected to be low, and impacts thus limited. When considering the species migratory behaviour and nature of the works, the potential for any indirect impacts are considered to be spatially and temporally limited during the non-breeding season..

Additional Mitigation

- 6.5.1.47 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.48 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to Arctic tern qualifying feature from the MHPGC Project.

Appropriate Assessment in-combination

Little tern

Assessment

- 6.5.1.49 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional potential indirect impacts from underwater sound affecting prey species to little tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.50 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.51 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Arctic tern

Assessment

- 6.5.1.52 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional potential indirect impacts from underwater sound affecting prey species to Arctic tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.53 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this impact pathway.

Conclusion

- 6.5.1.54 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to Arctic tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species (all phases)

Appropriate Assessment Alone

Little tern

- 6.5.1.55 Cook and Burton (2010) and Natural England's Advice on Operation (Natural England, 2023a) for Northumbria Coast SPA and Ramsar has been used to assess each qualifying feature's sensitivity to increased SSC which can reduce prey or vision to catch prey. Subsequently, little tern are considered to have high sensitivity to increased SSC.
- 6.5.1.56 During the breeding season, there is no overlap between little tern qualifying features foraging range and the Marine Ornithology Study Area (**Figure 6.2**). The Marine Ornithology Study Area is therefore significantly beyond little terns MMFR plus one SD of 5km (Woodward *et al.*, 2019). Furthermore, no adverse effect arising from SSC on fish and shellfish receptors was concluded during all phases (see **Section 6.4.1**). Therefore, the potential for potential for temporary habitat loss/disturbance from increased SSC including indirect impacts on prey species impacts is highly limited on the little tern feature.
- 6.5.1.57 Outside of the breeding season, little tern rapidly migrates south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Although there limited spatial overlap within the Marine Ornithology Study Area, the migratory movement of the species may overlap with the location of landfall activities. This is as assessed within **Section 7.4.4**. When considering the species migratory behaviour and nature of the works, impacts are highly limited spatially and temporally. Furthermore, no adverse effects on prey species arising from increase SSCs was concluded (see **Section 6.4.1**). Therefore, despite the high sensitivity, the potential for temporary habitat loss/disturbance from increased SSC including indirect impacts on prey species is expected to be highly limited for little tern qualifying features during the non-breeding seasons.

Additional Mitigation

- 6.5.1.58 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this effect pathway.

Conclusion

- 6.5.1.59 It is concluded that temporary habitat loss/ disturbance from increased SSC, including indirect impacts on prey species will not result in AEol on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project.

Arctic tern

- 6.5.1.60 Arctic tern are considered to have a high sensitivity to increase in SSC which can reduce prey or vision to catch prey (Cooke and Burton, 2010; Natural England 2023a).
- 6.5.1.61 During the breeding season, there is minor overlap at most between Arctic tern qualifying features foraging ranges and the Marine Ornithology Study Area (**Figure 6.2**). The Marine Ornithology Study Area is 39.95km from Arctic tern breeding site at Long Nanny, equating to a 2.77% overlap with the MHPGC Project PEIR Red-Line Boundary. Project-specific activities will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time Arctic tern are present foraging. Given the availability of alternative suitable foraging habitat, combined with the conclusions of no adverse effect on key prey species arising from increase SSC in all project phases (see **Section 6.4.1**), the potential for a any temporary habitat loss/disturbance is expected to be limited during the breeding season.
- 6.5.1.62 Outside of the breeding season, Arctic terns migrate to and from wintering grounds off Western Africa or the edge of the Antarctic pack ice in the case of Arctic tern (Wernham *et al.*, 2002). However, outside the breeding season birds originate from UK breeding colonies from a wider geographic area. This extensive mixing of populations means the proportion of birds attributable to the SPA population is expected to be low, and impacts thus limited. When considering the species migratory behaviour and nature of the works, the potential for temporary habitat loss/disturbance from increased SSC including indirect impacts on prey species is considered to be limited during the non-breeding season.

Additional Mitigation

- 6.5.1.63 No additional mitigation measures above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** are required for this effect pathway.

Conclusion

- 6.5.1.64 It is concluded that temporary habitat loss/ disturbance from increased SSC, including indirect impacts on prey species will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to Arctic tern qualifying feature from the MHPGC Project.

Appropriate Assessment in-combinationLittle tern

Assessment

- 6.5.1.65 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional impacts of temporary habitat loss/disturbance from increased SSCs to little tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.66 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this effect pathway.

Conclusion

- 6.5.1.67 It is concluded that temporary habitat loss/ disturbance from increased SSC, including indirect impacts on prey species will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern and Arctic tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Arctic tern

Assessment

- 6.5.1.68 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional impacts of temporary habitat loss/disturbance from increased SSCs to little tern occurring from other plans and projects.

Additional Mitigation

- 6.5.1.69 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this effect pathway.

Conclusion

- 6.5.1.70 It is concluded that temporary habitat loss/ disturbance from increased SSC, including indirect impacts on prey species will not result in AEoI on Northumbria Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

6.5.2 Teesmouth and Cleveland Coast SPA and Ramsar

Site description

- 6.5.2.1 Teesmouth and Cleveland Coast SPA and Ramsar site is located approximately 4.5km from the MHPGC Project PEIR Red Line Boundary at the closest point (see **Table 6.1**). Teesmouth and Cleveland Coast SPA and Ramsar site cover an area of 122.11km² from Castle Eden Dene Mouth to Marske-by-the-Sea, with a seaward boundary of 6km to include Saltholme and Crimdon Dene (Natural England, 2024). The site supports various habitat including intertidal mudflat and sand flats, rocky shore, saltmarsh, freshwater marsh, saline lagoon, sand dunes and estuarine and marine waters. (Natural England, 2024). The mudflats support high densities of key prey items for the qualifying species including worms, molluscs and crustaceans, with saltmarshes provided important roosting area.

Qualifying features (Marine Ornithology only)

- 6.5.2.2 The site is designated for Annex I species listed of the EC Birds Directive including pied avocet, sandwich tern, common tern, little tern and ruff, as well as supporting non-Annex I species such as knot and redshank. Accounts for each of the Marine Ornithology qualifying features are provided below.
- 6.5.2.3 This section focuses only on Marine Ornithology qualifying features; intertidal birds such as pied avocet, ruff, not and redshank are not considered here. It should be noted that these intertidal species have not been screened in for assessment within the Terrestrial and Intertidal Ornithology AA (see **Section 7.2** for further information).

Sandwich tern

- 6.5.2.4 Sandwich tern are summer migrants, nesting in dense colonies on dunes, shingle spits, ridges and low offshore islands, where disturbance is minimised (Natural England, 2012c). Although they exhibit a MMFR plus one SD of 57.5km (Woodward et al., 2019), their preferred foraging areas are shallow coastal waters, estuaries and offshore sandbanks (Natural England, 2012c). Within Teesmouth and Cleveland Coast SPA and Ramsar site in late summer, Sandwich tern aggregate in important numbers at Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook, Bran Sands (Natural England, 2024) (**Figure 6.2**). Sandwich tern are an amber listed species under UK BoCC and protected under Annex I of the Bird Directive (Stanbury et al, 2021).
- 6.5.2.5 Teesmouth and Cleveland Coast SPA and Ramsar site supports 1,900 individuals (based on the citation population estimate; 1988 to 1992), representing 4.3% of the GB population (Natural England, 2020).
- 6.5.2.6 However, the WeBS data shows that between 2019 to 2024 an average of 161 individuals were reported around the Durham Coast (BTO, 2025b). No records of this species along the Seaham Coast alone were reported in the WeBS portal. Furthermore, there were no sandwich tern recorded between October 2025 to June 2026 in the Intertidal Bird Survey Area (including the nearshore), which is to be expected given their post-breeding migration occurring between July-September (Furness, 2015). It should be noted that the programme of intertidal bird surveys was completed in July 2026. The final results of all six surveys undertaken in 2026 will be reported within the ES and used to refine the MHPGC Project RIAA, where required.

Common tern

- 6.5.2.7 Common tern nest in diverse locations, such as offshore islands, sand dunes, shingle spits, lagoon islands, gravel pits, lakes, reservoirs and provided floating rafts. Common tern feed on small fish, crustaceans, terrestrial insects and occasionally squid (Loliginidae), foraging in various habitats, including rivers, creeks, inlets and bays, especially during the breeding season (Natural England, 2012d). These favoured foraging habitats are reflective of this species' relatively low MMFR of 26.9km (Woodward et al., 2019). In terms of population trends, since the Seabird 2000 count, the population of common tern has declined by 9% in the UK (Burnell et al., 2023) and is amber listed under the UK BoCC (Stanbury et al., 2021).
- 6.5.2.8 In summer within the Teesmouth and Cleveland Coast SPA and Ramsar site common tern breed at various locations, but the main colony can be found at Saltholme. Common tern are known to forage within the River Tees, associated water bodies and the wider estuary mouth and bay (Natural England, 2024) (Figure 6.2). Teesmouth and Cleveland Coast SPA and Ramsar site supports an internationally important population of common tern, with 399 pairs (based on the citation population estimate; 2010 to 2014), representing 4.0% of the GB population (Natural England, 2020a). However, in 2018 common tern were completely absent from Saltholme with no recent data available (BTO, 2025a).
- 6.5.2.9 Within the Durham Coast, an average of 170 individual common tern were reported between 2019 and 2024 (BTO, 2025b). No records of this species along the Seaham Coast alone were reported in the WeBS database (BTO, 2025b). As well, no common tern were recorded between October 2025 to June 2026 in the Intertidal Bird Survey Area (including the nearshore). The programme of intertidal bird surveys is ongoing, due to be completed in September 2026. The results of these surveys shall be reported on in the EIA and included in the application for development consent and Marine Licence application(s) to the Scottish Ministers.

Little tern

- 6.5.2.10 At Teesmouth and Cleveland Coast SPA, little tern nest at Crimdon Dene and forage within the inshore area of the sea (Natural England, 2017) (**Figure 6.3**). Teesmouth and Cleveland Coast SPA and Ramsar site supports an internationally important population of little tern, with 81 pairs (based on the citation population estimate; 2010 to 2014), representing 4.3% of the GB population (Natural England, 2020a). However, the more recent counts at Teesmouth and Cleveland Coast SPA report 10 apparently occupied nests from the Seabird Count 2015 to 2021 (Burnell et al., 2023).

Conservation objectives

- 6.5.2.11 The COs for the qualifying features of Teesmouth and Cleveland Coast SPA and Ramsar site are outlined below.

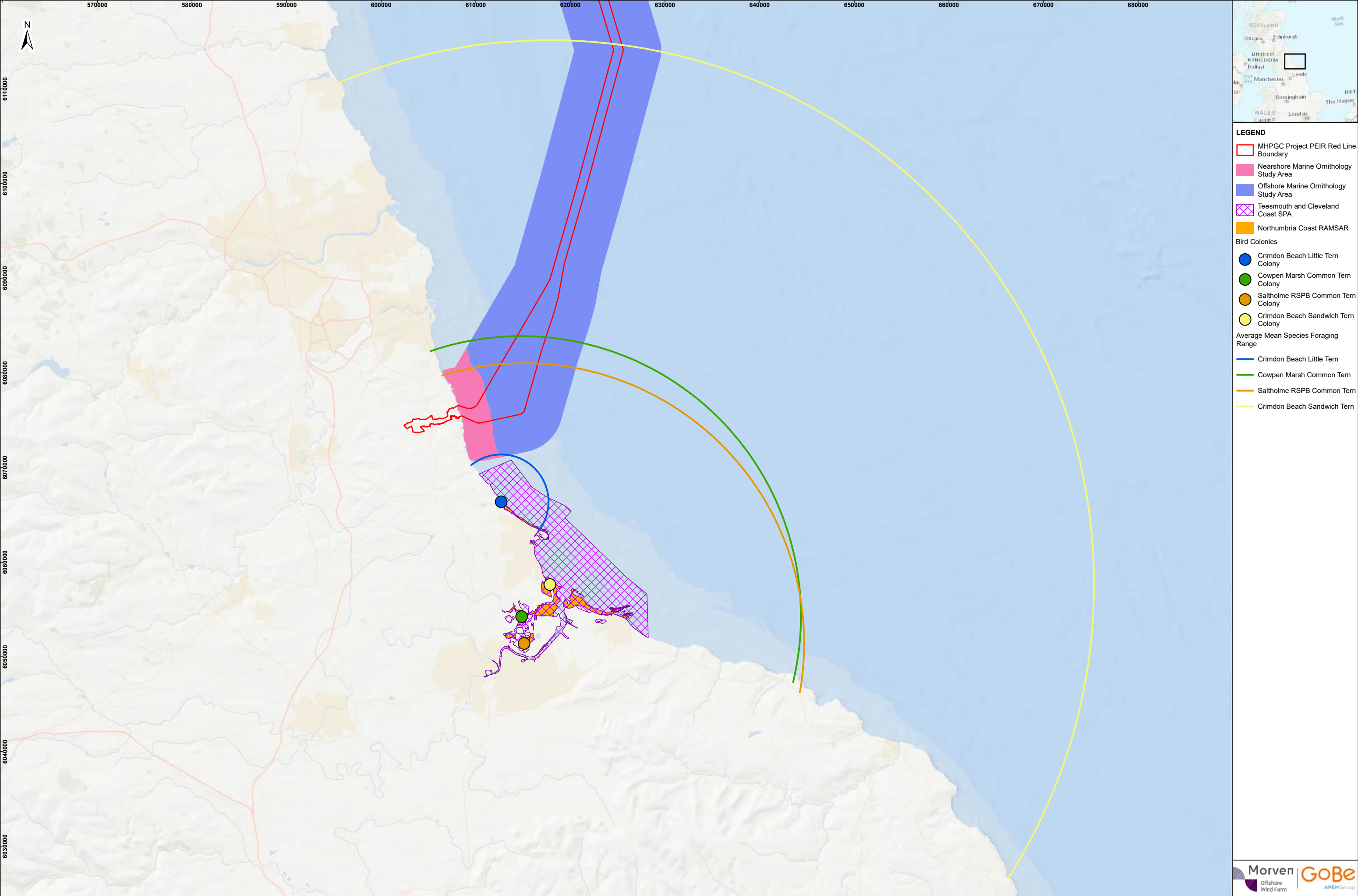
Teesmouth and Cleveland Coast SPA

- 6.5.2.12 The COs (Natural England, 2020b) for the qualifying features of Teesmouth and Cleveland Coast SPA are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
- the extent and distribution of the habitats of the qualifying features;
 - the structure and function of the habitats of the qualifying features;
 - the supporting processes on which the habitats of the qualifying features rely;
 - the population of each of the qualifying features;
 - the distribution of the qualifying features within the site.

Teesmouth and Cleveland Coast Ramsar

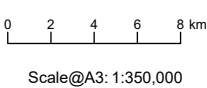
- 6.5.2.13 The COs (JNCC, 2008b) for the qualifying features of Teesmouth and Cleveland Coast Ramsar site are to maintain and restore the ecological integrity, maintain water quality, monitor ecosystem health, and the protection of designated bird populations.

-
- 6.5.2.14 These objectives are guided by the Ramsar Convention and the need to conserve the sites' qualifying features, including breeding and non-breeding bird species, and diverse wetland habitat.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
TERN BREEDING COLONIES WITHIN THE TEESMOUTH AND CLEVELAND SPA
AND RAMSAR AND THEIR AT-SEA FORAGING RANGE AREA



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Ocean Base: OceanWise, Esri, Garmin, NaturalVue
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS



Drawing Number:				
FIGURE 6-3				
VER	DATE	DETAILS	BY	CHECK
00	11/08/2026	Initial Issue	GB	SZ
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Disturbance and displacement from noise and visual disturbance associated with the presence of vessels (all phases)

Appropriate Assessment Alone

Little tern

- 6.5.2.15 Little tern are considered to have a low sensitivity to anthropogenic disturbance within the marine environment, including in relation to vessel presence (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Wade *et al.*, 2016; Bradbury *et al.*, 2014). As such the disturbance and displacement impact arising from vessel presence is expected to be minimal.
- 6.5.2.16 Within the Teesmouth and Cleveland Coast SPA and Ramsar, little terns breed at Crimdon Beach, which is located approximately 8.6km from the MHPGC Red-line Boundary. The Marine Ornithology Study Area overlap with this features MMFR plus one SD of 5km (Woodward *et al.*, 2019) (**Figure 6.2**). Therefore, there is potential for connectivity between the MHPGC Project and the little tern feature of Teesmouth and Cleveland Coast SPA and Ramsar during the breeding season (May to early August) (Furness, 2015). However, considering the minimal overlap (**Figure 6.3**), the qualifying feature's low sensitivity to disturbance and the localised ZoI of 2km (Based on SNCBs (2022)), any potential disturbance and displacement impacts are considered to have minimal energetic cost during the breeding season (May to early April) (Furness *et al.*, 2015).
- 6.5.2.17 Post-breeding (late July to early September) (Furness, 2015), little tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Migratory movements are expected to be within a narrow band from 0 to 10km from shore (WWT and MacArthurGreen, 2014). Compared to other tern species, little tern post-breeding migratory movements are rapid with UK breeding little terns reported as far south as Portugal in August, with no significant post breeding aggregations beyond their natal colony (Wernham *et al.*, 2002). Return migration movements are also considered to be relatively rapid with birds returning to breeding colonies in April and May. Given the rapid departure from (and return to) the UK, the potential for overlap between non-breeding little tern and the Marine Ornithology Study Area is thus highly limited. When considering the species migratory behaviour, and the qualifying features low sensitivity to disturbance, the potential for disturbance and displacement impacts is highly limited during the non-breeding season.
- 6.5.2.18 Furthermore, the commitment to a VTMP (CoT30) (see **Table 6.5**) will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

Additional Mitigation

- 6.5.2.19 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.20 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in an AEoI on the Teesmouth and Cleveland Coast SPA and Ramsar, in view of the site's COs with respect to the little tern qualifying feature from the MHPGC Project alone.

Common tern

- 6.5.2.21 Common tern are considered to have a low sensitivity to anthropogenic disturbance within the marine environment, including in relation to vessel presence (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Wade *et al.*, 2016; Bradbury *et al.*, 2014).
- 6.5.2.22 Within the Teesmouth and Cleveland Coast SPA and Ramsar, common tern breed at Saltholme Royal Society for the Protection of Birds (RSPB) and Cowpen Marsh. These colonies are located at a maximum 23.8km from the MHPGC Project PEIR Red Line Boundary (**Figure 6.2**). Therefore, the Marine Ornithology Study Area is within the 26.9km MMFR plus one SD for common tern (Woodward *et al.*, 2019). Given a minor degree of overlap between common tern MMFR plus one SD foraging range and the Marine Ornithology Study Area, there is potential for disturbance to

occur. However, the MHPGC Project PEIR Red Line Boundary only covers approximately 5% of the common tern's potential at-sea foraging range from these colonies. Given the extent of alternative suitable foraging habitat available, the qualifying features expected low sensitivity to disturbance at sea and highly localised ZOI for disturbance effects of 2km (based on SNCBs (2022)), any potential disturbance and displacement impacts are considered to have minimal energetic costs during the breeding season (May to early August) (Furness, 2015).

- 6.5.2.23 Post-breeding (late July to early September) (Furness, 2015), common tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Many birds stay close to their natal sites during July and August, however there is evidence of overland departures from Teesmouth south-west to Liverpool Bay (Wernham *et al.*, 2002). Offshore migration typically occurs within narrow band up to 10km offshore (WWT and MacArthur Green, 2014) so common tern may be present within the Marine Ornithology Study Area. Although limited potential for interaction is expected on post-breeding migration, due to wider mixing of the population. Return migration movements are relatively rapid with birds returning to breeding colonies in April and May. When considering the species migratory behaviour, the potential for disturbance and displacement impacts are considered to be limited during the non-breeding season.
- 6.5.2.24 Furthermore, the commitment to a VTMP (CoT30) (see **Table 6.5**) will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

Additional Mitigation

- 6.5.2.25 No additional mitigation measures are required above those presented in Section **6.4.3** (Marine Ornithology Commitments) for this impact pathway.

Conclusion

- 6.5.2.26 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in an AEoI on the Teesmouth and Cleveland Coast SPA and Ramsar, in view of the site's COs with respect to the common tern qualifying feature/s from the MHPGC Project alone.

Sandwich tern

- 6.5.2.27 Sandwich tern are considered to have a low sensitivity to anthropogenic disturbance within the marine environment, including in relation to vessel presence (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Bradbury *et al.*, 2014). As such the disturbance and displacement impact arising from vessel presence is expected to be minimal.
- 6.5.2.28 The sandwich tern feature of Teesmouth and Cleveland Coast SPA and Ramsar is designated for individuals during the post-breeding migration period, occurring between July and September (Furness, 2015). Sandwich terns concentrate at several sites within the SPA and Ramsar during this period, most notably Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands. These sites are located at a minimum 18.2km from the MHPGC PEIR Red-Line Boundary (**Figure 6.2**).
- 6.5.2.29 During this post-breeding migration period there is a significant turnover of individuals with birds no longer constrained to central-place foraging grounds, instead this species is more mobile, enabling the species access to suitable alternative foraging habitat, well beyond the ZOI for disturbance effects of 2km around vessels (based on SNCBs (2022)). Whilst the Marine Ornithology Study area is potentially used for foraging by sandwich tern aggregated within the SPA during the non-breeding season, alternative foraging habitat is widely available, and disturbance is not present within the entire Marine Ornithology Study area at any one time. Vessel movements will be spatially and temporally restricted, with vessels gradually traveling along the route rather than remaining in one location.
- 6.5.2.30 Considering the limited presence of the species during the post-migration season, the localised and temporary nature of the work, the extensive alternative suitable foraging habitat available, as well as the species low sensitivity to disturbance and displacement, the potential for a disturbance and displacement impact is considered to be limited.

- 6.5.2.31 Furthermore, the commitment to a VTMP (CoT30) (see **Table 6.5**) will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

Additional Mitigation

- 6.5.2.32 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.33 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in an AEol on the Teesmouth and Cleveland Coast SPA and Ramsar, in view of the site's COs with respect to the common tern qualifying feature/s from the MHPGC Project alone.

Appropriate Assessment in-combination

Terns

Assessment

- 6.5.2.34 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project.

Additional Mitigation

- 6.5.2.35 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.36 It is concluded that disturbance and displacement from noise and visual disturbance associated with the presence of vessels will not result in AEol on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern, common tern and sandwich tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Indirect impacts from underwater sound affecting prey species (all phases)

Appropriate Assessment Alone

Little tern

- 6.5.2.37 Receptor sensitivity to indirect impacts from underwater noise is based on the habitat specialisation scoring from Bradbury *et al.* (2014). Subsequently little tern have high sensitivity (habitat specialisation score of four) to indirect impact to prey species.
- 6.5.2.38 Within the Teesmouth and Cleveland Coast SPA and Ramsar, little terns breed at Crimdon Beach, which is located approximately 8.6km from the MHPGC Red Line Boundary. The Marine Ornithology Study Area slightly overlaps with this features MMFR plus one SD of 5km (Woodward *et al.*, 2019) (**Figure 6.3**). Therefore, there is potential for connectivity between the MHPGC Project and the little tern feature of Teesmouth and Cleveland Coast SPA and Ramsar during the breeding season (May to early August) (Furness, 2015). Project-specific activities will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time little tern are present foraging. Given the availability of alternative suitable foraging habitat available, combined with the conclusions of no adverse effect on key prey species arising from underwater sound in all project phases (see **Section 6.4.1**), the potential for a significant indirect impact is expected to be limited during the breeding season.
- 6.5.2.39 Post-breeding (late July to early September) (Furness, 2015), little tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Migratory movements are expected to be within a narrow band from 0 to 10km from shore (WWT and MacArthurGreen, 2014). Comparatively to other tern species, little tern post-breeding migratory movements are rapid with UK breeding little terns being reported as far south as Portugal in

August, with no significant post breeding aggregations beyond their natal colony (Wernham *et al.*, 2002). Return migration movements are also considered to be relatively rapid with birds returning to breeding colonies in April and May. When considering the species migratory behaviour, the potential for any connectivity with the MHPGC Project boundary is highly limited both spatially and temporally. Despite the high sensitivity to indirect impacts, work activities are spatially and temporally limited, with no adverse effect on key prey species concluded (see **Section 6.4.1**). Therefore, the potential for indirect impact from impacts to prey species is highly limited for little tern during the non-breeding seasons.

Additional Mitigation

- 6.5.2.40 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.41 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project.

Common tern

- 6.5.2.42 Common tern are classified as having a medium sensitivity (habitat specialisation score of three) to indirect impact to prey species with a habitat specialisation score of three (Bradbury *et al.*, 2014).
- 6.5.2.43 Within the Teesmouth and Cleveland Coast SPA and Ramsar, common tern breed at Saltholme RSPB and Cowpen Marsh. These colonies are located at a maximum 23.8km from the MHPGC Project PEIR Red Line Boundary (**Figure 6.3**). Therefore, the Marine Ornithology Study Area is within the 26.9km MMFR plus one SD for common tern (Woodward *et al.*, 2019). However, the MHPGC Project PEIR Red Line Boundary only covers approximately 5% of the common tern's potential at-sea foraging range from these colonies. Project-specific activities will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time common tern are present foraging. Given the availability of alternative suitable foraging habitat available, combined with the conclusions of no adverse effect on key prey species arising from underwater sound in all project phases (**Section 6.4.1**), potential for a significant indirect impact is highly limited during the breeding season.
- 6.5.2.44 Post-breeding (late July to early September) (Furness, 2015), common tern migrate south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002). Many birds stay close to their natal sites during July and August, however there is evidence of overland departures from Teesmouth south-west to Liverpool Bay (Wernham *et al.*, 2002). Offshore migration typically occurs within narrow band up to 10km offshore (WWT and MacArthur Green, 2014) so may be present within the Marine Ornithology Study Area. However, outside the breeding season birds originate from UK breeding colonies from a wider geographic area. This extensive mixing of populations means the proportion of birds attributable to the SPA population is expected to be low, and impacts thus limited. When considering the species migratory behaviour the potential for any significant indirect impacts are considered to be limited during the non-breeding season.

Additional Mitigation

- 6.5.2.45 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.46 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to common tern qualifying feature from the MHPGC Project.

Sandwich tern

- 6.5.2.47 Sandwich tern are classified as having a medium sensitivity (habitat specialisation score of three) to indirect impact to prey species with a habitat specialisation score of three (Bradbury *et al.*, 2014).
- 6.5.2.48 The sandwich tern feature of Teesmouth and Cleveland Coast SPA and Ramsar is designated for individuals during the post-breeding migration period, occurring between July and September (Furness, 2015). Sandwich terns concentrate at several sites within the SPA and Ramsar during this period, most notably Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands. These sites are located at a minimum 18.2km from the MHPGC PEIR Red-Line Boundary (**Figure 6.3**).
- 6.5.2.49 During this post-breeding migration period there is significant turnover of individuals with bird no longer constrained to central-place foraging grounds, instead this species is more mobile accessing alternative foraging habitat. Whilst the Marine Ornithology Study area is potentially used for foraging by sandwich tern aggregated within the SPA during the non-breeding season, alternative foraging habitat is widely available, and disturbance is not present within the entire Marine Ornithology Study area at any one time. Vessel movements will be spatially and temporally restricted, with vessels gradually traveling along the route rather than remaining in one location.
- 6.5.2.50 Considering the limited presence of the species during the post-migration season, the localised and temporary nature of the work, the extensive alternative suitable foraging habitat available, as well as the conclusions of no adverse effect on key prey species (**Section 6.4.1**) the potential for any indirect impacts are considered to be limited during the non-breeding season.

Additional Mitigation

- 6.5.2.51 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.52 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern, sandwich tern and common tern qualifying feature from the MHPGC Project.

Appropriate Assessment in-combination

- 6.5.2.53 To reduce repetition of information, indirect impacts from underwater sound affecting prey species has been assessed on a receptor group basis for all European sites requiring consideration.

Terns

Assessment

- 6.5.2.54 There are no projects or plans identified that that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional indirect impacts from underwater sound affecting prey species to all terns occurring from other plans and projects

Additional Mitigation

- 6.5.2.55 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.56 It is concluded that indirect impacts from underwater sound affecting prey species will not result in AEol on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern, common tern and sandwich tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species (all phases)

Appropriate Assessment Alone

Little tern

- 6.5.2.57 Cook and Burton (2010) and Natural England's Advice on Operation (Natural England, 2023c) for Teesmouth and Cleveland Coast SPA and Ramsar has been used to assess each qualifying feature's sensitivity to increased SSC which can reduce prey or vision to catch prey. Subsequently, little tern are considered to have high sensitivity to increased SSC.
- 6.5.2.58 Within the Teesmouth and Cleveland Coast SPA and Ramsar, little terns breed at Crimdon Beach, which is located approximately 8.6km from the MHPGC PEIR Red-line Boundary. The Marine Ornithology Study Area slightly overlaps with this features MMFR plus one SD of 5km (Woodward *et al.*, 2019) (**Figure 6.3**). There is potential for connectivity between the MHPGC Project and the little tern feature of Teesmouth and Cleveland Coast SPA and Ramsar during the breeding season (May to early August) (Furness, 2015). Project-specific activities will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time little tern are present foraging. Given the availability of alternative suitable foraging habitat available, combined with the conclusions of no adverse effect on key prey species arising from increase SSC in all project phases (see **Section 6.4.1**), the potential for temporary habitat loss/disturbance is expected to be limited during the breeding season.
- 6.5.2.59 Outside of the breeding season, little tern rapidly migrates south to their wintering grounds of nearshore areas off Western Africa (Wernham *et al.*, 2002), and rapidly return to breeding sites. When considering the species migratory behaviour, the potential for any connectivity with the Marine Ornithology Study Area is highly limited spatially and temporally. Furthermore, no adverse effects on key prey species arising from increase SSCs was concluded (see **Section 6.4.1**). Therefore, despite the high sensitivity, the potential for temporary habitat loss/disturbance from increased SSC including indirect impacts on prey species is expected to be highly limited for little tern qualifying features during the non-breeding seasons.

Additional Mitigation

- 6.5.2.60 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.61 It is concluded that temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species will not result in AEoI on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern qualifying feature from the MHPGC Project

Common tern

- 6.5.2.62 Common tern are considered to have a high sensitivity to an increase in SSC which can reduce prey or vision to catch prey (Cooke and Burton, 2010; Natural England 2023c).
- 6.5.2.63 Within the Teesmouth and Cleveland Coast SPA and Ramsar, common tern breed at Saltholme RSPB and Cowpen Marsh. These colonies are located at a maximum 23.8km from the MHPGC Project PEIR Red Line Boundary (**Figure 6.3**). Therefore, the Marine Ornithology Study Area is within the 26.9km MMFR plus one SD for common tern (Woodward *et al.*, 2019). However, the MHPGC Project PEIR Red Line Boundary only covers approximately 5% of the common tern's potential at-sea foraging range from these colonies. MHPGC Project-specific activities will be limited spatially and temporally, with works progressing gradually across the MHPGC Project PEIR Red Line Boundary rather than occurring simultaneously across its entire length. Therefore, activities may not occur within areas of overlap at the same time common tern are present foraging. Given the availability of alternative suitable foraging habitat available, combined with the conclusions of no adverse effect on key prey species arising from increase SSC in all project

phases (see **Section 6.4.1**), the potential for a significant temporary habitat loss/disturbance is expected to be limited during the breeding season.

- 6.5.2.64 Outside of the breeding season, common tern migrate to and from wintering grounds off Western Africa (Wernham *et al.*, 2002). However, outside the breeding season birds originate from UK breeding colonies from a wider geographic area. This extensive mixing of populations means the proportion of birds attributable to the SPA population is expected to be low, and impacts thus limited. Furthermore, there are no adverse effect on prey species arising from increase SSC concluded (see **Section 6.4.1**). Therefore, despite the high sensitivity, the potential for temporary habitat loss/ disturbance from increased SSC is expected to be limited for common tern qualifying features during the non-breeding seasons.

Additional Mitigation

- 6.5.2.65 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.66 It is concluded that temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species will not result in AEoI on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to common tern qualifying feature from the MHPGC Project

Sandwich tern

- 6.5.2.67 Sandwich tern are considered to have a high sensitivity to an increase in SSC which can reduce prey or vision to catch prey (Cooke and Burton, 2010; Natural England 2023c).
- 6.5.2.68 The sandwich tern feature of Teesmouth and Cleveland Coast SPA and Ramsar is designated for individuals during the post-breeding migration period, occurring between July and September (Furness, 2015). Sandwich terns concentrate at several sites within the SPA and Ramsar during this period, most notably Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands. These sites are located at a minimum 18.2km from the MHPGC PEIR Red-Line Boundary (**Figure 6.3**).
- 6.5.2.69 During this post-breeding migration period there is significant turnover of individuals with bird no longer constrained to central-place foraging grounds, instead this species is more mobile accessing alternative foraging habitat. Whilst the Marine Ornithology Study area is potentially used for foraging by sandwich tern aggregated within the SPA during the non-breeding season, alternative foraging habitat is widely available, and disturbance is not present within the entire Marine Ornithology Study area at any one time. Vessel movements will be spatially and temporally restricted, with vessels gradually traveling along the route rather than remaining in one location. When considering the species migratory behaviour and nature of the works, combined with the conclusions of no adverse effect on key prey species (**Section 6.4.1**) the potential for any temporary habitat loss/ disturbance from increased SSC is considered to be limited during the non-breeding season.

Additional Mitigation

- 6.5.2.70 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.71 It is concluded that temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species will not result in AEoI on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to sandwich tern qualifying feature from the MHPGC Project

Appropriate Assessment in-combination

- 6.5.2.72 To reduce repetition of information based on the similar conclusions, potential temporary habitat loss/disturbance from increased SSCs has been assessed on a receptor group basis for Teesmouth and Cleveland Coast SPA and Ramsar site.

Terns

Assessment

- 6.5.2.73 There are no projects or plans identified that overlap in construction schedules with the MHPGC Project. Therefore, there are no additional impacts of temporary habitat loss/disturbance from increased SSCs to all terns occurring from other plans and projects

Additional Mitigation

- 6.5.2.74 No additional mitigation measures are required above those presented in **Section 6.4.3 (Marine Ornithology Commitments)** for this impact pathway.

Conclusion

- 6.5.2.75 It is concluded that temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species will not result in AEoI on Teesmouth and Cleveland Coast SPA and Ramsar in view of the site's COs with respect to little tern, common tern and sandwich tern qualifying feature from the MHPGC Project in-combination with other plans or projects.

7 Terrestrial and Intertidal Ornithology

7.1 Introduction

- 7.1.1.1 This section presents the HRA for Terrestrial and Intertidal Ornithology receptors, specifically those identified as qualifying features of sites screened into the MHPGC Project RIAA.
- 7.1.1.2 **Section 7.2** first outlines the outcomes of the MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report, considering effects both alone (**Section 7.2.2**) and in-combination with other plans and projects (**Section 7.2.3**). **Section 7.2.4** then describes how consultation feedback and project design refinements have been incorporated into the screening conclusions, including updates such as the addition of an impact pathway and the removal of a site. An up-to-date summary of LSE taken forward to AA is presented in **Section 7.2.5**.
- 7.1.1.3 **Section 7.3** presents the Terrestrial and Intertidal Ornithology baseline, including the Study Area (**Section 7.3.1**), survey effort and results (**Section 7.3.2**), and any constraints and limitations of the available data (**Section 7.3.3**).
- 7.1.1.4 **Section 7.3.3.6** sets out the information used to inform the AA, including details and assessment criteria of relevant impact pathways (**Section 7.4.1**), design parameters (**Section 7.4.2**), embedded mitigation and project commitments (**Section 7.4.3**), and the plans and projects considered within the in-combination assessment (**Section 7.4.4**).
- 7.1.1.5 **Section 7.5** presents the AA for the MHPGC Project, both alone and in-combination, and determines whether the Project will result in an AEoI of the screened-in sites, in view of their COs.

7.2 Likely Significant Effect screening outcomes

- 7.2.1.1 This section summarises the European sites designated for terrestrial and intertidal ornithology qualifying features that were identified through the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report, as having the potential to experience LSE from the MHPGC Project**. This section presents updates to screening as a result of consultation and project refinements and defines the scope of the Stage 2 AA.

7.2.2 Screening outcomes for the MHPGC Project alone

- 7.2.2.1 European sites designated for Terrestrial and Intertidal Ornithology qualifying features were screened in where they either overlapped with the MHPGC Project Interim Boundary, occurred within the relevant Zol for an identified impact pathway, or where qualifying bird species could potentially utilise habitats within or adjacent to the MHPGC Project as functionally linked land. Screening considered pathways associated with permanent and temporary habitat loss, disturbance and displacement from noise and visual disturbance. For terrestrial and intertidal ornithology receptors, a Zol of up to 650m from the MHPGC Project Interim Boundary was applied where relevant to disturbance. For qualifying bird species associated with European sites, a precautionary search distance of 20km was applied to identify European sites whose qualifying features could utilise habitats within the Terrestrial Ornithology Study Area and Intertidal Study Area (both of which are defined in the Glossary).

The onshore screening approach also considered SPAs and Ramsar Sites where a pathway for effects exists between the MHPGC Project and qualifying Terrestrial or Intertidal Ornithology features. European sites were screened in where qualifying species could utilise habitats within the Study Area as functionally linked land or intertidal supporting habitat, or where disturbance and displacement from noise and visual disturbance habitat loss and indirect effects on prey resources could affect the COs of the European site. Marine SPAs were therefore considered where qualifying species have nesting, roosting, feeding, or other supporting habitat above MLWS that may be connected to the MHPGC Project.

- 7.2.2.2 These European sites were then considered for the potential for LSE where the MHPGC Project Scoping Report identified the following impact pathways:
- permanent habitat loss, including functionally linked land;

- temporary habitat loss and disturbance of supporting habitats;
- disturbance and displacement of birds arising from noise and visual disturbance;

- 7.2.2.3 The only impact pathway that was concluded to have potential LSE to the qualifying ornithological features of European sites was disturbance and displacement of birds. In the absence of noise modelling at the screening stage, it is considered that noise generated by construction activities could disrupt normal behaviours, including reducing birds' feeding intake rates or prompting temporary displacement from vital foraging grounds. These disturbances could diminish feeding opportunities and increase energy expenditure, with potential consequences for body condition, survival and reproductive success.
- 7.2.2.4 Following the screening assessment, disturbance and displacement of birds was the only impact pathway for which LSE could not be excluded. Other pathways, including habitat loss and indirect effects on prey resources, were screened out on the basis of the scale, location and nature of the MHPGC Project and the absence of a credible pathway to affect qualifying features. As a result, the European sites and relevant qualifying features that were concluded to be subject to potential LSE from the MHPGC Project, thus requiring AA were:
- Northumbria Coast SPA/Ramsar, designated for breeding Arctic tern (*Sterna paradisaea*) and little tern (*Sternula albifrons*); and non-breeding purple sandpiper (*Calidris maritima*) and turnstone (*Arenaria interpres*).
- 7.2.2.5 This site has been screened in for AA for effects from disturbance and displacement of Terrestrial and Intertidal qualifying features.
- 7.2.2.6 A summary of the European sites and relevant qualifying features for which LSE could not be ruled out at the time of the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** is presented in **Table 7.1**

Table 7.1: All European sites designated for Annex I Terrestrial and Intertidal Ornithology features screened in from the MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal

European site	Distance to the MHPGC Project Interim Boundary at the closest point (km)	Relevant qualifying features	Impact pathway
Northumbria Coast SPA/Ramsar (UK9006131/UK11049)	1.706	Breeding: • Arctic tern; • Little tern. Non-breeding: • Purple sandpiper; • Turnstone.	Disturbance and displacement of birds.

7.2.3 Screening outcomes for the MHPGC Project in-combination

- 7.2.3.1 The potential for LSE on Terrestrial and Intertidal Ornithology was considered in combination with other plans or projects. Any effect that could not be ruled out for the MHPGC Project alone was assumed to require in-combination screening assessment. Where an impact pathway had been discounted from having LSE on the European Site from the MHPGC Project alone, it still required additional consideration in-combination with other plans or projects except in cases where an impact had been assessed alone as resulting in a negligible or inconsequential effect.
- 7.2.3.2 The **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** identified the following In-combination effects to be considered within the MHPGC RIAA for European sites with Annex I Terrestrial and Intertidal Ornithology:
- Permanent habitat loss, including functionally linked land and bird nests;
 - Temporary loss of supporting habitats;

- Disturbance and displacement of birds.

7.2.4 Screening outcome updates following consultation and project refinement

7.2.4.1 With regards to Terrestrial and Intertidal Ornithology the following updates have been made to the Screening outcomes as a result of consultation feedback and refinements to the MHPGC Project, as summarised in **Section 4**:

- In response to NE Discretionary Advice Service (09 January 2026), the following effects have been screened in for further assessment to inform the AA:
 - Visual disturbance to qualifying features of the Northumbria Coast SPA and Ramsar Site;
 - Permanent and temporary habitat loss and disturbance affecting supporting habitat and potential functionally linked land used by qualifying features of the Northumbria Coast SPA and Ramsar Site;
 - Potential functionally linked land and supporting habitat used by qualifying features of the Northumbria Coast SPA and Ramsar site have been considered within the information to inform AA. Wintering and intertidal bird survey data, together with desk study information and habitat surveys, have been reviewed to determine whether habitats within the MHPGC Project PEIR Red Line Boundary provide functionally linked habitat for qualifying species features;
 - Potential impacts associated with HDD frac-out affecting qualifying features of the Northumbria Coast SPA and Ramsar.

7.2.4.2 The assessment of impacts to intertidal ornithology qualifying features is now incorporated within this Terrestrial and Intertidal Ornithology section of the MHPGC Project RIAA. Assessment of ornithological receptors associated with the offshore environment is presented separately within the Marine Ornithology **Section 6** of this MHPGC Project RIAA.

7.2.4.3 Review of the MHPGC Project PEIR Red Line Boundary (which is reduced in extent from the MHPGC Interim Boundary) has resulted in a minor update to the distance between the MHPGC Project and the Northumbria Coast SPA/Ramsar Site, which is now located approximately 1.7km from the MHPGC Project Boundary at its closest point. This refinement has informed the assessment of potential impact pathways but does not alter the screening conclusions.

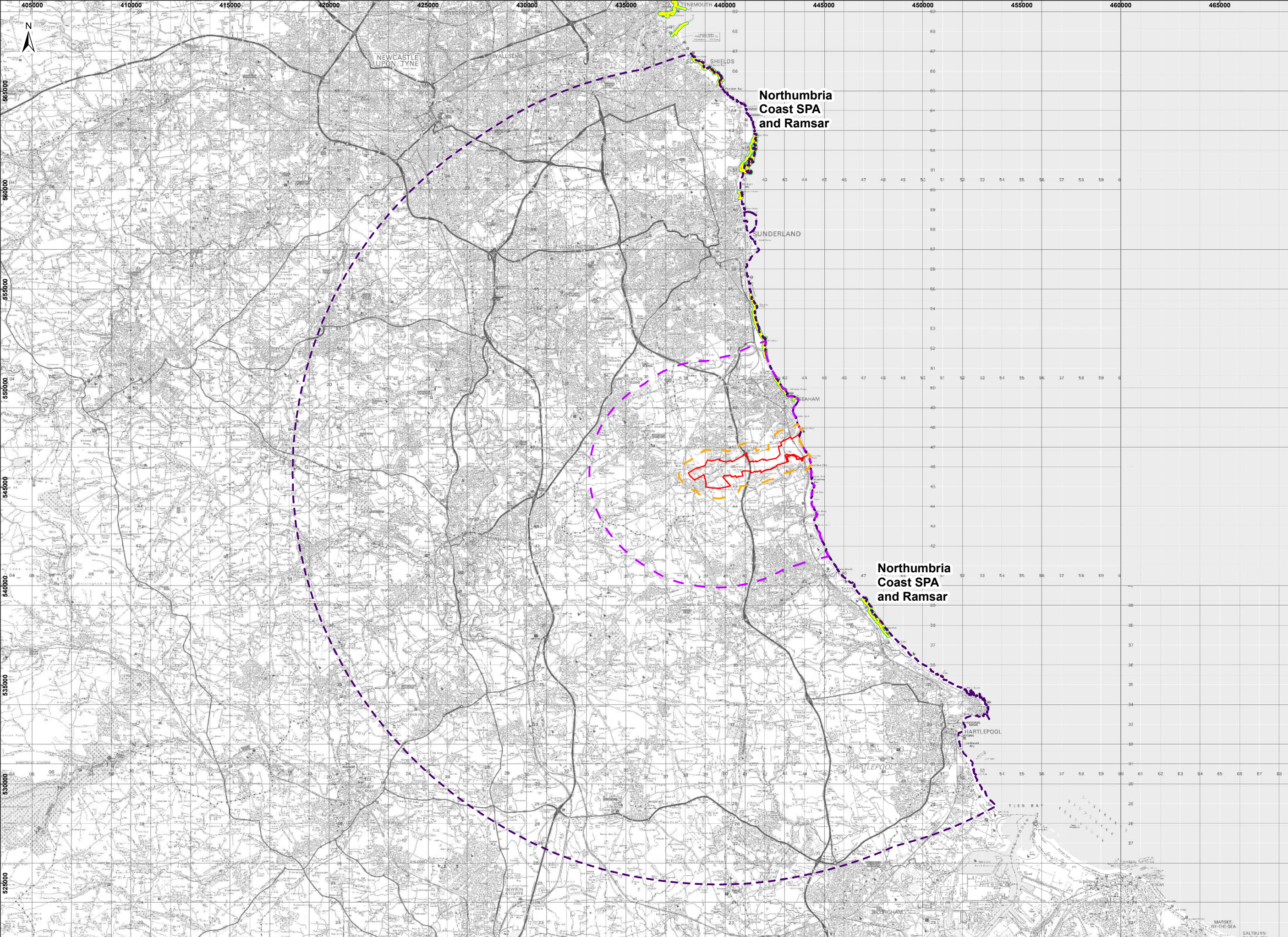
7.2.4.4 Review of the MHPGC PEIR Red Line Boundary and available survey information has not identified any additional European sites requiring inclusion within the Terrestrial and Intertidal Ornithology assessment. The updated Screening outcomes are presented in **Table 7.2** and locations shown in **Figure 7.1**.

7.2.5 Summary of Likely Significant Effects taken forward to Appropriate Assessment

7.2.5.1 A summary of the European sites and relevant qualifying Terrestrial and Intertidal Ornithological features for which LSE have been identified through screening and consideration of consultation responses is provided below. Therefore, **Table 7.2** includes all sites, features, and impact pathways screened in for consideration within the AA

Table 7.2: Updated Screening Outcomes and Impact Pathways for Terrestrial and Intertidal Ornithology

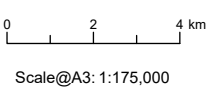
European site	Distance to the MHPGC Project PEIR Red Line Boundary at the closest point (km)	Relevant qualifying feature	Project Phases		
			Construction	O&M	Decommissioning
			Impact Pathways		
English National Site Network (European sites)					
Northumbria Coast SPA/Ramsar (UK9020325/UK11049)	1.706	Breeding: - Arctic tern; - Little tern. Non-breeding: - Purple sandpiper; - Turnstone.	- Disturbance and displacement from noise and visual disturbance; - Permanent habitat loss affecting supporting habitat used by qualifying species; - Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species; - Temporary reduction in habitat availability and foraging opportunities arising from disturbance to intertidal habitats and associated prey resources used by qualifying species; - Potential water quality, sedimentation and disturbance effects associated with frac-out affecting supporting habitat.	- Disturbance and displacement from noise and visual disturbance; - Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species; - Temporary disturbance of intertidal habitat; - Reduced access to foraging habitat; - Changes in prey abundance/distribution.	- Disturbance and displacement from noise and visual disturbance; - Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species; - Temporary habitat disturbance and supporting habitat impacts.



- LEGEND**
- MHPGC PEIR Red Line Boundary: Onshore
 - Onshore Study Area - 20km Buffer
 - 5km Buffer
 - 500m Buffer
 - Special Protection Area (SPA)
 - Ramsar

Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 7.1: SITES SCREENED IN FOR LIKELY SIGNIFICANT EFFECT (LSE) AND
INTERTIDAL ORNITHOLOGY FEATURES



Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
GB Background: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack
Contains public sector information licensed under the Open government License v3.0.
© Crown copyright and database rights 2026 Ordnance Survey AC0000848283

Drawing Number: MHPGC-WSP-PEIR-BIO-134				
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7.3 Terrestrial and Intertidal Ornithology baseline

7.3.1 Ornithology Study Areas and Survey Areas

- 7.3.1.1 The Terrestrial Ornithology Study Area, as defined in the **Glossary**, is the area within a 20km buffer of the MHPGC Project PEIR Red Line Boundary subject to a desk study to identify relevant European sites and their features (i.e., species) which may potentially be impacted by the Project. was defined based on the Zol of activities associated with the MHPGC Project with the potential to impact European Birds Directive Annex I terrestrial ornithology receptors, with a 20km buffer used for the baseline characterisation and assessment. This was considered to constitute the maximum likely distance at which impacts could reasonably expected to occur for ornithological receptors which may make use of potentially Functionally Linked Land (FLL) beyond the boundary of respective European sites.
- 7.3.1.2 **Figure 7.1** shows the European sites notified for Annex I bird species within the Terrestrial Ornithology Study Area. Figures showing the survey areas used for breeding, wintering and intertidal surveys are shown in the reports for those surveys (Annexes 3.12 and 3.13 of the PEIR, respectively).
- 7.3.1.3 The Intertidal Ornithology Study Area and Intertidal Bird Survey Area are both defined as the area between Mean High-Water Springs (MHWS) and Mean Low Water Springs (MLWS) within the MHPGC Project PEIR Red Line Boundary, including a 1.5km viewshed from the coast (to cover subtidal/marine habitat) and a buffer of up to 650m where Intertidal Bird Surveys were undertaken during the winters of 2023/2024 and 2025/2026.
- 7.3.1.4 The Breeding Bird Survey area is defined as the survey area considered for breeding birds which comprises the MHPGC PEIR Red Line Boundary: Onshore, with a 100m buffer applied. Surveys were undertaken during April to July 2025 inclusive and late March to July 2026 inclusive.
- 7.3.1.5 The Wintering Bird Survey Area is defined as the survey area considered for wintering and passage birds during October 2023 to March 2024 and October 2025 and March 2026 which comprises the MHPGC PEIR Red Line Boundary: Onshore, with a 250m buffer applied. Where appropriate, this was extended up to 650m based upon recommendations in Goodship and Furness (2022). This size of the buffer for the Wintering Bird Survey Area is considered to represent the area within which potential impacts on birds could occur, including potential indirect effects from visual disturbance and noise.
- 7.3.1.6 See **Volume 3 Annex 3.13 Interim Wintering and Intertidal Birds Survey Technical Report of the PEIR, Figure 2.1 and Figure 2.2)** for further detail. Distances are precautionary and based on recommendations presented within Goodship and Furness (2022).
- 7.3.1.7 In March 2025, Natural England advised that the HRA should consider whether habitats located outside the designated boundary of Northumbria Coast SPA and Ramsar site provide supporting habitat for qualifying features. FLL was therefore considered as part of the baseline review.
- 7.3.1.8 Habitats within the Wintering Bird Survey Area, Breeding Bird Survey Area and Intertidal Bird Survey Area include coastal habitats, grassland, agricultural land, scrub and intertidal habitats which have the potential to be utilised by mobile qualifying bird species for foraging, roosting, or resting purposes.
- 7.3.1.9 While each study/survey area was defined to address different ornithological receptor groups and their respective potential impact pathways, they are complementary and collectively provide the evidence base for the ornithological baseline. The Terrestrial Ornithology Study Area identifies relevant European sites and their qualifying features identified via a desk study. The Wintering Bird Survey Area characterises distribution and abundance of wintering and passage terrestrial birds surveyed within the MHPGC PEIR Red Line Boundary: Onshore, with a 250m buffer applied (where appropriate, this was extended up to 650m based upon recommendations presented within Goodship and Furness (2022)). The Intertidal Ornithology Study Area focuses on waterbirds surveyed using intertidal habitats up to 650m from the MHPGC Red Line Boundary. Together, these study areas ensure that all relevant potential ornithological receptors are appropriately represented within the baseline and assessment.

7.3.2 Survey Effort and Results

- 7.3.2.1 Intertidal, wintering/passage and breeding bird surveys were undertaken to understand the abundance and distribution of qualifying features of the Northumbria Coast SPA and Ramsar Site, namely breeding Arctic tern and little tern, and non-breeding purple sandpiper and turnstone. The surveys also considered the potential for habitats within the MHPGC Project PEIR Red Line Boundary: Onshore to function as supporting habitat or potential FLL for qualifying species.
- 7.3.2.2 Intertidal bird surveys were undertaken during April 2023 to March 2024 inclusive and October 2025 to September 2026 (inclusive; ongoing at the time of writing). In January 2026, a single turnstone was recorded inside the MHPGC Project Interim Boundary, located approximately 4.5km to the north of the MHPGC Project PEIR Red Line Boundary. No other Annex I bird species listed on the Northumbria Coast SPA/Ramsar was recorded, in either the MHPGC Project Interim Boundary or the MHPGC Project PEIR Red Line Boundary during intertidal bird surveys.
- 7.3.2.3 Wintering and passage bird surveys were undertaken between October 2025 and March 2026 inclusive, with a second year of wintering and passage bird surveys due to commence in October 2026 and finish in March 2027, at the time of writing. To date, no species designated as qualifying features of Northumbria Coast SPA and Ramsar site have been recorded during wintering and passage surveys.
- 7.3.2.4 Breeding bird surveys were undertaken during April to July 2025 inclusive and during late March to July 2026 inclusive. At the time of writing, the 2026 breeding bird data is yet to be fully analysed. To date, breeding bird surveys have not recorded any Annex I features of the Northumbria Coast SPA/Ramsar site.
- 7.3.2.5 Analysis of breeding bird survey data collected in 2023 and 2025, together with wintering and intertidal bird survey data collected between April 2023 and March 2024 and October 2025 and March 2026, shows that the Intertidal Bird Survey Area was not used by qualifying species associated with nearby SPA and Ramsar sites. No breeding or non-breeding qualifying species of Northumbria Coast SPA/Ramsar were recorded within the Intertidal Bird Survey Area. The Intertidal Bird Survey Area was therefore considered to be of limited importance to the qualifying features of nearby European sites, as discussed in further detail below.

Onshore breeding bird surveys

- 7.3.2.6 Detailed methodology and results are included in **Volume 3, Annex 3.12: Interim Breeding Birds Surveys Technical Report, of the PEIR**. The breeding bird surveys covered the MHPGC PEIR Red Line Boundary: Onshore with a 100m buffer applied (referred to as the Breeding Bird Survey Area), as shown in **Figure 2.2 of Volume 3, Annex 3.12: Interim Breeding Birds Surveys Technical Report, of the PEIR**. The breeding bird surveys involved six visits per year undertaken within the Breeding Bird Survey Area between April and July 2023, April and July 2025, and March and July 2026 respectively. Neither of the two qualifying breeding features of the Northumbria Coast SPA and Ramsar Site (i.e. Arctic tern and little tern) were recorded in 2023, 2025, or March-May 2026. Results from June-July 2026 surveys will be presented in the ES.

Wintering and intertidal bird surveys

- 7.3.2.7 Detailed methodology and results are included in **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Surveys Technical Report, of the PEIR**. The wintering bird surveys covered the MHPGC PEIR Red Line Boundary: Onshore with a 250m buffer applied (where appropriate extended up to 650m based upon advice in Goodship and Furness (2022); referred to as the 'Wintering Bird Survey Area'. The intertidal bird surveys covered the MHPGC PEIR Red Line Boundary: Onshore including a 1.5km viewshed from the coast (to cover subtidal/marine habitat) and a 250m buffer of habitats on land (referred to as the Intertidal Bird Survey Area (see **Figure 2.1 of Volume 3, Annex 3.13: Interim Wintering Passage and Intertidal Birds Technical Report, of the PEIR**)).

- 7.3.2.8 The intertidal bird surveys were undertaken alongside the wintering bird surveys, with one survey visit undertaken within the Intertidal Bird Survey Area each month between October 2025 and March 2026. These surveys were informed by survey data collected between April 2023 and March 2024 and were undertaken to characterise the use of intertidal habitats within and adjacent to the MHPGC PEIR Red Line Boundary: Onshore by wintering and intertidal bird species.
- 7.3.2.9 No species associated with the Northumbria Coast SPA and Ramsar site were recorded during wintering and intertidal surveys.

7.3.3 Constraints and Limitations

- 7.3.3.1 The assessment has been informed by desk study information, breeding bird surveys undertaken in 2023, 2025 and March-May 2026, and wintering and intertidal bird surveys undertaken between 2023/24 and 2025/26, with furthering wintering surveys taking place in 2026/27.
- 7.3.3.2 Availability and quality of desk study records are dependent upon the spatial and temporal coverage of third-party datasets and submitted records. However, desk study information was supplemented by extensive project-specific survey data and is not considered to materially affect the assessment conclusions.
- 7.3.3.3 Access to a limited number of areas within the survey extent was restricted due to private ownership and operational land uses. Where access was not possible, observations were undertaken from adjacent accessible land and supplemented through aerial imagery review. This is not considered to have materially affected the survey findings.
- 7.3.3.4 A proportion of breeding bird surveys extended beyond the period of optimal bird detectability, defined as the period from thirty minutes before sunrise until 11:00am, which may have had the potential to reduce the likelihood of recording some species in certain locations. However, survey effort was distributed across six survey visits and provided sufficient coverage of the survey area to robustly characterise the breeding bird assemblage.
- 7.3.3.5 There were differences in survey methodology deployed between the 2023–2024 and 2025–2026 intertidal surveys (i.e. through-the-tide timed counts vs. high and low-tide WeBS-style counts, respectively; (see Volume 3, Annex 3.1: Terrestrial Ecology and Terrestrial and Intertidal Ornithology Survey Methodologies Technical Report, of the PEIR). However, despite these methodological differences, all intertidal bird surveys cover high-tide and low-tide count data and to this extent are therefore comparable (notwithstanding that survey extent was refined between the survey periods).
- 7.3.3.6 None of the limitations identified above are considered sufficient to alter the conclusions of the HRA, and the available evidence is considered robust for the purposes of the assessment.

7.4 Information to inform Appropriate Assessment

7.4.1 Assessment criteria

- 7.4.1.1 The assessment of potential AEoI of European sites considers the information and conclusions of **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR** specifically in relation to the relevant ornithology qualifying features, their supporting habitats where relevant, and the Cos, site specific advice and feature condition of the European sites identified for assessment
- 7.4.1.2 Table 7-2 lists the potential impacts screened into the Terrestrial and Intertidal Ornithology Assessment. This section summarises the information used to assess the potential impacts on qualifying features of the screened-in European sites. A detailed analysis of the information used to assess the potential impacts on qualifying features of the screened-in European sites is presented in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**.

7.4.2 Design parameters

- 7.4.2.1 In order to allow flexibility in potential design options a design envelope approach to impact assessment (also known as the MDS) has been taken, see **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 7.4.2.2 The MDS for each Terrestrial and Intertidal Ornithology impact identified in **Section 7.2.5** is shown in **Table 7.3**. This identifies the maximum design scenario for each impact pathway and European site receptor assessed. This represents the 'worst case' or highest level of potential impact from the MHPGC Project to intertidal and terrestrial ornithology and all other design options should lie within this limit. Parameters are set out in **Volume 1, Chapter 2: Project Description, of the PEIR** in line with the methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 7.3: MDS relevant for the Appropriate Assessment of potential impacts on Terrestrial and Intertidal Ornithology.

Impact	Maximum Design Scenario	Explanation
Construction		
<i>Landfall</i>		
Permanent and temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species	Landfall (trenchless drill) Landfall trenchless drill installation method: HDD; Maximum burial depth of trenchless drill (per bore): 80m bgl; Maximum trenchless drill length: 2km; Duration of trenchless drilling activity: 300 days; Construction period for Landfall: 3.5 years; Number of trenchless drill entry points: 4 bores; Working hours are 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday, with shoulder mobilisation hours and continuous working required for trenchless techniques; Infrastructure subtidal (seaward of MLWS) Minimum distance from MHWS to exit pit (and associated vessels): 390m; Landfall vessel activity A maximum number of 1 Jack-Up Barge stationed for the duration of trenchless drilling activity (300 days), supported by 4 tugs, 1 construction support vessel, 1 supply vessel and 1 dive support vessel; Anchored cable lay barge: number, 1; 180x40m; There will be up to 250 return trips by installation and support vessels (including Cable Lay Vessel (CLV), Installation Support Vessel, Guard Vessel, dredging vessels, tug/anchor handlers, cable barge, Crew Transfer Vessel and Dive Support Vessels; A maximum of 14 vessels may be operational at any one time during the construction phase.	Trenchless drill length: The maximum total trajectory distance for the landfall trenchless drill is 2km (from entry pit to exit pit), within the parameters defined for the maximum length of trenchless drill in the following contexts: above MHWS (800m), between MHWS – MLWS (60m), and seaward of MLWS (1,660m). The HDD is assumed to be the worst case due to the likelihood of noise and risk of bentonite breakout. Excavated material volumes: Bore trajectory excavation material (full bore lengths) Launch / Entry Pit excavation TJB excavation Compound foundation Access road excavation TJB Whilst the maximum number of TJBs is 2, the MDS for 'working area for TJB construction' is defined by the
Temporary reduction in habitat availability and foraging opportunities arising from disturbance to intertidal habitats and associated prey resources used by qualifying species;		

Impact	Maximum Design Scenario	Explanation
Waterborne pollution and temporary deterioration in water quality, with consequent effects on supporting intertidal habitat and prey resources used by qualifying species.	Infrastructure intertidal (MLWS – MHWS) Trenchless drill length: 60m; Trenchless drill burial depth of trenchless drill: 40m. Landfall Infrastructure onshore (landward of MHWS) Maximum width of trenchless drill area, west of Durham Coast Line: 400m; Offshore Export Cable Corridor length: 800m; Material quantities associated with excavation: 130,000m ³ . TJBs Number of TJBs: 2; Location of TJBs: Within 150m of landfall trenchless drill entry point; Working Area for TJB (construction): 750m ² ; Depth of TJB: 2.5m;	construction area for a single TJB, which joints both HVDC export cables due to it having the largest construction working area.
Disturbance and displacement from noise and visual disturbance;	Landfall construction compound Number of main compounds: 1; Dimension of main compound: 48,000m ² ; Number of secondary compounds: 1; Dimension of secondary compound: 900m ² ; Number of access tracks: 2 from A192; Construction access track widths: 10m; Drilling mud: bentonite and/or polymer fluids.	
Onshore Export Cable Corridor and AC Connection Cable Corridor		

Impact	Maximum Design Scenario	Explanation
Permanent and temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species	Construction corridor length: 9.59km; Construction period for Onshore Export Cable: 42 months; Working hours are 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday, with shoulder mobilisation hours and continuous working required for trenchless techniques Dimensions of trench for grid connection export cable (HVAC) – Blue LSS Number of export cables: 24 (4 circuits); Length of cable route: 4,260m; Number of cable trenches: 4; Width of cable corridor (temporary including permanent): 100m; Onshore cable area (temporary): 426,000m²; Trench width at top per circuit: 4.8m; Trench width at base per circuit: 2.8m; Trench depth per circuit: 1.8m;	Component export cables HVAC (24) = Comprising of Power Cores, Earth Continuity Conductors, Fibre and control cables HVDC (4) = 2-off Conductors and 2-off Fibre Optics cables. The onshore export cable and AC cable parameters defined in this MDS are those required to construct the MHPGC Project, including the Blue LSS option. The Blue LSS option constitutes the worst-case due to the larger cable corridor width and length and thus area of temporary land-take required, when compared to the Green LSS Option.

Impact	Maximum Design Scenario	Explanation
Temporary reduction in habitat availability and foraging opportunities arising from disturbance to intertidal habitats and associated prey resources used by qualifying species	Depth of stabilised backfill: 450mm; Number of cable route joint bays: 32; Number of link boxes: 32; Volume of material excavated per joint bay: 2,264m³ (<u>total = 18,112m³, assuming 4 circuits are jointed in a single excavation</u>) Construction land take for link box: 100m² (total = 3200m²); Volume of material excavated per link box: 12.5m³; Volume of material excavated (link boxes): 400m³; Dimensions of trench for onshore export cable (HVDC) – Blue LSS Number of export cables: 4; Length of cable route: 4.83km; Width of cable corridor (temporary inc. permanent): 40m; Number of cable trenches: 2 ; Onshore cable area (temporary): 193,200m²; Trench width at top: 6.85m; Trench width at base: 4m;	The MDS for terrestrial ecology and terrestrial and intertidal ornithology is the greatest length and number of cable trenches, and number of joint bays, link boxes and construction compounds. In regards to watercourse crossings, open cut trenching represents the MDS in terms of direct disturbance. The use of open cut trenching to cross watercourses represents the greatest impacts to terrestrial ecology and terrestrial and intertidal ornithology receptors.

Impact	Maximum Design Scenario	Explanation
Potential water quality, sedimentation and disturbance effects associated with frac-out affecting supporting habitat	Cable trench depth: 1.8m; Depth of stabilised backfill: 450mm; Number of cable route joint bays: 12; Volume of material excavated per joint bay: 700m³ (total = 8,400m³); Volume of material excavated per monitoring box: 18m³ (total = 216m³); Construction land take per monitoring box: 64m²; Construction land take for all monitoring boxes: 768m²; Infrastructure Number of haul roads: 1; Haul road construction: geogrids and 500mm stone; Haul road widths: 8m; Haul road depth: 0.5; Dimensions of temporary culvert/bridge crossings for the haul road: 10 x 6 x 5; Number of main compounds: 2; Main compound area: 7ha; Total area of main compounds: 14ha; Number of secondary construction compounds: 6;	
Disturbance and displacement from noise and visual disturbance;	Dimensions per secondary construction compound: 10,000m²; Total area of secondary construction compounds: 6ha. Trenchless Drill Crossings Major Crossings understood to be: - A, B and Classified unnumbered roads (known as C roads) (including the A19 and B1432); - Hesledon Moor East SSSI. Trenchless drill methodology: HDD, micro-tunnelling (auger bore or direct pipe) Number of trenchless drill compounds: 6 (3 entry and 3 exit trenchless drill compounds) Dimensions of trenchless drill compounds: 6,000m² Total trenchless drill compound area: 36,000m² Trenchless depth (excluding landfall): 30m	

Impact	Maximum Design Scenario	Explanation
	Drilling mud used: bentonite and/or polymer fluids. Construction Access Number of construction access tracks (excluding existing tracks): 6.	
<i>Onshore Land Substation</i>		
Permanent and temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species	Dimensions Construction period for LSS: 4.5 years; Area of temporary construction footprint: 7ha; Area of temporary works (laydown and storage): 3.5ha; Number of buildings: 15; Width of main building/structure: 100m; Length of main building/structure: 200m LSS Construction Description of foundations: raft or pile caps (suspended structure) or piled foundations and suspended structures; Volume of excavation for foundations: 20,000m³; Cut and fill balance: 50,000m³; Material types and quantities associated to excavation: 14,000m³ topsoil, 65,000m³ other materials; Estimated waste quantities: 50,000m³. Access Temporary width of access including passing bays: 15m; Number of temporary accesses: 2; Reinstatement of temporary land: 4 months.	The MDS is represented by the largest working areas and excavation volumes which arise from the construction of the LSS. With respect to the optionality between an AIS and GIS solutions, the MDS is defined by the worst-case parameter from either design solution.
Temporary reduction in habitat availability and foraging opportunities arising from disturbance to intertidal habitats and associated prey resources used by qualifying species		
Disturbance and displacement from noise and visual disturbance;		

Impact	Maximum Design Scenario	Explanation
Operation and Maintenance		
<i>Landfall</i>		
Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species;	Typical duration of operation: 35 years; Operational land take for TJB (surface area): 25m ² ; Total area of TJB: 150m ² ; Activities anticipated during operation and maintenance: quarterly.	The MDS for terrestrial ecology and intertidal ornithology is represented by the largest permanent areas of impermeable surface/hard standing, which represent the worst case in terms of habitat loss and loss of fauna.
Temporary disturbance of intertidal habitat;		
Reduced access to foraging habitat; Changes in prey abundance/distribution.		
Disturbance and displacement from noise and visual disturbance;		
<i>Onshore Export Cable Corridor and AC Connection Cable Corridor</i>		
Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species;	Typical duration of operation: 35 years. AC Connection Cable Corridor – Blue LSS Length of cable route: 4.26km; Width of cable corridor (permanent): 25m; HVAC Onshore cable area (permanent): 106,500m ² ; HVAC Operational land take per access cover: 25m ² (total = 200m ²).	

Impact	Maximum Design Scenario	Explanation
Temporary disturbance of intertidal habitat; Reduced access to foraging habitat; Changes in prey abundance/ distribution.	Onshore Export Cable Corridor – Blue LSS Length of cable route: 4.83km; Width of cable corridor (permanent): 8.65m; HVDC Onshore cable area (permanent): 41,780m ² ; HVDC Operational land take per access cover: 6.25m ² (total = 75m ²); Number of operational access tracks (excluding existing tracks): 6; Operational access track construction: Assume the additional access tracks into the cable route (if required) will use existing access points and unpaved farm tracks where possible; Potential access tracks from the construction works will be retained during operation; Activities anticipated during operation and maintenance: quarterly.	
Disturbance and displacement from noise and visual disturbance;		
<i>Land Substation</i>		
Disturbance and displacement from noise and visual disturbance;	Typical duration of operation: 35 years; Area of permanent footprint: 6.5ha; Impermeable permanent area: 3.5ha; SuDS area: 2,300m ² ; SuDS volume: 3,500m ³ ; Number of permanent accesses: 2; Permanent access width: 15m; Permanent access points: 2; Activities anticipated during operation: Monthly day visit inspections; Quarterly detailed inspections/ non-intrusive work; Annual turnaround/shutdown.	
Decommissioning		
<i>Landfall</i>		
No impact	Leave cables in place, to minimise/ avoid environmental disturbance. Leaving the cables in place has little or no environmental impact whilst recovering them would disturb the local environment.	Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction
<i>Onshore Export Cable</i>		
No impact		

Impact	Maximum Design Scenario	Explanation
<i>Land Substation</i>		working areas and to require no greater amount or duration of activity than assessed for construction). The MDS during decommissioning is the removal of the above-ground infrastructure as this presents the greatest disturbance.
Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species; Temporary habitat disturbance and supporting habitat impacts.	Deconstruction in the inverted sequence of installation, after the Land Substation (LSS) has been decommissioned. All equipment and materials including foundations will be demolished and disposed of, in accordance with the latest relevant guidance. The site will be reinstated.	
Disturbance and displacement from noise and visual disturbance;		

7.4.3 Terrestrial and Intertidal Ornithology commitments

- 7.4.3.1 As part of the MHPGC Project design process, a number of commitments have been identified to avoid or reduce potential effects on environmental receptors. These are provided in **Volume 1; Annex 4.1: Draft Commitments Register, of the PEIR** and include avoidance, best practice and design commitments.
- 7.4.3.2 In accordance with the HRA process, these commitments have not been considered in determining LSE at Stage 1 Screening. They are, however, considered at Stage 2 AA, where implementation of the relevant commitments is assumed when assessing the potential for an AEol of the relevant European sites.
- 7.4.3.3 The commitments relevant to Terrestrial and Intertidal Ornithology qualifying features are presented in **Table 7.4**. These measures are considered standard industry practice for this type of development.

Table 7.4: Embedded Commitments Measures of Relevance for Terrestrial and Intertidal Ornithology Receptors

Code	Commitment	How Commitment if Secured
CoT11	All necessary vegetation removal will be undertaken outside of the bird breeding season (March-September inclusive). If this is not reasonably practicable, the vegetation requiring removal will be subject to a nesting bird check by a suitably qualified Ecological Clerk of Works (ECOW). If nesting birds are present, these will be protected by a suitable buffer and remain in place until all young have fledged or the nest failed. This will be carried out substantially in accordance with the Outline Landscape and Ecological Management Plan (LEMP) that will be prepared and submitted with the application for Development Consent.	Will be secured via DCO Schedule &/or Requirement
CoT17	Where practicable, the siting of the temporary and permanent footprint of the MHPGC Project will avoid areas of Flood Risk Zone 2 and 3, sensitive historic, cultural, ecological and other environmental receptors, both statutory and non-statutory, during the site selection process for the MHPGC Project.	Will be secured via DCO Schedule &/or Requirement
CoT18	An Outline Code of Construction Practice (CoCP) will be prepared and submitted with the application for development consent. A Detailed CoCP will be developed substantially in accordance with the Outline CoCP. The Outline CoCP will include (but is not limited to) measures to maintain and address: • flood protection and control measures; • water environment and drainage; • noise and vibration management measures; • air quality and dust management; • pollution prevention and management; • geology and ground conditions; • soil and materials management; • land use, tourism and recreational assets; • waste management.	Will be secured via DCO Schedule &/or Requirement
CoT21	An Outline Dust Management Plan (DMP) will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and submitted as part of the application for development	Will be secured via DCO Schedule &/or Requirement

Code	Commitment	How Commitment if Secured
	consent. A Detailed DMP will be developed substantially in accordance with the Outline DMP. The measures in the Detailed DMP will accord with guidance set out by the Institute of Air Quality guidance Management (IAQM, 2024) where appropriate and practicable and will include measures for monitoring and reporting dust levels, and dust suppression and mitigation measures during construction.	
CoT23	An Outline Surface Water and Groundwater Management Plan (SWGMP) will form part of the Outline Code of Construction Practice (CoCP), will be submitted with the application for development consent. The Outline SWGMP will set out measures to protect surface water and groundwater during construction, covering surface water and drainage management measures, flood risk control measures, and management of foul water from construction compounds. A Detailed SWGMP will be developed substantially in accordance with the Outline SWGMP.	Will be secured via DCO Schedule &/or Requirement
CoT25	Construction site lighting will only operate when required and will be positioned and directed to avoid unnecessary illumination to residential properties, sensitive ecological receptors and footpath users, and minimise glare to users of adjoining public highways. Construction site lighting will be designed in accordance with latest relevant available guidance and legislation and the details of the location, height, design and luminance of lighting to be used will be covered within the Outline Construction Artificial Light Emissions Management Plan, will form part of the Outline (CoCP), which will be prepared and submitted as part of the application for the development consent.	Will be secured via DCO Schedule &/or Requirement
CoT27	The onshore export cables and the AC connection cables will be completely buried underground for the entire length. No overhead pylons will be installed as part of the MHPGC Project.	Will be secured via DCO Schedule &/or Requirement
CoT29	Post-construction, the temporary working areas will be reinstated to pre-existing condition as far as reasonably practical, in line with best practice guidance.	Will be secured via DCO Schedule &/or Requirement
CoT42	Vegetation, including trees, woodland and hedgerows, will be mapped through a Vegetation Retention Plan (or similar) to inform construction activities, with vegetation retained wherever practicable. All vegetation works will be undertaken in accordance with BS 5837:2012, including the implementation of appropriate root protection measures. These measures will be consolidated	Will be secured via DCO Schedule &/or Requirement

Code	Commitment	How Commitment if Secured
	within an Arboricultural Management Plan that will form part of the Outline Landscape and Ecological Management Plan, which will be prepared and submitted with the application for development consent.	
CoT43	An Outline Landscape and Ecological Management Plan (LEMP) will be prepared and submitted with the development consent application and will establish the mitigation and management measures relevant to Terrestrial and Intertidal Ecology and conservation. It will include: - mitigation measures relating to protected or notable species and/or sensitive habitats; - appointment of an Ecological Clerk of Works (ECoW) where required; - details of mitigation planting at the onshore substation site including the number, location, species and details of management and maintenance of planting. A Detailed LEMP will be developed substantially in accordance with the Outline LEMP.	The Outline LEMP will be secured through the relevant requirements and conditions of the DCO and associated dML(s).
CoT47	An Outline Bentonite Breakout Plan will form part of the Outline Code of Construction Practice (CoCP), which will be submitted as part of the application for the development consent. A Detailed Bentonite Breakout Plan will be developed substantially in accordance with the outline plan.	Will be secured via DCO Schedule &/or Requirement
CoT48	An Outline Biosecurity Protocol will form part of the Outline (CoCP), which will be prepared and submitted as part of the application for the development consent. It will include measures such as the use of proven invasive species control and other biosecurity measures to avoid the spread of INNS and INNS contaminated materials. A Detailed Biosecurity Protocol will be developed substantially in accordance with the Outline Biosecurity Protocol.	Will be secured via DCO Schedule &/or Requirement
CoT51	An Onshore Crossing Schedule will be submitted with the application for development consent based on the refined design for the application. The following features will be crossed using trenchless techniques: - A, B and Classified unnumbered roads (known as C roads) (including the A19 and B1432);	Will be secured via DCO Schedule &/or Requirement

Code	Commitment	How Commitment if Secured
	- all railway lines (including the section of railway line which runs between Seaham and Horden); - the Durham Coast SSSI and SAC; - Hesledon Moor East SSSI.	
CoT59	An Outline Landfall Construction Method Statement (CMS) will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and submitted as part of the application for development consent. A Detailed Landfall CMS will be produced substantially in accordance with the Outline Landfall CMS and will include details of cable installation and methodology.	Will be secured via DCO Schedule &/or Requirement

7.4.4 List of plans and projects considered for the in-combination assessment

- 7.4.4.1 The Habitats Regulations require the Competent Authority to carry out an AA in respect of the LSE of a plan or project alone and in-combination with other plans or projects. For the in-combination methodology please refer to **Section 3.2. In-combination**
- 7.4.4.2 A full review of plans and projects was conducted for the MHPGC Project (**Volume 1: Annex 4.34; Cumulative Screening and Location Plan**).
- 7.4.4.3 The locations of all plans and projects considered for the in-combination assessment are listed in **Table 7.5**.
- 7.4.4.4 A project-specific screening range was applied to identify plans and projects with the potential to contribute to in-combination effects on Terrestrial and Intertidal Ornithology receptors. The screening range was informed by the ornithology Study Areas defined in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**, together with the mobility of the qualifying species and the potential extent of disturbance, habitat loss and habitat degradation pathways. Other plans and projects were only screened into the in-combination assessment where a realistic effect-receptor pathway existed between the MHPGC Project and the qualifying features of the Northumbria Coast SPA and Ramsar Site.
- 7.4.4.5 The assessment presented here draws on the cumulative assessment presented in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**. The in-combination assessment considers whether effects arising from the MHPGC Project could combine with effects from other projects in a manner that could result in AEoI of the qualifying features of Northumbria Coast SPA/Ramsar. European sites and qualifying features proposed for in-combination assessment are those located within the relevant species-specific ZOI and for which a plausible effect-receptor pathway has been identified. However, on assessing the effects of the MHPGC Project alone a conclusion of no AEoI has been reached which has negated the need for an in-combination assessment.

Table 7.5: Projects Identified for the Terrestrial and Intertidal Ornithology in-combination Assessment

Development Type	Project	Tier	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Construction Dates (if relevant)	European site Considered in Assessment	Distance from European site (km)	Pressure
Commercial Infrastructure	Electric Vehicle Charging Hub	1	0.73	Detail not available	Northumbria Coast SPA/Ramsar	2.2	Small scale and unlikely to coincide with MHPGC Project.
Residential Infrastructure	Durham County Council Affordable Dwellings	1	0.73	Under construction	Northumbria Coast SPA/Ramsar	7	Small scale and in progress currently so not understood to overlap with MHPGC Project.
Commercial Infrastructure	Petrol Station and Coffee Outlet (Class E)	1	<0.1	Under construction	Northumbria Coast SPA/Ramsar	2	Small scale and in progress currently so no overlap with MHPGC Project.
Commercial Infrastructure	EGL1 Visitor Centre	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	6	Small scale and unlikely to coincide with MHPGC Project.
Solar Farm	Croup Hill Solar Farm	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	5.5	Potential cumulative disturbance during construction if coincides with MHPGC Project but no data on timescales available.
Residential and Commercial Infrastructure	Seaham Garden Village	1	<0.1	Under construction	Northumbria Coast SPA/Ramsar	2.4	Small scale and in progress currently so no overlap with MHPGC Project.
Industrial Infrastructure	Phase 2 Jade Business Park	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	5.2	Potential cumulative disturbance during construction if coincides with MHPGC Project but no data on timescales available.
Public Transport Infrastructure	Transport Hub and Active Travel Scheme	1	<0.1	2025-2027	Northumbria Coast SPA/Ramsar	3.8	Small scale and in progress currently so no overlap with MHPGC Project.
Energy Infrastructure	Temporary Installation of Battery Energy Storage System (Caravan Storage)	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	5.8	Small scale and not likely to affect Northumbria Coast Spa/Ramsar or coincide with MHPGC Project but no data on timescales available
Energy Infrastructure	Battery Energy Storage System (Land East of Carrs Farm)	1	<0.1	12-month construction programme	Northumbria Coast SPA/Ramsar	5.8	Potential cumulative disturbance during construction.
Transmission Infrastructure	Eastern Green Link 1	1	<0.1	2025-2028	Northumbria Coast SPA/Ramsar	5.1	Potential cumulative disturbance during construction and ongoing operational impact however likely to be complete before start of MHPGC Project.
Residential and Commercial Infrastructure	Erection of Homes and Convenience Store (Class E)	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	4	Potential cumulative disturbance during construction if coincides with MHPGC Project but no data on timescales available.
Demolition and Residential infrastructure	Demolition of Farm Buildings and Erection of Dwellings (Class C3)	1	<0.1	Detail not available	Northumbria Coast SPA/Ramsar	1.9	Small scale and not likely to affect Northumbria Coast SPA/Ramsar or coincide with MHPGC Project but no data on timescales

Development Type	Project	Tier	Distance from nearest part of MHPGC Project PEIR Red Line Boundary (km)	Construction Dates (if relevant)	European site Considered in Assessment	Distance from European site (km)	Pressure
Energy Infrastructure	Battery Energy Storage System (Hawthorn Grid Site)	1	<0.1	Under construction	Northumbria Coast SPA/Ramsar	5.7	Potential cumulative disturbance during construction but currently under construction so will not coincide with MHPGC Project.
Solar Farm	Solar Farm and Battery Storage (South Sharpley Farm)	1	1.5	12-month construction programme	Northumbria Coast SPA/Ramsar	4.3	Small scale and in progress currently so no overlap with MHPGC Project.
Residential Infrastructure	Erection of 135 Dwellings (Class C3)	1	1.6	Detail not available	Northumbria Coast SPA/Ramsar	7.3	Potential cumulative disturbance during construction but sufficiently distant from Northumbria Coast SPA/Ramsar and MHPGC Project.

7.5 Appropriate Assessment (alone and in-combination)

7.5.1 Northumbria Coast SPA and Ramsar site

Site Description

- 7.5.1.1 The Northumbria Coast SPA and Ramsar site is located approximately 1.7km north of the MHPGC Project PEIR Red Line Boundary at its nearest point (see **Table 7.2**). The Northumbria Coast SPA and Ramsar site covers an area of 1107.98ha which includes several discrete sections of marine areas (i.e. land continuously or intermittently covered by tidal waters) between Spittal, in north Northumberland and an area south of Blackhall Rocks in County Durham, dominated by rocky foreshore with associated boulder and cobble beaches with areas of sandy beach. The Northumbria Coast SPA and Ramsar site is designated for internationally important populations of regularly occurring Annex I species and internationally important populations of regularly occurring migratory species.

Qualifying features (Terrestrial and Intertidal only)

- 7.5.1.2 The relevant qualifying features of Northumbria Coast SPA and Ramsar site are breeding Arctic and little tern and non-breeding turnstone and purple sandpiper, which have the potential to be impacted by disturbance and displacement from noise and visual disturbance during the construction, O&M and decommissioning phases of the MHPGC Project.
- 7.5.1.3 During the breeding season, Northumbria Coast SPA and Ramsar site regularly supports 2.92% of the GB population of Arctic tern (1,549 pairs, 5-year peak means 2009/10 to 2013/14) and 1.7% of the GB breeding population of little tern (40 pairs, 5-year peak means 1992/3 to 1996/7) (Natural England, 2000a; Natural England, 2017). Arctic tern breed and little tern breed/nest in colonies on the sandy beaches at Newton Links/Long Nanny within Northumbria Coast SPA and Ramsar site, while they make use of shallow inshore waters for foraging (Natural England, 2000b).
- 7.5.1.4 Over winter, the Northumbria Coast SPA and Ramsar site regularly supports 2.6% of the East Atlantic Flyaway population of turnstone (5-year peak means 1992/3 to 1996/7) and 1.6% of the East Atlantic population of purple sandpiper (5-year peak means 1992/3 to 1996/7) (Natural England, 2000a; RSIS, 2000). Rocky shore is the predominant habitat within Northumbria Coast SPA and Ramsar site. Although sandy areas are present, the use by purple sandpiper and turnstone is not significant. Purple sandpipers mainly forage within rocky shores and roost on offshore reefs and mainland shores. Turnstones feed on seaweed covered rocks and congregate within mainland shores to roost or feed at high tide. Artificial roost sites such as the piers are also used as high tide roosts by both species (Natural England, 2000b).

Survey Data

- 7.5.1.5 Breeding bird surveys for the MHPGC Project undertaken in 2023 and 2025 and 2026. Wintering and intertidal bird surveys undertaken between 2023/24 and 2025/26, were also used to determine whether habitats within the MHPGC PEIR Red Line Boundary: Onshore provide supporting habitat, including functionally linked land, for qualifying features of the Northumbria Coast SPA and Ramsar.
- 7.5.1.6 Neither of the two qualifying breeding features of the Northumbria Coast SPA and Ramsar Site, i.e., Arctic tern (*Sterna paradisaea*) and little tern (*Sternula albifrons*), was recorded within the Breeding Bird Survey Area. Similarly, neither of the two qualifying non-breeding features of the Northumbria Coast SPA and Ramsar Site, i.e., turnstone (*Arenaria interpres*) and purple sandpiper (*Calidris maritima*), was recorded within the Wintering Bird Survey Area or Intertidal Bird Survey Area during surveys completed to date.
- 7.5.1.7 The programme of intertidal bird surveys is due to be completed in September 2026. The final results of all six surveys undertaken in 2026 will be reported within the ES and used to refine the MHPGC Project RIAA considering the assessment of supporting habitat, including functionally linked land, where required.

Conservation Objectives

Northumbria Coast SPA

- 7.5.1.8 The COs for the qualifying features of Northumbria Coast SPA are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring (Natural England, 2023a):
- the extent, distribution and availability of the habitats of the qualifying features;
 - the structure and function of the habitats of the qualifying features;
 - the supporting processes on which the habitats of the qualifying features rely;
 - the populations of each of the qualifying features
 - the distribution of qualifying features within the site.

Northumbria Coast Ramsar

- 7.5.1.9 No conservation advice package has been produced for Northumbria Coast Ramsar site with Natural England considering the conservation packages for overlapping designations to be, in most cases, sufficient to support the management of Ramsar interests. As such, the COs outlined for Northumbria Coast SPA are considered to apply to Northumbria Coast Ramsar site (Natural England, 2023b).

Disturbance and displacement from noise and visual disturbance construction activities, noise, visual disturbance (construction, O&M and decommissioning phases)

Appropriate Assessment Alone

Arctic tern

Assessment

- 7.5.1.10 Breeding Arctic tern is a qualifying feature of the Northumbria Coast SPA and Ramsar Site. Breeding bird surveys undertaken within the MHPGC PEIR Red Line Boundary: Onshore and associated survey areas did not record Arctic tern. While limited areas of suitable coastal habitat capable of supporting nesting terns occur above MLWS, no breeding activity, nesting attempts or evidence of use by Arctic tern were recorded during surveys completed to date. There are no known colonies of little tern breeding along this part of the Durham coast. The Northumbria Coast SPA and Ramsar site lies approximately 1.7km from the MHPGC PEIR Red Line Boundary: Onshore at its closest point.
- 7.5.1.11 Construction, O&M and decommissioning activities have the potential to generate temporary visual and noise disturbance. However, no habitats within the 650m Survey Area have been identified as breeding, roosting or foraging habitat for Arctic tern and no evidence of FLL has been identified to date. Therefore, disturbance effects are anticipated to be localised and would not adversely affect the SPA/Ramsar breeding population.

Little tern

Assessment

- 7.5.1.12 Breeding little tern is a qualifying feature of the Northumbria Coast SPA and Ramsar Site. The MHPGC Project does not overlap the SPA/Ramsar Site and is separated from the European site by approximately 1.7km at its nearest point. The nearest known breeding colony of little tern associated with the Northumbria Coast SPA occurs at Low Newton, approximately 80km north of the MHPGC PEIR Red Line Boundary: Onshore. No little tern were recorded during breeding bird surveys and no evidence was identified that habitats within the MHPGC PEIR Red Line Boundary: Onshore support breeding, roosting or regularly used foraging habitat for this species.
- 7.5.1.13 Given that no little tern were recorded during breeding bird surveys and no evidence was identified that habitats within the 650m Survey Area provide supporting habitat, including functionally linked land, for little tern, disturbance effects arising from construction, O&M and decommissioning activities are not anticipated to affect little tern breeding, foraging or roosting behaviour or the integrity of the Northumbria Coast SPA and Ramsar site.

Turnstone

Assessment

- 7.5.1.14 Non-breeding turnstone is a qualifying feature associated with rocky shore and intertidal habitats. No turnstones were recorded within the 650m Survey Area although rocky reef and other intertidal habitat is suitable for turnstone.
- 7.5.1.15 Accordingly, disturbance associated with Project activities would not affect the population of turnstone associated with the Northumbria Coast SPA and Ramsar Site.

Purple sandpiper

Assessment

- 7.5.1.16 Purple sandpiper is a non-breeding qualifying feature associated with rocky intertidal habitats. No purple sandpiper records were identified within the 650m Survey Area although rocky reef and other intertidal habitat is suitable for purple sandpiper.
- 7.5.1.17 Accordingly, disturbance associated with Project activities would not affect the population of purple sandpiper associated with the Northumbria Coast SPA and Ramsar site.

Mitigation

- 7.5.1.18 The following embedded mitigation will limit effects of construction on birds generally.

Construction activities will be undertaken in accordance with the CoCP (CoT18), including measures relating to noise management, air quality and dust management, and pollution prevention.

- Construction activities will be undertaken in accordance with the CoCP (CoT18) and LEMP (CoT43), including appointment of a suitably ornithologically experienced Ecological Clerk of Works where necessary, and measures to minimise disturbance to sensitive habitats and species.
 - Temporary construction lighting will only be used where required and will be positioned and directed to avoid unnecessary illumination to sensitive ecological receptors in accordance with the Outline Construction Artificial Light Emissions Management Plan (CoT25).
- 7.5.1.19 No additional mitigation is considered to be required as no effects have been identified likely to adversely affect Arctic tern, little tern, turnstone or purple sandpiper.

Conclusion

- 7.5.1.20 It is concluded that disturbance and displacement from noise and visual disturbance, including construction activities, noise, lighting, plant, vehicles and personnel presence will not result in an AEol on the Northumbria Coast SPA and Ramsar site, in view of the site's COs with respect to all qualifying species: breeding Arctic tern, breeding little tern, turnstone and purple sandpiper from the MHPGC Project alone.
- 7.5.1.21 Little tern is also assessed within the Marine Ornithology chapter in relation to disturbance and displacement from noise and visual disturbance associated with the presence of vessels. Consideration of little tern across both the Offshore Export Cable Corridor and MHPGC PEIR Onshore assessments does not alter the conclusion that there will be no AEol of the Northumbria Coast SPA and Ramsar Site.

Permanent and Temporary Habitat Loss and Disturbance Affecting Supporting Habitat and Potential Functionally Linked Land (including temporary disturbance of intertidal habitat; reduced access to foraging habitat; changes in prey abundance/ distribution) (Construction, O&M and decommissioning phases).

Arctic tern, Little tern, Purple sandpiper and Turnstone

Assessment:

- 7.5.1.22 No habitat loss would occur within the Northumbria Coast SPA or Ramsar Site as the MHPGC is outside of the site. Surveys completed to date have not identified Arctic tern, little tern, purple sandpiper or turnstone within the 650m Study Area for the MHPGC Project. Furthermore, no evidence has been identified that habitats within the MHPGC PEIR Red Line Boundary: Onshore provide supporting habitat or FLL for these qualifying features.
- 7.5.1.23 Although temporary and permanent habitat losses may occur within the MHPGC PEIR Red Line Boundary: Onshore, these impacts would not affect habitat contributing to the maintenance of the qualifying populations of the Northumbria Coast SPA and Ramsar site.

Mitigation

- 7.5.1.24 The following embedded mitigation measures will limit effects of construction on birds generally.
- Temporarily disturbed habitats will be reinstated as soon as reasonably practicable following completion of works in each construction section, in accordance with best practice guidance (CoT29).
 - Ecological protection, habitat management and habitat reinstatement measures will be implemented in accordance with the LEMP (CoT43).
- 7.5.1.25 No additional mitigation is considered to be required as no effects have been identified likely to adversely affect Arctic tern, little tern, purple sandpiper, and turnstone.

Conclusion

- 7.5.1.26 It is concluded that there will be no permanent and temporary habitat loss and disturbance affecting supporting habitat and potential Functionally Linked Land of qualifying species. Therefore, there will be no AEoI on the Northumbria Coast SPA and Ramsar site, in view of the site's COs from the MHPGC Project alone.
- 7.5.1.27 ***Potential water quality, sedimentation and disturbance effects associated with frac-out affecting supporting habitat (Construction Phase)***

Qualifying features: Arctic tern, Little tern, Purple sandpiper and Turnstone

Assessment

- 7.5.1.28 Trenchless installation of the offshore export cables at the landfall presents a potential risk of frac-out, defined as the unintentional release of drilling fluid if HDD is used. This pathway was screened into this RIAA following consultation with Natural England.
- 7.5.1.29 A frac-out event has the potential to result in localised deterioration in water quality, sedimentation and smothering of intertidal habitats. Such effects could temporarily affect habitats and prey resources utilised by qualifying bird species. In addition, mobilisation of personnel, plant and equipment required to contain and remediate a frac-out event could temporarily increase disturbance within coastal habitats.
- 7.5.1.30 However, no Arctic tern, little tern, turnstone or purple sandpiper were recorded within habitats potentially impacted by trenchless installation works and survey data has not identified supporting habitat, including FLL, for these qualifying features within the MHPGC PEIR Red Line Boundary: Onshore and 650m Study Area. Any frac-out event would be expected to be highly localised, temporary in duration and managed through established environmental management procedures, pollution prevention measures and trenchless method-specific contingency planning (**Table 8.4**; CoT47).

- 7.5.1.31 Consequently, the pathway would not affect the conservation status of the qualifying features or their supporting habitats or undermine the COs of the Northumbria Coast SPA and Ramsar site.
- 7.5.1.32 The potential for effects on water quality and disturbance from frac out can confidently be ruled out for all qualifying features during any season.

Mitigation

- 7.5.1.33 The following embedded mitigation will limit effects of construction on birds generally.
- Trenchless installation works will be undertaken in accordance with the Outline Landfall Construction Method Statement (CoT59).
 - Implementation of the Outline Bentonite Breakout Plan (CoT47).
 - Implementation of pollution prevention and water quality protection measures in accordance with the CoCP and (CoT18).
 - Construction activities will be undertaken in accordance with the CoCP (CoT18), including measures relating to noise management, pollution prevention, and ecological protection.
- 7.5.1.34 No additional mitigation is considered to be required as no effects have been identified likely to adversely affect the qualifying features: arctic tern, little tern, turnstone and purple sandpiper.

Conclusion

- 7.5.1.35 It is concluded that potential impacts associated with HDD frac-out that has potential to affect supporting habitat and potential Functionally Linked Land will not result in an AEol on the Northumbria Coast SPA and Ramsar Site, in view of the site's COs with respect to Arctic tern, little tern, purple sandpiper and turnstone from the MHPGC Project alone.

Appropriate Assessment in-combination:

- 7.5.1.36 No projects have been identified that overlap in construction schedules, and no AEol on Northumbria Coast SPA/Ramsar has been identified to result from the MHPGC Project alone. Therefore, no in-combination assessment is necessary to be undertaken.

8 Terrestrial Habitats

8.1 Introduction

- 8.1.1.1 This section provides a summary of the pathways identified for potential LSE for European sites for Terrestrial Habitats. The potential LSE derived from MHPGC Project alone was detailed in the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report**.
- 8.1.1.2 This section presents the HRA for Terrestrial Habitat receptors, specifically those identified as qualifying features of sites screened into the RIAA.
- 8.1.1.3 **Section 8.2** first outlines the outcomes of the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Screening Report, considering effects both alone (**Section 8.2.2**) and in-combination with other plans and projects (**Section 8.2.3**). **Section 8.2.4** then describes how consultation feedback and project design refinements have been incorporated into the screening conclusions, including updates such as the addition of an impact pathway and the removal of a site. An up-to-date summary of LSE taken forward to AA is presented in **Section 8.2.5**.
- 8.1.1.4 **Section 8.3** presents the Terrestrial Habitats baseline, including the Study Area (**Section 8.3.1**), survey effort and results (**Section 8.3.2**), and any constraints and limitations of the available data (**Section 8.3.3**).
- 8.1.1.5 **Section 8.3.3.3** sets out the information used to inform the AA, including details and assessment criteria of relevant impact pathways (**Section 8.4.1**), design parameters (**Section 8.4.2**), embedded mitigation and project commitments (**Section 8.4.3**), and the plans and projects considered within the in-combination assessment (**Section 8.4.4**).
- 8.1.1.6 **Section 8.5** presents the AA for the MHPGC Project, both alone and in-combination, and determines whether the Project will result in an AEoI of the screened-in sites, in view of their COs.

8.2 Likely Significant Effect screening outcomes

- 8.2.1.1 This section summarises the European sites designated for terrestrial habitat qualifying features that were identified through the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report**, (carried out in 2025), as having the potential to experience LSE from the MHPGC Project. This section presents updates to screening as a result of consultation and project refinements and defines the scope of the Stage 2 AA.

8.2.2 Screening outcomes for the MHPGC Project alone

- 8.2.2.1 European sites designated for Terrestrial Habitats were screened where they overlapped with the MHPGC Project Interim Boundary or where they overlapped with the maximum ZoI for the MHPGC Project defined as 250m. The maximum ZoI distance relates to guidance published by the Institute of Air Quality Management (IAQM, 2024) which suggests that dust impacts may extend up to 250m from construction site boundaries, and up to 250m from the construction entrance/exit along roads on which construction traffic is travelling.
- 8.2.2.2 These sites were then considered for the potential for LSE where they occurred within the ZoI of the following impact pathways, as identified through the MHPGC Project Scoping Report:
- permanent habitat loss;
 - temporary loss and physical disturbance to habitats;
 - changes in air quality;
 - changes in water quality;
 - introduction and spread of Invasive Non-Native Species (INNS).
- 8.2.2.3 All impact pathways except changes in water quality were concluded to have potential LSE to the qualifying terrestrial habitat features of European sites. The permanent loss of habitat was considered further in the screening assessment on a precautionary basis as the permanent loss of habitat as a result of the MHPGC Project was unknown at the time of writing of the MHPGC

Project Scoping Report. Physical disturbance from the use of machinery/vehicle tracking was considered to be able to temporarily disturb/damage sensitive habitats while construction vehicle emissions and dust could adversely affect air quality and thus Terrestrial Habitats. It was considered that the introduction or spread of INNS during construction activities, such as vegetation clearance and vehicle movements, could impact Terrestrial Habitats by outcompeting native species. Changes to water quality was not considered to have LSE on Terrestrial Habitats due to implementation of industry best practice measures and management plans.

- 8.2.2.4 As the qualifying features are fixed in location, the screening assessment considered where impact pathways could take place within the Zol of the MHPGC Project with impacts from changes to air quality localised to the vicinity of the MHPGC PEIR Red Line Boundary: Onshore with a Zol of 250m. As a result, the European sites and relevant qualifying features that were concluded to be subject to potential LSE from the MHPGC Project, thus requiring Stage 2 AA are:
- Durham Coast SAC, designated for 'Vegetated Sea cliffs of the Atlantic and Baltic coasts'.
- 8.2.2.5 This site has been screened in for Stage 2 AA for effects from permanent habitat loss, temporary loss and physical disturbance to habitats, changes in air quality and introduction and spread of INNS.
- 8.2.2.6 A summary of the European sites and relevant qualifying features for which LSE could not be ruled out at the time of the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** is presented in **Table 8.1**.

Table 8.1: All European sites designated for Annex I Terrestrial Habitats features screened in from the MHPGC Project Habitats Regulation Assessment/Habitats Regulations Appraisal Report.

European site	Distance to the MHPGC Project Interim Boundary	Relevant qualifying features	Impact pathway
Durham Coast SAC (UK0030140)	0.0 (the MHPGC Project PEIR Onshore Red Line Boundary is within the European site)	Vegetated sea cliffs of the Atlantic and Baltic Coast	• Permanent habitat loss; • Temporary loss and physical disturbance to habitats; • Changes in air quality; • Introduction and spread of INNS.

8.2.3 Screening outcomes for the MHPGC Project in-combination

- 8.2.3.1 The potential for LSE was considered in combination with other plans or projects. Any effect that could not be ruled out for the MHPGC Project alone was assumed to require in-combination screening assessment. Where an impact pathway had been discounted from having LSE on the European site from the MHPGC Project alone, it still required additional consideration in-combination with other plans or projects except in cases where an impact had been assessed alone as resulting in a negligible or inconsequential effect.

8.2.4 Screening outcome updates following consultation and project refinement

- 8.2.4.1 Since submission of the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report**, the MHPGC Project has been subject to stakeholder consultation and has undergone design refinement. The following section is provided to ensure the screening outcomes remain up to date and reflect the latest statutory consultee feedback.
- 8.2.4.2 With regards to Terrestrial Habitats the following updates have been made to the Screening outcomes as a result of consultation feedback and refinements to the MHPGC Project, as summarised in **Section 4**.
- 8.2.4.3 In response to NE Discretionary Advice Service (09 January 2026):

- The Zol for the introduction and spread of INNS has been reviewed and amended to up to 500m from the MHPGC PEIR Red Line Boundary: Onshore.
- Hydrological change affecting the qualifying vegetated sea cliff habitat of Durham Coast SAC has been screened into the information for AA. The hydrological Zol for sensitive ecological receptors is up to 1km from the MHPGC PEIR Red Line Boundary: Onshore as described within **Volume 3, Chapter 4: Water Resources and Flood Risk of the PEIR**. This update has resulted in the inclusion of hydrological change as an additional impact pathway requiring Stage 2 AA;
- Potential impacts associated with frac-out affecting the qualifying habitat of Durham Coast SAC have been screened into Stage 2 AA. This also uses the hydrological Zol as detailed above.

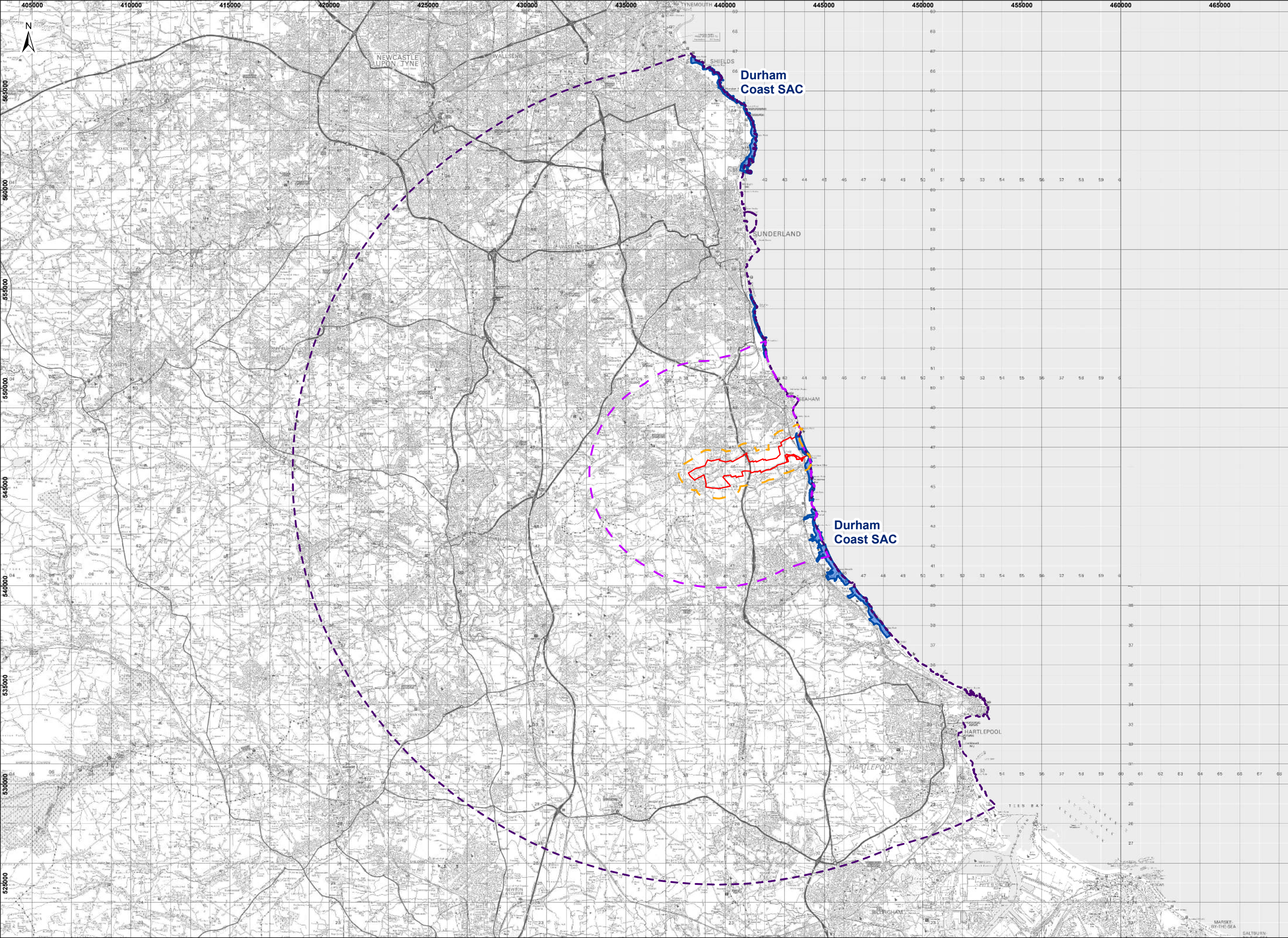
8.2.4.4 In addition, the MHPGC Project has been refined since the **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report** was published, and the new refined MHPGC PEIR Red Line Boundary: Onshore has been considered within this Stage 2 AA. Durham Coast SAC remains the only European site screened into Stage 2 AA for Terrestrial Habitat qualifying features. However, following consultation with NE, additional impact pathways relating to hydrological change and frac-out have been screened into the assessment. The updated screening outcomes are presented in **Table 8.2**.

8.2.5 Summary of Likely Significant Effects taken forward to Appropriate Assessment

8.2.5.1 A summary of the European sites and relevant Terrestrial Habitat qualifying features for which LSE have been identified through screening and consideration of consultation responses is provided below. Therefore, **Table 8.2** includes all sites, features, and impact pathways screened in for consideration within the Stage 2 AA. The locations of the European sites taken forward to AA are shown in **Figure 8.1**.

Table 8.2: Update Screening of Likely Significant Effects for Terrestrial Habitats taken forward to Appropriate Assessment.

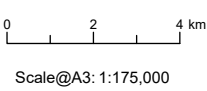
European site	Distance to the MHPGC PEIR Project boundary at the closest point (km)	Relevant qualifying feature	Project Phases		
			Construction	O&M	Decommissioning
Durham Coast SAC (UK0030140)	The MHPGC PEIR Red Line Boundary: Onshore extends into the Durham Coast SAC boundary.	Vegetated sea cliffs of the Atlantic and Baltic coasts	• Permanent habitat loss; • Temporary loss and physical disturbance to habitats; • Changes in air quality • Introduction and spread of INNS. • Hydrological change • Frac-out	• Permanent habitat loss; • Introduction and spread of INNS; • Hydrological change	• Permanent habitat loss; • Temporary loss and physical disturbance to habitats; • Changes in air quality; • Introduction and spread of INNS



- LEGEND**
- MHPGC PEIR Red Line Boundary: Onshore
 - Onshore Study Area - 20km Buffer
 - 5km Buffer
 - 500m Buffer
 - Special Area of Conservation (SAC)

Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.1: SITES SCREENED IN FOR LIKELY SIGNIFICANT EFFECT (LSE) ON
TERRESTRIAL HABITAT FEATURES



Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
GB Background: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack
Contains public sector information licensed under the Open government License v3.0.
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Drawing Number: MHPGC-WSP-PEIR-BIO-136				
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8.3 Terrestrial Habitats baseline

8.3.1 Study Area

- 8.3.1.1 The Terrestrial Habitats Study Area encompasses terrestrial land above MHWS, south of Seaham, Durham in England. This includes coastal habitats, including the Annex I habitat 'vegetated sea cliffs of the Atlantic and Baltic coasts' at Blast Beach for which Durham Coast SAC is notified.
- 8.3.1.2 The Terrestrial Habitats Study Area was defined based on the Zol of activities associated with the MHPGC Project with potential to impact Annex I terrestrial habitats as defined in **paragraph 8.2.2.1**.
- 8.3.1.3 In response to Natural England's Discretionary Advice Service (09 January 2026), hydrological change affecting vegetated sea cliff habitat within Durham Coast SAC has been screened into Stage 2 AA. This refinement does not alter the site screening results because Durham Coast SAC already overlaps the MHPGC PEIR Red Line Boundary: Onshore; however, it introduces an additional impact pathway to be considered within the Stage 2 AA. As set out in **Section 3.2.1 of the MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report**, European sites located outside this Zol and designated for Annex I terrestrial habitats were screened out due to the static nature of the notified features and the absence of pathways for LSEs. In particular, Castle Eden Dene SAC and Thrislington SAC are not hydrologically connected to the MHPGC Project and therefore cannot be affected by the hydrological change pathway identified for Durham Coast SAC.
- 8.3.1.4 **Figure 8.1** shows the European sites notified for Annex I Terrestrial Habitats within Terrestrial Habitats Study Area.

8.3.2 Survey Effort and Results

- 8.3.2.1 UK Habitat (UKHab) Classification surveys were undertaken to provide site-specific data to inform the onshore habitat baseline within the MHPGC PEIR Red Line Boundary: Onshore. Detailed methodology and results are included in **Volume 3, Annex 3.2: UK Habitat Classification, National Vegetation Classification, River Condition Assessment and Hedgerow Surveys Technical Report, of the PEIR**. The UKHab surveys covered the MHPGC PEIR Red Line Boundary: Onshore with a 30m buffer applied (referred to as the 'UKHab Survey Area') as shown in **Figure 2.1 of Volume 3, Annex 3.2: UK Habitat Classification, National Vegetation Classification of the PEIR, River Condition Assessment and Hedgerow Surveys Technical Report, of the PEIR**. The UKHab surveys were conducted between June and August 2025, and further surveys were carried out in April and July 2026 to complete coverage of the UKHab Survey Area.
- 8.3.2.2 The UKHab field survey results show a dominance of arable cropland and modified grassland habitat within the UKHab Survey Area. Notable habitats recorded include other neutral grassland, wetland habitats, scrub along with stands of broadleaved and mixed woodland. Further surveys have been undertaken in 2026 to provide complete coverage of the UKHab Survey Area, including coastal habitats and vegetated sea cliffs (Annex I habitats) associated with Durham Coast SAC are present within the MHPGC PEIR Red Line Boundary: Onshore (**see Volume 3, Annex 3.2: UK Habitat Classification, National Vegetation Classification, River Condition Assessment and Hedgerow Surveys Technical Report, of the PEIR**). Invasive plant species were identified within the UKHab Survey Area including giant hogweed (*Heracleum mantegazzianum*), Himalayan balsam (*Impatiens glandulifera*) and Japanese knotweed (*Fallopia japonica*).

8.3.3 Constraints and Limitations

- 8.3.3.1 The UKHab survey programme has been ongoing with UKHab surveys programmed for 2026 to complete coverage of all habitats within the MHPGC PEIR Red Line Boundary: Onshore, including coastal habitats associated with Durham Coast SAC. The results for the coastal habitats associated with Durham Coast SAC have not been available to inform this document for PEIR stage but will be used for the full ES.

- 8.3.3.2 Notwithstanding this, sufficient information is available from completed habitat surveys, desk study records and existing designation information to inform the baseline characterisation of the qualifying habitat feature of Durham Coast SAC and undertake a precautionary Stage 2 AA.
- 8.3.3.3 Any additional survey information collected in 2026 will be incorporated into the ES and revised MHPGC Project RIAA.

8.4 Information to Inform Appropriate Assessment

8.4.1 Assessment criteria

- 8.4.1.1 The assessment of potential for AEoI of European sites considers the information and conclusions of **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology of the PEIR**, specifically in relation to the designated terrestrial habitat features, and the relevant COs, site-based advice and feature condition of the European sites identified for assessment.
- 8.4.1.2 As outlined in **Section 8.2.5**, a number of potential impacts during the construction, O&M and decommissioning phases of the MHPHC Project were screened into the Terrestrial Habitats assessment.
- 8.4.1.3 The following sections summarise the information used to assess the potential impacts on qualifying features of the screened-in European sites. The aim of this section is not to replicate the information within the PEIR and associated appendices, but to present a summary of the key data used to inform the HRA. A more detailed analysis is presented in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**.

Permanent habitat loss

- 8.4.1.4 Permanent habitat loss could arise through installation of permanent project infrastructure. The pathway relates to the direct removal of qualifying habitat and associated reductions in habitat extent.

Temporary loss and physical disturbance to habitats

- 8.4.1.5 Temporary habitat loss and disturbance could occur through construction compounds, temporary working areas, access routes, storage areas and construction activities. The pathway relates to temporary damage, alteration or loss of habitat structure and function until reinstatement is completed.

Changes in air quality

- 8.4.1.6 Changes in air quality could occur through dust generation and emissions from construction traffic, plant and machinery. Dust deposition and nitrogen enrichment have the potential to affect sensitive vegetation communities associated with the qualifying habitat.

Introduction and spread of INNS

- 8.4.1.7 Introduction and spread of INNS could occur through movement of construction personnel, vehicles, machinery and imported materials. INNS have the potential to alter habitat composition, reduce native species diversity and affect habitat structure and function.

Hydrological Change

- 8.4.1.8 Hydrological change could occur where excavation activities, trenching, trenchless technique entry and exit pits, joint bays, construction compounds or other below-ground works intercept or alter groundwater pathways, seepage systems or surface water movement supporting the vegetated sea cliff habitat. In addition, construction activities have the potential to generate sediment-laden run-off which could affect drainage pathways and local moisture regimes supporting the qualifying habitat. The pathway therefore relates to potential changes in

groundwater and surface water movement, habitat moisture conditions, sediment inputs and the supporting ecological processes upon which the vegetated sea cliff habitat depends.

Frac-Out

- 8.4.1.9 Frac-out is the unintended release of drilling fluid during trenchless installation. Should a frac-out occur, temporary smothering or contamination of vegetated sea cliff habitat could occur where drilling fluids reach the ground surface.

8.4.2 Design parameters

- 8.4.2.1 In order to allow flexibility in potential design options a design envelope approach to impact assessment (also known as the MDS) has been taken, see **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 8.4.2.2 The MDS for each Terrestrial Habitat impact identified in **Section 8.2.5** is shown in **Table 8.3**. This identifies the maximum design scenario for each impact pathway and European site receptor assessed. This represents the 'worst case' or highest level of potential impact from the MHPGC Project to Terrestrial Habitats and all other design options should lie within this limit. Parameters are set out in **Volume 1, Chapter 2: Project Description, of the PEIR** in line with the methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 8.3: MDS relevant for the Appropriate Assessment of potential impacts on Terrestrial Habitats

Impact	Maximum Design Scenario	Explanation
Construction		
<i>Landfall</i>		
Permanent habitat loss	Landfall (trenchless drill) Landfall trenchless drill installation method: HDD Maximum burial depth of trenchless drill (per bore): 80m bgl Maximum trenchless drill length: 2km Duration of trenchless drilling activity: 300 days Construction period for Landfall: 3.5 years Number of trenchless drill entry points: 4 bores Working hours are 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday, with shoulder mobilisation hours and continuous working required for trenchless techniques Landfall Infrastructure onshore (landward of MHWS) Maximum width of trenchless drill area, west of Durham Coast Line: 400m Corridor length: 800m Material quantities associated with excavation: 130,000m ³	<u>Trenchless drill length</u> The maximum total trajectory distance for the landfall trenchless drill is 2km (from entry pit to exit pit), within the parameters defined for the maximum length of trenchless drill above MHWS (800m), between MHWS – MLWS (60m) and seaward of MLWS (1,660m). <u>Excavated material volumes:</u> Bore trajectory excavation material (full bore lengths) Launch / Entry Pit excavation TJB excavation Compound foundation Access road excavation
Temporary loss and physical disturbance to habitats		

Impact	Maximum Design Scenario	Explanation
Changes in air quality Introduction and spread of INNS Hydrological Change Frac-Out	<i>TJBs</i> Number of TJBs: 2 Location of TJBs: Within 150m of landfall trenchless drill entry point Working Area for TJB (construction): 750m² Depth of TJB: 2.5m <i>Landfall construction compound</i> Number of main compounds: 1 Dimension of main compound: 48,000m² Number of secondary compounds: 1 Dimension of secondary compound: 900m² Number of access tracks: 2 from A192 Construction access track widths: 10m Drilling mud: bentonite and/or polymer fluids	<u>TJB</u> Whilst the maximum number of TJBs is 2, the MDS for 'working area for TJB construction' is defined by the construction area for a single TJB, which joints both HVDC export cables.
Onshore Export Cable Corridor and AC Connection Cable Corridor		

Impact	Maximum Design Scenario	Explanation
Temporary loss and physical disturbance to habitats	Construction corridor length: 9.59km Construction period for Onshore Export Cable: 42 months Working hours are 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday, with shoulder mobilisation hours and continuous working required for trenchless techniques Dimensions of trench for grid connection export cable (HVAC) – Blue LSS Number of export cables: 24 Length of cable route: 4,260m Number of cable trenches: 4 Width of cable corridor (temporary including permanent): 100m Onshore cable area (temporary): 426,000m² Trench width at top per circuit: 4.8m Trench width at base per circuit: 2.8m Trench depth per circuit: 1.8m Depth of stabilised backfill: 450mm Number of cable route joint bays: 32 Number of link boxes: 32 Volume of material excavated per joint bay: 2,264m³ (<u>total = 18,112m³, assuming 4 circuits are jointed in a single excavation</u>) Construction land take for link box: 100m² (total = 3200m²) Volume of material excavated per link box: 12.5m³ Volume of material excavated (link boxes): 400m³	<u>Component export cables</u> HVAC (24) = Comprising of Power Cores, Earth Continuity Conductors, Fibre and control cables HVDC (4) = 2-off Conductors and 2-off Fibre Optics cables. The Onshore Export Cable parameters defined in this MDS are those required to construct the MHPGC Project, including the Blue LSS option. The Blue LSS option constitutes the worst-case due to the larger cable corridor width and thus area of temporary land-take required, when compared to the Green LSS Option. The MDS for terrestrial habitats is the greatest length and number of cable trenches, and number of joint bays, link boxes and construction compounds. In regard to watercourse crossings, open cut trenching represents the MDS in terms of direct disturbance. The use of open cut trenching to cross watercourses represents the greatest impacts to terrestrial habitats

Impact	Maximum Design Scenario	Explanation
	Dimensions of trench for onshore export cable (HVDC) – Blue LSS Number of export cables: 4 Length of cable route: 4.83km Width of cable corridor (temporary inc. permanent): 40m Number of cable trenches: 2 Onshore cable area (temporary): 193,200m² Trench width at top: 6.85m Trench width at base: 4m Cable trench depth: 1.8m Depth of stabilised backfill: 450mm Number of cable route joint bays: 12 Volume of material excavated per joint bay: 700m³ (total = 8,400m³) Volume of material excavated per monitoring box: 18m³ (total = 216m³) Construction land take per monitoring box: 64m² Construction land take for all monitoring boxes: 768m² Infrastructure Number of haul roads: 1 Haul road construction: geogrids and 500mm stone Haul road widths: 8m Haul road depth: 0.5 Dimensions of temporary culvert/bridge crossings for the haul road: 10 x 6 x 5 Number of main compounds: 2	

Impact	Maximum Design Scenario	Explanation
Changes in air quality Introduction and spread of INNS Hydrological Change	Main compound area: 7ha Total area of main compounds: 14ha Number of secondary construction compounds: 6 Dimensions per secondary construction compound: 10,000m² Total area of secondary construction compounds: 6ha. Trenchless Drill Crossings Major Crossings understood to be: 1) A19 road (crossed by all HVDC routes), 2) Dalton Beck and Jade Business Park (crossed by HVAC or HVDC depending on LSS option taken and cable route taken), 3) Pinch-point between Jade Business Park and future asset SEGL convertor station (crossed by HVAC or HVDC depending of selected LSS site and chosen cable route). Trenchless drill methodology: HDD, micro-tunnelling (auger bore or direct pipe) Number of trenchless drill compounds: 6 (3 entry and 3 exit trenchless drill compounds) Dimensions of trenchless drill compounds: 6,000m² Total trenchless drill compound area: 36,000m² Trenchless depth (excluding landfall): 30m Drilling mud used: bentonite and/or polymer fluids Construction Access Number of construction access tracks (excluding existing tracks): 6	
Onshore Land Substation		

Impact	Maximum Design Scenario	Explanation
Permanent habitat loss	Dimensions Construction period for LSS: 4.5 years Area of temporary construction footprint: 7ha Area of temporary works (laydown and storage): 3.5ha Number of buildings: 15 Width of main building/structure: 100m Length of main building/structure: 200m LSS Construction Description of foundations: raft or pile caps (suspended structure) or piled foundations and suspended structures Volume of excavation for foundations: 20,000m³ Cut and fill balance: 50,000m³ Material types and quantities associated to excavation: 14,000m³ topsoil, 65,000m³ other materials Estimated waste quantities: 50,000m³ Access Temporary width of access including passing bays: 15m Number of temporary accesses: 2 Reinstatement of temporary land: 4 months	The MDS is represented by the largest working areas and excavation volumes which arise from the construction of the LSS. With respect to the optionality between an air insulated substation (AIS) and gas insulated substation (GIS) solutions for the onshore Land Substation (LSS), the MDS is defined by the worst-case parameter which is AIS due to the larger footprint.
Temporary loss and physical disturbance to habitats		
Changes in air quality Introduction and spread of INNS Hydrological Change		
O&M		
Landfall		

Impact	Maximum Design Scenario	Explanation
Temporary loss and physical disturbance to habitats	Typical duration of operation: 35 years Operational land take for TJB (surface area): 25m ² Total area of TJB: 150m ² Activities anticipated during O&M: quarterly	
Changes in air quality Introduction and spread of INNS Hydrological Change		
Onshore Export cable Corridor and AC Connection Cable Corridor		

Impact	Maximum Design Scenario	Explanation
Temporary loss and physical disturbance to habitats	Typical duration of operation: 35 years AC Connection Cable Corridor – Blue LSS Length of cable route: 4.26km Width of cable corridor (permanent): 25m HVAC Onshore cable area (permanent): 106,500m² HVAC Operational land take per access cover: 25m² (total = 200m²) Onshore Export Cable Corridor – Blue LSS Length of cable route: 4.83km Width of cable corridor (permanent): 8.65m HVDC Onshore cable area (permanent): 41,780m² HVDC Operational land take per access cover: 6.25m² (total = 75m²)	
	Number of operational access tracks (excluding existing tracks): 6 Operational access track construction: Assume the additional access tracks into the cable route (if required) will use existing access points and unpaved farm tracks where possible. Potential access tracks from the construction works will be retained during operation. Activities anticipated during O&M: quarterly	

Impact	Maximum Design Scenario	Explanation	
Changes in air quality Introduction and spread of INNS Hydrological Change			
Land Substation			
Permanent habitat loss	Typical duration of operation: 35 years Area of permanent footprint: 6.5ha Impermeable permanent area: 3.5ha SuDS area: 2,300m² SuDS volume: 3,500m³ Number of permanent accesses: 2 Permanent access width: 15m Permanent access points: 2 Activities anticipated during operation: Monthly day visit inspections; Quarterly detailed inspections/ non-intrusive work; Annual turnaround/shutdown.		
Temporary loss and physical disturbance to habitats			
Changes in air quality Introduction and spread of INNS Hydrological Change			
Decommissioning			
Landfall			
Temporary loss and physical disturbance to habitats Changes in air quality Introduction and spread of INNS Hydrological Change	Leave cables in place, to minimise/ avoid environmental disturbance. Leaving the cables in place has little or no environmental impact whilst recovering them would disturb the local environment.	Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction). The MDS during decommissioning is the removal of the	
Onshore Export Cable			

Impact	Maximum Design Scenario	Explanation
Temporary loss and physical disturbance to habitats Changes in air quality Introduction and spread of INNS Hydrological Change		above-ground infrastructure as this presents the greatest disturbance.
Land Substation		
Temporary loss and physical disturbance to habitats Changes in air quality Introduction and spread of INNS Hydrological Change	Deconstruction in the inverted sequence of installation, after the Land Substation (LSS) has been decommissioned. All equipment and materials including foundations will be demolished and disposed of, in accordance with the latest relevant guidance. The site will be reinstated.	

8.4.3 Terrestrial Habitats commitments

- 8.4.3.1 As part of the MHPGC Project design process, a number of commitments have been identified to avoid or reduce potential effects on Terrestrial Habitat receptors. These are provided in **Volume 1; Annex 4.1: Draft Commitments Register, of the PEIR** and include avoidance, best practice and design commitments.
- 8.4.3.2 In accordance with the HRA process, these commitments have not been considered in determining LSE at Stage 1 Screening. They are, however, considered at Stage 2 AA, where implementation of the relevant commitments is assumed when assessing the potential for an AEol of the relevant European sites.
- 8.4.3.3 The commitments relevant to Terrestrial Habitat qualifying features are presented in **Table 8.4**. These measures are considered standard industry practice for this type of development.

Table 8.4: Embedded Commitment measures of relevance for Terrestrial Habitats receptors

Code	Commitment	How Commitment is Secured
CoT11	All necessary vegetation removal will be undertaken outside of the bird breeding season (March-September inclusive). If this is not reasonably practicable, the vegetation requiring removal will be subject to a nesting bird check by a suitably qualified Ecological Clerk of Works (ECoW). If nesting birds are present, these will be protected by a suitable buffer and remain in place until all young have fledged or the nest failed. This will be carried out substantially in accordance with the Outline Landscape and Ecological Management Plan (LEMP) that will be prepared and submitted with the application for Development Consent.	Will be secured via DCO Schedule &/or Requirement
CoT13	The Project Description (Volume 1, Chapter 2 of the PEIR) sets out that the installation of the offshore export cables under Durham Coast SSSI and SAC will be undertaken by trenchless technologies. The exit pits associated with the trenchless technologies installation will be at least 100 m seaward of the eastern boundary of the Durham Coast SSSI and SAC.	Will be secured via DCO Schedule &/or Requirement
CoT17	Where practicable, the siting of the temporary and permanent footprint of the MHPGC Project will avoid areas of Flood Risk Zone 2 and 3, sensitive historic, cultural, ecological and other environmental receptors, both statutory and non-statutory, during the site selection process for the MHPGC Project.	Will be secured via DCO Schedule &/or Requirement
CoT18	An Outline Code of Construction Practice (CoCP) will be prepared and submitted with the application for development consent. A Detailed CoCP will be developed substantially in accordance with the Outline CoCP. The Outline CoCP will include (but is not limited to) measures to maintain and address: • flood protection and control measures; • water environment and drainage; • noise and vibration management measures; • air quality and dust management; • pollution prevention and management; • geology and ground conditions; • soil and materials management; • land use, tourism and recreational assets; • waste management.	Will be secured via DCO Schedule &/or Requirement
CoT21	An Outline Dust Management Plan (DMP) will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and	Will be secured via DCO Schedule &/or Requirement

Code	Commitment	How Commitment is Secured
	submitted as part of the application for development consent. A Detailed DMP will be developed substantially in accordance with the Outline DMP. The measures in the Detailed DMP will accord with guidance set out by the Institute of Air Quality guidance Management (IAQM, 2024) where appropriate and practicable and will include measures for monitoring and reporting dust levels, and dust suppression and mitigation measures during construction.	
CoT23	An Outline SWGMP will form part of the Outline Code of Construction Practice (CoCP), will be submitted with the application for development consent. The Outline SWGMP will set out measures to protect surface water and groundwater during construction, covering surface water and drainage management measures, flood risk control measures, and management of foul water from construction compounds. A Detailed SWGMP will be developed substantially in accordance with the Outline SWGMP.	Will be secured via DCO Schedule &/or Requirement
CoT27	The onshore export cables and the AC connection cables will be completely buried underground for the entire length. No overhead pylons will be installed as part of the MHPGC Project.	Will be secured via DCO Schedule &/or Requirement
CoT29	Post-construction, the temporary working areas will be reinstated to pre-existing condition as far as reasonably practical, in line with best practice guidance.	Will be secured via DCO Schedule &/or Requirement
CoT42	Vegetation, including trees, woodland and hedgerows, will be mapped through a Vegetation Retention Plan (or similar) to inform construction activities, with vegetation retained wherever practicable. All vegetation works will be undertaken in accordance with BS 5837:2012, including the implementation of appropriate root protection measures. These measures will be consolidated within an Arboricultural Management Plan that will form part of the Outline Landscape and Ecological Management Plan (LEMP), which will be prepared and submitted with the application for development consent.	Will be secured via DCO Schedule &/or Requirement
CoT43	An Outline Landscape and Ecological Management Plan (LEMP) will be prepared and submitted with the development consent application and will establish the mitigation and management measures relevant to terrestrial and intertidal ecology and conservation. It will include: - mitigation measures relating to protected or notable species and/or sensitive habitats; - appointment of an Ecological Clerk of Works (ECoW) where required; - details of mitigation planting at the onshore substation site including the number, location,	Will be secured via DCO Schedule &/or Requirement

Code	Commitment	How Commitment is Secured
	species and details of management and maintenance of planting. A Detailed LEMP will be developed substantially in accordance with the Outline LEMP.	
CoT47	An Outline Bentonite Breakout Plan will form part of the Outline Code of Construction Practice (CoCP), which will be submitted as part of the application for the development consent. A Detailed Bentonite Breakout Plan will be developed substantially in accordance with the outline plan.	Will be secured via DCO Schedule &/or Requirement
CoT48	An Outline Biosecurity Protocol will form part of the Outline (CoCP), which will be prepared and submitted as part of the application for the development consent. It will include measures such as the use of proven invasive species control and other biosecurity measures to avoid the spread of INNS and INNS contaminated materials. A Detailed Biosecurity Protocol will be developed substantially in accordance with the Outline Biosecurity Protocol.	Will be secured via DCO Schedule &/or Requirement
CoT51	An Onshore Crossing Schedule will be submitted with the application for development consent based on the refined design for the application. The following features will be crossed using trenchless techniques: • A, B and Classified unnumbered roads (known as C roads) (including the A19 and B1432); • all railway lines (including the section of railway line which runs between Seaham and Horden); • the Durham Coast SSSI and SAC; • Hesledon Moor East SSSI.	Will be secured via DCO Schedule &/or Requirement
CoT59	An Outline Landfall Construction Method Statement (CMS) will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and submitted as part of the application for development consent. A Detailed Landfall CMS will be produced substantially in accordance with the Outline Landfall CMS and will include details of cable installation and methodology.	Will be secured via DCO Schedule &/or Requirement

8.4.4 List of plans and projects considered for the in-combination assessment

- 8.4.4.1 The Habitats Regulations require the Competent Authority to carry out an AA in respect of the LSE of a plan or project alone and in-combination with other plans or projects. For the in-combination methodology please refer to **Section 3.2**. A full review of plans and projects was conducted for the MHPGC Project (**Volume 1, Annex 4.3: Cumulative Screening and Location Plan**). Those plans and projects considered in this assessment are detailed in **Table 8.5**.
- 8.4.4.2 The assessment presented here draws on the cumulative assessment presented in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology of the PEIR**. The in-combination assessment considers whether effects arising from the MHGPC Project could

combine with effects from other projects in a manner that could result in AEol of the qualifying habitat of Durham Coast SAC. Projects and plans were screened for inclusion within the in-combination assessment based on their potential to contribute in-combination to effects on the qualifying habitat of Durham Coast SAC.

- 8.4.4.3 Screening considered the spatial relationship between projects and the European site, the presence of shared impact pathways and the potential for temporal overlap between project phases. Particular consideration was given to projects with the potential to contribute cumulatively to impact pathways such as habitat loss, habitat disturbance, changes in air quality, introduction and spread of INNS, hydrological change and HDD frac-out related effects. Only those projects for which a plausible effect-receptor pathway could be identified were taken forward into the in-combination assessment.
- 8.4.4.4 Only those projects identified in **Table 8.5.** were brought forwards into the assessment in **Section 8.5** on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved. A tiered approach has been applied to the in-combination assessment to reflect the different levels of uncertainty associated with the design and timeframes for the MHPGC Projects screened into the assessment, the tiers applied for terrestrial habitats is described in **Section 3.2.**

Table 8.5: Projects identified for the Terrestrial Habitats in-combination assessment.

Development Type	Project	Tier	Distance from nearest part of MHPGC PEIR Red Line Boundary: Onshore (km)	Construction Dates (if relevant)	Operational by (if relevant)	National Site considered in Assessment	Distance from National Site (km)	Pressure
Commercial Infrastructure	Electric Vehicle Charging Hub	1	0.73	Detail not available	Detail not available	Durham Coast SAC	0.7	Small scale and unlikely to coincide with MHPGC Project
Residential Infrastructure	Durham County Council Affordable Dwellings	1	0.73	Under construction	Detail not available	Durham Coast SAC	6.5	Small scale and in progress currently so no overlap with MHPGC Project
Commercial Infrastructure	Petrol Station and Coffee Outlet (Class E)	1	<0.1	Under construction	Detail not available	Durham Coast SAC	0.7	Small scale and in progress currently so no overlap with MHPGC Project
Commercial Infrastructure	EGL1 Visitor Centre	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	5	Small scale and unlikely to coincide with MHPGC Project
Solar Farm	Croup Hill Solar Farm	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	4.8	This project is located 4.8km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.
Residential and Commercial Infrastructure	Seaham Garden Village	1	<0.1	Under construction	Detail not available	Durham Coast SAC	0.5	Small scale and in progress currently so no overlap with MHPGC Project
Industrial Infrastructure	Phase 2 Jade Business Park	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	4.5	Potential cumulative disturbance during construction if coincides with MHPGC Project but no data on timescales available.
Public Transport Infrastructure	Transport Hub and Active Travel Scheme	1	<0.1	2025-2027	April 2027	Durham Coast SAC	2.8	Small scale and in progress currently so no overlap with MHPGC Project
Energy Infrastructure	Temporary Installation of Battery Energy Storage System (Caravan Storage)	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	4.8	This project is located 4.8km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.
Energy Infrastructure	Battery Energy Storage System (Land East of Carrs Farm)	1	<0.1	12-month construction programme	Detail not available	Durham Coast SAC	4.7	This project is located 4.7km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.
Transmission Infrastructure	Eastern Green Link 1	1	<0.1	2025-2028	2029	Durham Coast SAC	4.3	This project is located 4.3km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.
Residential and Commercial Infrastructure	Erection of Homes and Convenience Store (Class E)	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	2.3	This project is located 2.3km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.
Demolition and Residential infrastructure	Demolition of Farm Buildings and Erection of Dwellings (Class C3)	1	<0.1	Detail not available	Detail not available	Durham Coast SAC	0.1	Small scale and not likely to affect Durham Coast SAC or coincide with MHPGC Project but no data on timescales
Energy Infrastructure	Battery Energy Storage System (Hawthorn Grid Site)	1	<0.1	Under construction	Detail not available	Durham Coast SAC	5.2	This project is located 5.2km from the boundary of the Durham Coast SAC. This is outside of the ZoI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.

Solar Farm	Solar Farm and Battery Storage (South Sharpley Farm)	1	1.5	12-month construction programme	Detail not available	Durham Coast SAC	4.9	Small scale and in progress currently so no overlap with MHPGC Project
Residential Infrastructure	Erection of 135 Dwellings (Class C3)	1	1.6	Detail not available	Detail not available	Durham Coast SAC	7	This project is located 7km from the boundary of the Durham Coast SAC. This is outside of the ZOI for all impact pathways considered for MHPGC Project therefore there will be no in-combination effect.

8.5 Appropriate Assessment (alone and in-combination)

8.5.1 Durham Coast SAC

Site Description

- 8.5.1.1 The Durham Coast SAC falls within the MHPGC PEIR Red Line Boundary: Onshore and the Zol of the MHPGC Project see **Figure 8.1**. The Durham Coast SAC covers an area of 389.61 hectares (ha) and is the only example of vegetated sea cliffs on Magnesian Limestone exposures in the UK. These cliffs stretch over 20km along the North Sea coast, from South Shields to Blackhall Rocks. This habitat is the primary reason for the designation of the Durham Coast SAC.

Qualifying features

- 8.5.1.2 The relevant qualifying feature of this site is vegetated sea cliffs of the Atlantic and Baltic coasts which has the potential to be impacted by permanent habitat loss, temporary loss and physical disturbance of habitats, changes in air quality, introduction, spread of INNS and hydrological change during the construction, O&M and decommissioning phases of the MHPGC Project.
- 8.5.1.3 The Durham Coast SAC is the only example of vegetated sea cliffs on Magnesian Limestone exposures in the UK. These cliffs extend along the North Sea coast, from South Shield to Blackhall Rocks. The vegetation within these cliffs is unique in the British Isles and consists of a complex mosaic of paramaritime, mesotrophic and calciolous grasslands, tall-herb fen, seepage flushes and wind-pruned scrub. Rare species often grow together forming unusual and species-rich communities (Natural England, 2014).
- 8.5.1.4 Further habitat surveys have been undertaken in April and July 2026 to provide complete coverage of the site, including coastal areas. These shall be reported on in the ES, the final RIAA and included in the DCO application.

Conservation Objectives

- 8.5.1.5 The COs for the Durham Coast SAC are to ensure the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving Favourable Conservation Status of vegetated sea cliffs of the Atlantic and Baltic coasts, by maintaining or restoring:
- The extent and distribution of vegetated sea cliffs of the Atlantic and Baltic coasts;
 - The structure and function (including typical species) of vegetated sea cliffs of the Atlantic and Baltic coasts;
 - The supporting processes on which the vegetated sea cliffs of the Atlantic and Baltic coasts rely.

Permanent habitat loss – Construction, O&M, Decommissioning

Appropriate Assessment Alone

Vegetated sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.6 The Durham Coast SAC overlaps the MHPGC PEIR Red Line Boundary: Onshore and therefore there is potential for direct and indirect effects on the qualifying habitat.
- 8.5.1.7 The COs require the maintenance of the extent and distribution of vegetated sea cliffs of the Atlantic and Baltic coasts, together with maintaining their structure, function and supporting ecological processes.
- 8.5.1.8 The MHPGC Project has been developed to minimise direct impacts on designated habitats. The following CoTs have been committed to by the MHPGC Project to avoid habitat loss within the Durham Coast SAC;

- CoT13: The Project Description (**Volume 1, Chapter 2: Project Description, of the PEIR**) sets out that the installation of the offshore export cables under Durham Coast SSSI and SAC will be undertaken by trenchless technologies. The exit pits associated with the trenchless technologies installation will be at least 100 m seaward of the eastern boundary of the Durham Coast SSSI and SAC.
- CoT27: The onshore export cables and the AC connection cables will be completely buried underground for the entire length. No overhead pylons will be installed as part of the MHPGC Project.
- CoT51: An Onshore Crossing Schedule will be submitted with the application for development consent based on the refined design for the application. The Durham Coast SAC will be crossed using trenchless techniques.

- 8.5.1.9 The use of trenchless techniques to install the offshore export cables between the subtidal exit pits and the transition joint bays means that the cables will pass beneath the Durham Coast SAC. The subtidal exit pits will be situated at least 100 m from the SAC boundary, while all surface construction works will be undertaken at the entry pits, located outside of the Durham Coast SAC boundary. As a result, no permanent habitat loss within the Durham Coast SAC is anticipated.

Additional Mitigation

- 8.5.1.10 At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the effects of permanent habitat loss associated with construction, O&M and decommissioning activities, taking into account the embedded mitigation measures already identified.

Conclusion

- 8.5.1.11 It is concluded that permanent habitat loss will not result in an AEoI on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.12 The assessment alone concluded that there would be no effect to the Durham Coast SAC from permanent habitat loss. Therefore, there is no effect to act in-combination with other projects and plans and in-combination assessment is not required for this impact pathway.

Temporary loss and physical disturbance to habitats – Construction and Decommissioning

Appropriate Assessment Alone

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.13 The Durham Coast SAC overlaps the MHPGC PEIR Red Line Boundary: Onshore and therefore there is potential for temporary habitat disturbance during , construction and decommissioning activities
- 8.5.1.14 The COs require the maintenance of the extent and distribution of vegetated sea cliffs of the Atlantic and Baltic coasts, together with maintaining their structure, function and supporting ecological processes.
- 8.5.1.15 The MHPGC Project has been developed to minimise direct impacts on designated habitats. The following CoTs have been committed to by the MHPGC Project to avoid habitat loss within the Durham Coast SAC;
- CoT13: The Project Description (**Volume 1, Chapter 2: Project Description, of the PEIR**) sets out that the installation of the offshore export cables under Durham Coast SSSI and SAC will be undertaken by trenchless technologies. The exit pits associated with the trenchless technologies installation will be at least 100 m seaward of the eastern boundary of the Durham Coast SSSI and SAC.

- CoT27: The onshore export cables and the AC connection cables will be completely buried underground for the entire length. No overhead pylons will be installed as part of the MHPGC Project.
- CoT51: An Onshore Crossing Schedule will be submitted with the application for development consent based on the refined design for the application. The Durham Coast SAC will be crossed using trenchless techniques.

8.5.1.16 There will be no temporary disturbance to habitats within the SAC boundary during the construction and decommissioning phases.

Conclusion

8.5.1.17 It is concluded that temporary habitat loss and physical disturbance will not result in an AEoI on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

8.5.1.18 The assessment alone concluded that there would be no effect to the Durham Coast SAC from permanent habitat loss. Therefore, there is no effect to act in-combination with other projects and plans, and in-combination assessment is not required for this impact pathway.

Changes in air quality - Construction and Decommissioning

Appropriate Assessment Alone

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.19 Construction and decommissioning activities have the potential to generate dust and pollution emissions through vehicle movements, plant operation and earthworks.
- 8.5.1.20 The following CoTs have been committed to by the MHPGC Project to reduce changes in air quality within the Durham Coast SAC. CoT27 and CoT51 both commit to the use of trenchless technologies for cable installation within the Durham Coast SAC, no earthworks will occur within the SAC boundary.
- 8.5.1.21 CoT13 identifies that the exit pits for trenchless technologies installation will be located 100m seaward of the eastern boundary of the SAC. The ZOI for air quality is 250m therefore there is the potential for earthworks at the exit pit to result in emissions that could affect the SAC. Sensitive vegetation associated with Durham Coast SAC could potentially be affected by dust deposition and nitrogen enrichment.
- 8.5.1.22 Embedded mitigation measures relating to the control of dust would be implemented during the construction and decommissioning phase of the MHPGC Project, through the following CoTs:
- CoT16: An Onshore Decommissioning Plan will be developed prior to decommissioning. It will include provisions for the removal of all onshore above ground infrastructure and the decommissioning of below ground infrastructure (if and where relevant and practicable). The Onshore Decommissioning Plan will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.
 - CoT18: An Outline Code of Construction Practice (CoCP) will be prepared and submitted with the application for development consent. A Detailed CoCP will be developed substantially in accordance with the Outline CoCP.
 - CoT 21: An Outline Dust Management Plan (DMP) will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and submitted as part of the application for development consent.
- 8.5.1.23 The Air Quality Assessment in the PEIR (**Volume 3, Chapter 7: Air Quality, of the PEIR**) has assessed that with the embedded mitigation measures in place the dust impact risk for

construction is negligible. The impact pathway is localised and temporary. The scale of effect is therefore insufficient to affect the integrity of the SAC.

- 8.5.1.24 Changes in traffic within 200m of the Durham Coast SAC are assessed within **Volume 3: Chapter 5: Traffic and Transport, of the PEIR**. There will be negligible adverse changes to traffic within 200m of the Durham Coast SAC based on Annual Average Daily Traffic (AADT) flow. Changes to air quality as a result of changes in traffic within 200m of the Durham Coast SAC are screened out in **Volume 3, Chapter 7 Air quality, of the PEIR**. There will therefore be no effect to the Durham coast SAC as a result of increased pollution emissions.

Additional Mitigation

- 8.5.1.25 At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the effects of air quality changes associated with construction and decommissioning activities, taking into account the embedded mitigation measures already identified.

Conclusion

It is concluded that changes in air quality will not result in an AEol on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.26 The assessment alone concluded that there would be no effect to the Durham Coast SAC from changes in air quality. Therefore, there is no effect to act in-combination with other projects and plans, and in-combination assessment is not required for this impact pathway.

Introduction and spread of INNS - Construction and Decommissioning

Appropriate Assessment Alone

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.27 The ZoI for the introduction and spread of INNS is 500m from the MHPGC PEIR Red Line Boundary: Onshore. The movement of personnel, machinery, vehicles, equipment and imported materials during construction, O&M and at decommissioning phases within this ZoI have the potential to facilitate the introduction or spread of invasive non-native species. Should INNS become established, habitat composition and ecological functioning could be adversely affected.
- 8.5.1.28 Embedded mitigation measures relating to the control of INNS would be implemented during the construction phase of the MHPGC Project, through CoT48 which will include measures such as the use of proven invasive species control and other biosecurity measures to avoid the spread of INNS and INNS contaminated materials. A Detailed Biosecurity Protocol will be developed substantially in accordance with the Outline Biosecurity Protocol.
- 8.5.1.29 Control of INNS during decommissioning will be managed via CoT16. The Onshore Decommissioning Plan will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.

Additional Mitigation

At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the effects of the introduction and spread of INNS associated with construction and

decommissioning activities, taking into account the embedded mitigation measures already identified.

Conclusion

It is concluded that with the implementation of mitigation measures which are project commitments the introduction and spread of INNS will not result in an AEol on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.30 The assessment alone concluded that there would be no effect to the Durham Coast SAC from the introduction or spread of INNS. Therefore, there is no effect to act in-combination with other projects and plans, and in-combination assessment is not required for this impact pathway.

Hydrology Change – Construction

Appropriate Assessment Alone

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.31 A further potential impact pathway was identified whereby installation of the offshore export cables could affect groundwater seepages and spring-fed systems associated with vegetated sea cliff habitats of the Durham Coast SAC. During construction, trenchless installation methods will be used at landfall and there is a potential for effects to arise through changes to groundwater flow pathways supporting seepage flushes associated with the qualifying habitat. These supporting processes contribute to the structure, function and long-term maintenance of the qualifying habitat.
- 8.5.1.32 CoT13 commits to the measure that the exit pits associated with the trenchless technologies installation will be located 100m seaward of the eastern boundary of the SAC. CoT51 states that Durham Coast SAC will be crossed by trenchless techniques. CoT23 commits to the production of an Outline SWGMP which will set out measures to protect surface water and groundwater during construction. A Detailed SWGMP will be developed substantially in accordance with the Outline SWGMP.
- 8.5.1.33 Further information on the onshore water environment is provided in **Volume 3, Annex 2.3: Onshore Water Framework Directive Assessment, of the PEIR, Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PEIR and Volume 3, Chapter 2: Water Environment, of the PEIR.**
- 8.5.1.34 Impacts on groundwater levels and flow during construction works for the MHPGC Project are addressed in **Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PEIR.**
- 8.5.1.35 Based on the adopted mitigation measures stated above impacts on groundwater levels and flows, during the construction phase is considered to be negligible.

Additional Mitigation

- 8.5.1.36 At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the risk of changes to groundwater associated with construction activities, taking into account the embedded mitigation measures already identified.

Conclusion

- 8.5.1.37 It is concluded that with the implementation of mitigation measures which are project commitments the risk of groundwater change will not result in an AEol on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.38 No additional plans or projects have been identified that would act in combination with the MHPGC Project to increase the risk of effects on groundwater pathways supporting the Durham Coast SAC.

Additional Mitigation

- 8.5.1.39 No additional mitigation measures above those presented in **Section 8.4.3 Terrestrial Habitats commitments** are required for this impact pathway.

Conclusion

- 8.5.1.40 It is concluded that changes to hydrology will not result in AEoI on Durham Coast SAC in view of the site's COs from the MHPGC Project in-combination with other plans or projects..

Trenchless technique frac-out –Construction

Appropriate Assessment Alone

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.41 Natural England identified frac-out as a pathway requiring Stage 2 AA. A frac-out is the unintended release of drilling fluid during trenchless installation activities.
- 8.5.1.42 The potential effect relates to temporary smothering or contamination of habitat should drilling fluids reach the ground surface during construction. The MHPGC Project incorporates trenchless techniques within the SAC boundary. Any frac-out event would be localised, temporary and capable of remediation.
- 8.5.1.43 Construction activities will be undertaken in accordance with the Outline Code of Construction Practice CoCP (CoT18), including pollution prevention measures. Monitoring and reporting procedures will be implemented throughout trenchless installation works to ensure compliance with environmental commitments.
- 8.5.1.44 An Outline Bentonite Breakout Plan (CoT47) will form part of the Outline Code of Construction Practice (CoCP), which will be submitted as part of the application for the development consent. A Detailed Bentonite Breakout Plan will be developed substantially in accordance with the outline plan.

Mitigation

- 8.5.1.45 At this stage, no additional mitigation measures or monitoring requirements have been identified in relation to the risk of frac-out associated with construction activities, taking into account the embedded mitigation measures already identified.

Conclusion

It is concluded that frac-out, managed with mitigation measures embedded in the MHPGC Project commitments, will not result in an AEoI on Durham Coast SAC, in view of the site's COs with respect to vegetated sea cliffs of the Atlantic and Baltic coasts, from the MHPGC Project alone.

Appropriate Assessment In-combination

Vegetated Sea cliffs of the Atlantic and Baltic coasts

Assessment

- 8.5.1.46 The assessment alone concluded that there would be no effect to the Durham Coast SAC from the risk of frac-out. Therefore, there is no effect to act in-combination with other projects and plans, and in-combination assessment is not required for this impact pathway.

9 Transboundary statement

- 9.1.1.1 No European sites located outside the UK National Site Network were screened into the Stage 2 AA presented within this MHPGC Project RIAA.
- 9.1.1.2 The potential for transboundary effects has been considered in relation to the relevant impact pathways and receptor groups identified for the MHPGC Project. Based on the location, the distance to European sites located outside the UK and the anticipated spatial extent and magnitude of potential effects, no credible pathway for LSE on these European sites has been identified.
- 9.1.1.3 The following sections provide the receptor-specific rationale for this conclusion, including consideration of Marine Mammals and Marine Ornithology, as appropriate.

9.2 Marine Mammals

- 9.2.1.1 Potential transboundary effects on European sites located outside the UK have been considered in relation to the relevant impact pathways for marine mammals, as assessed within this RIAA and in **Volume 2, Chapter 5: Marine Mammals, of the PEIR**.
- 9.2.1.2 Marine mammals are wide-ranging and individuals occurring in UK waters may be associated with populations and Natura 2000 sites located in other European Economic Area (EEA) Member States. The potential for transboundary effects has therefore been considered for Annex II marine mammal qualifying features (harbour porpoise, bottlenose dolphin, grey seal and harbour seal), taking account of available evidence on species distribution and movements, the location of relevant Natura 2000 sites and the spatial extent of potential effects associated with the MHPGC Project (see **Table 9.1**).

Table 9.1: Natura 2000 sites within the EEA designated within the Marine Mammal Regional Study Area with Annex II marine mammal qualifying features

Jurisdiction	Site name	Distance to the MHPGC Project PEIR Red Line Boundary (km)
Netherlands	Doggersbank (NL2008001)	257.77
	Klaverbank (NL2008002)	263.55
	Noordzeekustzone (NL9802001)	427.86
	Waddenzee (NL1000001)	434.97
	Duinen en Lage Land Texel (NL2003060)	435.73
	Duinen Vlieland (NL2003061)	438.83
	Duinen Terschelling (NL2003059)	447.63
	Voordelta (NL4000017)	464.82
	Vlakte can de Raan (NL2008003)	469.10
	Westerschelde & Saeftinghe (NL9803061)	480.16
	Oosterschelde (NL3009016)	480.17
Belgium	Vlaamse Banken (BEMNZ0001)	440.35
	Vlakte van de Raan (BEMNZ0005)	467.81
Denmark	Sydlig Nordsø (DK00VA347)	482.97
	Gule Rev (DK00VA259)	537.02
	Sandbanker ud for Thyborøn (DK00VA340)	538.91
	Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde (DK00AY176)	556.69

Jurisdiction	Site name	Distance to the MHPGC Project PEIR Red Line Boundary (km)
	Store Rev (DK00VA258)	619.02
	Skagens Gren og Skagerak (DK00FX112)	662.87
	Ålborg Bugt, Randers Fjord og Mariager Fjord (DK00FX122)	672.08
	Hirsholmene, havet vest herfor og Ellinge Å's udløb (DK00FX122)	693.79
	Strandenge på Læsø og havet syd herfor (DK00FX010)	710.25
	Havet omkring Nordre Rønner (KD00FX257)	714.14
	Herthas Flak (DK00VA248)	717.66
	Læsø Trindel og Tønneberg Banke (DK00VA249)	734.26
	Anholt og havet nord for (DK00DX146)	746.02
	Kims Top og den Kinesiske Mur (DK00VA247)	753.70
	Store Middlegrund (DK00VA250)	791.87
	Gilleleje Flak og Tragten (DK00VA171)	803.56
Germany	Doggerbank (DE1003301)	281.46
	Sylter Außenriff (DE1209301)	462.85
	Borkim-Riffgrund (DE2104301)	478.28
	Nationalpark Niedersächsisches Wattenmeer (DE2306301)	518.30
	NTP S-H Wattenmeer und angrenzende Küstengebiete (DE0916391)	565.20
	Helgoland mit Helgoländer Felssockel (DE1813391)	579.30
	Steingrund (DE174391)	587.49
	Hamsburgisches Wattenmeer (DE2016301)	612.84
	Unterelbe (DE2018331)	645.77
France	Banc des Flandres (FR3102002)	446.17
	Ridens et dunes hydrauliques du détroit du Pas-de-Calais (FR3102004)	462.98
	Récifs Gris-Nez Blanc-Nez (FR3102003)	464.45
	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardingen et Dunes de Wissant (FR3100478)	476.34
	Baie de Canche et couloir des trois estuaires (FR3102005)	504.76
	Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire (FR2500085)	561.34
Sweden	Kosterfjorden-Väderöfjorden (SE0520170)	738.82
	Fladen (SE0510127)	765.21
	Vrångöskärgården (SE0520001)	768.63
	Lilla Middelgrund (SE0510126)	774.31
	Balgö (SE0510050)	787.72

Jurisdiction	Site name	Distance to the MHPGC Project PEIR Red Line Boundary (km)
	Stora Middelgrund och Röde bank (SE0510186)	790.10
	Västra Getterön (SE0510048)	797.55
	Nordvästra Skånes havsområde (SE0420360)	797.83
	Kullaberg (SE0420002)	819.83

- 9.2.1.3 Harbour porpoise are widely distributed throughout the North Sea. Their distribution has primarily been informed by modelling studies, which indicate that substantial numbers occur throughout the region, with the distribution in the central and southern North Sea primarily associated with coastal UK waters and the Wadden Sea (ASCOBANS, 2024). Although there is limited individual-level tracking data for harbour porpoise in this region, satellite telemetry has demonstrated movements of individuals associated with Danish and German waters into coastal UK waters and waters in the vicinity of the MHPGC Project PEIR Red Line Boundary (Scheidat *et al.*, 2024). Connectivity between harbour porpoise occurring in UK waters and individuals associated with Natura 2000 sites in Denmark and Germany can therefore not be excluded (see **Table 9.1**).
- 9.2.1.4 Bottlenose dolphins are wide-ranging within the North Sea and wider northwest European waters. Available evidence indicates that bottlenose dolphins associated with the east coast of Scotland may occur intermittently in the southern and central North Sea, including waters off the Netherlands, Belgium, Germany and northern France (OSPAR Commission, 2017; Scottish Government, 2021; Joint Cetacean Data Programme, 2026). However, available survey and acoustic data are insufficient to reliably assign individual animals occurring in the vicinity of the MHPGC Project PEIR Red Line Boundary to particular populations or Natura 2000 sites.
- 9.2.1.5 One Natura 2000 site outside UK waters has been identified within the Marine Mammal Regional Study Area with bottlenose dolphin as an Annex II qualifying feature (FR2500085), located 561.52km away in a straight line from the MHPGC PEIR Red Line Boundary (see **Table 9.1**). The available information for the site indicates that the site may be used by bottlenose dolphins for movement between the western and eastern English Channel. The potential for effects on the site is therefore considered further in relation to the spatial extent and nature of the impact pathways associated with the MHPGC Project.
- 9.2.1.6 A recent analysis of grey and harbour seal movements in the North Sea has indicated that grey seals present within UK North Sea waters can be apportioned to haul-out sites in France (~700 individuals), the Netherlands (~115 individuals) and Germany (~40 individuals; Carter *et al.*, 2025). For harbour seal, less than 10 individuals were reported to result from haul-out sites in other EEA member states within the North Sea (Carter *et al.*, 2025). Furthermore, genetic analysis has suggested that the grey seal population within the North Sea (including Shetland, southeast England, France, Belgium, Wadden Sea, northwest Denmark, Skagerrak, Kattegat, and southwestern Norway) represent a single genetic unit (McCarthy *et al.*, 2025).
- 9.2.1.7 Review of the telemetry tracks, however, suggest that although some individuals occur in the MHPGC Project PEIR Red Line Boundary, most of these individuals remain in the central and southern North Sea or English Channel (Brasseur, 2017; Carter *et al.*, 2025). Additionally, although grey seal are known to have wide foraging ranges up to 480km (Carter *et al.*, 2022), the MHPGC Project PEIR Red Line Boundary occurs beyond this distance for individuals associated with French Natura 2000 sites and at the edge of the foraging range for individuals associated with the Wadden Sea and Dutch/German Natura 2000 sites (see **Table 9.1**).
- 9.2.1.8 Thus, although small numbers of individual grey or harbour seals may occur near the MHPGC Project from other EEA Member States, they are unlikely to occur in substantial numbers to warrant further consideration under the transboundary assessment.
- 9.2.1.9 This screening has identified potential transboundary effects of Annex II marine mammal qualifying features with the largest Zol associated with the MHPGC Project being in relation to underwater sound. The potential transboundary effects are screened within **Volume 1, Annex 4.2: Transboundary Screening, of the PEIR**:

- Injury and disturbance from underwater sound (excluding UXO);
- Injury and disturbance from underwater sound produced by UXO clearance;
- Changes in prey availability;
- Collisions with vessels.

- 9.2.1.10 The offshore components of the MHPGC Project PEIR Red Line Boundary are located within UK territorial waters, which were considered as part of the baseline characterisation (see **Section 5.3**). Potential effects on Annex II marine mammal qualifying features associated with construction, O&M and decommissioning activities are expected to be spatially limited, with the maximum Zol extending approximately 27km from the MHPGC Project PEIR Red Line Boundary for disturbance from the CLV (see **Section 5.5**).
- 9.2.1.11 While connectivity between marine mammal populations occurring in UK and continental European waters cannot be entirely excluded, the spatial extent of the potential impact pathways associated with the MHPGC Project does not extend to the identified Natura 2000 sites in other EEA Member States (see **Table 9.1**). In addition, due to the nature of the project activities and the COs for the sites being site specific, with little consideration to connectivity for qualifying features, the MHPGC Project is unlikely to impact the SACs. Consequently, AEol of these sites, with respect to their marine mammal qualifying features, can be excluded.
- 9.2.1.12 Accordingly, no European sites located outside the UK National Site Network are considered further for Marine Mammals within the MHPGC Project RIAA, either alone or in-combination with other plans or projects.

9.3 Marine Ornithology

- 9.3.1.1 Potential transboundary effects on European sites located outside the UK have been considered in relation to the relevant impact pathways for Marine Ornithology (within this RIAA and **Volume 2, Chapter 6: Marine Ornithology, of the PEIR**).
- 9.3.1.2 The relevant impact pathways comprise disturbance and displacement from noise and visual disturbance associated with vessels, indirect impacts associated with effects on prey species, and temporary habitat loss/disturbance from increased SSCs.
- 9.3.1.3 The maximum Zol for temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species, was 13.5km at the Screening stage and has subsequently been refined to 9km based on updated physical processes modelling. The closest SPA located outside the UK is Duinen Terschelling SPA (Netherlands), approximately 467.68km from the MHPGC Project PEIR Red Line Boundary. Considering the localised maximum Zol and the availability of the alternative suitable foraging habitat across the entire North Sea, there is no credible pathway for MHPGC Project-related changes in SSC, sediment disturbance or associated effects on prey species to reach transboundary European sites.
- 9.3.1.4 Other potential effects, including disturbance and displacement from noise and visual disturbance associated with vessels, are similarly spatially constrained to the vicinity of the MHPGC Project. Although some seabird species have large foraging ranges, the Marine Ornithology screening assessment has considered the potential for individuals associated with European sites to interact with the MHPGC Project and whether this could result in transboundary effects. Given the localised nature and limited magnitude of the potential effects, no credible pathway for transboundary impacts at European sites located outside the UK has been identified.
- 9.3.1.5 Accordingly, no European sites located outside the UK National Site Network are considered further for Marine Ornithology within the MHPGC Project RIAA, either alone or in combination with other plans or projects.

9.4 Terrestrial and Intertidal Ornithology

- 9.4.1.1 The Transboundary Screening from PINS identified no onshore receptors that could be affected by transboundary effects. Given the localised nature and limited magnitude of the potential effects, no credible pathway for transboundary impacts at European sites located outside the UK has been identified.

- 9.4.1.2 For intertidal ornithological receptors, for reasons discussed in **paragraph 9.3.1.3** and **paragraph 9.3.1.4** there is no potential for transboundary effects on intertidal ornithological receptors.
- 9.4.1.3 Accordingly, no European sites located outside the UK National Site Network are considered further for Terrestrial and Intertidal Ornithology within the MHPGC Project RIAA, either alone or in combination with other plans or projects.

9.5 Terrestrial Habitats

- 9.5.1.1 The Transboundary Screening from PINS identified no onshore receptors that could be affected by transboundary effects. Given the localised nature and limited magnitude of the potential effects, no credible pathway for transboundary impacts at European sites located outside the UK has been identified.
- 9.5.1.2 Accordingly, no European sites located outside the UK National Site Network are considered further for Terrestrial Habitats within the MHPGC Project RIAA, either alone or in combination with other plans or projects.

10 Conclusion

- 10.1.1.1 This MHPGC Project RIAA has been prepared to inform and enable the Competent Authority to determine if the MHPGC Project, alone or in-combination with any other plans or projects will have AEol on any European sites when they are undertaking an AA.
- 10.1.1.2 Having considered site specific surveys, scientific investigations, and assessments (which are set out in the MHPGC Project RIAA and associated documents) and in light of the best scientific knowledge in the field, all aspects of the MHPGC Project which may affect European sites alone or in-combination with any other plans or projects, have been considered.
- 10.1.1.3 This MHPGC Project RIAA contains information which the relevant public authority, and Competent Authority, must consider in making its own complete, precise and definitive findings and conclusions and upon which the relevant public authority is capable of determining that all reasonable scientific doubt has been removed as to the effects of the MHPGC Project on the integrity of the relevant European sites.
- 10.1.1.4 In light of the conclusions of the assessment conducted in this RIAA, the Applicant is of the view that the construction, O&M, and decommissioning of the MHPGC Project will result not in an AEol alone or in-combination for any European sites.
- 10.1.1.5 A summary of the assessment is presented below in **Table 10.1**.

Table 10.1: Conclusions of the Stage 2 AA for the MHPGC Project (A dash (-) indicates no potential for effect at this project phase was screened into Stage 2 AA)

European Site	Qualifying Feature (Screened In)	Potential for Effect	Project Phase	Conclusion of AEoI – Alone	Conclusion of AEoI – In-Combination
Marine Mammals					
Berwickshire and Northumberland Coast SAC	Grey seal	Injury from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Disturbance from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI
		Disturbance from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by UXO clearance	Construction phase	No AEoI	No AEoI
		Disturbance from underwater sound produced by UXO clearance	Construction phase	No AEoI	No AEoI
		Changes to prey availability	All phases	No AEoI	No AEoI
Moray Firth SAC	Bottlenose dolphin	Injury from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Disturbance from underwater sound produced by offshore export cable installation and O&M activities	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI

		Disturbance from underwater sound produced by site investigation surveys	All phases	No AEoI	No AEoI
		Injury from underwater sound produced by UXO clearance	Construction phase	No AEoI	No AEoI
		Disturbance from underwater sound produced by UXO clearance	Construction phase	No AEoI	No AEoI
Marine Ornithology					
Northumbria Coast SPA and Ramsar site	Little tern, Breeding; Arctic tern, Breeding.	Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels	All phases	No AEoI	No AEoI
		Indirect impacts from underwater sound affecting prey species	All phases	No AEoI	No AEoI
		Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species	All phases	No AEoI	No AEoI
Teesmouth and Cleveland Coast SPA and Ramsar site	Little tern, Breeding; Common tern, Breeding; Sandwich tern, Non-breeding.	Disturbance and displacement from noise and visual disturbance associated with the presence of vessels	All phases	No AEoI	No AEoI
		Indirect impacts from underwater sound affecting prey species	All phases	No AEoI	No AEoI
		Temporary Habitat Loss/disturbance from increased SSCs, including indirect impacts on prey species	All phases	No AEoI	No AEoI
Terrestrial and Intertidal Ornithology					
Northumbria Coast SPA and Ramsar site	Little tern, Breeding; Arctic tern, Breeding; Turnstone, Non-breeding;	Disturbance and displacement from noise and visual disturbance.	All phases	No AEoI	No AEoI
		Permanent/Temporary habitat loss and disturbance affecting supporting habitat including functionally linked land used by qualifying species;	Construction and O&M	No AEoI	No AEoI

	Purple sandpiper, Non-breeding.	Water quality, sedimentation and disturbance effects associated with frac-out affecting supporting habitat.	Construction	No AEoI	No AEoI
Terrestrial Habitats					
Durham Coast SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts	Permanent habitat loss	All phases	No AEoI	No AEoI
		Temporary loss and physical disturbance to habitats	Construction and Decommissioning	No AEoI	No AEoI
		Changes in air quality	Construction and Decommissioning	No AEoI	No AEoI
		Introduction and spread of INNS	Construction and Decommissioning	No AEoI	No AEoI
		Hydrological change	Construction	No AEoI	No AEoI
		Trenchless technique frac-out	Construction	No AEoI	No AEoI

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