

MONA OFFSHORE WIND PROJECT

Environmental Statement

Non-Technical Summary (F02)

Deadline: 7

Application Reference: EN010137

Reference Number: MOCNS-J3303-RPS-10033

Document Reference: F1 F02

14 January 2025

F02



Image of an offshore wind farm

MONA OFFSHORE WIND PROJECT

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	RPS	Mona Offshore Wind Ltd	Mona Offshore Wind Ltd	Feb 2024
F02	Submission at Deadline 7	RPS	Mona Offshore Wind Ltd	Mona Offshore Wind Ltd	14 Jan 2025

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Prepared for:

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Deadline 7 Changes

This document has been updated at Deadline 7 of the Mona Offshore Wind Project examination in order to reflect the change to the Order Limits, forming the Change Request, which was accepted by the Examining Authority on 19 December 2024.

The following figures have been updated to reflect the updated onshore red line boundary change:

- Figure 1.1: Location of the Mona Offshore Wind Project
- Figure 1.4: Mona Onshore Development Area
- Figure 1.6: Onshore environmental and landscape designations: Overview
- Figure 1.7: Onshore environmental and landscape designations: Landfall
- Figure 1.8: Onshore environmental and landscape designations: Onshore Substation.

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Glossary

Term	Meaning
Applicant	Mona Offshore Wind Limited.
Candidate Special Areas of Conservation (cSACs)	SACs that were submitted to the European Commission before the end of the Transition Period following the UK's exit from the European Union (EU), but not yet formally designated. See also Special Areas of Conservation (SAC).
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Mona Generation Assets.
European Protected Species (EPS)	European Protected Species (such as bats, great crested newts, otters and dormice) receive full protection under The Conservation of Species and Habitats Regulations 2010.
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities (English and Welsh inshore and offshore waters). Section 149A of the Planning Act 2008 allows an applicant for a Development Consent Order to apply for 'deemed marine licences' as part of the Development Consent Order process. In addition, licensable activities within 12nm of the Welsh coast require a separate marine licence from Natural Resource Wales (NRW).
Marine spatial planning	A public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process.
Maximum design scenario	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Mona Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located.
Mona Scoping Report	The Mona Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Mona Offshore Wind Project.
Nationally Significant Infrastructure Project (NSIP)	Large scale development including power generating stations which requires development consent under the Planning Act 2008. An offshore wind farm project with a capacity of more than 100MW in England constitutes an NSIP.
Offshore Wind Leasing Round 4	The Crown Estate auction process which allocated developers preferred bidder status on areas of the seabed within Welsh and English waters and ends when the Agreements for Lease (AfLs) are signed.
Special Area of Conservation (SAC)	A site designation specified in the Conservation of Habitats and Species Regulations 2017. Each site is designated for one or more of the habitats and species listed in the Regulations. The legislation requires a management plan to be prepared and implemented for each SAC to ensure the favourable conservation status of the habitats or species for which it was designated. In combination with SPAs and Ramsar sites, these sites contribute to the national site network.
Special Protection Area (SPA)	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. SPAs contribute to the national site network.
The Planning Inspectorate	The executive agency of the Department for Communities and Local Government responsible for operating the planning process for NSIPs.

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Term	Meaning
The Secretary of State for Department for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Mona Offshore Wind Project.

Acronyms

Acronym	Description
AfL	Agreement for Lease
AHEF	Archaeology and Heritage Engagement Forum
AIS	Aeronautical Information Service
ALARP	As Low as Reasonably Practicable
ALC	Agricultural Land Classification
BEIS	Department for Business, Energy and Industrial Strategy
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAS	Controlled Airspace
CCS	Carbon Capture and Storage
CEA	Cumulative Effect Assessment
CoCP	Code of Construction Practice
CRNRA	Cumulative Regional Navigational Risk Assessment
cSAC	Candidate Special Area of Conservation
DCO	Development Consent Order
dML	Deemed Marine Licence
DESNZ	Department for Energy Security and Net Zero
eDNA	Environmental Deoxyribonucleic Acid
EEA	European Economic Area
EIA	Environmental Impact Assessment
EMF	Electro-Magnetic Field
EMP	Environmental Management Plan
EU	European Union
EWG	Expert Working Group
GHG	Greenhouse Gas
GVA	Gross Value Added
HDD	Horizontal Directional Drilling
HER	Historic Environment Record
HGV	Heavy Goods Vehicle

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Acronym	Description
HMRI	Helicopter Main Route Indicators
HND	Holistic Network Design
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
IAQM	Institute for Air Quality Management
ISAA	Information to Support the Appropriate Assessment
JB	Joint Bay
LAT	Lowest Astronomical Tide
LB	Link Box
LWS	Local Wildlife Site
MCA	Marine Character Areas
MCZ	Marine Conservation Zone
MDS	Maximum Design Scenario
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
ML	Marine Licence
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Protocol
MNEF	Marine Navigation Engagement Forum
MP	Member of Parliament
MS	Member of the Senedd
MU	Management Unit
NCR	National Cycle Route
NGESO	National Grid Electricity System Operator
NMRW	National Monuments Record of Wales
NRA	Navigation Risk Assessment
NRHE	National Record of the Historic Environment
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OREI	Offshore Renewable Energy Installations
OSP	Offshore Substation Platform
PAD	Protocol for Archaeological Discoveries
PEIR	Preliminary Environmental Information Report
PEXA	Practice and Exercise Areas
PPW	Planning Policy Wales

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Acronym	Description
Public Rights of Way	Public Rights of Way
pSPA	Potential Special Protection Area
PSR	Primary Surveillance Radar
REWS	Radar Early Warning Systems
SAC	Special Area of Conservation
SCI	Site of Community Importance
SLA	Special Landscape Area
SoCC	Statement of Community Consultation
SPA	Special Protection Area
SSC	Suspended Sediment Concentrations
SSSI	Site of Special Scientific Interest
SSZ	Seascape Sensitivity Zone
SVIA	Seascape and Visual Impact Assessment
TAN	Technical Advice Note
TCE	The Crown Estate
TJB	Transition Joint Bays
TMZ	Transponder Mandatory Zone
TSS	Traffic Separation Scheme
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

Units

Unit	Description
%	Percentage
°C	Degrees Celsius
km ²	Square kilometres
knots	knots
m/s	Metres per second
MI/l	Milligrams per litre
MW	Megawatt
nm	Nautical miles

1 Non-Technical Summary

1.1 Introduction

1.1.1 The Mona Offshore Wind Project

Overview

1.1.1.1 Mona Offshore Wind Limited is a joint venture between two leading energy companies (bp Alternative Energy Investments (hereafter referred to as bp) and Energie Baden-Württemberg AG (hereafter referred to as EnBW)). The Mona Offshore Wind Project is a proposed offshore wind farm located in the east Irish Sea (Figure 1.1). The project includes offshore elements to generate electricity and both offshore and onshore elements to enable transmission of the electricity generated to the UK National Grid through the existing Bodelwyddan National Grid substation in Denbighshire, Wales. This NTS supports the Mona Offshore Wind Project application for a Development Consent Order (DCO) to the Planning Inspectorate to be decided by the Secretary of State for the Department for Energy Security and Net Zero (DESNZ). In addition, a separate application will be made to Natural Resources Wales (NRW) for a marine licence for the offshore export cables and related works located within the Mona Array Area and the Mona Offshore Cable Corridor and Access Areas.

Purpose of this document

1.1.1.2 This document is a Non-Technical Summary (NTS) of the Environmental Statement. This NTS forms part of the documents submitted by the Applicant in support of the application for development consent for the Mona Offshore Wind Project as required under the Planning Act 2008 (the 2008 Act).

1.1.1.3 This NTS has been written in a non-technical language and summarises information contained within the Environmental Statement. It is intended to act as a stand-alone document that provides an overview of the Mona Offshore Wind Project and the likely significant effects of the Mona Offshore Wind Project.

1.2 About the Applicant

1.2.1.1 The Applicant is a joint venture between two leading energy companies (bp and EnBW). These two companies are working together as partners to deliver offshore wind projects in the UK.

- bp has set out an ambition to be a net zero company by 2050, or sooner. This strategy will see bp transform from an international oil company producing oil and gas, to an integrated energy company providing broader energy solutions to customers
- EnBW is one of the largest energy supply companies in Germany and supplies electricity, gas, water and energy solutions and energy industry services to around 5.5 million customers with a workforce of more than 27,000 employees. EnBW aims to strengthen its position as a sustainable and innovative infrastructure partner for customers, citizens and local authorities to an even greater extent.

1.3 Introduction to the Mona Offshore Wind Project and Site Location

- 1.3.1.1 The Applicant entered into an Agreement for Lease (AfL) for the seabed from The Crown Estate (TCE) for the Mona Offshore Wind Project in early 2023. The Mona Array Area (i.e. the area within which the offshore wind turbines will be located) is 300 km² in area and is located approximately 28.8 km from the north coast of Wales, 46.9 km from the northwest coast of England and 46.6 km from the Isle of Man. The Mona Array Area is located in Welsh offshore waters (beyond 12 nm from the Welsh coast) (Figure 1.1).
- 1.3.1.2 The offshore export cables (cables that bring the electricity from the Mona Array Area to shore) and related works located within and between the Mona Array Area and the landfall will be routed through the Mona Offshore Cable Corridor and Access Areas, which overlaps with both Welsh offshore and Welsh inshore waters. The offshore export cables will make landfall in Llanddulas, North Wales where they will be connected to the onshore export cables at the onshore Transition Joint Bays (TJB). The onshore export cables and onshore substation will be located within the Mona Onshore Development Area, which is within Conwy and Denbighshire, in North Wales. The Mona Onshore Cable Corridor will extend inland to connect with an existing National Grid substation. The consenting regime for the Mona Offshore Wind Project is detailed in section 1.5.2.

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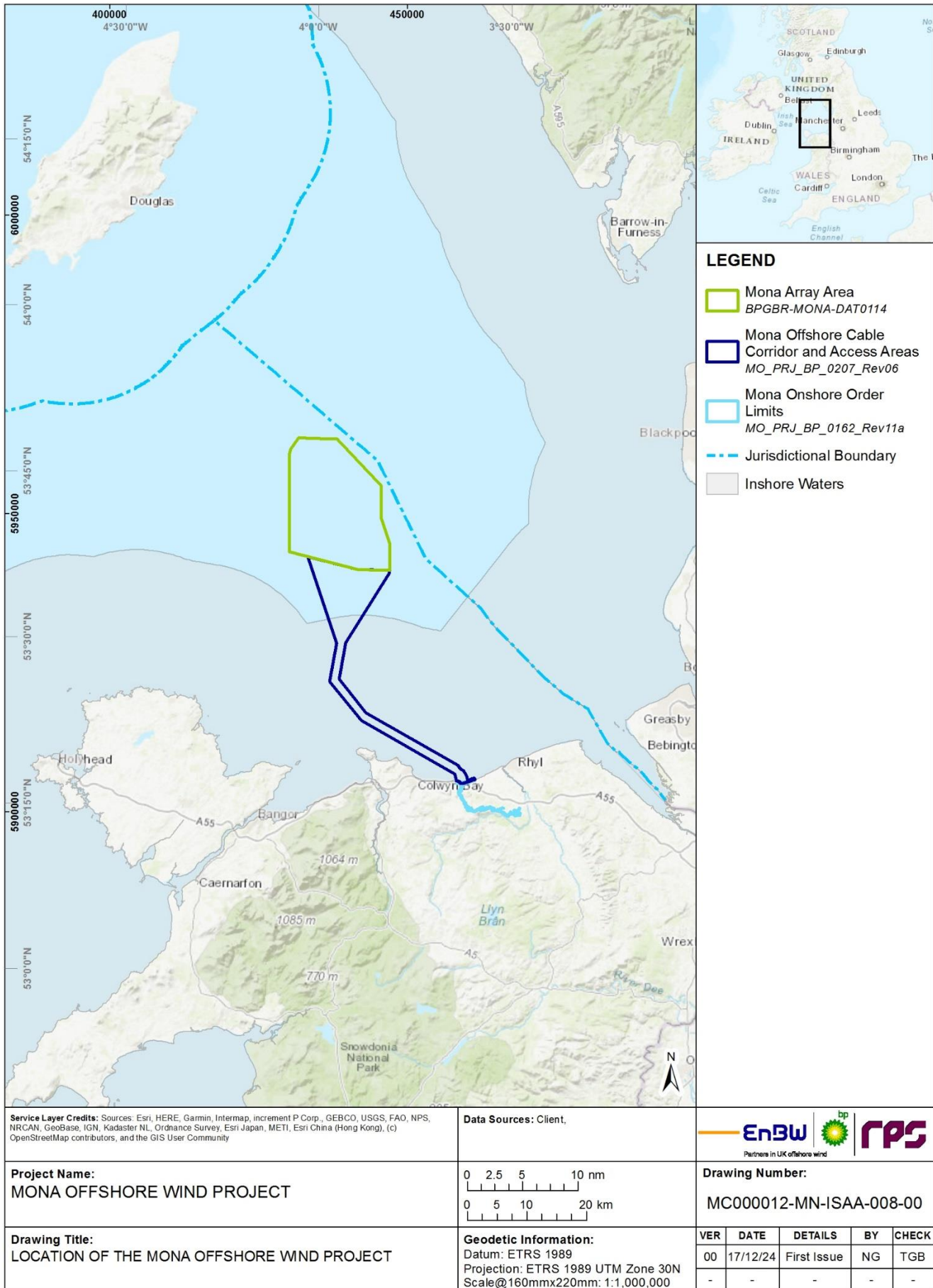


Figure 1.1: Location of the Mona Offshore Wind Project.

1.4 Need for the Mona Offshore Wind Project

1.4.1 Climate change and renewable energy

- 1.4.1.1 The UK government has an ambition to generate 50 GW of clean, renewable energy from offshore wind by 2030. The Department for Business, Energy & Industrial Strategy (BEIS) (now DESNZ) released information and figures in December 2022 that show that the UK had 13.1 GW of installed offshore wind capacity in the UK by this date. There is some way to go to meet the target. The Mona Offshore Wind Project therefore has an important role to play – both in helping the UK to achieve its net zero ambitions and, specifically, in reaching its offshore wind generation goals.
- 1.4.1.2 The UK’s ambition is to lead the world in combatting climate change, reducing its reliance on fossil fuels and embracing a future where renewable energy powers homes and businesses. At the centre of this drive is a commitment to reducing UK greenhouse gas (GHG) emissions and reaching net zero. Under the Climate Change Act 2008, the UK committed to a net reduction in GHG emissions of 80% by 2050 against the 1990 baseline in line with the commitments of the Kyoto Protocol.
- 1.4.1.3 In June 2019, secondary legislation (the Climate Change Act 2008 (2050 Target Amendment) Order 2019) was passed that extended that target to at least 100% against the 1990 baseline. In order for the UK to meet these ambitions it needs to work with developers to support proposals to produce clean, renewable energy within the UK. As the Mona Offshore Wind Project is planned to be operational by 2030 it would significantly contribute to meeting these ambitions.
- 1.4.1.4 On 7 April 2022, the UK Government published its British energy security strategy (BEIS and Prime Minister’s Office, 2022). The strategy builds on the UK net zero target, placing a heavy reliance on a renewable and low carbon energy supply with a view to *‘bring clean, affordable, secure power to the people for generations to come...’*. The strategy plans to accelerate delivery of offshore wind by developing an Offshore Wind Acceleration Task Force to work on reducing the consenting and delivery times for offshore wind projects and fast tracking priority projects. Specifically, the strategy states an ambition to deliver up to 50 GW of offshore wind by 2030, an increase on previous targets of 40 GW. The Mona Offshore Wind Project would bring clean, affordable, secure power to millions of homes and be a key project to deliver 50 GW of offshore wind by 2030.
- 1.4.1.5 In July 2022, the UK Government published the Pathway to 2030 Holistic Network Design (HND) documents, which set out the approach to connecting 50 GW of offshore wind to the UK electricity network (National Grid ESO, 2022). The Mona Offshore Wind Project was identified with the Pathway to 2030 HND. Whilst the decision for where projects connect to the grid ultimately sits with National Grid Electricity System Operator (NGESO), the Mona Offshore Wind Project has engaged with NGESO throughout the HND to understand the proposed solutions for connecting the Mona Offshore Wind Project to the grid. NGESO concluded that the preferred connection option representing the most optimal design (economic, efficient and co-ordinated) considering all criteria (i.e. technical, cost, environmental and deliverability) for the Mona Offshore Wind Project was a single radial grid connection into Bodelwyddan Substation in Denbighshire, North Wales.

1.5 Policy and legislative context

1.5.1 Introduction

1.5.1.1 This section provides a summary of the policy and legislative context for the Mona Offshore Wind Project, with reference to the consenting process, including details of the Planning Act 2008 and associated planning policy.

1.5.1.2 Policy and legislation specific to individual environmental topics and Environmental Impact Assessment (EIA) are set out within each topic chapter of the Environmental Statement. This includes (as applicable) National Policy Statements, Planning Policy Wales (PPW) and reference to the following local authorities and their Local Development Plans:

- Conwy County Borough Council: Adopted Local Development Plan
- Denbighshire County Council: Adopted Local Development Plan.

1.5.2 Consenting regime and Application Process

1.5.2.1 The Mona Offshore Wind Project requires consent under the Planning Act 2008. A marine licence is required before carrying out any licensable marine activities under the Marine and Coastal Access Act 2009. The marine licence (ML) for activities located in Welsh offshore waters will be deemed under the DCO. The deemed ML (dML) will cover works related to the offshore wind farm generation infrastructure (wind turbines, Offshore Substation Platforms (OSPs), inter-array cables and interconnector cables). A separate, standalone ML will be required for activities within 12 nm of the Welsh coast. The standalone ML will cover works associated to the offshore export cables, OSPs, and Mona Offshore Cable Corridor and Access Areas. The OSPs are included in both marine licences as it has not yet been determined whether they would be generation or transmission infrastructure, and notification of this will be provided to NRW in advance. This section provides a summary of the consenting process and describes the legal requirements for EIA.

1.5.2.2 An EIA is required for the assessment of the effects of certain projects on the environment under European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive). The EIA Directive is transposed into English law for Nationally Significant Infrastructure Projects (NSIPs) by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

1.5.2.3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and the Marine Works (Environmental Impact Assessment) Regulations 2007 set out the requirements for EIA under the Planning Act 2008 (in compliance with the EIA directive) and the Marine and Coastal Access Act 2009 respectively.

1.5.2.4 The Planning Act 2008 defines the key stages in the application process for NSIPs. These stages are summarised below in Diagram 1.1.

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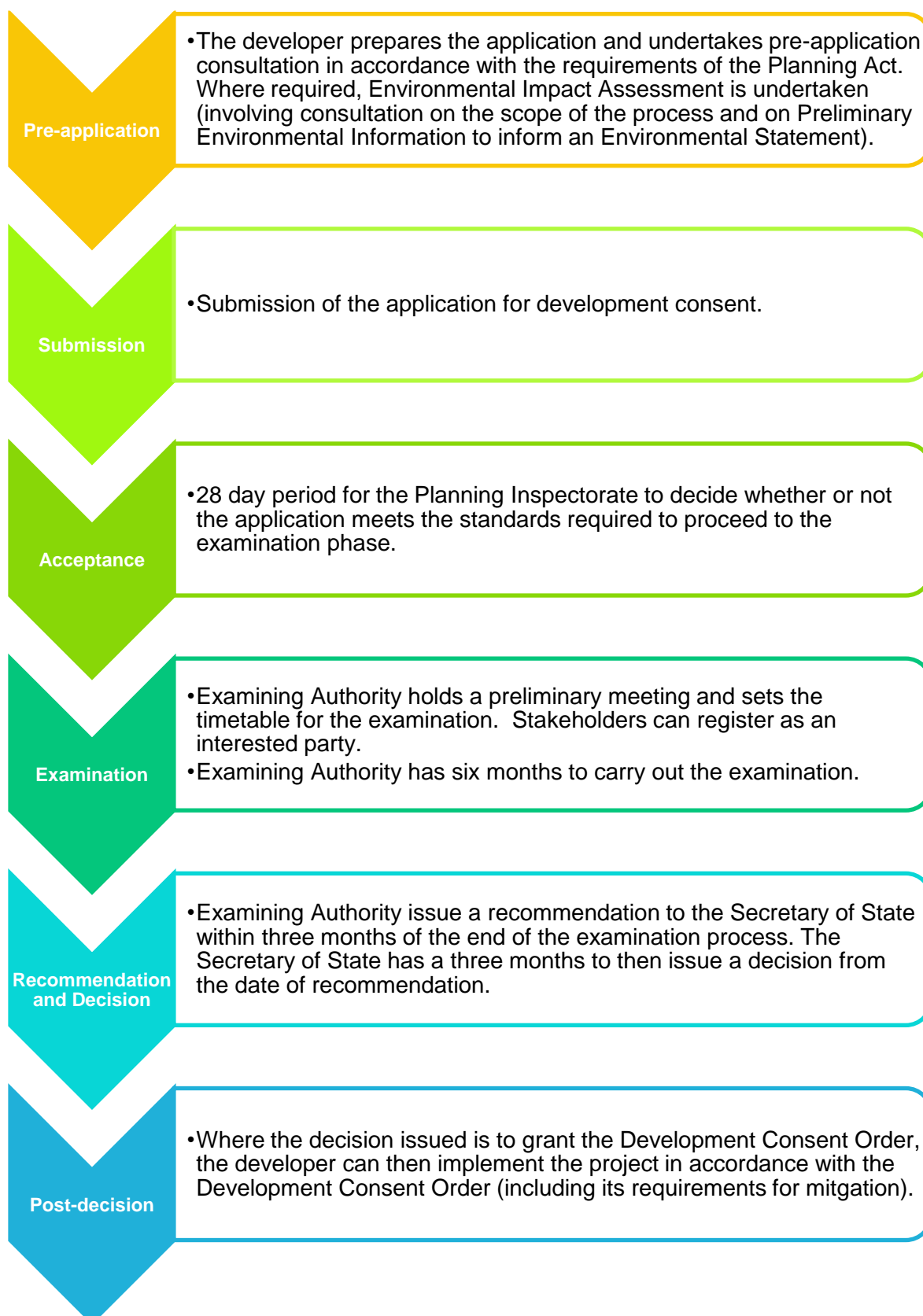


Diagram 1.1: Overview of the Planning Act 2008 Application Process.

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1.5.2.5 The Environmental Statement ensures that the decision maker has enough information on the likely significant effects on the environment arising from a project. The approach to EIA for the Mona Offshore Wind Project is set out in further sections.

1.5.3 Habitats Regulations

1.5.3.1 The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 require the assessment of significant effects on internationally important nature conservation sites where these may arise as a result of a project. These internationally important sites include Special Areas of Conservation (SACs), or Candidate Special Areas of Conservation (cSAC), Special Protection Areas (SPAs) or potential SPAs (pSPAs), Sites of Community Importance (SCI). In the UK, the requirements of the Habitats Regulations are also extended to consider the effects on Ramsar sites (listed under the Ramsar Convention on Wetlands of International Importance). The assessment is to be undertaken by the 'competent authority', which in the case of the Mona Offshore Wind Project is the Secretary of State for DESNZ for the application for consent for infrastructure applied for under the DCO. NRW is the competent authority for the application for consent for infrastructure applied for under the standalone NRW marine licence.

1.5.3.2 In order to carry out the Habitat Regulations Assessment (HRA), the competent authority requires a report to be submitted alongside the application for development consent that provides the information required to undertake the Appropriate Assessment. The Information to Support Appropriate Assessment (ISAA) (Document References E1.1 – E1.3) is provided alongside the Environmental Statement.

1.6 Consultation and engagement

1.6.1.1 Comprehensive consultation and engagement with stakeholders have formed an integral part of the development of the Mona Offshore Wind Project. The following section provides a high level summary of the consultation and engagement activities that have been undertaken as part of the Mona Offshore Wind Project. More details on all public consultations can be found in the Consultation report (Document Reference E3).

- **EIA Scoping May – June 2022:** The EIA Scoping Report outlined details of the proposed approach to EIA and was submitted to the Planning Inspectorate in May 2022. The Applicant received a response from the Secretary of State for BEIS in the form of the Scoping Opinion in June 2022 (Planning Inspectorate, 2022). The Preliminary Environmental Information Report (PEIR) and the Environmental Statement have been directly informed by the Scoping Opinion and the Applicant has also engaged with relevant stakeholders on the development of these documents through the Evidence Plan Process, Engagement Forums and wider technical engagement
- **Non-statutory Public Consultation 7 June to 3 August 2022:** The Applicant carried out the first phase of non-statutory public consultation in the summer of 2022. During the consultation period, several promotional activities and events took place
 - To promote the consultation, a postcard was sent to over 27,000 addresses, and an email was sent to local stakeholders (including Members of Parliament (MPs), Members of the Senedd (MSs) for immediate and neighbouring constituencies, local planning authorities, local elected leaders, community councils, and interest groups such as associations, universities, government agencies and environmental groups). The email was also distributed to local seldom-heard groups. A media release was issued to local media and advertisements were taken out in the Daily Post, Isle of Man Courier and Blackpool Gazette
 - A consultation website was launched to provide a platform to share consultation material and three events, two pop-up events and a webinar were held. At all events, members of the public were able to view the latest information and speak directly with members of the Mona Offshore Wind Project team to ask any questions or raise concerns. Anyone with an interest in the project was able to have their say and complete a feedback form
 - At the end of the consultation, feedback was collated and considered to inform the development of the Mona Offshore Wind Project. All feedback is comprehensively presented within the Consultation report (Document Reference E3), which is submitted as part of this application
- **Non-statutory targeted Public Consultation 26 September to 7 November 2022:** A second stage of targeted non-statutory consultation was held in autumn 2022 seeking views on potential sub-station locations. During the consultation period, several promotional activities and events took place, focused on the area in the vicinity of National Grid's existing Bodelwyddan substation in Denbighshire
 - To promote the consultation a newsletter was sent to over 3,000 addresses, and an email was sent to local stakeholders (including MPs, MSs for immediate and neighbouring constituencies, local planning authorities, local elected leaders, community councils, and interest groups such as associations,

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- universities, government agencies and environmental groups). The email was also distributed to local seldom-heard groups. A media release was issued to local media and advertisements were taken out in the Daily Post
- The consultation website hosted all consultation materials and two events, and a webinar were held. At all events, members of the public were able to view the latest information and speak directly with members of the Mona Offshore Wind Project team to ask any questions or raise concerns. Anyone with an interest in the project was able to have their say and complete a feedback form
 - At the end of the consultation, feedback was collated and considered to inform the development of the project. All feedback is comprehensively presented within the Consultation report (Document Reference E3), which is submitted as part of this application
 - **Statement of Community Consultation (7 October to 4 November 2022 and 9 March to 6 April 2023):** The Applicant prepared an initial Statement of Community Consultation (SoCC) in autumn 2022. This set out how local communities would be consulted on the Mona Offshore Wind Project. A second round of consultation was undertaken on an updated draft SoCC to reflect some minor changes to the programme. The Applicant consulted on both draft SoCCs with the local authorities and other relevant bodies in whose area the Mona Offshore Wind Project is situated. Further details of these consultations can be found in the Consultation report (Document Reference E3)
 - **Statutory Public Consultation 19 April to 7 June 2023:** Statutory consultation was undertaken in accordance with the Planning Act 2008 during the spring of 2023. The Consultation report (Document Reference E3) details all aspects of the consultation and how it was delivered as per sections 42, 47, 48 and 49 of the 2008 Act
 - The statutory consultation was carried out on a draft Environmental Statement in the form of a PEIR in accordance with the published SoCC. This consultation was aimed at anyone with an interest in the project but specifically as required by the Act – statutory stakeholders including local authorities, communities and landowners, and those with an interest in land
 - The consultation was widely promoted via various means – postcards were sent to over 30,000 addresses and a direct email to stakeholders (including MPs, MSs for immediate and neighbouring constituencies, local planning authorities, local elected leaders, community councils, and interest groups such as associations, universities, government agencies, and environmental groups). The email was also distributed to local seldom-heard groups. A press release was issued to local media and advertisements were placed in local newspapers and online
 - All consultation materials could be found on the consultation website along with the feedback form and interactive feedback map. Documents were also placed in deposit locations across the area
 - Six exhibitions, three pop-up events, and a webinar were held. At all events, members of the public were able to view the latest information and speak directly with members of the Mona Offshore Wind Project team to ask any questions or raise concerns. Anyone with an interest in the project was able to have their say and give their feedback
 - At the end of the consultation, feedback was collated and considered to inform the development of the project. All feedback is comprehensively presented

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within the Consultation report (Document Reference E3), which is submitted as part of this application

- **Additional Statutory Consultation Autumn/Winter 2023/2024:** Throughout the development process through continued diligent inquiry, additional landowners and interests have been identified. All have been contacted and had the opportunity to provide their feedback on the PEIR documents. Details of this additional consultation can also be found in the Consultation report (Document Reference E3)
- **Expert Working Groups (EWGs)** have been established to discuss topic-specific issues with relevant stakeholders. EWG meetings have been held at key stages in the EIA process or when new information has become available for each topic, to provide the opportunity for stakeholders to provide feedback and advice to inform the proposals at an early stage. EWGs have been established for the following topics:
 - Physical processes, benthic ecology, and fish and shellfish ecology
 - Marine mammals
 - Offshore ornithology
 - Onshore ecology and onshore and intertidal ornithology.

1.6.1.2 In addition to the EWGs established for specific topics in the Evidence Plan Process, a number of engagement forums for consultation with stakeholders have been set up:

- Marine archaeology (in the form of the offshore Archaeology and Heritage Engagement Forum (AHEF))
- Shipping and navigation (in the form of the Marine Navigation Engagement Forum (MNEF))
- Historic environment (in the form of the onshore AHEF).

1.6.1.3 Technical engagement has also taken place with stakeholders relating to the following topics:

- Commercial Fisheries
- Shipping and Navigation
- Aviation and radar
- Other sea users
- Seascape and visual resources
- Geology, hydrogeology, and ground conditions
- Hydrology and flood risk
- Land use and recreation
- Traffic and transport
- Noise and vibration
- Socio-economics

1.6.1.4 Full details of discussions held are set out in the Technical engagement plan (Document Reference E4).

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1.6.1.5 The Applicant recognises the importance of ongoing engagement with all stakeholders and will continue to liaise with interested groups, the community, landowners, and elected representatives as the proposals move through the planning process.

1.7 Approach to Environmental Impact Assessment

1.7.1 Introduction

1.7.1.1 This section summarises the EIA methodology that has been employed for the Mona Offshore Wind Project in the preparation of the technical assessments. The EIA for the Mona Offshore Wind Project describes the likely effects on the environment arising from the construction, operations and maintenance, and decommissioning of the Mona Offshore Wind Project. Where likely significant effects are predicted, it identifies mitigation to reduce the magnitude of impacts (where practical).

1.7.2 What is EIA and its approach

1.7.2.1 EIA is the formal process of identifying and assessing the positive (beneficial) and negative (adverse) effects of a proposed development on the environment and determining if these are likely to be significant. Where adverse impacts are identified which lead to significant effects, mitigation measures are introduced to reduce the magnitude of impacts and seek to avoid significant effects. The EIA is then reported in an Environmental Statement.

1.7.2.2 The approach to determining the scope of the EIA to be included in an application for a DCO can be broadly summarised as consisting of three main elements that take place prior to the submission of the application for the DCO and Environmental Statement:

- **Scoping:** To determine the issues to be addressed during the EIA process
- **Consultation:** Pre-application consultation in accordance with the 2008 Act, (including production of a PEIR which forms the basis of statutory consultation)
- **Environmental Statement preparation:** Reporting on the EIA process, updating the information provided in the PEIR and continuing with design iteration and consultation.

1.7.3 Scoping

1.7.3.1 The purpose of the EIA Scoping Report is to provide information on the Mona Offshore Wind Project and to allow for engagement with stakeholders on the key topics to be addressed in the EIA. In addition, scoping can be used to present the baseline data sources and assessment methodologies to be used to inform the EIA. Through scoping, the key environmental issues are identified at an early stage in the application process, which allows the EIA to prioritise aspects of the environment likely to experience significant effects because of a proposed development.

1.7.3.2 As set out above, the Applicant submitted a Scoping Report setting out the scope and methodology of the EIA. Feedback in the form of the Scoping Opinion was received from the Planning Inspectorate, taking into account representations from relevant stakeholders, and this formed the basis of the EIA for the Mona Offshore Wind Project by identifying and confirming which environmental topics required assessment, their scope and their assessment methodology.

1.7.4 Preliminary Environmental Information Report

1.7.4.1 Following the scoping report and the receipt of the scoping opinion, the PEIR (with supplementary reports, plans and drawings) was published as part of the statutory consultation process. The PEIR set out the preliminary findings of the EIA at the time. This provided stakeholders with the opportunity to review and comment upon the proposed Mona Offshore Wind Project development. As part of this consultation, six consultation events were held at which members of the public and other consultees could attend to meet members of the project team, as well as three smaller 'pop-up' events and one virtual event delivered as an online webinar. All PEIR documents were available on the Mona Offshore Wind Project consultation website. Feedback received from stakeholders during the consultation period was then used to inform the Environmental Statement, where appropriate.

1.7.5 EIA Methodology

1.7.5.1 The Mona Offshore Wind Project has the potential to create a range of effects with regard to the physical, biological and human environment. For each environmental topic considered as part of the EIA process (e.g. marine mammals, shipping and navigation etc.), the following information has been provided in the Environmental Statement:

- Identification of the study area for the topic-specific assessments
- Relevant legislation and policy considered
- Consultation and engagement carried out and how stakeholder feedback has been considered
- The methodology and assessment criteria used for the assessment
- Key project parameters considered for the assessment (i.e. identification of the Maximum Design Scenario (MDS))
- A description of the existing environment and identification of receptors. Receptors are defined as the physical or biological resource or human user group that could be affected by the Mona Offshore Wind Project. These receptors are identified through available data and baseline studies that have been reviewed
- A description of the future environment (without the Mona Offshore Wind Project)
- Identification of suitable mitigation measures to reduce or offset environmental effects (where required)
- Identification and assessment of the likely significant effects on receptors.

Approach to assessment

1.7.5.2 For the purposes of the Environmental Statement, the term 'impact' is defined as a change that is caused by an action. For example, the laying of an inter-array cable (action) is likely to result in seabed disturbance (impact). Impacts can be defined as direct, indirect, secondary, cumulative and inter-related. They can be either positive/beneficial or adverse, although the relationship between them is not always straightforward and relies on available evidence and professional judgement.

1.7.5.3 The term 'effect' is defined as the consequence of an impact. For example, the laying of an inter-array cable (action) results in seabed disturbance (impact), with the potential to disturb benthic habitats and species (effect).

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1.7.5.4 The ‘significance’ of each effect is determined by considering the magnitude of the impact alongside the importance, or sensitivity, of the receptor/receptor group, in accordance with the defined significance criteria. Unless set out otherwise within a chapter, a matrix approach has been adopted as a guide (Table 1.1). The magnitude of an impact considers the spatial extent, duration, frequency and reversibility of the impact from the construction, operations and maintenance, or decommissioning phase of the Mona Offshore Wind Project. The sensitivity of a receptor considers the vulnerability, recoverability and value/importance of each receptor. Professional judgement is used to define the magnitude of impact and receptor sensitivity. The matrix is then used, together with professional judgement, to evaluate the significance of effect.

Table 1.1: Matrix used for the assessment of the significance of the effect.

Sensitivity of Receptor	Magnitude of Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Minor	Minor or Moderate	Moderate or Major	Major
Very High	Minor	Moderate or Major	Major	Major

Cumulative and inter-related effects

1.7.5.5 The EIA process has also considered the potential for cumulative effects between the Mona Offshore Wind Project and other proposed developments. Cumulative effects are those which occur on the environment as result of the interaction between the Mona Offshore Wind Project and other proposed developments, where the effect is greater than if the Mona Offshore Wind Project was considered in isolation. For example, the cumulative effect of traffic generated during construction of the Mona Offshore Wind Project and another nearby development on the local road network.

1.7.5.6 The assessment of cumulative effects for the Mona Offshore Wind Project was undertaken using a four stage process, which can be summarised as follows:

- Stage 1: identification of a ‘longlist’ of other proposed developments based on the area around the Mona Offshore Wind Project that may be affected for each environmental topic
- Stage 2: preparation of a ‘shortlist’ of other proposed developments, which was defined by reviewing the longlist against inclusion/exclusion criteria
- Stage 3: collection of environmental information (if available) relating to other proposed developments in the shortlist
- Stage 4: determining if significant cumulative effects were likely to occur between the Mona Offshore Wind Project and the other proposed developments in the shortlist.

1.7.5.7 The shortlisting process identified a number of other proposed developments within the area around the Project that may give rise to potential cumulative effects.

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1.7.5.8 In addition, inter-related effects between the environmental topics covered in the Environmental Statement have also been evaluated as part of the EIA process. Inter-related effects occur where the combined effect of one or more environmental topics on a single receptor (or a group of receptors) is greater than if the environmental topics were considered in isolation. For example, the combined effects of dust, sound, and visual changes during construction of the Project on nearby residential properties.

1.7.6 Transboundary effects

1.7.6.1 The EIA process has also considered the potential for transboundary effects. Transboundary effects arise when impacts from a project within one State affect the environment of another state(s). Transboundary effects have been considered in each topic chapter of the Environmental Statement, based on the outcome of the transboundary screening.

1.8 Project description

1.8.1 Overview

Introduction

1.8.1.1 This section provides an outline description of the design of the Mona Offshore Wind Project infrastructure, as well as activities associated with the construction, operations and maintenance, and decommissioning of the Mona Offshore Wind Project.

1.8.1.2 It is important to note that the Mona Offshore Wind Project is in the early stages of the development process, therefore the project description has been designed to include flexibility to allow for further project refinement during detailed design, post consent. Offshore wind is a continually evolving industry with a constant focus on cost reduction and efficiency, therefore improvements in technology and construction methodologies occur frequently and flexibility is required to allow for the adoption of new technology and methods.

1.8.1.3 Taking into account the above considerations the EIA process has considered an MDS approach, also known as the 'Rochdale Envelope' approach. The MDS approach allows the EIA process to be conducted on the basis of a realistic 'worst case' scenario (i.e. the maximum project design parameters) which is selected from different design and construction scenarios.

1.8.2 Key elements of the Mona Offshore Wind Project

1.8.2.1 The key components of the Mona Offshore Wind Project infrastructure are shown in Figure 1.2. The key components of the Mona Offshore Wind Project include the following:

- Offshore wind turbines
- Foundations (for wind turbines and OSPs)
- Inter-array cables linking the individual wind turbines to each other and the OSPs
- Scour protection for foundations and cables where required
- High Voltage Alternating Current (HVAC) transmission system components, including:
 - OSPs

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- Offshore interconnector cable(s)
- Offshore export cables
- TJB (connecting the offshore and onshore cables)
- Onshore export cables
- Onshore Substation
- Connection into existing Bodelwyddan National Grid Substation.

1.8.2.2 Construction of the Mona Offshore Wind Project is intended to commence in 2026, and the project is intended to be fully operational by 2030 in order to provide an important contribution to the UK Government's renewable energy targets.

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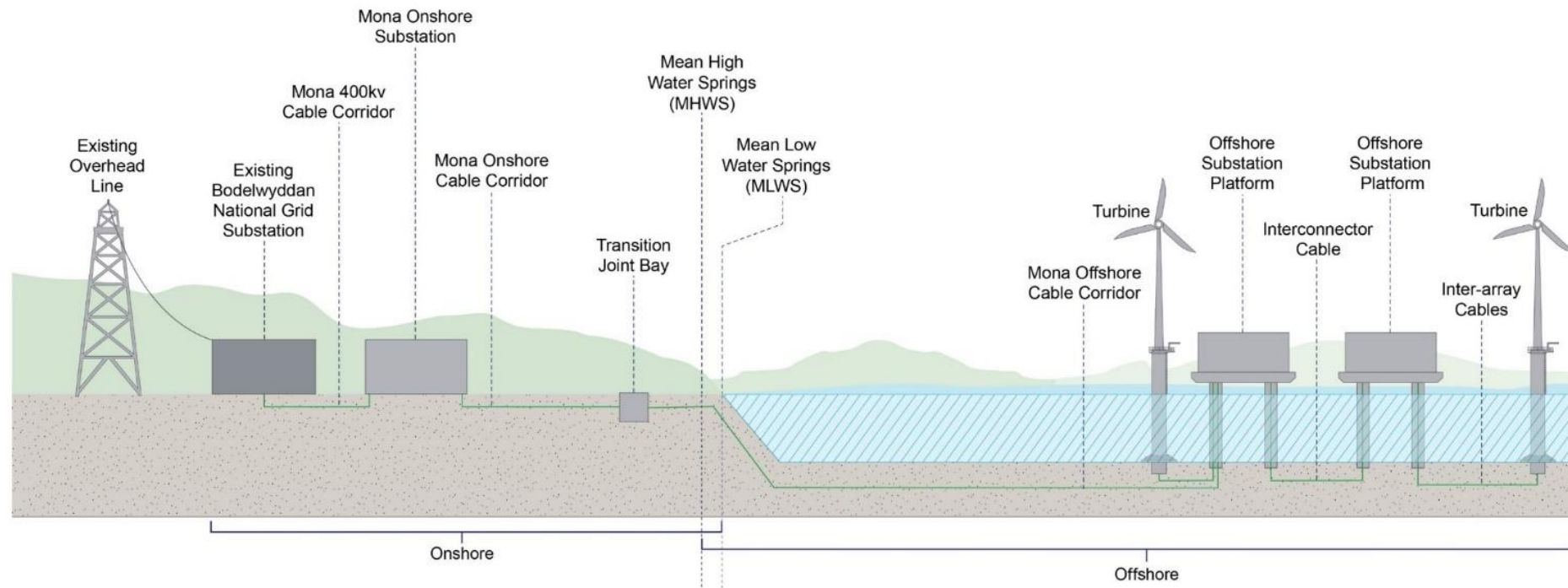


Figure 1.2: Overview of the Mona Offshore Wind Project Infrastructure.

1.8.3 Offshore elements of the Mona Offshore Wind Project

Wind turbines

1.8.3.1 The Mona Offshore Wind Project will consist of up to 96 wind turbines (the final number will be determined during the post-consent detailed design phase) and will follow the traditional design with a horizontal rotor axis with three blades. Depending on the type and size of the chosen wind turbine the maximum blade tip height above the Lowest Astronomical Tide (LAT) will range between 293 m to 364 m, and the minimum height of lowest blade tip above LAT will be 34 m. The maximum rotor diameter will range between 250 m to 320 m.

1.8.3.2 Wind turbines are generally constructed by installing the foundation structure followed by installation of the tower. The nacelle containing the generator is next then the three turbine blades are installed, all lifted from a transport vessel/barge onto the foundation.

Offshore Substation Platforms

1.8.3.3 The OSPs will contain the equipment required to transform electricity generated by wind turbines to a higher voltage for transportation. They may also house secondary equipment and facilities for operating, maintaining and controlling the OSP. They are likely to have one or more decks, a helicopter platform, cranes and communication antenna.

1.8.3.4 Up to four separate OSPs will be required and the exact locations will be determined during the post-consent detailed design phase. Locations will take into account the seabed conditions and the most efficient cable routing amongst other considerations. OSPs are generally constructed by installing the foundation structure, then the substation components will be lifted from a transport vessel/barge onto the foundation.

Foundations for wind turbines and OSPs

1.8.3.5 The wind turbines and OSPs will be attached to the seabed by foundation structures. The Applicant requires flexibility in foundation choice to ensure that anticipated changes in available technology can be accommodated. The foundation types that are being considered are shown in Figure 1.3 below.

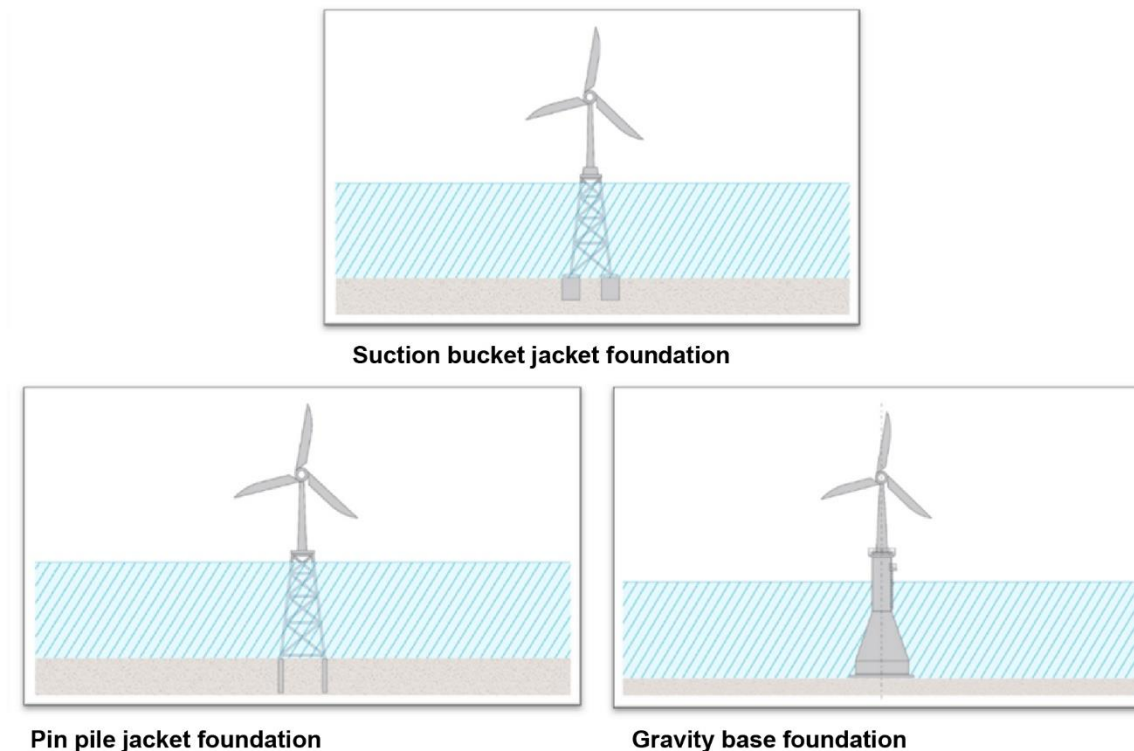


Figure 1.3: Schematic of foundation design types.

Inter-array cables

- 1.8.3.6 The Inter-array cables carry the electrical current produced by the wind turbines to an OSP. A small number of wind turbines will typically be grouped together on the same cable 'string' connecting those wind turbines to the OSP. The maximum length of the inter-array cables is 325 km.
- 1.8.3.7 These inter-array cables will be buried below the seabed wherever possible and protected with a hard-protective layer (such as rock or concrete mattresses) where adequate burial is not achieved.

Offshore interconnector cables

- 1.8.3.8 The Mona Offshore Wind Project will require interconnector cables to connect OSPs to one another in order to provide redundancy in the case of cable failure. The maximum length of interconnector cables is 50 km.

Offshore export cables

- 1.8.3.9 Although the Mona Offshore Cable Corridor and Access Areas have been identified, the exact route of the offshore export cables is yet to be determined and will be based upon geophysical and geotechnical survey information.
- 1.8.3.10 Up to four offshore export cables of up to 90 km in length, with a voltage of up to 275 kV will be required for the Mona Offshore Wind Project. The Mona Offshore Cable Corridor is generally 1.5 km wide and will be wider where it meets the Mona Array Area. Each offshore export cable will also house a fibre optic cable for communication. Where possible, the cables will be buried below the seabed to the landfall.

Pre-construction site investigation surveys

- 1.8.3.11 In addition to the work carried out to date, pre-construction site investigation surveys will be undertaken to provide detailed information on seabed conditions and to identify the presence/absence of any potential obstructions or hazards. Pre-construction site investigation surveys are likely to include geophysical and geotechnical surveys which will be conducted within the Mona Array Area, and the Mona Offshore Cable Corridor and Access Areas.

1.8.4 Landfall

- 1.8.4.1 The landfall is the area where the offshore export cables come on shore. This is the transitional area where the offshore cabling makes contact with land and connects to the onshore cabling. The offshore export cables for the Mona Offshore Wind Project will make landfall in Llanddulas to the west of Abergele, North Wales.
- 1.8.4.2 The offshore export cables will be installed underneath the intertidal area to a location to the south of the A547 where they can be connected to the onshore export cables. This approach has been selected to avoid potential impacts to intertidal and coastal receptors. The offshore export cables are connected to the onshore export cables at the onshore TJB.

1.8.5 Onshore elements of the Mona Offshore Wind Project

Onshore export cables

- 1.8.5.1 The offshore export cables will connect to the onshore export cables at the TJB and will transfer the electricity to the onshore substation. The onshore export cables will be buried for their entire length. Overhead lines are not proposed for the Mona Offshore Wind Project.
- 1.8.5.2 A maximum of four cable circuits has been assumed as the maximum design parameter for the environmental assessment. Each cable circuit will consist of three cables, giving a total of up to 12 cables. Once installed, the cables will occupy a permanent easement of approximately 30 m wide, although this width may change where obstacles are encountered. In addition to the above, fibre-optic cables are likely to be required for communications and temperature sensing. This may include up to one communications and one temperature sensing fibre-optic cable per circuit.
- 1.8.5.3 The Mona Onshore Cable Corridor will route south from the landfall and pass to the west of Abergele. The Mona Onshore Cable Corridor will be approximately 15 km in length and up to 74 m wide (including the temporary construction width). The width of the corridor may increase to 100 m at crossings where trenchless techniques will be used. The cables will be buried underground at a target depth of 1.8 m. This target burial depth may be increased where the route is required to cross beneath existing utilities such as pipelines, land drains, highways or rivers.
- 1.8.5.4 A further section of buried onshore export cabling is required to connect the Onshore Substation with the existing National Grid substation at Bodelwyddan. This is referred to as the 'Mona 400 kV Grid Connection Cable'.
- 1.8.5.5 This section of cabling will be similar in design to the Onshore Cable Corridor: it will be approximately 1 km in length and will be up to 48 m wide (including the temporary construction width) The Mona Onshore Cable Corridor, the Onshore Substation and 400kV Grid Connection Cable will be located within the Mona Onshore

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Development Area, together with temporary construction compounds and accesses to the public highway network.

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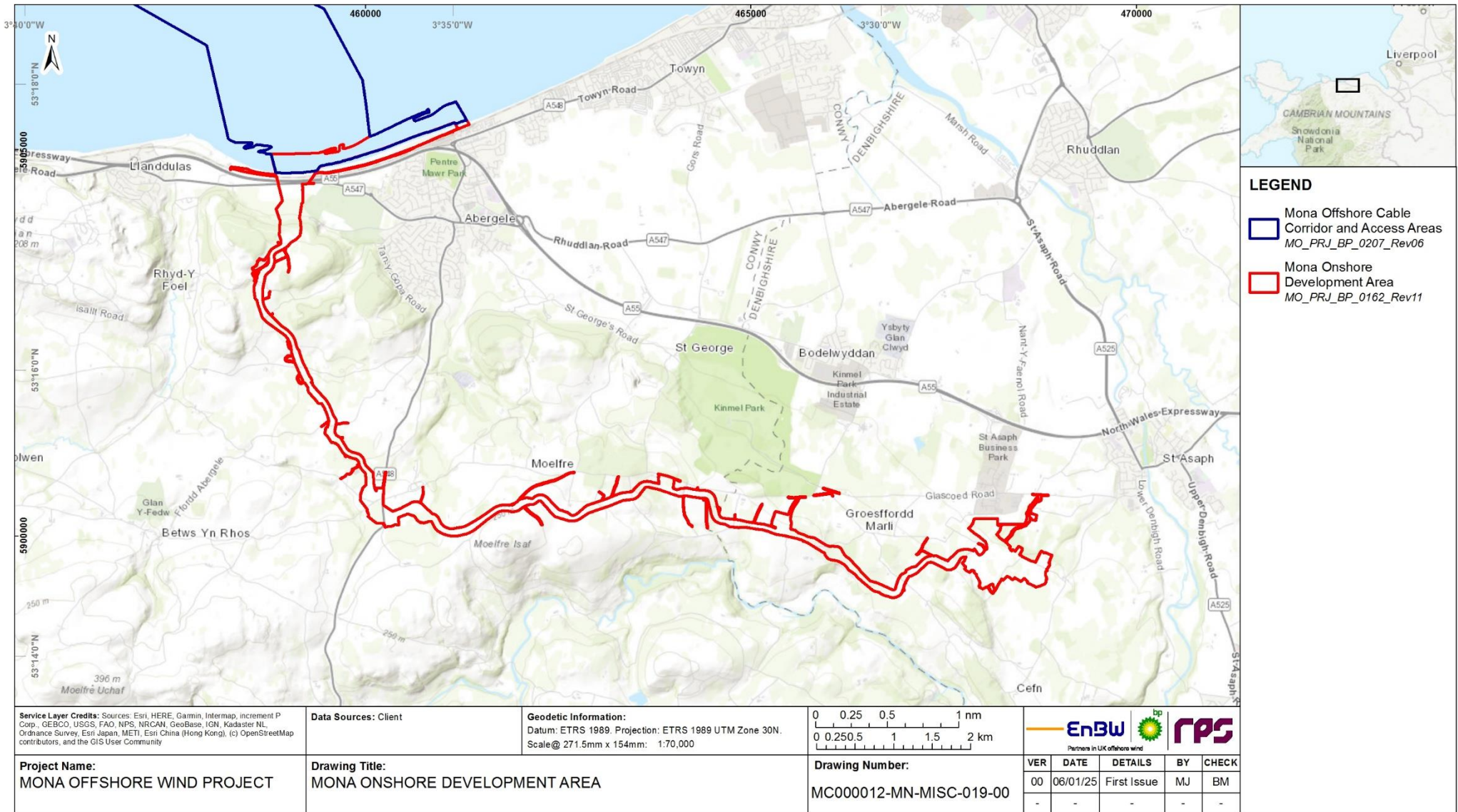


Figure 1.4: Mona Onshore Development Area.

Onshore Substation

- 1.8.5.6 The Mona Offshore Wind Project will connect to the National Grid at the Bodelwyddan substation, North Wales. The Onshore Substation will be located immediately south of the Bodelwyddan National Grid Substation and the Bodelwyddan to Pentir 400 kV overhead lines.
- 1.8.5.7 The Onshore Substation will contain the electrical components for transforming the power supplied from the offshore wind farm to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the national grid.
- 1.8.5.8 The Onshore Substation buildings are likely to be composed of steel frame and cladding materials and will be in accordance with the Design principles document (Document Reference J3) The structural steelwork will be fabricated and prepared off site and delivered to site for construction.
- 1.8.5.9 A detailed Landscape and Ecology Management Plan will be prepared post consent for the Onshore Substation site that will set out areas of landscape planting and creation of ecological habitats and their management. An outline version of the plan has been submitted with the application for development consent (Document Reference J22).

1.8.6 Construction environmental management

Code of Construction Practice

- 1.8.6.1 An Outline Code of Construction Practice (CoCP) (Document Reference J26) has been prepared and submitted with the application for development consent. The detailed CoCP will be prepared post consent and will be agreed with the planning authority. The CoCP is a written set of standards and measures that will be implemented during the construction process to ensure a consistent and efficient approach to managing potential impacts in order to minimise nuisances to communities and safeguard the environment.
- 1.8.6.2 Construction will be undertaken in accordance with the CoCP, which will set out key management measures that the Applicant will require their contractors to adopt and implement for all relevant construction activities for the landfall and onshore elements of the Mona Offshore Wind Project.
- 1.8.6.3 Measures to be included in the CoCP have been identified through the EIA process and through engagement with stakeholders. The measures include strategies, control measures and monitoring procedures for managing the potential environmental impacts and limiting disturbance from construction activities as far as reasonably practicable to mitigate against potentially significant effects.

Working hours

- 1.8.6.4 Core working hours for the construction of the onshore and intertidal elements of the Mona Offshore Wind Project are proposed below:
- 07:00 to 19:00 Monday to Saturday
 - No core working proposed on Sundays or bank holidays
 - Up to one hour before and after core working hours for mobilisation, (i.e. staff and delivery arrivals ('mobilisation period')).

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1.8.6.5 Extended working hours may be required to maintain time critical activities; 24 hour working may be required for activities such as the trenchless techniques at Landfall and for emergencies.

1.8.7 Operations and maintenance phase

1.8.7.1 The overall operations and maintenance strategy will be finalised once the operations and maintenance base location and technical specification of the Mona Offshore Wind Project are known, including wind turbine type and final layout. The operations and maintenance requirements for the Mona Offshore Wind Project has been set out within an Outline offshore operations and maintenance plan (Document Reference J12) which was submitted alongside the application for consent.

1.8.8 Decommissioning phase

1.8.8.1 The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment. This section summarises the assumptions that have been made regarding decommissioning in order to undertake an EIA on the decommissioning phase of the Mona Offshore Wind Project. The Energy Act 2004 requires that a decommissioning programme must be submitted to the Secretary of State for DESNZ prior to the construction of the Mona Offshore Wind Project and is typically prepared post-consent. The Decommissioning programme (and associated assumptions regarding the decommissioning of the Mona Offshore Wind Project) will be updated during the Mona Offshore Wind Project lifetime to take account of changes in regulations, best practice and new technologies.

1.8.8.2 Wind turbines will be removed and any piled foundations would likely be cut below the seabed at a level that means they will not create a hazard for fishing or shipping.

1.8.8.3 Offshore export, inter-array and interconnector cables could be removed and would be disposed of onshore. At this time, it is difficult to foresee what techniques will be used to remove cables during decommissioning.

1.8.8.4 It is expected that the onshore export cables will be left in place to minimise the environmental disturbance during decommissioning. The cable ends will be cut, sealed and securely buried as a precautionary measure, and any above ground infrastructure will be removed.

1.8.8.5 Decommissioning of the Onshore Substation will be reviewed in discussion with the transmission system operator and the regulator in the light of any other existing or proposed future use of the Onshore Substation. If complete decommissioning is required, then all of the electrical infrastructure will be removed and any waste arising disposed of in accordance with relevant regulations. The permanent access road and its associated services and drainage will also be removed.

1.9 Site selection and alternatives

1.9.1 Overview

1.9.1.1 This section summarises the site selection process and approach undertaken for the Mona Offshore Wind Project to identify the various elements of the Mona Offshore Wind Project and the alternatives (both onshore and offshore) that have been considered as the project has been developed.

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- 1.9.1.2 The Applicant has undertaken the site selection process to identify the location of the Mona Offshore Wind Project infrastructure through early engagement with a range of stakeholders. The aim was to identify sites and routes that are environmentally acceptable, deliverable and consentable, whilst also enabling the benefits in the long term of the lowest energy cost to be passed to the consumer.
- 1.9.1.3 The process has taken account of environmental, physical, technical, commercial, and social considerations and opportunities as well as engineering requirements. Each stage of the site selection process forms part of an iterative design process undertaken to identify the most suitable locations and configuration for the Mona Offshore Wind Project infrastructure.
- 1.9.1.4 A full description of the site selection process is provided in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives (Document Reference F1.4).
- 1.9.1.5 It is important to note that, whilst the site selection process is described as a linear approach in this document for ease of presentation, the reality of any project development is that site selection is a complex, iterative process with decisions made having considered multiple factors.

1.9.2 Stage 1: Identification of the Mona Array Area

- 1.9.2.1 The Crown Estate (TCE) launched the Offshore Wind Leasing Round 4 process in 2018. The Northern Wales and Irish Sea Bidding Area was one of four Bidding Areas identified by TCE through the Offshore Wind Leasing Round 4 process. The Mona Array Area was identified from within the Northern Wales and Irish Sea Bidding Area.

1.9.3 Stage 2: Identification of Point of Interconnection

- 1.9.3.1 Mona Offshore Wind Project was scoped into the Holistic Network Design (HND) process as a Pathway to 2030 Project. National Grid's (as the Electrical System Operator – NGENSO) recommended design for the Northwest Region (of which the Irish Sea is part) is a combination of collaborative developer-led solutions and single radial connections.
- 1.9.3.2 A number of potential grid connection locations and options were considered by NGENSO through the HND process based on an understanding of the grid infrastructure capacity in relation to the location of the Mona Offshore Wind Project (and considering other Round 4 offshore wind projects coming forward in the Irish Sea).
- 1.9.3.3 Whilst the decision for where projects connect to the grid ultimately sits with NGENSO, the Mona Offshore Wind Project engaged with NGENSO throughout the HND to understand the proposed solutions for connecting the Mona Offshore Wind Project to the grid and to provide input on environmental and consenting constraints for the POI under consideration.
- 1.9.3.4 The Applicant undertook constraints analysis for six POI in the Irish Sea; Wylfa, Pentir, Bodelwyddan, Connah's Quay, Kirkby and Penwortham.
- 1.9.3.5 Ultimately, NGENSO concluded, through the HND process, that the preferred connection option representing the most optimal design (economic, efficient and coordinated) considering all criteria (i.e. technical, cost, environmental and deliverability) for the Mona Offshore Wind Project was a single radial grid connection into Bodelwyddan Substation in Denbighshire, North Wales (NGESO, 2022) and therefore this is the only option the Applicant considered as part of the site selection process.

1.9.4 Stage 3: Identification of onshore and offshore areas of search for scoping (including onshore substation zone)

- 1.9.4.1 Stage 3 of the Mona Offshore Wind Project design process involved the identification of the offshore Export Cable Corridor (ECC) and landfall zone(s). During Stage 3 of the route design work, existing infrastructure such as railways, roads, ports, recreational areas and built-up areas were considered in identifying an initial search area. The initial search area encompassed the North Wales coast. Following an initial appraisal, a landfall search area was brought forward for consideration.
- 1.9.4.2 Following further onshore cable routeing work, site walkover, input from electrical design and construction specialists, and consultation with stakeholders via the EIA Evidence Plan process, individual areas of search were identified for the Mona Offshore Cable Corridor landfall.
- 1.9.4.3 Stage 3 also involved the identification of the Onshore Cable Corridor and Onshore Substation zones. The substation area of search was defined as a 3 km buffer around the grid connection point at Bodelwyddan National Grid substation; this buffer distance was initially considered appropriate in order to minimise the works associated with an onward 400kV cable connection between the Mona Offshore Wind Project onshore substation and the National Grid substation.
- 1.9.4.4 The boundary of the 3 km buffer was subsequently expanded to 5 km following engineering review of the maximum electrical distance between the Mona Offshore Wind Project onshore substation and the National Grid substation. This also increased the potential number of areas to site the onshore substation as part of the site selection process.
- 1.9.4.5 The 5 km buffer was further refined to avoid the city of St. Asaph with its associated Conservation Area and listed buildings, as well as the Main River (Elwy), and its associated Flood Zones 2 and 3 to the east. The southern boundary was refined to avoid a number of ecological designations and historic environment assets.
- 1.9.4.6 The area of search (Zone 5) was used to identify available parcels of land to site a potential onshore substation. These available parcels were included for site selection consideration. In parallel with the scoping phase of the Mona Offshore Wind Project, in March to June 2022, a long list of onshore substation zones within the overall area of search was identified.

1.9.5 Stage 4: Refinement of the Mona Offshore Wind Project for PEIR

- 1.9.5.1 Following the scoping phase, further consideration was given to the consideration of the areas of search and a detailed appraisal was undertaken of the offshore and onshore export cable options, and the landfall options.
- 1.9.5.2 The Offshore Cable Corridor, Landfall, Onshore Cable Corridor, and Onshore Substation, were subject to a process of multi-criteria analysis alongside a longlisting and shortlisting process, in order to identify preferred routes for the purposes of PEIR. Longlists comprised up to 20 options and were reduced to a shortlist of options, that were consulted on with the EWG membership through the Evidence Plan process and Site Selection EWGs, including Natural Resources Wales (NRW), local councils and the Welsh historic environment authority, Cadw.
- 1.9.5.3 For the Mona Offshore Cable Corridor, an initial list of four potential offshore export cable route options and associated landfall locations were identified which were subject to further assessment.

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- 1.9.5.4 The Mona Offshore Cable Corridor was designed to avoid ‘hard constraints’ including existing offshore wind farms (Burbo Bank, Gwynt y Môr), an existing anchorage area, pipeline and cable infrastructure and the ‘Liverpool Bay’ marine aggregate extraction Area 457. In addition, it sought to specifically avoid interactions as far as possible with key ecological designations including the Dee Estuary/Aber Dyfrdwy SAC and SPA, Lavan Sands SPA and Anglesey Terns SPA. It looked to minimise interaction with ecological designations that could not be avoided, specifically Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and the Liverpool Bay/Bae Lerpwl SPA.
- 1.9.5.5 The preferred option for offshore routeing would minimise interaction with the Constable Bank feature and route to the south from Mona Array Area, travelling to the west of the existing Gwynt y Mor and proposed Awel y Mor windfarms and make landfall at one of two potential landfall locations on Pensarn Beach.
- 1.9.5.6 The preferred option for offshore routeing was presented to the Evidence Plan Process (EPP) Steering Group in July 2022.
- 1.9.5.7 Following the identification of the landfall area of search, five zones along the North Wales coast were identified. Further analysis was also undertaken for the onshore cable routes, to understand potential constraints and risks that may further influence the balance of landfall options. As a result of the analysis and consultation feedback, the landfall location at Pensarn Beach (Llanddulas East zone) was progressed.
- 1.9.5.8 For the onshore cable route, sixteen routes were identified. Following an appraisal of these options, fourteen were discounted on a variety of environmental and engineering grounds, as well as consideration of land interests. The remaining two options were therefore taken forward for further consultation with the Site Selection EWG. Following consultation, it was determined that the chosen onshore route would be progressed for the purposes of PEIR.
- 1.9.5.9 For the onshore substation identification, the initial area of search was refined to seventeen possible onshore substation locations. The locations were each analysed, with an eventual seven possible onshore substation locations put forward for a non-statutory onshore substation consultation that ran from Monday 26 September 2022 until Monday 7 November 2022. The targeted consultation was designed specifically to seek feedback on the shortlisted locations and identify if there was any information about the shortlisted locations that the Applicant was unaware of; or that had not been considered previously in the site selection process. The site selection process then combined the ongoing environmental assessment and technical studies with local knowledge to help narrow the location for the onshore substation for PEIR assessment.
- 1.9.5.10 Of the possible seven locations, options were discarded for a combination of factors including consultation feedback, potential impacts associated with landscape impacts from views across the Elwy Valley (combined with access complexities and topography), and greater potential for other LVIA impacts.
- 1.9.5.11 Of the remaining two onshore substation options, the constraints on the surrounding land fed into the assessment of mitigation and access. It was determined that both options were constrained by existing woodland, properties to the west and east, and overhead lines but had sufficient land available for potential mitigation to be implemented. In addition, an assessment of the potential access to both options identified that both were constrained, with a need to include multiple options for access that could offer optionality – the PEIR consultation sought comments on the most feasible and less impactful solution.

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1.9.6 Stage 5: Refining of the Project between PEIR and ES / DCO Application submission

1.9.6.1 Following the statutory consultation on the PEIR, a number of modifications and refinements were made to the Mona Offshore Wind Project as a result of responses to the statutory consultation, formal and information consultation with landowners, further design refinements, engineering optimisation, and findings from additional environmental appraisals and surveys that were ongoing during and after statutory consultation on the PEIR.

1.9.6.2 These include:

- A refinement of the proposed Mona Array Area, reducing it from approximately 450 km² to 300 km²
- A reduction in the maximum number of turbines from 107 to 96
- Removal of the short trenchless techniques landfall option and commitment to use the long trenchless technique option with an entry / exit point below MLWS
- Refined landfall access and temporary construction compound
- Refined onshore cable corridor from 100 m to a 74 m (widening to 100 m in places)
- Reduction in onshore cable route optionality running parallel to the Glascoed Road
- Selection of a preferred onshore substation location and a reduced onshore substation zone
- Refined operational accesses for the Onshore Substation
- Refined 400kV cable route.

Mona Array Area

1.9.6.3 The key refinements to the Mona Array Area boundary related to minimising risks to shipping and navigation. Feedback on the PEIR, workshops with the NRA and CRNRA and further engineering, environmental and technical work, informed the Applicant's decision to reduce the Mona Array Area from what was presented in the PEIR. The spatial extent of the Mona Array Area was reduced from approximately 450 km² to 300 km² with refinements in the north, east and south. In reducing the Mona Array Area boundary, and seeking to minimise potential impacts on the existing environment as far as practicable, the Mona Offshore Wind Project also refined the array design by reducing the total number of wind turbines from a maximum of 107 as proposed within PEIR to a maximum of 96. Maximum rotor diameter has increased from 280 m at PEIR to 320 m, whilst maximum tip height has increased from 324 m to 364 m over LAT.

Landfall

1.9.6.4 Consultation feedback received from the PEIR consultation and regular Onshore Ecology EWGs stated that the NRW preference was to reduce or remove any potential interaction with the intertidal area to reduce the potential direct impact on the Traeth Pensarn SSSI and intertidal habitats, and to reduce the potential activity on the beach to support the trenchless techniques (including access to these areas). A design decision was made to commit to no above-ground works through the intertidal area, and to commit to a trenchless technique that would achieve this with an exit point below

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MLWS. As a result of this commitment, the landfall/beach access route to the east was refined, with an associated temporary construction compound. The access route and temporary construction compound location were determined through consultee engagement at the Site Selection EWG and through separate meetings with NRW, and consideration of the technical and environmental constraints.

Onshore cable route

- 1.9.6.5 The Mona Offshore Wind Project onshore cable route retained optionality at the PEIR consultation phase. Optionality was at four specific locations due to potential constraints associated with landowners, drainage, utilities, Ancient Woodland, historic landfill, hedgerows, and engineering feasibility.
- 1.9.6.6 BRAG assessment of each option is contained with Volume 5, Annex 4.2 Selection and Refinement of the Onshore Infrastructure of the Environmental Statement (Document Reference F5.4.2).
- 1.9.6.7 At each option, decisions were taken to avoid existing constraints including potential interaction with watercourses, steep gradients and topography, and Ancient Woodland and historic landfill.
- 1.9.6.8 These optionality decisions were presented to the Site Selection EWG and announced via newsletter and online publication in August 2023 (along with an announcement regarding the preferred onshore substation location). One area of optionality remained on the onshore cable route at Llanfair Talhaiarn. This was dependent on engagement with Wales and West Utilities. Following engagement in October 2023, the southern onshore cable route option was selected primarily to avoid any potential interaction with hedgerows and severance of landowner field parcels.
- 1.9.6.9 The width of the onshore cable corridor was also refined to 74 m. This width increases to 100m for trenchless technique crossings beneath public highways, woodlands, hedgerows and utilities, and to provide necessary engineering flexibility.

Onshore Substation

- 1.9.6.10 Following the decision at PEIR consultation to consider two potential onshore substation locations, a process of micro-siting and feedback review was undertaken to refine the best location for the Onshore Substation, taking into account Statutory Consultation feedback, technical input including onshore substation construction layouts, platform layouts and onshore cable route options, ongoing ecological and archaeological surveys, landowner feedback and EIA/Engineering/Land BRAG assessment criteria.
- 1.9.6.11 Following statutory consultation feedback, the project has committed to reducing the maximum height of the onshore substation by 5 m (from 20 m). This results in a maximum building height of 15 m. In combination with this height reduction, the project has also committed to a GIS onshore substation. This also means that the maximum footprint of the Onshore Substation has reduced by 60,000 m² (from 125,000 m²). This results in a maximum footprint of 65,000 m²
- 1.9.6.12 BRAGs were undertaken of the remaining two options, incorporating updated layouts / options and reviewed those BRAGs for the onshore substation against consultation responses. Micro-siting suggestions for the onshore substation were also reviewed against consultation responses. Based on input from the multidisciplinary project team and stakeholder engagement, it was decided that the proposed onshore substation immediately south of the National Grid Bodelwyddan substation (Onshore Substation Option 2 in the PEIR) offers the most appropriate option for the siting of the Mona

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Offshore Wind Project onshore substation. Following this decision further refinements were made to take account of specific features and constraints surrounding the Onshore Substation location and to orientate the Onshore Substation accordingly.

- 1.9.6.13 Additional refinements, which include a lateral reduction in the width of the construction and operational access road and location as far east as possible, have been introduced to minimise traffic, visual and noise-related impacts, as well as cumulative effects associated with Awel y Môr, to residential properties on Glascoed Road.

1.9.7 Stage 6: Final details for Application

- 1.9.7.1 The final boundaries and routes for the Mona Offshore Wind Project application can be seen in detail within the plans that accompany the application for development consent. The final boundaries and routes are considered to balance environmental and technical constraints, whilst taking into account feedback from landowners and other stakeholders wherever feasible.
- 1.9.7.2 The Applicant has undertaken an interactive site selection process to identify the location of the Mona Offshore Wind Project infrastructure. The aim was to identify sites and routes that are environmentally acceptable, deliverable and consentable, whilst also enabling the benefits in the long term of the lowest energy cost to be passed to the consumer.
- 1.9.7.3 The process has taken account of environmental, physical, technical, commercial, and social considerations and opportunities as well as engineering requirements. Each stage of the site selection process forms part of an iterative design process undertaken to identify the most suitable locations and configuration for the Mona Offshore Wind Project infrastructure.

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1.10 Potential environmental effects

1.10.1 Overview

1.10.1.1 The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. The Applicant has undertaken assessment of potential effects on a number of topics for both offshore and onshore areas following feedback received during statutory consultation, the findings of the site-specific surveys and the scheme design refinements. While some topics relate to offshore area only, others relate to the onshore areas only. In addition, there are few topics which are relevant to both offshore and onshore.

1.10.1.2 Figure 1.5 below provides an overview of the topics covered under each area.

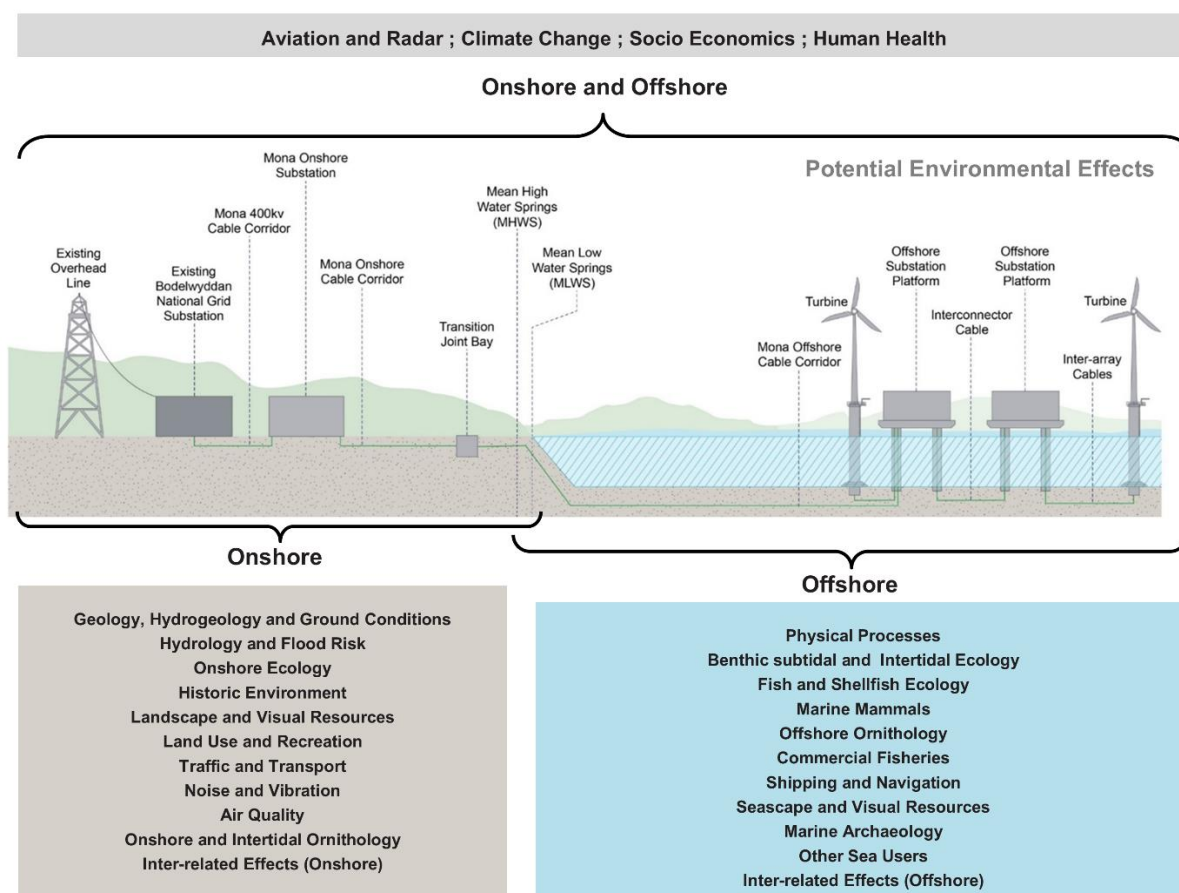


Figure 1.5: Overview of topics covered by the Environmental Statement.

1.10.1.3 The potential environmental effects for the offshore, onshore and both offshore and onshore areas have been described in further sections (see sections 1.11, 1.12 and 1.13 respectively).

1.11 Potential environmental effects – offshore

1.11.1 Introduction

1.11.1.1 This section sets out a summary of the EIA for the following:

- Physical processes
- Benthic subtidal and intertidal ecology
- Fish and shellfish ecology
- Marine mammals
- Offshore ornithology
- Commercial fisheries
- Shipping and navigation
- Seascape and visual resources
- Marine archaeology
- Other sea users
- Inter-related effects – offshore.

1.11.2 Physical processes

Introduction

1.11.2.1 Physical processes refers to the coastal and marine processes and the relationship with the physical environment and includes tidal currents, wave climate and sediment transport regime.

Approach and assessment methodology

1.11.2.2 The physical processes potentially impacted by the Mona Offshore Wind Project were numerically modelled using datasets collected from a series of site-specific surveys, including geophysical and metocean data, coupled with a detailed desktop review of existing studies and datasets.

Baseline environment

1.11.2.3 The site-specific surveys carried out indicated that the seabed within the Mona Array Area is comprised of sandwaves, megaripples, sediment waveforms and moraine features. The north section of the Mona Array Area is generally flat with sandwaves and megaripples mostly observed on the south section. The seabed sediments present in the Mona Array Area are classified as sand, sandy gravel, and gravelly sand. Within the Mona Array Area, the water depth varies from 28.5 m to 46.1 m relative to LAT. As the Mona Offshore Cable Corridor runs from the Mona Array Area towards the coast, there is a transition from coarse gravelly seabed to finer sand. From the south extent of the Mona Array Area along the Mona Offshore Cable Corridor, the water depth varies from 28.5 m relative to LAT to the shoreline.

1.11.2.4 The Constable Bank is a sandbank of geomorphological and geological importance on the outskirts of Liverpool Bay and meets the Annex 1 habitat criteria of the EC Habitats Directive although is not within a designated site. Although the Mona Offshore Cable

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Corridor and Access Areas do not pass through the main body of the bank, it crosses the 'tail' of the bank feature to the west. Constable Bank is the outermost part of the embayment that forms the approach to Liverpool and is over 20 km in length and 2 km wide which increases progressively towards the coast, at a height of 10 m. All of the seafloor is covered in sand apart from the west corner where coarser sediment is found.

1.11.2.5 Across the Mona Array Area, the tidal current floods to the east and ebbs to the west. The flows are relatively strong with tidal current speeds typically between 1.2 m/s and 0.9 m/s during peak flood: with ebb currents being slightly lower at circa 0.8 m/s. Both the largest proportion and greatest magnitude of waves approach the Mona Offshore Wind Project from the southwest sector.

1.11.2.6 Residual current flow into the east Irish Sea from the north of the Isle of Man and west around Anglesey correlates with this region being a sediment sink. During storms approaching from the west, sediment transport increases during flood tides in the Mona Array Area. The non-algal Suspended Particulate Matter historically displays typical seasonal patterns with an increase in concentration in winter months within the Mona Offshore Wind Project.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.11.2.7 The Mona Offshore Wind Project has committed to several measures to reduce the impact on physical processes:

- Development and adherence to a Construction Method Statement, which will include details of scour protection management, to be used around offshore structures and foundations to reduce scour as much as is practical
- Sandwave clearance on Constable Bank will be minimised by restricting any sandwave clearance to within the swept path width (20 m) of the cable burial tool, and there will be no sandwave clearance in the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC
- No cable protection will be installed within Constable Bank
- No cable protection higher than 70 cm will be installed within in the Menai Strait and Conwy Bay SAC. Additionally, the percentage of export cable requiring cable protection will not exceed 10% of the total length of the export cable within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC
- No more than 5% reduction in water depth will occur at any point along the Mona Offshore Cable Corridor and Access Areas without prior written approval from the Licensing Authority.

Assessment of effects

1.11.2.8 A number of potential impacts on the physical processes receptors due to the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project have been identified. These include:

- Increase in Suspended Sediment Concentrations (SSCs) due to construction, operations and maintenance and/or decommissioning related activities, and the potential impact to physical features
- Impacts to the tidal regime due to the presence of infrastructure
- Impacts to the wave regime due to the presence of infrastructure

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- Impacts to sediment transport and sediment transport pathways due to the presence of infrastructure and associated potential impacts to physical features, adjacent shorelines and bathymetry
- Impacts to temperature and salinity stratification due to the presence of infrastructure.

- 1.11.2.9 The potential impacts of an increase in suspended sediments due to construction, operations and maintenance and/or decommissioning related activities, and the potential impact to physical features were of negligible significance (i.e. not significant in EIA terms). The sediment plumes arising during the construction phase are identified as localised and do not persist beyond the physical processes study area with limited deposition occurring at distance from the site of construction. Sedimentation during the construction phase comprises of native material which is not expected to influence the bathymetry of receptors. Hydrodynamic processes are not altered by the diminutive level of bathymetric change as a result of the construction phase sediment releases. The increased sedimentation from the export cable installation causes a slight increase in sedimentation within the intertidal zone however it would be insufficient to affect beach morphology.
- 1.11.2.10 During the operations and maintenance phase the effects are reduced in comparison to the construction phase, as works are limited to intermittent, discrete repair activities. Overall, for all receptors associated with Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC, Great Ormes Head SSSI, Little Ormes Head SSSI and Constable Bank, the effect will be of negligible significance (not significant in EIA terms). During the decommissioning phase increases in SSCs due to the removal of inter-array, interconnector and offshore export cables would be similar to those experienced during the construction phase, as retrieval would be undertaken using similar techniques to installation. Increases in suspended sediments may also occur during decommissioning if suction bucket foundations are removed however the sediment plume would be short lived and localised in nature and not interact with any designated areas.
- 1.11.2.11 The export cable route passes through the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and the Constable Bank with measures being undertaken to minimise the sandwave clearance and cable protection placement undertaken in these areas. The Applicant has committed to no sandwave clearance in the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and no cable protection is anticipated on Constable Bank. The landfall site on the North Wales coastline intersects the Traeth Pensarn (SSSI). Any increase in sediment material is native to the sediment cell and will therefore not affect geodiversity. The temporary increased sedimentation from the offshore export cable installation causes little or no sedimentation in the intertidal zone which would be insufficient to affect beach morphology. The use of trenchless techniques at the landfall between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) avoids open-cut trenching and the need for cable protection in the intertidal area. Overall, for all receptors in the intertidal zone, the effect will be negligible (not significant in EIA terms).
- 1.11.2.12 The presence of infrastructure may lead to changes in impacts to the tidal regime, wave regime and sediment transport and associated sediment transport pathways and the associated potential impacts along adjacent shorelines and physical features. The best form of cable protection is achieved through cable burial but where ground conditions mean this is not possible no more than a 5% reduction in water depth (referenced to Chart Datum) will occur at any point along the export cables without

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prior written approval from the Licensing Authority in consultation with the Marine Character Areas (MCA).

- 1.11.2.13 The impacts on receptors such as the sandbanks, reefs, mudflats and sandflats within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC, Traeth Pensarn SSSI and Constable Bank was deemed to be of negligible (not significant in EIA terms). Minor changes in hydrodynamics occur in close proximity to the location of the wind turbines and do not extend beyond the physical processes study area. The limited magnitude of changes observed would not alter the hydrography of sandbanks such as the Constable Bank which would remain unaffected.
- 1.11.2.14 During the decommissioning phase, the magnitude of the impacts in relation to SSC would be similar to the construction phase as all structures above the seabed would be removed, with only scour protection to remain in situ. The residual effects on physical processes would be indiscernible from natural variability. Overall, for all receptors, the effect will be of negligible significance (not significant in EIA terms).
- 1.11.2.15 Cumulative effects from aggregate extraction activities and other offshore renewable developments were assessed and predicted to result in effects of negligible significance (not significant in EIA terms) on physical processes receptors within a distance of two spring tidal excursions from the Mona Offshore Wind Project.
- 1.11.2.16 No transboundary effects with regard to physical processes from the Mona Offshore Wind Project on the interests of other European Economic Area (EEA) States were predicted.

1.11.3 Benthic subtidal and intertidal ecology

Introduction

- 1.11.3.1 Benthic ecology refers to the communities of animals and plants which live on or in the seabed and the relationships that they have with each other and with the physical environment.

Approach and assessment methodology

- 1.11.3.2 The subtidal and intertidal benthic ecology of the Mona Offshore Wind Project was characterised via a series of site-specific surveys using grab sampling, underwater video and Environmental Deoxyribonucleic Acid (eDNA).

Baseline environment

- 1.11.3.3 These surveys indicated that seabed within the Mona Array Area supports a variety of plant and animal communities that are typical of this area. Key habitats recorded included shallow coarse sediment supporting a range of species such as catworms, sea urchins and amphipods, as well as deeper, fine sand habitats characterised by marine worms. The Mona Offshore Cable Corridor and Access Areas also support a variety of plant and animal communities, including key habitats such as sandy and muddy sediments which support a range of species such as catworms, shrimp and bivalves. Overlying these sediment based communities were plant and animal assemblages comprised of larger, more mobile species, such as brown shrimp, hermit crab, common starfish and brittlestars.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.3.4 The Mona Offshore Wind Project has committed to several measures to reduce the impact on benthic subtidal and intertidal ecology:
- Applicant has committed to no sandwave clearance within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC
 - The Applicant commits to a 50 m exclusion buffer from the edge of the *Sabellaria alveolata* reef and the *Mytilus edulis* bed at the landfall, as per industry standard practice
 - Export cables will be installed under the intertidal area
 - The percentage of export cable requiring cable protection will not exceed 10% of the total length of the export cable within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC
 - No cable protection to be installed within Constable Bank.

Assessment of effects

- 1.11.3.5 A number of potential impacts on benthic subtidal and intertidal communities/species, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These include:
- Temporary habitat loss/disturbance
 - Increased SSCs and deposition
 - Disturbance/remobilisation of sediment bound-contaminants
 - Long term habitat loss/habitat alteration
 - Introduction of artificial structures
 - Increased risk of introduction or spread of invasive non-native species (INNS), removal of hard substrate
 - Changes in physical processes
 - Electromagnetic fields
 - Heat from subsea cabling.
- 1.11.3.6 With the measures adopted as part of the project in place, the majority of these potential impacts result in effects of either negligible or minor adverse significance (i.e. not significant in EIA terms).
- 1.11.3.7 Temporary habitat disturbance/loss (e.g. cable installation) and long-term habitat loss (e.g. wind turbine foundations) was deemed to be of negligible to minor adverse significance (not significant in EIA terms) for the subtidal and intertidal habitats as well as the habitats identified within the overlap between the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and the Mona Offshore Cable Corridor. This conclusion was reached based on the small proportion of habitat loss predicted in the context of available habitats in the Mona benthic subtidal and intertidal ecology study area as most of the disturbed habitat is sedimentary the habitat is likely to recover following disturbance/loss. The impacts within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC in particular was found not to be significant due to measures adopted such as a commitment to no sandwave clearance within the SAC and minimising cable protection within the SAC. Additionally, no significant effects were predicted on the

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Annex I low resemblance stony reef (outside an SAC) Important Ecological Feature (IEF) within the Mona Array Area due to recoverability of this habitat from abrasion and smothering. No significant effects were predicted on protected potential seapens and burrowing megafauna habitats within the Mona Array Area either due to their sedimentary nature allowing for recovery.

- 1.11.3.8 Increases in SSCs and associated deposition were also deemed to be of negligible to minor adverse significance (not significant in EIA terms) for the subtidal and intertidal habitats as well as the habitats identified within the overlap between the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and the Mona Offshore Cable Corridor. This conclusion was reached due to the short-term nature of the impact with sediments quickly dispersing and most of the important ecological features being of low sensitivity to this type of impact. Again, no significant effects were predicted on Annex I low resemblance stony reef (outside an SAC) IEF within the Mona Array Area due to recoverability of this habitat regarding smothering. No significant effects were predicted on protected potential seapens and burrowing megafauna habitats within the Mona Array Area either due to their sedimentary nature allowing for recovery.
- 1.11.3.9 Long term habitat loss/habitat alteration was deemed to be of negligible to minor adverse significance (not significant in EIA terms) for the subtidal habitats and the habitats identified within the overlap between the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and the Mona Offshore Cable Corridor (no long-term habitat loss in the intertidal is predicted). This conclusion was reached due to the small area affected in relation to the Mona benthic subtidal and intertidal ecology study area. Again, no significant effects were predicted on Annex I low resemblance stony reef (outside an SAC) IEF within the Mona Array Area due to the proportionately small area affected. No significant effects were predicted on protected potential seapens and burrowing megafauna habitats within the Mona Array Area either due to their sedimentary nature allowing for recovery.
- 1.11.3.10 Cumulative effects from projects and activities such as aggregate extraction and other offshore renewable developments were assessed and predicted to result in effects of negligible or minor adverse significance (not significant in EIA terms) upon subtidal and intertidal benthic communities within a 50 km buffer of the Mona Offshore Wind Project. There will be significant cumulative effects (moderate adverse) in the short to medium term from temporary habitat disturbance/loss associated with the Mona Offshore Wind Project alongside the other projects in the region. The significance of the cumulative effects is, however predicted to decrease to minor adverse significance in the long term as the sediments and associated benthic communities will recover over time. Therefore, effects of minor adverse significance are predicted in the long term which is not significant.
- 1.11.3.11 No transboundary effects with regard to benthic subtidal and intertidal ecology from the Mona Offshore Wind Project on the interests of other EEA States were predicted.

1.11.4 Fish and shellfish ecology

Introduction

- 1.11.4.1 Fish and shellfish ecology refers to the communities of animals (various commercially and ecologically important fish, crustacean, and mollusc species) which live in the water column or on and in the seabed, including diadromous fish which move between marine and freshwater environments for spawning activity, and the relationships these organisms have with each other and the physical environment.

Approach and assessment methodology

- 1.11.4.2 The fish and shellfish ecology study area of the Mona Offshore Wind Project (encompassing both the Mona Array Area, and the Mona Offshore Cable Corridor and Access Areas) was characterised primarily through desktop review due to the large amount of data publicly available, with incorporation of data opportunistically collected from seabed characterisation surveys and incidental sightings from the site-specific digital aerial surveys to help increase the scope of the review and to provide empirical evidence to support characterisation of habitat for substrate-specific species, such as herring and sandeel.

Baseline environment

- 1.11.4.3 The desktop review and site-specific survey results (including digital aerial surveys) showed the presence of a range of fish, shellfish, and shark and ray species with spawning, nursery or feeding grounds in the vicinity of the Mona Offshore Wind Project, and in the wider fish and shellfish ecology study area. Species of particular ecological interest include herring, which are a commercially important species with high and low intensity spawning grounds to the north and northeast of the Mona Offshore Wind Project. Sandeel, which are a key prey species for many other marine predators, were also noted as having important populations and spawning grounds in this area.
- 1.11.4.4 Consultation with stakeholders highlighted the importance of queen and king scallop to commercial fishing activities in the vicinity of the Mona Offshore Wind Project. Therefore, information from vessel position data and outputs from fisheries stakeholder consultation were incorporated to show the distribution of key fishing and spawning grounds for these species, with overlap with the Mona Array Area noted. Basking shark and angel shark populations were also examined, with the potential for these passing through or occurring within the Mona Offshore Wind Project highlighted. The likelihood of angel shark being present within the area is low, with the most abundant local populations identified approximately 30 km from the Mona Array Area, and only intermittently present. Whilst basking shark are known to migrate through the wider fish and shellfish ecology study area, none were recorded from the digital aerial surveys commissioned across the Mona Offshore Wind Project.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.4.5 The Mona Offshore Wind Project has committed to the development of an Underwater sound management strategy (an outline version of which was submitted with the application (Document Reference J16) which will investigate options to reduce any potential significant impacts to a non-significant level. It will consider further mitigation measure options, on the basis of a refined project design post consent, when more detailed information is available. Further mitigation measures would be applied to reduce sound impacts to a level whereby a magnitude of low or negligible for herring and cod could be concluded. These mitigation measures would also result in a reduction of sound impacts to other fish and shellfish receptors. The Underwater Sound Management Strategy will be developed and agreed with stakeholders post-consent.

Assessment of effects

- 1.11.4.6 A number of potential impacts on fish and shellfish species associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project have been identified. These include:
- Temporary habitat loss or disturbance
 - Underwater sound impacts
 - Increased SSCs and associated sediment deposition
 - Long term habitat loss
 - Electromagnetic fields from subsea electrical cabling
 - Introduction of artificial structures and colonisation of structures
 - Disturbance/remobilisation of sediment-bound contaminants
 - Injury to basking shark due to increased risk of collision with vessels.
- 1.11.4.7 Temporary and long-term habitat loss/disturbance were both deemed to be of minor adverse significance (not significant in EIA terms) to fish and shellfish receptors, as the proportion of habitat lost within the Mona Offshore Wind Project was predicted to be small in the context of other similar available habitats in the wider fish and shellfish ecology study area.
- 1.11.4.8 The impact of underwater sound from pile driving was assessed to potentially cause a significant impact to herring spawning at the mapped spawning grounds off the coast of the Isle of Man for the Mona Offshore Wind Project alone. This is due to the location of these grounds in relation to the Mona Offshore Wind Project and the sensitivity of this species to underwater sound impacts.
- 1.11.4.9 Cumulative effects from nearby offshore wind farm construction, dredging and disposal, and other relevant projects were assessed within a 50 km radius of the Mona Offshore Wind Project for direct impacts, and a 100 km radius for underwater sound. These nearby projects were examined and predicted to result in negligible to minor adverse (non-significant) impacts on fish and shellfish species within the defined 50 km study area. For underwater sound, the impact was assessed to be of moderate adverse significance in relation to herring and cod spawning, however as discussed for the Mona Offshore Wind Project alone, the project has committed to the development of an Underwater sound management strategy to reduce sound levels associated with significant impacts. This strategy will be developed and agreed with stakeholders post-consent, however an outline strategy has been submitted with the application (Document Reference J16).
- 1.11.4.10 No transboundary effects on the interests of other EEA States are predicted with regard to fish and shellfish ecology from the Mona Offshore Wind Project.

1.11.5 Marine mammals

Introduction

- 1.11.5.1 The marine mammals chapter considers species of whales, dolphins and porpoises as well as seal species found in the vicinity of the Mona Array Area and Mona Offshore Cable Corridor and Access Areas, in terms of their distribution, abundance and density.

Approach and assessment methodology

- 1.11.5.2 The chapter baseline was informed by a combination of site-specific surveys, in the form of digital aerial surveys, and a desktop study.

Baseline environment

- 1.11.5.3 The site-specific surveys indicated that the species found in the vicinity of the Mona Array Area include harbour porpoise, bottlenose dolphin, Risso's dolphin, grey seal and harbour seal. Other species known to occur regularly in the region include short-beaked common dolphin and minke whale. Harbour porpoise occur throughout the Mona marine mammal study area, whilst short-beaked common dolphin and Risso's dolphin are largely restricted to the south of the Irish Sea. Sightings of bottlenose dolphin are highest in coastal waters of Cardigan Bay (approximately 164 km from the Mona Array Area) in west Wales. Harbour porpoise and bottlenose dolphin occur year-round, whereas common-dolphin, Risso's dolphin and minke whale occur in highest numbers during summer months, moving further offshore in winter months. Grey seal occur extensively throughout the south Irish Sea, whereas harbour seal are concentrated along the northeast coast of Ireland, east coast of Northern Ireland and the Firth of Clyde.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.5.4 The Applicant has committed to the development of and adherence to a Marine Mammal Mitigation Protocol (MMMP), an outline version of which was submitted with the application (Document Reference J21) that requires implementation of an initiation stage of a piling soft start and ramp-up, sets a maximum separation limit of 15 km and a minimum separation limit of 1.4 km for concurrent piling as well as the limit on maximum hammer energy to be used during piling.
- 1.11.5.5 The Mona Offshore Wind Project has committed to the development of an Underwater sound management strategy, an outline version of which was submitted with the application (Document Reference J16), which will investigate options to reduce any potential significant impacts to a non-significant level. It will consider further mitigation measure options, on the basis of a refined project design post consent, where more detailed information is available. These mitigation measures would also result in a reduction of sound impacts to other marine mammal receptors. The Underwater Sound Management Strategy will be developed and agreed with stakeholders post-consent.

Assessment of effects

- 1.11.5.6 A number of potential impacts on marine mammals, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, have been identified. These include:
- Injury and disturbance from elevated underwater sound during piling
 - Injury and disturbance to marine mammals from elevated underwater sound during Unexploded Ordnance (UXO) clearance
 - Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other activities
 - Increased likelihood of injury to marine mammals due to collision with vessels

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- Injury and disturbance to marine mammals from elevated underwater sound during site investigation surveys
- Underwater sound from wind turbine operation
- Changes in fish and shellfish communities affecting prey availability.

- 1.11.5.7 Injury and disturbance from elevated underwater sound during piling was deemed to be of minor adverse significance (not significant in EIA terms) to marine mammals in the regional marine mammal study area from the Mona Offshore Wind Project alone. The underwater sound modelling predicted ranges of impact which had the potential to result in injury and disturbance to a small number of animals. For the assessment of injury, with measures adopted as part of the Mona Offshore Wind Project in place in the form of an Outline MMMP (Document Reference J21), the impact would result in a very small risk of injury, as animals will be deterred beyond the predicted injury range. For the assessment of disturbance, it was considered that whilst a small number of animals could experience mild disturbance, this was unlikely to lead to population level effects. In addition, population modelling was carried out to explore the potential of disturbance during piling to affect the population trajectory over time for harbour porpoise, bottlenose dolphin, minke whale and grey seal, which confirmed the assessment that this impact was unlikely to lead to population level effects.
- 1.11.5.8 Increased likelihood of injury of marine mammals due to collision with vessels was deemed to be of minor adverse significance (not significant in EIA terms). An increase in vessel movements could lead to an increase in interactions between marine mammals and vessels, resulting in fatal and non-fatal injuries. Vessels travelling at 14 knots or faster are those most likely to cause death or serious injury to marine mammals. Largely, vessels involved in the construction phase are likely to be travelling slower than this, and all vessels will be required to follow the provisions set out in the offshore Environmental Management Plan (EMP). With the adherence of this offshore EMP, which includes measures to minimise disturbance to marine mammals and rafting birds from transiting vessels, in combination with the likelihood that animals will be deterred by the sound of moving vessels, the risk of collision is reduced.
- 1.11.5.9 For harbour porpoise only, a significant impact was concluded from elevated underwater sound during UXO clearance when UXO detonation was assessed.
- 1.11.5.10 Cumulative effects were assessed for injury and disturbance from elevated underwater sound during piling, injury and disturbance to marine mammals from elevated underwater sound during site investigation surveys, injury and disturbance to marine mammals from elevated underwater sound during UXO clearance, injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other activities, increased risk of injury of marine mammals due to collision with vessels, and changes in fish and shellfish communities affecting prey availability. Overall, for most impacts, it is concluded that there will be no significant cumulative effects from the Mona Offshore Wind Project alongside other projects/plans, except as a result of behavioural disturbance during piling for bottlenose dolphin within the Irish Sea Management Unit (MU) and potential injury from UXO clearance for harbour porpoise. Cumulative impact of piling at projects across the Irish Sea could result in potential reductions to lifetime reproductive success to some individuals in the Irish Sea MU population as disturbance in offshore areas during piling could lead to a longer duration over which individuals may be displaced from key feeding areas and therefore there may be a further reduction in the size of a declining MU population. As a result of UXO clearance, on the basis of UXO detonation, a small number of animals potentially exposed to sound levels that could elicit permanent auditory injury.

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- 1.11.5.11 As the project alone assessment determined there is the potential for significant effect in EIA terms from UXO clearance, it is acknowledged this may contribute to the cumulative impact within the Cumulative Effects Assessment (CEA) area. The project has committed to the development of an Underwater sound management strategy (an outline version of which was submitted with the application (Document Reference J16) to investigate options to reduce any potential significant impacts to a non-significant level. The Underwater sound management strategy will be developed and agreed with stakeholders post-consent.
- 1.11.5.12 No transboundary effects with regard to marine mammals from the Mona Offshore Wind Project on the interests of other EEA States were predicted.

1.11.6 Offshore ornithology

Introduction

- 1.11.6.1 Seabirds refer to species that depend on the marine environment for survival at some point in their life cycle. In addition to the true seabirds, seaducks, divers and grebes are also considered because of their additional reliance on marine areas, especially in the non-breeding season.

Approach and assessment methodology

- 1.11.6.2 Information on seabirds within the Mona Offshore Ornithology Array Area study area and the Mona Offshore Ornithology Offshore Cable Corridor study area was collected through a detailed desktop review of existing studies and datasets and site-specific surveys (digital aerial surveys).

Baseline environment

- 1.11.6.3 The site-specific digital aerial surveys indicated that the Mona Array Area supported a seabird assemblage that is typical of the Irish Sea, and dominated by common guillemot, razorbill, black-legged kittiwake, Manx shearwater and northern gannet.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.6.4 The Mona Offshore Wind Project has committed to the development of an Offshore EMP which will include measures to reduce disturbance to rafting birds from transiting vessels. With the offshore EMP in place, the impacts will result in effects of either negligible or minor adverse significance which is not significant in EIA terms.

Assessment of effects

- 1.11.6.5 A number of potential impacts on seabird species, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project were identified. These included:
- Increased disturbance and displacement from airborne sound, underwater sound, and presence of vessels and infrastructure
 - Indirect impacts from underwater sound affecting prey species
 - Collision
 - Temporary habitat loss/disturbance and increased SSCs
 - Barrier effects.

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- 1.11.6.6 In order to inform the Environmental Statement, 24 months of site-specific surveys were undertaken between March 2020 and February 2022. The site-specific surveys characterised the distribution and number of seabirds within the Mona Offshore Ornithology Array Area study area.
- 1.11.6.7 Offshore ornithology modelling to determine the risk of collisions between birds and wind turbines was also undertaken to inform the baseline.
- 1.11.6.8 Disturbance of birds and displacement of birds from their preferred areas from sound and presence of vessels and infrastructure was deemed to be of either negligible to minor adverse significance (not significant in EIA terms) to the seabird species within the Mona Array Area and in the vicinity of the Mona Offshore Wind Project, due to the short-term nature of the impact during the construction and decommissioning phases. Furthermore, seabirds recorded in the site-specific surveys over the Mona Array Area (plus buffer) have a low sensitivity to this type of impact during the operations phase of the wind farm.
- 1.11.6.9 Indirect impacts from sound affecting prey species of birds were also deemed to be of negligible adverse significance (not significant in EIA terms) on ornithological receptors due to the short-term nature of the impact. Similarly, temporary habitat loss/disturbance and increased SSCs were deemed to be of negligible adverse significance (not significant in EIA terms). Crucially no significant effects of collision were predicted on seabirds and migratory non-seabirds within the Mona Array Area and the barrier effect was deemed to be of negligible adverse significance which is not significant in EIA terms. Furthermore, the combined collision risk and disturbance and displacement from airborne sound, underwater sound, and presence of vessels and infrastructure was considered to be of minor adverse significance (not significant in EIA terms). Population modelling was carried out to explore the potential of the combined collision risk and disturbance and displacement to affect the population trajectory of common guillemot at selected colonies over time. The results confirmed the assessment that this combined impact would not lead to a population level effect.
- 1.11.6.10 Cumulative effects from offshore renewable developments were assessed and predicted to result in effects of negligible to minor adverse significance (not significant in EIA terms) upon seabirds within regional populations (i.e. Biologically Defined Minimum Population Scales). Population modelling was also carried out on the cumulative effect to explore the potential of the collision risk to affect the population trajectory over time for great black-backed gull and common guillemot. The results confirmed the assessment that this combined impact would not lead to a population level effect.
- 1.11.6.11 No transboundary effects with regard to offshore ornithology from the Mona Offshore Wind Project on the interests of other EEA States were predicted.

1.11.7 Commercial fisheries

Introduction

- 1.11.7.1 Commercial fisheries are defined as any form of fishing activity where the catch is sold for taxable profit.

Approach and assessment methodology

- 1.11.7.2 The commercial fisheries baseline was characterised via a review of publicly available data, site specific surveys and consultation with fisheries stakeholders.

Baseline environment

1.11.7.3 Within the region, landings were dominated by dredge vessels, and shellfish were the most important species group in terms of landed weight and value. Within and around the Mona Array Area there are queen scallop grounds of particular importance to dredge vessels from the west coast of Scotland. These vessels, as well as nomadic vessels from Ireland and Northern Ireland also engage in the king scallop fishery in the region. English static gear vessels targeting whelk and crab in the Mona Array Area operate out of Fleetwood and Whitehaven. Beam trawl vessels from Belgium and the south coast of England are also occasionally present within the vicinity targeting flatfish, such as sole. Within the nearshore parts of the Mona Offshore Cable Corridor and Access Areas, small static gear vessels are present in low numbers, which operate out of ports along the North Wales coast.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.11.7.4 With the measures adopted as part of the Mona Offshore Wind Project, committed to within the Outline fisheries co-existence and liaison plan (Document Reference J13), these impacts result in effects of negligible or minor adverse significance which is not significant in EIA terms.

Assessment of effects

1.11.7.5 A number of potential impacts on commercial fisheries groups, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:

- Loss or restricted access to fishing grounds
- Displacement of fishing activity
- Interference with fishing activity
- Temporary increase in steaming distances
- Loss or damage to fishing gear due to snagging
- Potential impacts on commercially important fish stocks
- Supply chain opportunities for local fishing vessels.

1.11.7.6 Loss or restricted access to fishing grounds is an impact that is of particular importance for Scottish west coast vessels, who rely on a queen scallop grounds within and around the Mona Array Area. During construction, the loss or restricted access to fishing grounds is assessed as an effect no greater than minor adverse significance (not significant in EIA terms) on all commercial fisheries receptor groups, due to the temporary and intermittent nature of the works. During the operations and maintenance phase, a minor adverse effect is also predicted on the Scottish west coast scallop vessels receptor, which is not significant in EIA terms. To mitigate loss or restricted access to fishing grounds and promote co-existence and co-location during the operations and maintenance phase, a commitment has been made to maintaining an area free of wind turbines and OSPs located over an area of core scallop grounds within the Mona Array Area. This commitment, among other relevant commitments, are detailed within the Outline fisheries liaison and co-existence plan (Document Reference J13).

1.11.7.7 Displacement of vessels into other fishing grounds can cause conflict with other fishing gears. During construction, the displacement of vessels into other areas, and the

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potential adverse impacts on existing fisheries in the areas that vessels are displaced into, is assessed as an effect no greater than negligible adverse significance (not significant in EIA terms) on all commercial fisheries receptor groups. This is due to the use of rolling construction zones, and the temporary and intermittent nature of the works during the construction phase. Following consultation feedback received at PEIR, the minimum spacing between wind turbines was increased to allow continued fishing within the Mona Array Area. The rows of wind turbines will be aligned to allow for improved fishing access. Subsequent feedback has indicated that during the operations and maintenance phase, the minimum spacing between wind turbines (1,400 m) and between rows of wind turbines (1,400 m) may restrict mobile gear such as the scallop vessels from fishing within the Mona Array Area. The Scottish west coast scallop vessels, for example, have limited spatial tolerance due to significant dependence upon the commercial fisheries study area for queen scallop dredging. To mitigate the potential for Mona Offshore Wind Project infrastructure to severely restrict fishing and ultimately result in displacement of fishing activity into other areas during the operations and maintenance phase, the Applicant has committed to maintaining an area free of wind turbines and OSPs that covers core scallop grounds located through the centre of the Mona Array Area. By reason of this and the other commitments (such as orientation of wind turbines and spacing arrangements within the Mona Array Area), committed to within the Outline fisheries liaison and co-existence plan (Document Reference J13), it is assumed that fishing by this receptor group will continue within the Mona Array Area, mitigating potential displacement of fishing activity into other areas and promoting co-existence during the operations and maintenance phase. Based on this, displacement of fishing activity is assessed as an effect of negligible adverse significance (not significant in EIA terms). This impact was also assessed as negligible adverse for Isle of Man vessels, as they also target these fishing grounds.

- 1.11.7.8 The main cumulative impact identified between the Mona Offshore Wind Project and the Morgan Offshore Wind Project: Generation Assets for commercial fisheries focused on loss or restricted access to fishing grounds arising from the operations and maintenance phase. The cumulative effect of loss or restricted access to fishing grounds on Scottish west coast scallop vessels, as a result of other offshore wind developments has been reduced through the commitments made to maintaining an area free of wind turbines and OSPs, as discussed above. As such this impact is assessed as minor adverse significance (which is not significant in EIA terms).
- 1.11.7.9 Transboundary effects outside UK waters are limited to the potential displacement of effort from the Mona Offshore Wind Project into non-UK waters and potential effects on commercially important fish and shellfish resources which could occur in non-UK waters. It is not anticipated that these effects would be significant.

1.11.8 Shipping and navigation

Introduction

- 1.11.8.1 The construction, operations and decommissioning of an offshore wind farm can have impacts upon maritime safety and the activities of commercial shipping, ferries, ports/harbours, commercial fisheries, recreational cruising and other maritime operations.

Approach and assessment methodology

- 1.11.8.2 A shipping and navigation baseline was developed through a review of relevant publications, collection and analysis of historical vessel traffic and incident data, and consultation with key stakeholders. Potential impacts were identified and assessed following guidance documents and best practice.

Baseline environment

- 1.11.8.3 The Mona Offshore Wind Project is located in an area frequently utilised by a variety of different maritime users. Traffic separation schemes, existing offshore wind farms, oil and gas and aggregate activities occur within the shipping and navigation study area. Commercial shipping bound for the ports of Liverpool, Douglas and Heysham cross through the Mona Array Area. Regular ferry services between the UK, Isle of Man and the island of Ireland operate through or adjacent to the Mona Array Area. Fishing by static and mobile gear takes place throughout the shipping and navigation study area. Offshore recreational cruising routes between the UK and the Isle of Man were also identified, however, the numbers of vessels using them is low. Tug and service activities supporting existing offshore infrastructure is widespread. An anchorage is located to the east of Anglesey, near to the Mona Offshore Cable Corridor and Access Areas.
- 1.11.8.4 Adverse weather, particularly from the prevailing southwest, was demonstrated to have an influence on vessel traffic patterns, particularly regular ferry services. Historical incident data demonstrated that relatively few navigational incidents had occurred within the shipping and navigation study area, with the majority analysed occurring in the approaches to Liverpool.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.8.5 The Mona Offshore Wind Project has adopted a number of measures to reduce the impact on shipping and navigation. These include within the design of the infrastructure, promulgation of activities, development of plans and compliance with national and international best practice. These will be secured within the deemed marine license of the draft DCO and some of which are expected to be secured within the standalone NRW marine licence.
- 1.11.8.6 To address significant effects identified in the PEIR, the Applicant has committed to additional risk control options to reduce risks to Broadly Acceptable or Tolerable if As Low as Reasonably Practicable (ALARP), including:
- Reduction in the spatial extent of the Mona Array Area in the north, east and south
 - Increase in separation between the Mona Array Area and the Liverpool Bay Traffic Separation Scheme (TSS)
 - Commitment to two lines of orientation in the arrangement of wind turbines and OSPs.

Assessment of effects

- 1.11.8.7 A number of potential impacts on shipping and navigation, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:
- Impacts to vessel routing

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- Impacts to port operations
- Impacts to navigational safety
- Impacts to emergency response.

- 1.11.8.8 With the measures adopted as part of the Mona Offshore Wind Project (e.g. lines of orientation, aids to navigation, safety zones and guard vessels) in place, the majority of these impacts result in effects which are not significant. However, as a result of the presence of the Mona Array Area, the impact on adverse weather routeing for some ferry services was assessed as significant leading to a significant effect in EIA terms. During adverse weather conditions, Stena Line vessels operating between Liverpool and Belfast, and Isle of Man Steam Packet Company vessels operating between Liverpool and Douglas navigate through the footprint of the Mona Array Area. With the wind turbines in place, vessels would be required to deviate to the southwest of the Mona Array Area to maintain safe and comfortable vessel motions. This would cause longer journey times and it is feasible that there would be additional cancellations of these services as a result.
- 1.11.8.9 To address this significant effect, the Applicant has committed to further engagement with affected stakeholders.
- 1.11.8.10 The assessment of impacts on shipping and navigation of the Mona Offshore Wind Project were considered cumulatively with other proposed and existing projects. The Applicant has been collaborating with the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm Generation Assets to identify and address any significant effects on ship routeing and navigational safety which were identified at PEIR. The assessment undertaken to support the Environmental Statement noted that whilst routes between the three array areas and existing offshore wind farms would be created which could increase the risk of collision and allision, these risks were judged to be ALARP and manageable with existing operational procedures.
- 1.11.8.11 However, with the inclusion of the Moir Vannin Offshore Wind Farm and the reduction in searoom for these routes, the risks of collision and allision were judged to be unacceptable and as a result significant cumulative effects were concluded. Furthermore, the presence of multiple offshore wind farms in the Irish Sea was judged to have an impact on transit durations of lifeline ferry services and had the potential to increase cancellations of these services during adverse weather conditions. Therefore, significant cumulative effects on vessel routeing were concluded.
- 1.11.8.12 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects with regard to shipping and navigation from the Mona Offshore Wind Project upon the interests of other EEA States has been assessed as part of this Environmental Statement. Each individual vessel may be internationally owned or operating between ports in different EEA States. These impacts have been captured and assessed within Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement (Document Reference F2.7), the Navigational Risk Assessment (NRA) (Document Reference F6.7.1) and the Cumulative Regional Navigational Risk Assessment (CRNRA). Therefore, no additional transboundary impacts are anticipated.

1.11.9 Seascape and visual resources

Introduction

- 1.11.9.1 The Seascape Visual Impact Assessment (SVIA) within the seascape resources chapter considers the potential SVIA impact of the Mona Offshore Wind Project

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seaward of MLWS during the construction, operations and maintenance, and decommissioning phases.

- 1.11.9.2 Seascape resources and receptors refer to areas of sea and their existing character and perceptual qualities. Visual resources and receptors are the views and visual amenity experienced by people, usually from publicly accessible locations such as settlements, transport routes, and public rights of way (PRoW).

Approach and assessment methodology

- 1.11.9.3 The visual baseline analysis involved a desktop exercise and consultation process to identify appropriate visual receptors and representative viewpoints. A Zone of Theoretical Visibility (ZTV) has been created, which is a computer-generated tool which identifies the likely extent (theoretical) of visibility of the offshore components of the Mona Offshore Wind Project within the seascape study area and helps to identify locations for representative viewpoints.
- 1.11.9.4 The representative viewpoints have been selected to represent a broad range of locations and sensitive visual receptors across the study area. Fieldwork was undertaken to verify the visual receptors and representative viewpoint locations and photography captured in both summer and winter conditions.

Baseline environment

- 1.11.9.5 National landscape character areas, national Marine Character Areas (MCAs) and Seascape Sensitivity Zones (SSZs) within the study area have been identified. These include the following:
- Welsh National MCA
 - Welsh SSZs
 - English MCAs and Isle of Man Seascape Character Areas (RPS Characterisation).
- 1.11.9.6 Four nationally and internationally designated landscapes partly lies within the 60 km SVIA study area (extended from 50 km for the purpose of the assessment of effects on these landscapes). These include Isle of Anglesey National Landscape, the Clwydian Range and Dee Valley National Landscape, Eryri (Snowdonia) National Park and the Lake District National Park and English Lake District World Heritage Site.
- 1.11.9.7 Forty-five representative viewpoints, from publicly accessible locations have been included within the assessment. These represent a range of locations, distances and directions to the proposed development on land in England, Wales and the Isle of Man. Three of these viewpoints are located at sea.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.9.8 There are no specific mitigation measures for the offshore components of the Mona Offshore Wind Project.

Assessment of effects

- 1.11.9.9 The impacts of the construction, operations and maintenance, and decommissioning phases of the offshore elements of the Mona Offshore Wind Project have been assessed on seascape and visual resources. In this regard, impacts will arise as a result of the following:

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- 68 wind turbines (the tallest wind turbines (364 m maximum blade-tip height) are considered to be the maximum design scenario for seascape)
 - Four OSPs, each measuring 55m x 65m x 45m (height above LAT x length x width)
 - Construction and service vessels/helicopters.
- 1.11.9.10 Potential daytime and night-time impacts upon seascape, landscape, and visual resources associated with the construction, operations and maintenance and decommissioning phases of the offshore elements of the Mona Offshore Wind Project have been identified. The majority of these effects are not significant.
- 1.11.9.11 Significant effects on parts of two SSZs (areas of the sea within Welsh territorial waters) will arise as a result of the offshore elements of the Mona Offshore Wind Project as follows:
- Temporary significant effects on the parts of SSZs 2 and 5 occupied by the construction and decommissioning activities in the Mona Array Area directly affected by the construction works. It is noted however that significant effects during construction and decommissioning on these seascape sensitivity zones, in their entirety overall, will not arise
 - Long term significant effects on the parts of SSZs 2 and 5 occupied by the Mona Offshore Wind Project wind turbines and OSPs during operations and maintenance. It is noted however that significant effects during operations and maintenance on these SSZs, in their entirety overall, will not arise.
- 1.11.9.12 No significant visual effects are predicted to arise as a result of the offshore elements of the Mona Offshore Wind Project that are significant in EIA terms.
- 1.11.9.13 No significant effects are predicted to arise on the special qualities of the four nationally and internationally designated landscapes referenced in the baseline section above as a result of the offshore components of the Mona Offshore Wind Project.

1.11.10 Marine archaeology

Introduction

- 1.11.10.1 Marine archaeology refers to the physical remains of the human past that survive within the marine environment. This includes maritime archaeology, such as shipwrecks and submerged prehistoric archaeological material.

Approach and assessment methodology

- 1.11.10.2 The existing marine archaeology conditions have been characterised through a review of existing data and studies alongside an assessment of site-specific surveys.

Baseline environment

- 1.11.10.3 The site-specific survey data corroborates academic theories that the now submerged coastal areas of the east Irish Sea may have previously formed a partially terrestrial landscape during the Upper Palaeolithic and into the Mesolithic periods. Submergence to the modern coastline would have occurred towards the end of the Mesolithic periods (circa 6,000 years before present). This partially terrestrial landscape would have allowed humans the opportunity to exploit the resources of the intertidal zone during these times and therefore there is the potential for the survival of submerged prehistoric archaeology associated with these activities.

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1.11.10.4 The East Irish Sea was an area of historically high maritime traffic with 107 anomalies of potential archaeological interest identified. Of these, 16 have been assessed to be of medium potential and 17 of high potential. The high potential anomalies include the identification of six confirmed wreck sites and various potential wreck sites and material of potential anthropogenic origin. Of the six verified wrecks, all six correspond to desktop records held by the UK Hydrographic Office (UKHO), National Monuments Record of Wales (NMRW) or National Record of the Historic Environment (NRHE). The remaining 74 geophysical anomalies have been classified as low potential and their positions are recorded to allow for avoidance or other mitigation measures as appropriate.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.11.10.5 The Applicant has committed to the identification and implementation of exclusion zones around those sites identified as having high and medium archaeological potential. With the measures adopted as part of the Mona Offshore Wind Project in place, all of these impacts result in effects of either negligible or minor adverse significance (not significant in EIA terms).

Assessment of effects

1.11.10.6 A number of potential impacts on marine archaeology, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified:

- Sediment disturbance and deposition leading to indirect impacts on marine archaeology
- Direct damage to marine archaeology receptors during the construction, operations and maintenance and decommissioning phases
- Direct damage to deeply buried marine archaeology receptors during the construction phase
- Alteration of sediment transport regimes leading to indirect impacts to marine archaeology during the operations and maintenance phase of the Mona Offshore Wind Project.

1.11.10.7 Direct impacts were deemed to be of minor adverse significance (not significant in EIA terms) to marine archaeology receptors in the Mona marine archaeology study area, as the measures adopted as part of the Mona Offshore Wind Project including the implementation and monitoring of exclusion zones around high and medium potential archaeological anomalies will ensure that no project related activities will be carried out in these zones.

1.11.10.8 Indirect impacts through sediment disturbance and deposition and the alteration of sediment transport regimes were also deemed to be of minor adverse significance as changes to physical processes are limited to the immediate vicinity of the infrastructure and therefore the potential for the exposure and/or burial of marine archaeology receptors is minimal. Measures adopted as part of the Mona Offshore Wind Project include the provision of an Outline Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) that will ensure both the operational awareness of all known marine archaeology receptors and that provisions are in place in the event of the discovery of as yet unknown marine archaeology during the lifetime of the Mona Offshore Wind Project.

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- 1.11.10.9 Cumulative effects from other offshore renewable developments were assessed and predicted to result in effects of negligible or minor adverse significance (not significant in EIA terms) upon marine archaeology within a 2 km buffer of the Mona Offshore Wind Project.
- 1.11.10.10 No transboundary effects with regard to marine archaeology from the Mona Offshore Wind Project on the interests of other EEA States were predicted.

1.11.11 Other sea users

Introduction

- 1.11.11.1 Other sea users include recreational activities, cables, pipelines, aggregate extraction, disposal activities, oil and gas activities which include carbon capture and storage (CCS), and other offshore wind farms.

Approach and assessment methodology

- 1.11.11.2 The other sea users baseline was developed through a review of relevant publications and consultation with key stakeholders.

Baseline environment

- 1.11.11.3 There are three licenced marine aggregate extraction areas in the vicinity of the Mona Offshore Wind Project. Of these three sites, none are within the regional other sea users study area.
- 1.11.11.4 There are no marine disposal sites within the regional other sea users study area.
- 1.11.11.5 There are two wreck diving sites within the regional other sea users study area, including one in the Mona Offshore Cable Corridor near the south boundary of the Mona Array Area.
- 1.11.11.6 There are four recreational bathing sites within the regional other sea users study area:
- Llandudno North Shore
 - Colwyn Bay
 - Colwyn Bay Porth Eirias
 - Abergele (Pensarn).
- 1.11.11.7 Recreational sailing and motor cruising in inshore and coastal areas is of a low to medium intensity with recreational vessels also transiting through offshore waters within the local other sea users study area. There are no Royal Yachting Association (RYA) clubs, training centres or marinas located within the local other sea users study area.
- 1.11.11.8 There is no spatial overlap between any proposed or operational wind farms and the local other sea users study area (and therefore the Mona Array Area or the Mona Offshore Cable Corridor and Access Areas). The closest operational wind farm is Gwynt y Môr located 17.8 km from the Mona Array Area.
- 1.11.11.9 There are seven active cables and one proposed cable which intersect the local other sea users study area.
- 1.11.11.10 No currently licenced blocks overlap with the local other sea users study area, although block 110/12a to the east of the local other sea users study area is currently licenced and operated by Eni.

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- 1.11.11.11 There are two main clusters of oil and gas platforms with associated pipelines nearby but not within the Mona other sea users local study area:
- The South Morecambe cluster to the northeast of the Array Area, operated by Spirit Energy
 - The Douglas cluster to the southeast of the Mona Array Area (including the Offshore Storage Installation, a barge which serves as a floating oil terminal), operated by Eni.
- 1.11.11.12 There are no platforms or pipelines within the local other sea users study area.
- 1.11.11.13 There are no CCS projects or underground gas storage projects within the local other sea users study area.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.11.11.14 Measures adopted as part of the Mona Offshore Wind Project include:
- Safety zones around each of the wind turbines and OSPs whilst construction/decommissioning works are ongoing: Safety zones are established in the interests of safety to other sea users receptors
 - Communication: Communication of information advising on the nature, timing and location of activities, including through Notices to Mariners to ensure other marine users are aware of operations associated with the Mona Offshore Wind Project
 - Navigational aids and marine charting: To ensure other marine users are aware of operations and infrastructure associated with the Mona Offshore Wind Project
 - Cable Specification and Installation Plan: Development and adherence to a Cable Specification and Installation Plan to ensure that the cable remains secure, is not a hazard to other sea users and does not risk becoming exposed and damaged by tidal currents.

Assessment of effects

- 1.11.11.15 A number of potential impacts on other sea users, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:
- Displacement of recreational activities
 - Increased SSCs and associated deposition affecting recreational diving and bathing sites
 - Impacts to existing cables or pipelines or restrictions on access to cables or pipelines
 - Reduction or restriction of other offshore energy
 - Interference with the performance of Radar Early Warning Systems (REWS) located on oil and gas platforms.
- 1.11.11.16 With the mitigation measures adopted as part of the Mona Offshore Wind Project in place, these impacts result in effects which are of minor adverse significance and thus not significant in EIA terms.
- 1.11.11.17 The displacement of recreational activities was deemed to be of minor adverse for all phases of the Mona Offshore Wind Project. This conclusion was reached based on

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the distance from the Mona Array Area to the nearest coastline (Anglesey, 28.8 km) and accordingly the low level of recreational activity within the Mona Array Area. There is low to moderate recreational sailing and motor cruising activity in the inshore areas of the Mona Offshore Cable Corridor and Access Areas. However, if required recreational vessels are able to alter their route. Notices to Mariners will be promulgated throughout all phases of the Mona Offshore Wind Project, advising of the location and nature of any works, and information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly.

- 1.11.11.18 The cumulative effects assessment takes into account the impact associated with the Mona Offshore Wind Project together with other projects and plans. All cumulative impacts assessed were deemed to be of minor adverse significance and thus not significant in EIA terms.
- 1.11.11.19 Cumulatively, the displacement of recreational activities during the operations and maintenance phase was assessed to have a minor adverse impact. The magnitude of the impact is higher than just for the Mona Offshore Wind Project alone due to the added effects when including projects such as the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm Generation Assets and Moir Vannin, but as for the impact alone, after factoring in the measures adopted as part of the Mona Offshore Wind Project the effect is not significant in EIA terms.
- 1.11.11.20 No transboundary effects with regard to other sea users from the Mona Offshore Wind Project on the interests of other EEA States were predicted.

1.11.12 Inter-related effects – offshore

- 1.11.12.1 The EIA is required to consider indirect and secondary likely significant impacts. For example, the separate impacts of sound and habitat loss may have an effect upon a single receptor such as marine mammals. The inter-related effects assessment is presented in Volume 2, Chapter 11: Inter-related effects – offshore of the Environmental Statement (Document Reference F2.11).
- 1.11.12.2 Based on one or a combination of the following factors the overall significance of any inter-related effects was not judged to increase above the significance value assessed for individual effects in the topic-specific chapters. Project lifetime effects can originate from impacts occurring on a receptor group over several phases of the Mona Offshore Wind Project. For example, a receptor group may experience impacts during the construction and decommissioning phase of the Mona Offshore Wind Project. These inter-related effects over time are collectively described as project lifetime effects.
- 1.11.12.3 For all receptor groups identified, following the implementation of measures adopted as part of the Mona Offshore Wind Project and further mitigation (if required), impacts arising during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project are unlikely to result in significant project lifetime effects.

Receptor-led effects

- 1.11.12.4 Inter-related effects may also occur where a receptor group experiences impacts across several different aspects of the environment. For example, a protected species may be impacted by habitat loss, sound, and dust during the construction phase of the Mona Offshore Wind Project. These inter-related effects are collectively described as receptor-led effects.
- 1.11.12.5 All the potential receptor-led effects identified during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project have

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already been considered within the relevant chapters of the Environmental Statement. Therefore, the potential significance of receptor-led effects of the Mona Offshore Wind Project on each of the identified receptor groups was not considered further in Volume 2, Chapter 11: Inter-related effects – offshore of the Environmental Statement (Document Reference F2.11).

1.12 Potential environmental effects – onshore

1.12.1 Introduction

1.12.1.1 This section sets out the potential significant effects for the following:

- Geology, hydrogeology and ground conditions
- Hydrology and flood risk
- Onshore ecology
- Onshore and intertidal ornithology
- Historic environment
- Landscape and visual resources
- Land use and recreation
- Traffic and transport
- Noise and vibration
- Air quality
- Inter-related effects – onshore.

1.12.2 Geology, hydrogeology and ground conditions

Introduction

1.12.2.1 As part of the Mona Offshore Wind Project, potential impacts on geology, hydrogeology and ground conditions have been assessed. Geology is the science that deals with the earth's physical structure, its history, and the processes that act on it, whereas hydrogeology is the study of groundwater and how it is distributed within soil and rocks of the Earth's crust. Ground conditions is a term used to encompass geology, hydrology, soil conditions and any contamination of the ground. Potential impacts were assessed during the construction, operations and maintenance, and decommissioning phases.

Approach and assessment methodology

1.12.2.2 The assessment was based on a desktop review of available literature, both public and online data and information contained in a related report regarding the geology, hydrogeology and ground conditions study area. The report included targeted comprehensive information on the geological, hydrogeological and hydrological setting of the study area and other information such as historical mining activities, pollutions incidents, abstraction licences, private water supplies and constraints. Historical Ordnance Survey mapping and aerial photography was also reviewed as part of the assessment.

Baseline environment

1.12.2.3 The geology, hydrogeology and ground conditions study area includes sections of Llanddulas beach to the west of Abergele and includes a pronounced ridge that extends south-eastward towards Bodelwyddan, south of the A55 road which is formed by bedrock of the Clwyd Limestone Group and the underlying Ffernant Formation. The low-lying land situated to the north of the ridge is underlain by sandstone bedrock

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principally of the Warwickshire Group. Much of the high ground, south of the ridge, is underlain by old bedrock that comprises mudstones of the Silurian Elwy Formation. The limestones of the Clwyd Limestone Group as well as the sandstones of the Warwickshire Group and the Kinnerton Sandstone Formation which underly the low-lying land west of St Asaph are also in the geology, hydrogeology and ground conditions study area.

1.12.2.4 With respect to groundwater, the limestones of the Clywd Limestone Group constitute an important groundwater resource whereas the predominantly sandstone units of the Warwickshire Group and Ffernant Formation can form locally important groundwater bodies and the Silurian bedrock of the Elwy Formation yields little groundwater. However, the bedrock across the Mona Onshore Development Area is concealed beneath a surface layer of clay-rich glacial till, with only highly localised occurrences of groundwater. No groundwater source protection zones or licensed groundwater abstractions have been identified within the Mona Onshore Development Area. However, multiple private groundwater abstractions have been identified and are considered within the assessment of effects.

1.12.2.5 The only designated sites within the geology, hydrogeology and ground conditions study area notified for geological or geomorphological importance are the caves within the Llanddulas Limestone and Gwrych Castle Wood SSSI. Non-designated geological features, called drumlins, are present within the geology, hydrogeology and ground conditions study area and two of these features are located within the Mona Onshore Development Area.

1.12.2.6 The Mona Onshore Development Area has been subject to significant deep, metal mining principally associated with the Clwyd Limestone Group. This metal mining is old, dating back to the 1800s and is commonly associated with surface shafts and associated infrastructure. The presence of historical deep mining does have implications with respect to geotechnical stability, however it is unlikely to represent a risk for the Onshore Cable Corridor given the distance of separation and that this part of the Mona Onshore Development Area is underlain by glacial till. The former Llanddulas Beach landfill could represent a risk to groundwater quality given it is crossed by the Mona Onshore Development Area.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.12.2.7 Several measures have been proposed to mitigate the potential effects of the Mona Offshore Wind Project on geology, hydrogeology and ground conditions. These measures include:

- The use of trenchless techniques for construction under the Llanddulas Beach landfill and the Llanddulas Limestone and Gwrych Castle Wood SSSI
- The preparation of a detailed CoCP to ensure the effective management of environmental impacts during the construction phase of the onshore and intertidal elements of the Mona Offshore Wind Project. The detailed CoCP will be general accordance with the Outline CoCP submitted in the application (Document Reference J26). The detailed CoCP will also include detailed versions the following documents:
 - Outline Construction Surface Water and Drainage Management Plan (Document Reference J26.6)
 - Outline Spillage and Emergency Response Plan (Document Reference J26.1)

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- Outline Discovery Strategy for Contaminated Land (Document Reference J26.12)
- Mitigation measures for private groundwater supply sources
- Onshore Construction Method Statement (Document Reference J26.15)
- Landfall Construction Method Statement (Document Reference J26.14).
- The preparation of a detailed Operational Drainage Management Strategy to ensure the effective management of environmental impacts during the operational phase of the Mona Offshore Wind Project. The detailed Operational Drainage Management Strategy will be in general accordance with the Outline Operational Drainage Management Strategy (Document Reference J27).

Assessment of effects

- 1.12.2.8 A number of potential impacts on geology, hydrogeology and ground conditions associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:
- The impact on, loss of, or damage to, designated sites of geological and geomorphological interest
 - Loss of, or damage to non-designated sites of geological and geomorphological interest
 - Sterilisation of safeguarded limestone mineral resources
 - Alteration groundwater quantity or quality in the glacial till and bedrock aquifers
 - Deterioration of groundwater quality in the glacial till and bedrock aquifers through the disturbance and mobilisation of existing contamination
 - Ground stability issues associated with areas of historical deep mining operations
 - Impact on private groundwater supply sources in terms of abstraction quantity, abstraction reliability and abstraction quality.
- 1.12.2.9 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to geology, hydrogeology and ground conditions during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.2.10 Groundwater source protection zones and licensed groundwater abstractions were deemed to not be at risk of impact given their position within the local groundwater system and therefore the effects of the impacts are not considered significant in EIA terms.
- 1.12.2.11 An assessment of cumulative effects on geology, hydrogeology and ground conditions between the Mona Offshore Wind Project and other plans/projects located within 1 km of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no likely significant cumulative effects with respect to geology, hydrogeology and ground conditions during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.2.12 It is considered that there is no potential for significant transboundary effects to occur during the construction, operations and maintenance and decommissioning phase of

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the Mona Offshore Wind Project upon the interests of other EEA States with respect to geology, hydrogeology and ground conditions.

1.12.3 Hydrology and flood risk

Introduction

1.12.3.1 This section considers the existing surface watercourses which may be directly affected by the construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project. The section also considers how the flood risk may be affected.

Approach and assessment methodology

1.12.3.2 The location of watercourses and the potential for flood risk within the hydrology and flood risk study area was collected through a detailed desktop review of existing studies and datasets. A Flood Consequences Assessment and a Water Framework Directive assessment have also been undertaken.

Baseline environment

1.12.3.3 The hydrology and flood risk study area is located within the Western Wales River Basin District. The majority of the Mona Onshore Development Area, including the Mona Onshore Cable Corridor and the Onshore Substation is located within Flood Zone 1 and is at a low risk of flooding. Land to the north of the mean high water line is located within Flood Zone 2 and 3 and is assessed to have a medium-high risk of flooding. Flood risk has also been assessed from fluvial, surface water, groundwater, sewer and artificial sources.

1.12.3.4 As the landfall crosses an area of Flood Zone 3, the Mona Offshore Wind Project is subject to the Justification Test, including acceptability of consequences. The Justification Test is explained in Volume 7, Annex 2.1: Flood consequences assessment of the Environmental Statement (Document Reference F7.2.1). The Mona Offshore Wind Project will contribute towards meeting the UK Government's targets for generating energy from a renewable source and within this area, includes the installation of below ground export cables with no permanent above ground development proposed which is unable to be routed without crossing areas of this Flood Zone. As such, the Justification Test is considered to be satisfied.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.12.3.5 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on hydrology and flood risk:

- The use of trenchless techniques to pass beneath Llanddulas beach; trenchless techniques will also be used along the Onshore Cable Corridor to cross watercourses
- The preparation of a detailed CoCP to ensure the effective management of environmental impacts during the construction phase of the onshore and intertidal elements of the Mona Offshore Wind Project. The detailed CoCP will be general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application. The detailed CoCP will include detailed versions of the following documents:

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- Outline Construction Surface Water and Drainage Management Plan (Document Reference J26.6)
- Outline Spillage and Emergency Response Plan (Document Reference J26.1)
- Onshore Construction Method Statement (Document Reference J26.15).
- The preparation of a detailed Operational Drainage Management Strategy for the Onshore Substation. The detailed Operational Drainage Management Strategy will be in general accordance with the Outline Operational Drainage Management Strategy (Document Reference J27) submitted in the DCO application.
- The preparation of a detailed Flood Management Plan for construction support activities on Pensarn Beach. The detailed plan will be in general accordance with the Outline Flood Management Plan (Document Reference J26.7) submitted in the DCO application.

Assessment of effects

- 1.12.3.6 A number of potential impacts on hydrology and flood risk associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project were identified. These included:
- The impact of increased flood risk arising from additional surface water runoff during construction
 - The impact of increased flood risk arising from the diversion of the watercourse at the Onshore Substation
 - The impact of increased flood risk arising from additional surface water runoff during operation of the Onshore Substation
 - The impact of increased flood risk arising from damage to existing flood defences
 - The impact of contaminated runoff on the quality of watercourses
 - The impact of damage to existing field drainage
 - The impact of damage to existing water pipelines.
- 1.12.3.7 The construction of the Onshore Substation will require the diversion of a section of the watercourse around the perimeter of the substation. The diversion will be appropriately designed to ensure conveyance of existing flows without increasing flood risk upstream of the site. The design of the diversion will be set out in the detailed Operational Drainage Management Strategy.
- 1.12.3.8 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to hydrology and flood risk during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.3.9 An assessment of cumulative effects on hydrology and flood risk between the Mona Offshore Wind Project and other plans/projects located within 1 km of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no likely significant cumulative effects with respect to hydrology and flood risk during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.3.10 It is considered that there is no potential for significant transboundary effects to occur during the construction, operations and maintenance and decommissioning phase of

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the Mona Offshore Wind Project upon the interests of other EEA States with respect to hydrology and flood risk.

1.12.4 Onshore ecology

Introduction

1.12.4.1 This section presents a summary of the assessment of likely significant effects on onshore ecology during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project. Onshore ecology refers to the communities of animals and plants which occur on land and the relationships that they have with each other and with the physical environment. The assessment considered potential impacts on sites designated for nature conservation and legally protected and/or notable habitats and species.

Approach and assessment methodology

1.12.4.2 Existing ecology and nature conservation conditions were established using a detailed desk review of existing studies and data sets, including records of protected and/notable species acquired from local record centres.

1.12.4.3 Information on ecology and nature conservation within the desk study search area was collected through data gathering exercises carried out from 2022 to 2023 to obtain information relating to statutory and non-statutory nature conservation sites and protected and/or notable habitats and species.

1.12.4.4 The desk based information was used to inform the requirement for site surveys, which determined the ecological value of the Mona Onshore Development Area and its potential to support legally protected and/or notable habitats and species.

Baseline environment

1.12.4.5 A desk study and a range of site-specific surveys for habitats and species were undertaken between 2022 and 2023 to establish existing ecological conditions within and surrounding the Mona Onshore Development Area.

1.12.4.6 The desk based review identified two statutory (legally protected) sites for nature conservation within the Mona Onshore Development Area. These included Llanddulas Limestone and Gwrych Castle Wood Site of Special Scientific Interest (SSSI) and Traeth Pensarn SSSI. One non-statutory (not legally protected) site designated for nature conservation was identified within the Mona Onshore Development Area, Coed Cord, block to NW and Coed y Saeson Local Wildlife Site (LWS). Several other non-statutory sites designated for nature conservation were also identified near the Mona Onshore Development Area.

1.12.4.7 The desk based review and site surveys identified a variety of notable habitats within the Mona Onshore Development Area, including grassland, woodland, scrub, hedgerows, scrub, rivers, ponds and small areas of coastal vegetated shingle. Of these, grassland was the most abundant habitat identified within the Mona Onshore Development Area.

1.12.4.8 The desk based review and site surveys identified several protected and/or notable species within or near the Mona Onshore Development Area. These comprised bats, hazel dormouse, otter, water vole, badger, reptiles, common lizard, Great Crested Newt, fish, eels and terrestrial/aquatic invertebrates.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.4.9 Several measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on onshore ecology:
- The utilisation of trenchless techniques (where possible) during construction of the onshore export cable to avoid direct impacts to areas of woodland, watercourses and sites designated for nature conservation.
 - The reinstatement of habitats (e.g. hedgerows) to be temporarily affected during construction of the Mona Offshore wind Project using locally sourced native species (where practicable) to minimise habitat loss, disturbance and fragmentation.
 - The preparation of a detailed Landscape and Ecological Management Plan. The detailed Landscape and Ecological Management Plan will be in general accordance with the Outline Landscape and Ecological Management Plan (Document Reference J22) submitted in the DCO application, which includes the following measures:
 - the creation and future management/monitoring of woodland belts, species rich hedgerows, tree planting, species rich grassland, scrub, ponds and wildflower planting at the Onshore Substation
 - Great crested newt mitigation strategy
 - the creation of hedgerows within the Mona Onshore Development Area to minimise habitat loss (e.g. temporary and permanent loss of hedgerows), disturbance and fragmentation and enhance connectivity the surrounding area.
 - The preparation of a detailed CoCP which contains measures to avoid impacts to protected and/or notable species during construction of the Mona Offshore Wind Project. The detailed CoCP will be in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application, which includes the provision of an Ecological Clerk of Works, tree protection plans and actions to minimise the spread of Invasive and Non-native Species.

Assessment of effects

- 1.12.4.10 A number of potential impacts on onshore ecology associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:
- The impact of temporary and permanent habitat loss
 - The impact of habitat disturbance
 - The impact of habitat fragmentation
 - The impact of pollution caused by accidental spills/contaminant release
 - The impact of spreading Invasive and Non-native Species.
- 1.12.4.11 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to onshore ecology during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.4.12 An assessment of cumulative effects on onshore ecology between the Mona Offshore Wind Project and other plans/projects located within 1 km of the Mona Onshore

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Development Area and 2 km of the Onshore Substation was undertaken. The assessment of cumulative effects determined that there would be no likely significant cumulative effects with respect to onshore ecology during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.

- 1.12.4.13 It is considered that there is no potential for significant transboundary effects to occur during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project upon the interests of other States with respect to onshore ecology.

1.12.5 Onshore and intertidal ornithology

Introduction

- 1.12.5.1 Breeding, wintering, and migratory birds use both the terrestrial and intertidal habitats located along the Mona Onshore Development Area. Waterbird and seabird species that depend on wetlands and the marine environment for survival at some point in their life cycle use the intertidal habitats and nearshore waters at the landfall in winter and during passage periods (i.e. spring and autumn). In addition, terrestrial habitats along the Mona Onshore Development Area provide a range of functions (e.g. foraging, non-foraging activities and nesting) for breeding birds (e.g. birds of prey and passerines) and wintering and migratory birds.

Approach and assessment methodology

- 1.12.5.2 Information on breeding, wintering and migratory birds within the onshore ornithology study area and the intertidal ornithology study area was collected through a detailed desktop review of existing studies and datasets, and site-specific surveys, including intertidal waterbird, onshore breeding bird, and onshore wintering and migratory bird surveys.

Baseline environment

- 1.12.5.3 The site-specific intertidal ornithological surveys indicated that the landfall supported a waterbird and a seabird assemblage that is typical of the coast of north Wales and is dominated by seaducks and divers in the nearshore waters, and gulls and small numbers of waders within the intertidal zone.
- 1.12.5.4 The site-specific terrestrial bird surveys undertaken within the Mona Onshore Development Area found the breeding bird assemblage to be dominated by mostly common and widespread passerines nesting in hedgerows and woodland. A total of 52 species were recorded as breeding in the area and notable bird species included little ringed plover in 2022 and red kite in 2022 and 2023.
- 1.12.5.5 During the migratory periods several species of passerines and birds of prey were recorded moving through, and during the winter period a total of 64 species were recorded. Passerines again dominated the bird assemblage with other species groups such as waders and gulls also present in lower numbers during the winter.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.5.6 Several measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on onshore and intertidal ornithology:

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- The utilisation of trenchless techniques (where possible) during construction to avoid direct impacts to sensitive intertidal habitats, areas of woodland and sites designated for nature conservation
- The Offshore Environmental Management Plan, which contains measures designed to minimise the potential for contaminant release in nearshore waters that may adversely affect the intertidal areas
- The preparation of a detailed CoCP which contains measures to avoid impacts to protected and/or notable species during construction of the Mona Offshore Wind Project. The detailed CoCP will be general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application, which includes the provision of an Ecological Clerk of Works, pre-construction checks for breeding/nesting birds, appropriate timing of works, bird protection zones and dissuasion techniques.

Assessment of effects

1.12.5.7 Several potential impacts on bird species, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:

- The impact of temporary and permanent habitat loss
- The impact of habitat disturbance
- The impact of habitat fragmentation and species isolation
- The impact of pollution caused by accidental spills/contaminant release
- The impact of the spread of Invasive and Non-native Species.

1.12.5.8 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to onshore and intertidal ornithology during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

1.12.5.9 An assessment of cumulative effects on onshore and intertidal ornithology between the Mona Offshore Wind Project and other plans/projects located within 1km of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no likely significant cumulative effects with respect to onshore and intertidal ornithology during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.

1.12.5.10 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to onshore and intertidal ornithology.

1.12.6 Historic environment

Introduction

1.12.6.1 Historic environment encompasses all aspects of the past including buried archaeological remains, built heritage and the character of the historic landscape.

Approach and assessment methodology

- 1.12.6.2 As part of the Mona Offshore Wind Project, potential impacts on the terrestrial historic environment were assessed through a combination of desk-based research, targeted site visits and a phased programme of fieldwork.

Baseline environment

- 1.12.6.3 The Mona historic environment study area comprises the area of land that will be temporarily or permanently occupied during the construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project. The study area includes designated historic assets of significance within 1 km from the edge of the Mona Onshore Development Area and between 1 to 5 km radius centred on the Onshore Substation depending on the type/importance of asset. The study area also included buried archaeology and other non-designated historic assets (as recorded on the regional Historic Environment Record (HER) data) within 500 m from the edge of the Mona Onshore Development Area and a 1 km radius centred on the Onshore Substation. Marine archaeology is addressed in section 1.11.10 of this document.
- 1.12.6.4 There are just two designated historic assets located within the Mona Onshore Development Area, which include Registered Park and Garden of Special Historic Interest at Gwrych Castle and Grade II listed boundary wall at Gwrych Castle. Within the historic environment study area, there are numerous other designated historic assets, some of which are directly adjacent or very close to the Mona Onshore Development Area.
- 1.12.6.5 The geophysical survey undertaken within the Mona Onshore Development Area found only a small number of areas of archaeological interest. These areas either related to Post-medieval or Modern farming practices or are considered natural in origin. Following completion of the geophysical survey, a programme of intrusive archaeological trial trenching was carried out. Furthermore, a survey was undertaken in the intertidal part of the Mona Onshore Development Area and found no artefacts.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.6.6 Several measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on the historic environment:
- The Mona Onshore Cable Corridor, Mona 400 kV Grid Connection Cable and the construction site accesses have been designed to minimise land take and to avoid, where possible, impacts on known buried archaeological sites and features.
 - A combination of desk-based research, targeted site visits and a phased programme of fieldwork has informed the site selection and design refinement process to ensure that direct physical impacts on designated historic assets and on buried archaeological sites and features have been avoided wherever possible, or otherwise minimised.
 - The western part of the Mona Onshore Development Area passes through a Grade II* Registered Park and Garden of Special Historic Interest at Gwrych Castle, the northern boundary of which comprises a Grade II listed stone wall. The cables would be installed beneath the boundary wall and also beneath a historic tree belt within the park and garden using trenchless construction techniques which avoid direct physical impacts to these historic assets.

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- The preparation of a detailed Landscape and Ecological Management Plan in general accordance with the Outline Landscape and Ecological Management Plan (Document Reference J22) submitted in the DCO application. The Outline Landscape and Ecological Management Plan includes landscape planting and a landscape scheme to avoid or reduce any potential harm to the significance of designated historic assets as a result of change within their setting, and would also eliminate or reduce harm to the character of the historic landscape.
- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application, which includes an Outline Construction Noise and Vibration Plan (Document Reference J26.3). The Outline Construction Noise and Vibration Plan contains measures to avoid or reduce any potential harm to the significance of designated historic assets as a result of change within their setting during construction of the Mona Offshore Wind Project.

Assessment of effects

- 1.12.6.7 A number of potential impacts on the historic environment associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:
- The loss of, or harm to, buried archaeological remains and deposits of geoarchaeological and paleoenvironmental interest
 - The loss of, or harm to, above ground historic assets
 - The impact on above ground historic assets as a result of change with their setting
 - The impact on the character of the historic landscape.
- 1.12.6.8 Taking into account the mitigation measures described above, the following likely significant effects are likely to occur with respect to the historic environment:
- Adverse effect arising from the loss of, or harm to, above buried archaeological remains and deposits of geoarchaeological and paleoenvironmental interest and above ground historic assets during construction and decommissioning of the Mona Offshore Wind Project. However, this effect would be offset through a programme of further investigation pre-construction.
 - Adverse effect within the setting of the Grade II listed Pentre Meredydd during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project. However, landscape planting around the Onshore Substation would reduce this effect over time such that it would no longer be significant.
- 1.12.6.9 An assessment of cumulative effects on the historic environment between the Mona Offshore Wind Project and other plans/projects located within 1 km of the Mona Onshore Development Area and 5 km of the Onshore Substation was undertaken. The assessment of cumulative effects determined that there would be significant adverse effect within the setting of the Grade II listed Pentre Meredydd during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project. However, landscape planting around the Onshore Substation would reduce this effect over time such that it would no longer be significant.
- 1.12.6.10 An assessment of potential cumulative impacts on designated historic assets between the Mona Offshore Wind Project and other existing, consented and proposed offshore

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wind farms was undertaken. The assessment determined that there would be potential for significant adverse effects arising from changes within the settings of the following designated historic assets: Creuddyn and Conwy Registered Historic Landscape; Conover House Grade II* Registered Park and Garden and Grade II* listed building; Gwrych Castle Grade II* Registered Park and Garden and Grade I listed building; Happy Valley Grade II Registered Park and Garden; Church of St Tudno Grade II* listed building; and Llandudno Pier Grade II* listed building. These effects would occur during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project. The greatest contribution to the assessed significant cumulative effects comes from the consented Awel y Môr offshore wind farm which on its own was assessed as having a significant adverse effect on the Grade II* listed Llandudno Pier. Local weather data indicates that the Mona Array Area could be visible 40-50% of the year from these designated historic assets.

- 1.12.6.11 No mitigation is proposed as there are no reasonable practicable measures which would avoid or reduce these significant cumulative effects.
- 1.12.6.12 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to the historic environment.

1.12.7 Landscape and visual resources

Introduction

- 1.12.7.1 Volume 3, Chapter 6: Landscape and visual resources of the Environmental Statement (Document Reference F3.6) sets out the assessment of effects in relation to landscape and visual resources. Landscape resources and receptors refer to the existing landscape character (some of which include areas of sea), physical elements of the landscape and perceptual qualities of the landscape. Landscape resources include designated landscapes and their special qualities. Visual resources and receptors are the views and visual amenity experienced by people, usually from publicly accessible locations such as settlements, transport routes, and Public Rights of Way.

Approach and assessment methodology

- 1.12.7.2 The landscape and visual baseline comprises two distinct but connected aspects; landscape character baseline, including nationally and locally designated landscapes, and the visual baseline. Both resources were collated via a desktop analysis of publicly available data, site-specific surveys and fieldwork, and consultation with stakeholders to agree viewpoints.
- 1.12.7.3 The visual baseline analysis involved a desktop exercise and consultation process to identify appropriate visual receptors and representative viewpoints. A ZTV has been created, which is a computer-generated tool which identifies the likely extent (theoretical) of visibility of the Onshore Substation within the Onshore Substation study area and helps to identify locations for representative viewpoints.
- 1.12.7.4 The representative viewpoints have been selected to represent a broad range of locations and sensitive visual receptors across the study area. Fieldwork was undertaken to verify the visual receptors and representative viewpoint locations and photography captured in both summer and winter conditions.

Baseline environment

- 1.12.7.5 National landscape character areas, national MCAs and relevant regional landscape and seascape character areas within the study area have been identified. These include the following.
- Seascape character: Welsh MCA
 - Landscape character: Welsh National Character Areas and the relevant LANDMAP Aspect Areas.
- 1.12.7.6 One nationally designated landscape partly lies within the Onshore Substation study area, the Clwydian Range and Dee Valley National Landscape. Two locally designated landscapes lie within the same study area, Rhyd y Foel to Abergele Special Landscape Area (SLA) and Elwy and Aled Valleys SLA.
- 1.12.7.7 Thirty representative viewpoints, from publicly accessible locations have been included within the assessment. Of these, seven are of the landfall and the Mona onshore cable corridor and as there would be no built structures remaining above ground, no visualisations have been undertaken for these viewpoints. The remaining representative photographs are of the Onshore Substation, for which visualisations (photomontages or photo-wirelines) have been completed.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.7.8 Several measures are proposed as part of the Mona Offshore Wind Project to mitigate potential landscape and visual impacts:
- The onshore cables will be completely buried underground for the entire length of the Mona Onshore Cable Corridor. No overhead pylons are proposed as part of the Mona Offshore Wind Project
 - Joint Bays will be completely buried below ground, with the land above reinstated. An inspection cover will be provided on the surface of the associated Link Boxes or access during operations and maintenance phase
 - The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application. The Outline CoCP includes measures to protect existing vegetation or reinstate trees/hedgerows where these are to be lost during construction.
 - The preparation of a detailed Landscape and Ecological Management Plan. The detailed Landscape and Ecological Management Plan will be in general accordance with the Outline Landscape and Ecological Management Plan (Document Reference J22) submitted in the DCO application, which includes the retention/protection of existing vegetation and landscape planting to reduce landscape and visual impacts. Where possible, landscape mitigation planting will be established as early as reasonably practicable in the construction phase.
 - The preparation of a detailed Public Rights of Way Management Strategy in general accordance with the Outline Public Rights of Way Management Strategy (Document Reference J26.17) submitted in the DCO application. The Outline Public Rights of Way Management Strategy Identifies measures to avoid severance and maintain access to affected Public Rights of Way and would ensure these are reinstated as soon as reasonably practicable.

Assessment of effects

- 1.12.7.9 A number of potential landscape and visual impacts associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:
- The impact of the onshore elements of the Mona Offshore Wind Project on landscape character
 - The impact of the onshore elements of the onshore elements on publicly accessible views.
- 1.12.7.10 Taking into account the mitigation measures described above, the following likely significant effects are likely to occur with respect to the landscape and visual receptors:
- Temporary adverse effects on those LANDMAP Aspect Areas directly affected by the construction works at the landfall and along the Mona Onshore Cable Corridor
 - Temporary and permanent adverse effects on the LANDMAP Aspect Areas as a result of the Onshore Substation during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project. The effects during the operations and maintenance phase will lessen as the landscape mitigation establishes. These effects would be local in extent (arising due to the change in character of agricultural fields to energy infrastructure). The effects on adjacent and more distant Aspect Areas would not be significant
 - Temporary adverse effects on views gained by people using the beach and Public Rights of Way as a result of the Mona Onshore Cable Corridor and landfall construction activities
 - Temporary and short-term adverse effects on views gained by people using the Public Rights of Way network near the Onshore Substation site during construction and at completion, but reducing in significance during the operations and maintenance phase, as the landscape mitigation proposals mature.
- 1.12.7.11 No significant permanent visual effects are predicted by Year 15, once the landscape proposals included in the Outline Landscape and Ecological Management Plan (Document Reference J22) have become established.
- 1.12.7.12 An assessment of cumulative effects on landscape and visual receptors between the Mona Offshore Wind Project and other plans/projects located was undertaken. With respect to the Mona Array Area, the assessment considered existing/proposed offshore windfarms within 100 km, existing/proposed onshore windfarms within 85km and other development types within 50 km. With respect to the Onshore Substation, the assessment considered existing/proposed onshore windfarms within 45 km and the development types within 10 km. The assessment of cumulative effects determined that there would be no likely significant cumulative effects with respect to landscape and visual receptors during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.7.13 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to the historic environment.

1.12.8 Land use and recreation

Introduction

1.12.8.1 This chapter considers existing land uses, including agriculture and recreation, which may be physically or indirectly affected during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project.

Approach and assessment methodology

1.12.8.2 Existing land uses were identified through a combination of desk-based analysis and site-specific surveys. Desk based analysis of existing studies and datasets identified the soil types and patterns, agricultural land quality, farm holdings and recreational resources (e.g. footpaths, bridleways) likely to be affected by the Mona Offshore Wind Project. Site-specific surveys were undertaken in 2022 and 2023. These comprised walkover surveys of Public Rights of Way to establish the nature and condition of recreational resources and soil surveys to determine the quality of agricultural land.

Baseline environment

1.12.8.3 The desk-based analysis determined that land within the Mona Onshore Development Area predominantly comprised Agricultural Land Classification (ALC) Grade 3a and Grade 3b land and several landholdings. In addition, recreational resources were identified within or near the Mona Onshore Development Area, including coastal areas (e.g. beaches), Wales Coast Path, National Cycle Route (NCR) 5 and several Public Rights of Way.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.12.8.4 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on land use and recreation:

- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application. The Outline CoCP includes an Outline Soil Management Plan (Document Reference J26.8), which contains designed to maintain the quality of agricultural land and continued operation of farming businesses during construction
- The preparation of a detailed Public Rights of Way Management Strategy in general accordance with the Outline Public Rights of Way Management Strategy (Document Reference J26.17), which identifies measures to avoid severance and maintain access to affected Public Rights of Way during construction of the Mona Offshore Wind Project.

Assessment of effects

1.12.8.5 A number of potential impacts on land use and recreation associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:

- The impact of temporary and permanent loss of best and most versatile land
- The impact of temporary and permanent disruption caused to the operation of farm holdings

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- The impact of temporary disruption to the recreational use of recreational resources, including Wales Coast Path, National Cycle Route (NCR) 5 and several Public Rights of Way.

1.12.8.6 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to land use and recreation during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

1.12.8.7 An assessment of cumulative effects on land use and recreation between the Mona Offshore Wind Project and other plans/projects located within 1km of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no significant cumulative effects with respect to land use and recreation during construction, operation and maintenance of the Mona Offshore Wind Project.

1.12.8.8 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to the land use and recreation.

1.12.9 Traffic and transport

Introduction

1.12.9.1 Traffic and transport relates to the movement demand generated by the Mona Offshore Wind Project and its effects upon other road users and surroundings. The construction phase of the Mona Offshore Wind Project will generate the greatest number of vehicle movements as the transportation of construction materials will incur the greatest number of Heavy Goods Vehicles (HGVs) and staff movements and it is this phase that the traffic and transport chapter of the Environmental Statement focusses on.

Approach and assessment methodology

1.12.9.2 The traffic and transport chapter of the Environmental Statement sets out the traffic and transport study area, the key highway links within this, the typical daily number of construction vehicle movements, an EIA and a cumulative impact assessment.

1.12.9.3 The traffic and transport study area has been identified including the A55 road and relevant parts of the local highway network determined to be used by construction generated vehicles.

Baseline environment

1.12.9.4 A base position has been established by obtaining publicly available traffic surveys, undertaking new traffic surveys, analysing road safety and analysing public transport services and provision and facilities for pedestrians and cyclists.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.12.9.5 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on traffic and transport:

- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26). The Outline CoCP will include detailed versions of the following documents:

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- Outline Construction Traffic Management Plan (Document Reference J26.13), which contains measures to avoid or reduce impacts of construction traffic on the local road network
- Outline Highways Access Management Plan (Document Reference J26.16), which contains measures to maintain highways safety.

Assessment of effects

1.12.9.6 A number of potential impacts on traffic and transport associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. These included:

- The impact on driver delay
- The impact on severance
- The impact on pedestrian (incorporating non-motorised users) delay
- The impact non-motorised user amenity, fear and intimidation
- The impact on road safety
- The impact on abnormal indivisible loads.

1.12.9.7 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to traffic and transport during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

1.12.9.8 An assessment of cumulative effects on traffic and transport between the Mona Offshore Wind Project and other plans/projects likely to affect the same road network was undertaken. The assessment of cumulative effects determined that there would be no significant cumulative effects with respect to traffic and transport during construction, operation and maintenance of the Mona Offshore Wind Project.

1.12.9.9 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to the land use and recreation.

1.12.10 Noise and vibration

Introduction

1.12.10.1 Unwanted noise and vibration can lead to adverse impacts on existing residential amenity and public health. As such, it's important that the impacts of noise and vibration predicted from the construction and operation of new developments be assessed and mitigated as best is reasonably practicable.

Approach and assessment methodology

1.12.10.2 The existing noise environment within the Mona Onshore Development Area was characterised via site-specific surveys, including long-term and short-term noise monitoring. The noise monitoring data was then used to inform the assessment of noise and vibration.

Baseline environment

- 1.12.10.3 The long-term and short-term noise surveys highlight that much of the area forming the Mona Onshore Development Area has a low noise climate due to the rural nature of the area. The dominant sources of noise were noted to be traffic on the A55 and other local roads, which became more influential towards the landfall region.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.10.4 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on noise and vibration:
- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application, which includes an Outline Construction Noise and Vibration Plan (Document Reference J26.3). The Outline Construction Noise and Vibration Plan contains measures to avoid or reduce impacts of noise and vibration generated during construction of the Mona Offshore Wind Project.
 - The establishment of an operational noise limit (34 A-weighted decibels, dBA) for the Onshore Substation, to avoid impacts of noise on residential amenity and public health. The operational noise limit for the Onshore Substation will be secured under requirement 17 of the Draft DCO.

Assessment of effects

- 1.12.10.5 A number of potential noise and vibration impacts associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project were identified. These included:
- Noise impacts arising from the construction of the offshore generation assets, the Mona Onshore Cable Corridor, and the Onshore Substation
 - Vibration impacts arising from the construction of the Mona Onshore Cable Corridor and Onshore Substation
 - Operational noise impacts due to the Onshore Substation plant.
- 1.12.10.6 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to noise and vibration during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.10.7 An assessment of cumulative effects of noise and vibration between the Mona Offshore Wind Project and other plans/projects located within 1 km of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no significant cumulative effects with respect to noise and vibration during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.10.8 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to the noise and vibration.

1.12.11 Air quality

Introduction

- 1.12.11.1 Air quality is a measure used to describe the level of pollutants present within the air. Dust and particulate matter can be generated by onsite construction activities and dust also can be tracked out onto the public road network. There may also be changes in atmospheric pollutant concentrations due to the combustion of fuel in vehicles.
- 1.12.11.2 During construction and decommissioning, the key pollutant is dust, covering both the particulate matter fraction that is suspended in the air that can be breathed, and the deposited dust that has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects. Property, human-health and vegetation (ecological receptors) are all potentially affected.
- 1.12.11.3 Additional traffic generated during the construction phase is not yet known and the potential effects of tracked out dust and changes in vehicle emissions cannot be determined at this stage. Therefore, the air quality assessment only considers the potential risk of impacts of deposited dust and an increase in particulate matter generated during the construction and decommissioning phases of the Mona Offshore Wind Project.

Approach and assessment methodology

- 1.12.11.4 The effects of dust are linked to particle size and two main categories are usually considered:
- PM₁₀ particles, those up to 10 µm in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health
 - Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly and can soil surfaces (e.g. a car, window-sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.
- 1.12.11.5 Consistent with the recommendations in the Institute of Air Quality Management (IAQM) dust guidance, a risk-based assessment has been undertaken for the development, using the well-established source-pathway-receptor approach.
- 1.12.11.6 The dust impact (the change in dust levels attributable to the development activity) at a particular receptor will depend on the magnitude of the dust source and the effectiveness of the pathway (i.e. the route through the air) from source to receptor.
- 1.12.11.7 The effects of the dust are the results of these changes in dust levels on the exposed receptors, for example annoyance or adverse health effects. The effect experienced for a given exposure depends on the sensitivity of the particular receptor to dust. An assessment of the overall dust effect for the area as a whole has been made using professional judgement taking into account the dust emission magnitude and the sensitivity of the area.

Baseline environment

- 1.12.11.8 The baseline conditions for this report have been characterised by drawing on information from Defra Maps (Defra, 2018), The North Wales Authorities Collaborative Project 2021 Air Quality Progress Report (Wood, 2021), and published results of local authority review and assessment studies of air quality.

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- 1.12.11.9 The background annual-mean particulate matter with a diameter less than 10 µm (PM₁₀) concentration used in this assessment has been derived from the highest concentration of 9.8 µg.m⁻³ predicted by Defra for the 1 km grid squares through which the Mona Onshore Development Area passes. This concentration is low and is less than half of the air quality limit value of 40 µg.m⁻³ as set out in the UKs Air Quality Standards Regulations 2010.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.12.11.10 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on air quality:
- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application, which includes an Outline Dust Management Plan (Document Reference J26.2). The Outline Dust Management Plan contains measures to avoid or reduce the impacts of dust on people, property and ecological receptors (e.g. dust sensitive habitats) during construction of the Mona Offshore Wind Project.

Assessment of effects

- 1.12.11.11 The following potential impacts were identified with respect to air quality during the construction and decommissioning phase of the Mona Offshore Wind Project:
- A medium dust impact risk of dust soiling on property arising from onsite activities
 - A low dust impact risk of particulate matter on people arising from onsite activities
 - A high dust impact risk of particulate matter on ecology arising from onsite activities.
- 1.12.11.12 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to air quality during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.11.13 An assessment of cumulative effects of air quality between the Mona Offshore Wind Project and other plans/projects located within 700 m of the Mona Onshore Development Area was undertaken. The assessment of cumulative effects determined that there would be no significant cumulative effects with respect to air quality during construction, operation and maintenance and decommissioning of the Mona Offshore Wind Project.
- 1.12.11.14 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to air quality.

1.12.12 Inter-related effects – onshore

Introduction

- 1.12.12.1 The EIA has assessed the potential for inter-related effects to occur on groups of receptors (receptor groups) during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project. The inter-related effects

assessment (onshore) is presented in Volume 3, Chapter 11: Inter-related effects – onshore of the Environmental Statement.

Approach and assessment methodology

1.12.12.2 The EIA has assessed the potential for inter-related effects to occur on groups of receptors (receptor groups) during the construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project. The inter-related effects assessment (onshore) is presented in Volume 3, Chapter 11: Inter-related effects – onshore of the Environmental Statement.

Assessment of effects

1.12.12.3 For all the receptor groups identified, following the implementation of measures adopted as part of the Mona Offshore Wind Project and further mitigation (if required), impacts arising during the construction, operations and maintenance and decommissioning phases are unlikely to result in significant adverse project-lifetime effects.

1.12.12.4 There is potential for significant beneficial project-lifetime effects to occur on the socio-economic receptor group with regard to employment, supply chain demand and housing/accommodation/local services demand.

1.13 Potential environmental effects – offshore and onshore

1.13.1 Introduction

1.13.1.1 This section sets out the potential significant environmental effects for the following:

- Aviation and radar
- Climate change
- Socio-economics
- Human health.

1.13.2 Aviation and radar

Introduction

1.13.2.1 Aviation and radar relates to the potential interactions between the Mona Offshore Wind Project and the surrounding aviation activities (e.g. aerodromes, airports, search and rescue activities).

Approach and assessment methodology

1.13.2.2 An aviation and radar baseline was developed through a review of relevant publications and consultation with key stakeholders.

Baseline environment

1.13.2.3 The aviation and radar study area covers the aviation radar systems that provide radar coverage over the Mona Array Area, and which may detect the highest wind turbine blade tip height of up to 364 m above LAT. It has been defined on the basis of the Civil

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Aviation Authority (CAA) Civil Aviation Publication (CAP) 764 Policy and Guidelines on Wind Turbines (CAA, 2016a) consultation zones and criteria.

- 1.13.2.4 The Mona Array Area is located within lower level uncontrolled airspace and higher level Controlled Airspace (CAS). Above and surrounding the Mona Array Area, the uncontrolled airspace is used by both military and civil registered aircraft. There are no Military Practice and Exercise Areas (PEXAs) located within close proximity to the Mona Array Area and consequently there will be no direct obstruction created to airborne activities conducted in PEXAs. A network of Helicopter Main Route Indicators (HMRI) is established to the east and southeast of the Mona Array Area. No HMRI cross the Mona Array Area and they are located at a sufficient distance not to be impacted by the operation of the Mona Offshore Wind Project.
- 1.13.2.5 Within CAS, NATS are the main Air Traffic Service provider utilising Primary Surveillance Radar (PSR) and Secondary Surveillance Radar (SSR) systems to provide coverage of UK airspace. There are 10 PSR sites located within the aviation and radar study area. There are no SSR systems located within 10 km of the Mona Array Area (the CAA suggested radius where impact is expected).
- 1.13.2.6 Helicopters operating in support of the offshore oil and gas industry conduct flights to helicopter platform equipped offshore facilities. There are two offshore installations located within the 9 nautical mile consultation zone of the Mona Array Area.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.13.2.7 Measures to be adopted as part of the Mona Offshore Wind Project to reduce aviation and radar impact are as follows.
- 1.13.2.8 Development of, and adherence to a Design Plan (DP): The Mona Offshore Wind Project will consider Maritime and Coastguard Agency Marine Guidance Note (MGN) 654 Safety of Navigation Offshore Renewable Energy Installations (OREI) - Guidance on UK Navigational Practice, Safety and Emergency Response, in addition to CAP 393 Air Navigation Order 2022, CAP 764 CAA Policy and Guidelines on Wind Turbines and CAP 437 Standards for Offshore Helicopter Landing Areas, where applicable. The final array layout will include two lines of orientation for search and rescue purposes.
- 1.13.2.9 Appropriate marking, lighting and aids to navigation will be employed during the construction, operations and maintenance and decommissioning phases as appropriate to ensure the safety of all parties. Appropriate lighting, in line with Maritime and Coastguard Agency guidance, will ensure the offshore structures are visible for search and rescue and emergency response procedures.
- 1.13.2.10 Information regarding construction should be passed to the Defence Geographic Centre in advance of the obstacle type(s) erection detailing position, height (tip of arc) and type of aviation lighting. Once reported, all will be included in the Defence Geographic Centre Obstruction database and all that meet aviation chart inclusion criteria will be published for broader awareness. Appropriate information about the site construction and any associated lighting (where applicable), will also be provided to the NATS Aeronautical Information Service (AIS).

Assessment of effects

- 1.13.2.11 A number of potential impacts on aviation and radar, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:
- Creation of a physical obstacle to aircraft operations

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- Wind turbines causing interference to civil PSR systems.
- 1.13.2.12 The creation of a physical obstacle to aircraft operations will take place during the construction, operations and maintenance and decommissioning phases due to the implementation, operation or removal of physical objects as part of the Mona Array Area. A range of adopted measures, in the form of appropriate notification to aviation stakeholders, development of, and adherence to a Design Plan (DP), and lighting and marking to minimise effects to aviation flight operations would apply to the development of the Mona Offshore Wind Project. The significance of effect is deemed to be of minor adverse significance for military and low flying operations, negligible significance for helicopter operations, and minor adverse significance for instrument flight procedures after technical mitigation. This is not significant in EIA terms.
- 1.13.2.13 For the interference by wind turbines on civil PSR systems, the operational wind turbines in the Mona Array Area would be theoretically detectable by the NATS Lowther Hill, St Anne's and Great Dun Fell PSRs, and the Ronaldsway Airport and Liverpool Airport PSR systems. Wind turbines detectable by a PSR system might degrade the system by creating false targets, reduce system sensitivity, create radar shadowing behind the wind turbines and saturate the radar receiver leading to clutter potentially concealing real aircraft targets. The significance of effect is deemed to be of minor adverse significance after technical mitigation, such as radar blanking and radar infill or an application for an airspace change to implement a Transponder Mandatory Zone (TMZ), is agreed with affected stakeholders if applied, making the impact not significant in EIA terms.
- 1.13.2.14 The cumulative effect for the creation of a physical obstacle to aircraft operations in relation to military and low flying operations is considered to be minor adverse during all phases of the Mona Offshore Wind Project due to the regional spatial extent of the impact, which is not significant in EIA terms.
- 1.13.2.15 The cumulative effect for the wind turbines causing interference to civil PSR systems when factoring in mitigation measures is predicted to be minor adverse during the operations and maintenance phase of the Mona Offshore Wind Project, which is not significant in EIA terms.
- 1.13.2.16 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to aviation and radar from the Mona Offshore Wind Project upon the interests of other EEA States.

1.13.3 Climate change

Introduction

- 1.13.3.1 Climate change refers to the long-term shifts in temperatures and weather patterns that are fundamentally driven by human activities.
- 1.13.3.2 Climate change in the context of the assessment undertaken can be considered in two parts:
- The effect of GHG emissions arising from the construction, operation and decommissioning of the Mona Offshore Wind Project, which may contribute to climate change
 - The potential effects of the future climate on the Mona Offshore Wind Project.

Approach and assessment methodology

- 1.13.3.3 The GHG emissions arising from, and avoided by, the Mona Offshore Wind Project are characterised by a series of desk-based assessments and articles using published data to determine the impact of the Mona Offshore Wind Project on climate change. The potential risks to the Mona Offshore Wind Project from a changing climate have also been assessed and reported, with the impact of the effects of climate change on the Mona Offshore Wind Project being established through the risk assessment process. This is demonstrated through the supplementary technical reports in the Environmental Statement.

Baseline environment

- 1.13.3.4 The current baseline with regards to the assessment of GHGs arising from the Mona Offshore Wind Project is defined as areas that would be occupied by the Mona Offshore Wind Project, thereby changing the land use. The current onshore baseline largely comprises agricultural land, with no areas with high levels of carbon (e.g. peat) anticipated to be disturbed. The current offshore baseline largely consists of various subtidal habitats (i.e. reef and sediments). The future baseline for existing land use without the Mona Offshore Wind Project are expected to remain similar to the current baseline.
- 1.13.3.5 The current baseline with regards to the assessment of climate on the Mona Offshore Wind Project are current climate observations within the area local to the Mona Offshore Wind Project. The future baseline has been informed by climate projections, showing worst case predictions of climate (including temperature, precipitation and wave height) over the Mona Offshore Wind Project's lifetime.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.13.3.6 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on (or effects of) climate change:
- The application of anti-corrosion protective coatings
 - Integrated scour protection to offshore equipment, where appropriate
 - Safety margin within the turbine design to be fitted with automatic shutdowns/lockdowns with regards to spinning too fast
 - If located internally, the substation building will house auxiliary equipment (e.g. appropriate cooling plant) for an in building substation solution to account for a range of temperature conditions
 - Regular inspections to be carried out to assess turbine and substation conditions (i.e. following severe weather events).

Assessment of effects

- 1.13.3.7 A number of potential impacts on aviation and radar, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:
- The impact of GHG emissions arising from land use change during construction, operations and maintenance and decommissioning

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- The impact of GHG emissions arising from construction, including manufacturing and installation
- The impact of GHG emissions arising from recovery or disposal of materials during decommissioning
- The impact of GHG emissions arising from the consumption of materials and activities required to facilitate operations and maintenance
- The impact of the effects of climate change during operations and maintenance of the Mona Offshore Wind Project.

1.13.3.8 Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to climate change during construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project.

1.13.3.9 All developments that emit, avoid or sequester GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Cumulative effects due to other specific local development projects are not individually predicted but are taken into account when considering the impact of the Mona Offshore Wind Project by defining the atmospheric mass of GHGs as a high sensitivity receptor.

1.13.3.10 All developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a transboundary impact on climate change. Consequently, transboundary effects due to other specific international development projects are not individually identified but would be taken into account when considering the impact of the Mona Offshore Wind Project by defining the atmospheric mass of GHGs as a high sensitivity receptor. Each country has its own policy and targets concerning carbon and climate change which are intended to limit GHG emissions to acceptable levels within that country's defined budget and international commitments.

1.13.4 Socio-economics

Introduction

1.13.4.1 The assessment of the potential impact of the Mona Offshore Wind Project on socio-economics considered the following categories:

- **Economic:** assessing the potential employment and Gross Value Added (GVA) impacts associated with the Mona Offshore Wind Project and the associated impacts on local employment opportunities
- **Social:** assessing the potential impacts of the workforce associated with the Mona Offshore Wind Project on housing, accommodation and population (including local services)
- **Tourism:** assessing the potential indirect impacts associated with visual amenity, overnight accommodation and recreation on tourism.

- **Isle of Man interactions with lifeline ferry services:** assessing potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services¹.

Approach and assessment methodology

Economic and social

1.13.4.2 Expenditure on major energy infrastructure projects can stimulate economic growth by creating jobs and increasing output. The movement of labour associated with the delivery of major energy infrastructure projects has the potential to result in social impacts. Workforce movements during construction may lead to an increase in demand for short-term and temporary accommodation, whilst labour migration during the operations and maintenance of a project may increase demand for long-term and permanent accommodation. Long-term changes to populations associated with labour migration can lead to increased demand for public services such as healthcare and education.

1.13.4.3 The following study areas have been identified for the assessment of economic and social impacts:

- North Wales
- Northwest England
- Wales
- UK.

Tourism

1.13.4.4 There are potential impacts associated with major energy infrastructure projects which primarily have the potential to indirectly impact the visitor economy. The potential visual impacts associated with a project may result in adverse or beneficial impacts in relation to the visitor economy. The short-term and temporary accommodation requirements of construction workers has the potential to impact overnight accommodation providers. Finally, the physical infrastructure has the potential to impact recreational activities, which could indirectly impact the visitor economy.

1.13.4.5 Potential offshore impacts of the construction, operations and maintenance, and decommissioning of the Mona Offshore Wind Project on tourism are indirect in nature. It is necessary to derive an assessment of significance of effects on tourism from the findings elsewhere in the Environmental Statement on the basis of visual amenity, overnight trips and accommodation, and recreation. On this basis, three tourism study areas have been identified:

- North Wales
- Northwest England
- Isle of Man.

¹ Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement has assessed potentially significant cumulative effects on adverse weather routing of ferry services to and from the Isle of Man.

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Isle of Man

- 1.13.4.6 Potential impacts on Isle of Man lifeline ferry services have been assessed within Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement.
- 1.13.4.7 The Isle of Man utilises ferry services for:
- Residents who need to access mainland services, employment, social, and leisure opportunities
 - Businesses and public services which move goods on and off the Island, generate business travel, and require connectivity for visitors and staff
 - Tourists who want to visit the Island, contributing to the Island's visitor economy.
- 1.13.4.8 As well as their role in supporting essential requirements for Island life, lifeline ferries serve an important economic role in connecting Island-based businesses with mainland markets.
- 1.13.4.9 It is therefore important to assess the potential socio-economic impacts associated with potential lifeline ferry rescheduling in order to understand the extent to which the Isle of Man might be impacted.

Baseline environment

- 1.13.4.10 The offshore wind sector is identified as a high priority industry within national, regional and local policies across the UK. This reflects the opportunities the sector provides for supporting economic development and growth and providing jobs and incomes for UK residents.
- 1.13.4.11 The tourism sector is an important sector within the relevant policy environments, providing jobs for local residents and contributing to economic output.
- 1.13.4.12 The Isle of Man economy can be characterised as a service dominated economy. The day-to-day operations of the service economy and public services are not dependant on the movement of freight and passengers, therefore a large proportion of the Isle of Man economy (90% of GDP, 71% of resident employment) have limited dependency on lifeline ferry services. The day-to-day operations of the retail and wholesale, construction, and manufacturing sectors are heavily reliant on the movement of freight. The visitor and leisure economy is highly reliant on the movement of passengers. These sectors are highly dependent on lifeline ferry services.

Mitigation measures adopted as part of the Mona Offshore Wind Project

- 1.13.4.13 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential socio-economic impacts:
- The preparation of a detailed Skills and Employment Plan in general accordance with the Outline Skills and Employment Plan (Document Reference J24) submitted in the DCO application. The Outline Skills and Employment Plan sets out opportunities for engagement to enable local workers and training providers to prepare for anticipated employment opportunities associated with the Mona Offshore Wind Project.

Assessment of effects

- 1.13.4.14 A number of potential impacts on socio-economics, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:

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- The impact on economic receptors including employment and GVA
 - The impact of increased employment opportunities
 - The impact on population, housing and accommodation
 - The impact on tourism
 - The potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services.
- 1.13.4.15 Taking into account the mitigation measures described above, the following significant effects are likely to occur with respect to socio-economics:
- Beneficial effect on economic receptors, including employment and GVA in North Wales during operation and maintenance of the Mona Offshore Wind Project.
- 1.13.4.16 The assessment concludes that, during the construction, operation and maintenance, and decommissioning phases, the adverse effect on socio-economic conditions in the Isle of Man is likely to be not significant in EIA terms.
- 1.13.4.17 An assessment of cumulative effects on socio-economics between the Mona Offshore Wind Project and other plans/projects was undertaken. The assessment of cumulative effects determined that there would be the following significant cumulative effects with respect to socio-economics:
- Beneficial cumulative effect on economic receptors, including employment and GVA in North Wales, North West England, Wales and the UK during construction of the Mona Offshore Wind Project
 - Beneficial cumulative effect on economic receptors, including employment and GVA in North Wales during operation and maintenance of the Mona Offshore Wind Project
 - Beneficial cumulative effect on employment opportunities in North Wales during operation and maintenance of the Mona Offshore Wind Project.
- 1.13.4.18 With respect to potential socio-economic impacts on the Isle of Man associated with potential adverse effects on lifeline ferry services, cumulative effects with other plans and projects were assessed and predicted as likely to result in no adverse change to the levels of significance assessed when considering the Mona Offshore Wind Project in isolation.
- 1.13.4.19 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to socio-economics.

1.13.5 Human health

Introduction

- 1.13.5.1 Health is a state of physical, mental and social wellbeing. Population health refers to the health outcomes of a group of individuals, including the distribution of such outcomes within the group. Population health varies, given factors such as personal choice, location, mobility and exposure. These factors that influence health are called determinants of health and span environmental, social, behavioural, economic and institutional aspects. The Mona Offshore Wind Project has the potential to change determinants of health, with beneficial and adverse effects, either directly or indirectly.

There may also be greater health effects when considering combined effects with other projects.

Approach and assessment methodology

1.13.5.2 The health assessment is informed by the findings of other Environmental Statement chapters, including on commercial fisheries; shipping and navigation; seascape and visual resources; landscape and visual resources; transport and traffic; land use and recreation; noise and vibration; other sea users, climate change; and socio-economics. The health assessment has also been informed by a review of relevant public health evidence sources, including scientific literature, baseline data, health policy, local health priorities and health protection standards.

Baseline environment

1.13.5.3 An overall baseline health profile was gathered for Wales, Isle of Man, and North West England using publicly available public health evidence. This data shows that compared to Wales, the health study area in North Wales has similar rates of healthy life expectancy. There are slightly poorer health outcomes on the Isle of Man compared to England. For example, healthy life expectancy on the Isle of Man is similar for men but slightly lower for women compared to England. Public health data also indicate poorer health outcomes in the North West region compared to England. Socio-economic conditions and other health determinants are typically worse in the North West compared to England. For example, there is a higher percentage of children in low-income families compared to the England average. The indicators confirm elevated sensitivity, particularly for vulnerable groups, on several measures.

Mitigation measures adopted as part of the Mona Offshore Wind Project

1.13.5.4 The following measures are proposed as part of the Mona Offshore Wind Project to mitigate potential impacts on human health:

- The preparation of a detailed CoCP in general accordance with the Outline CoCP (Document Reference J26) submitted in the DCO application. The Outline CoCP includes an Outline Communications Plan (Document Reference J26.4), which sets out procedures for early and ongoing information sharing with emergency and healthcare services, and non-technical communication with the public that actual electro-magnetic field (EMF) risks are within standards set for health protection.

Assessment of effects

1.13.5.5 A number of potential impacts on human health, associated with the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project, were identified. The impacts assessed include:

- The impact of offshore shipping on strategic routes and lifeline ferries to the Isle of Man
- The impact of onshore construction vehicles on local vehicle traffic and active travel
- The impact of the Mona Array Area on views and subsequent impacts on community identity
- The impact on access to recreation and leisure

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- The impact of changes in offshore employment and income in relation to loss or restricted access to commercial fishing grounds
- The impact of noise and vibration
- The impact of EMFs
- The impact of GHG emissions
- The contribution to energy security provided by the Mona Offshore Wind Project.

1.13.5.6 Taking into account the mitigation measures described above, no significant adverse effects are likely to occur during construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project. However, significant beneficial effects are likely to occur with respect to human health as a result of improved energy security during operation of the Mona Offshore Wind Project.

1.13.5.7 An assessment of cumulative effects on human between the Mona Offshore Wind Project and other plans/projects was as undertaken. The assessment of cumulative effects determined that there would be the following significant cumulative effects with respect to human health:

- Adverse cumulative effect on strategic routes and lifeline ferries to the Isle of Man because of the Moir Vannin Offshore Wind Farm
- Beneficial cumulative effect as a result of improved energy security during operation of the Mona Offshore Wind Project.

1.13.5.8 It is considered that there is no potential for significant transboundary effects to occur on the interests of other EEA States during the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project with respect to socio-economics.

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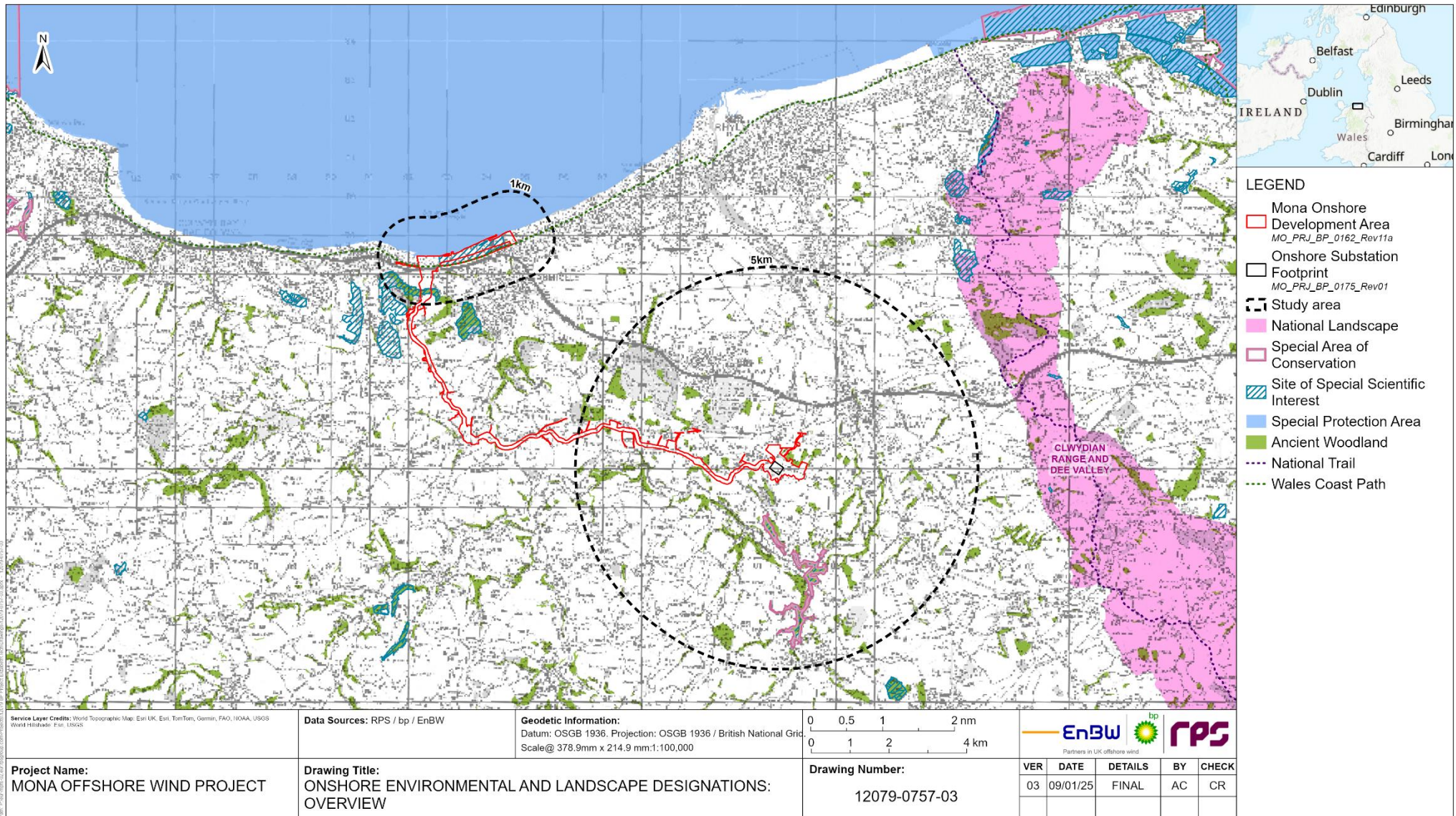


Figure 1.6: Onshore environmental and landscape designations: Overview.

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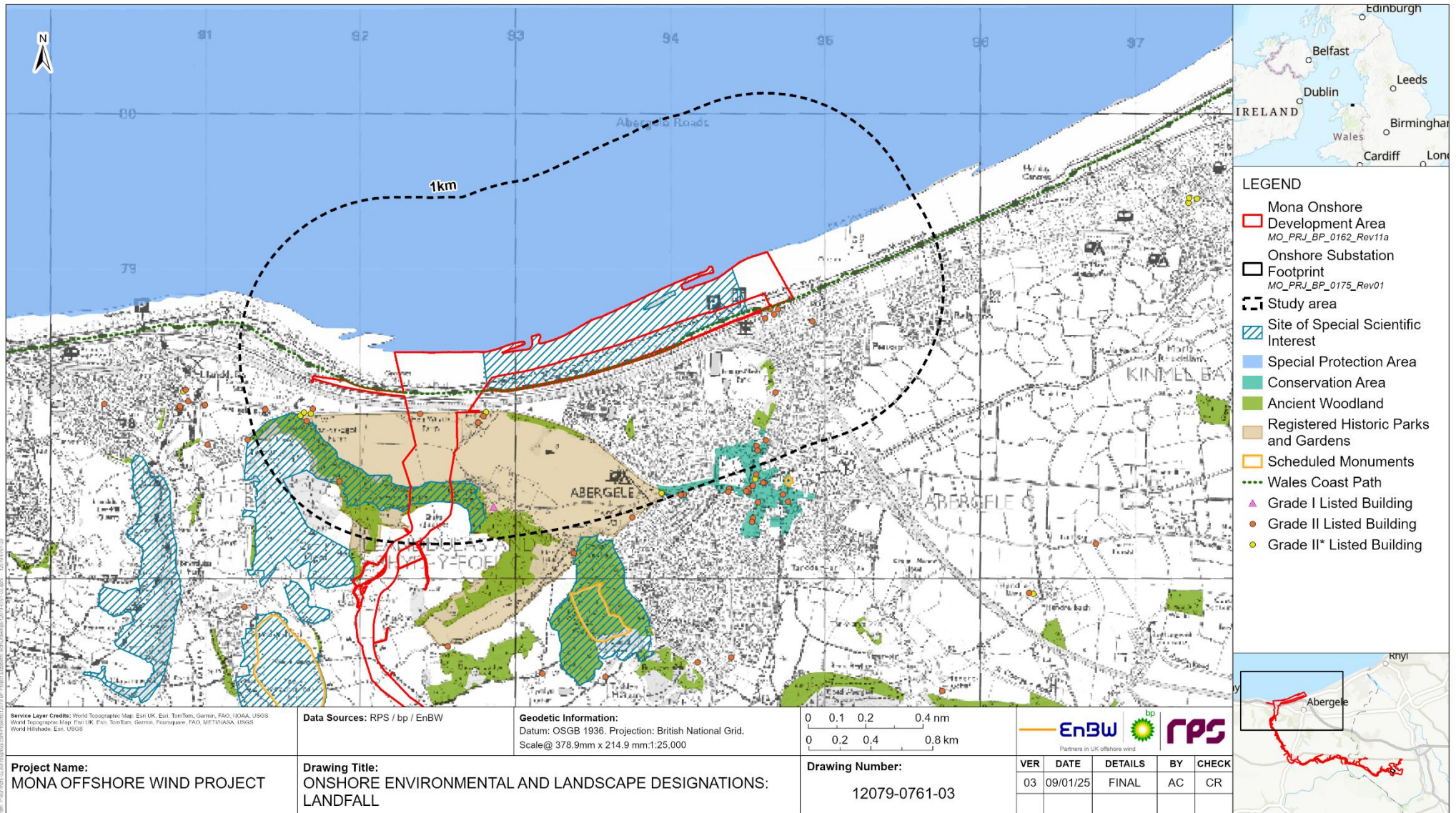


Figure 1.7: Onshore environmental and landscape designations: Landfall.

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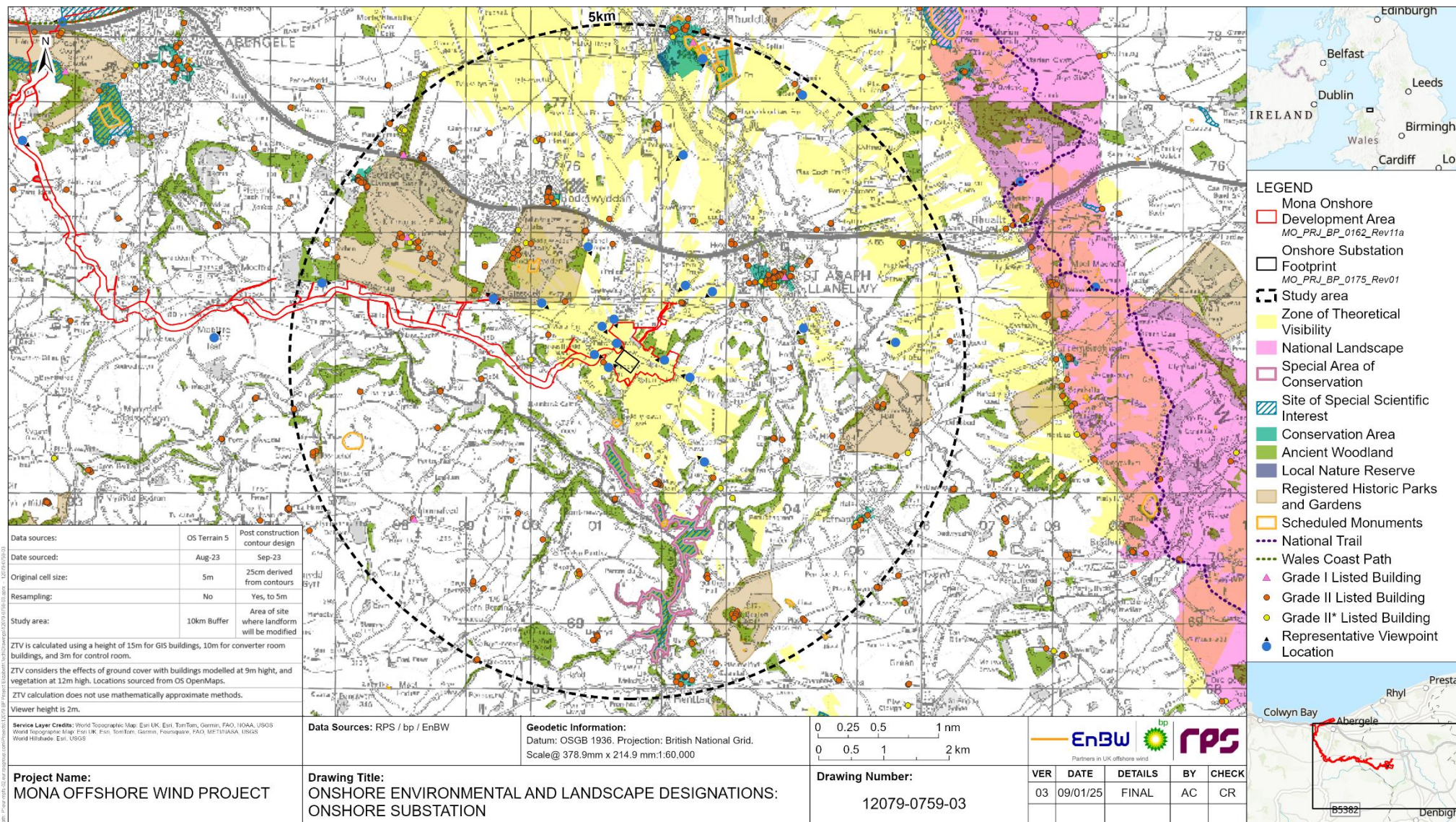


Figure 1.8: Onshore environmental and landscape designations: Onshore Substation.

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