

MONA OFFSHORE WIND PROJECT

Preliminary Environmental Information Report

Volume 1, chapter 4: Site selection and alternatives



April 2023
FINAL

Image of an offshore wind farm

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Glossary

Term	Meaning
Applicant	Mona Offshore Wind Limited.
Bodelwyddan National Grid Substation	This is the Point of Interconnection (POI) selected by National Grid for the Mona Offshore Wind Project.
Cable Route Protocol	This comprises a set of requirements developed by The Crown Estate detailed in Appendix 1, to help developers establish a transmission system infrastructure including export cabling.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Draft NPS	The draft national policy statements for energy that are undergoing consultation.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Mona Offshore Wind Project.
Evidence Plan Expert Working Group (EWG)	Expert working groups set up with relevant stakeholders as part of the Evidence Plan process.
Evidence Plan process	The Evidence Plan process is a mechanism to agree upfront what information the Applicant needs to supply to the Planning Inspectorate as part of the Development Consent Order (DCO) applications for the Mona Offshore Wind Project.
Export Cable Region	The Region defined by Niras within the Round 4 HRA for the Irish Sea and North Wales bidding area where preferred bidders may place cable infrastructure
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.
Intertidal area	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS).
Landfall	The area in which the offshore export cables make contact with land and the transitional area where the offshore cabling connects to the onshore cabling.
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom.
Local Highway Authority	A body responsible for the public highways in a particular area of England and Wales, as defined in the Highways Act 1980.
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 400kV Cable Corridor	The corridor from the Mona onshore substation to the Bodelwyddan National Grid substation.

Term	Meaning
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 Offshore Wind Project	The Mona Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities.
Mona Offshore Cable Corridor	The corridor located between the Mona Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and the offshore booster substation will be located.
Mona Offshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Mona Scoping Report as the area encompassing and located between the Mona Potential Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and any offshore booster substation will be located.
Mona Onshore Cable Corridor Search Area	The corridor located between Mean High Water Springs (MHWS) at the landfall and the Mona onshore substation, in which the onshore cable route will be located.
Mona Onshore Transmission Infrastructure Scoping Search Area	The area that was presented in the Mona Scoping Report as the area located between Mean High Water Springs (MHWS) at the landfall and the onshore National Grid substation, in which the onshore export cables, onshore substation and other associated onshore transmission infrastructure will be located.
Mona Potential Array Area	The area that was presented in the Mona Scoping Report as the area within which the wind turbines, foundations, meteorological mast, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project were likely to be located.
Mona Proposed Onshore Development Area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction compounds), and the connection to National Grid Bodelwyddan substation will be located.
Mona Scoping Report	The Mona Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) and Natural Resources Wales (NRW) for the Mona Offshore Wind Project.
Non-statutory consultee	Organisations that an applicant may choose to consult in relation to a project who are not designated in law but are likely to have an interest in the project.
NPS	The current national policy statements published by the Department of Energy and Climate Change in 2011.
Offshore Booster Substation	The offshore booster substation (also known as mid-point reactive power compensation substation), located within the Mona offshore cable corridor, and required in High Voltage Alternating Current (HVAC) transmission systems only.
Offshore Substation Platform (OSP)	The offshore substation platforms located within the Mona Array Area will transform the electricity generated by the wind turbines to a higher voltage allowing the power to be efficiently transmitted to shore.
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.

Term	Meaning
Preferred Bidding Areas	The Applicant identified two Preferred Bidding Areas (Morgan and Mona) within the Northern Wales and Irish Sea Bidding Area. In February 2021, The Crown Estate awarded the Applicant the right to develop up to 1.5GW of wind capacity within each of the two Preferred Bidding Areas.
Relevant Local Planning Authority	The Relevant Local Planning Authority is the Local Authority in respect of an area within which a project is situated, as set out in Section 173 of the Planning Act 2008. Relevant Local Planning Authorities may have responsibility for discharging requirements and some functions pursuant to the Development Consent Order, once made.
Round 4 HRA	The Plan Level Habitats Regulations Assessment undertaken by The Crown Estate for UK offshore leasing Round 4
Secretary of State for the Department for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Mona Offshore Wind Project.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
The Northern Wales and Irish Sea Bidding Area	The Northern Wales and Irish Sea Bidding Area was one of four Bidding Areas identified by The Crown Estate through the Offshore Wind Leasing Round 4 process.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Wind turbines	The wind turbine generators, including the tower, nacelle and rotor.

Acronyms

Acronym	Description
AfL	Agreement for Lease
AEF	Archaeology Engagement Forum
AONB	Area of Outstanding Natural Beauty
AoS	Area of Search
BRAG	Black, Red, Amber, Green
CCS	Carbon Capture and Storage
CION	Connection and Infrastructure Options Note
CPAT	Clywd-Powys Archaeological Trust
CRIA	Cable Route Identification and Approval
CRP	Cable Route Protocol
DCO	Development Consent Order
ECRA	Export Cable Region Assessment

Acronym	Description
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
EWG	Expert Working Group
FRAP	Flood Risk Activity Permit
GHG	Greenhouse gas
HDD	Horizontal Directional Drilling
HND	Holistic Network Design
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
LPA	Local Planning Authority
LSE	Likely Significant Effect
LVIA	Landscape Visual Impact Assessment
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MNEF	Maritime Navigation Engagement Forum
MPA	Marine Protected Area
NGESO	National Grid Electricity System Operator
NGET	National Grid Electricity Transmission
NMWTRA	North and Mid Wales Trunk Road Agent
NNR	National Nature Reserve
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Projects
OFTO	Offshore Transmission Owner
OTNR	Offshore Transmission Network Review
PEIR	Preliminary Environmental Information Report
PoI	Point of Interconnection
PRoW	Public Rights of Way
SAC	Special Area of Conservation
SNCB	Statutory Nature Conservation Body
SoS	Secretary of State
SPA	Special Protection Area

MONA OFFSHORE WIND PROJECT

Acronym	Description
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
TSS	Traffic Separation Scheme
UK	United Kingdom
ZTV	Zone of Theoretical Visibility

4. Site Selection and Consideration of Alternatives

4.1 Introduction

4.1.1 Overview

4.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents a description of the site selection process and the approach undertaken by Mona Offshore Wind Limited (the Applicant) to develop and refine the design of the Mona Offshore Wind Project.

4.1.1.2 This chapter sets out the stages of design iteration that the Mona Offshore Wind Project has been through from inception to the statutory consultation and this PEIR submission. The site selection process is described in the following stages:

- Stage 1 - Identification of Agreement for Lease (AfL) area
- Stage 2 - Identification of Point of Interconnection (PoI)
- Stage 3 - Identification of onshore and offshore areas of search for EIA scoping (including substation zone)
- Stage 4 - Refinement of project for PEIR
 - Identification and refinement of landfall and Mona Offshore Cable Corridor options
 - Refinement of onshore cable corridor and onshore substation options (and associated 400kV cable corridor connection to the Bodelwyddan National Grid substation)
- Stage 5 - Statutory consultation
- Stage 6 - Post statutory consultation stakeholder engagement
- Stage 7 – Final application boundary

4.1.1.3 The chapter will be updated to include stages 5, 6 and 7 following the completion of statutory consultation and feedback on the PEIR prior to the application for development consent being submitted.

4.1.2 Purpose of chapter

4.1.2.1 The primary purpose of the PEIR is outlined in volume 1, chapter 1: Introduction of the PEIR. In summary, the primary purpose of an Environmental Statement is to support the Development Consent Order (DCO) application for the Mona Offshore Wind Project under the Planning Act 2008 (the 2008 Act). The PEIR constitutes the Preliminary Environmental Information for the Mona Offshore Wind Project and sets out the findings of the EIA to date to support the pre-application consultation activities required under the 2008 Planning Act. The EIA will be finalised following completion of pre-application consultation and the Environmental Statement will accompany the application to the Secretary of State for Development Consent.

4.1.2.2 The PEIR forms the basis for statutory consultation which will last for 47 days and conclude on 4 June 2023 as outlined in volume 1, chapter 2: Policy and legislation of the PEIR. At this point, comments received on the PEIR will be reviewed and incorporated (where appropriate) into the Environmental Statement, which will be submitted in support of the application for Development Consent scheduled for quarter one of 2024.

4.1.2.3 In particular, this PEIR chapter:

- Outlines the approach taken to defining the spatial boundaries and constituent parts of the Mona Offshore Wind Project
- Explains the siting decisions taken to date by the Applicant
- Details the reasonable alternatives considered for the project, including location and infrastructure options
- Identifies future steps to be undertaken to refine the Mona Offshore Wind Project prior to application submission.

4.1.3 Project overview

4.1.3.1 Figure 4.1 identifies the proposed offshore and onshore infrastructure associated with the Mona Offshore Wind Project.

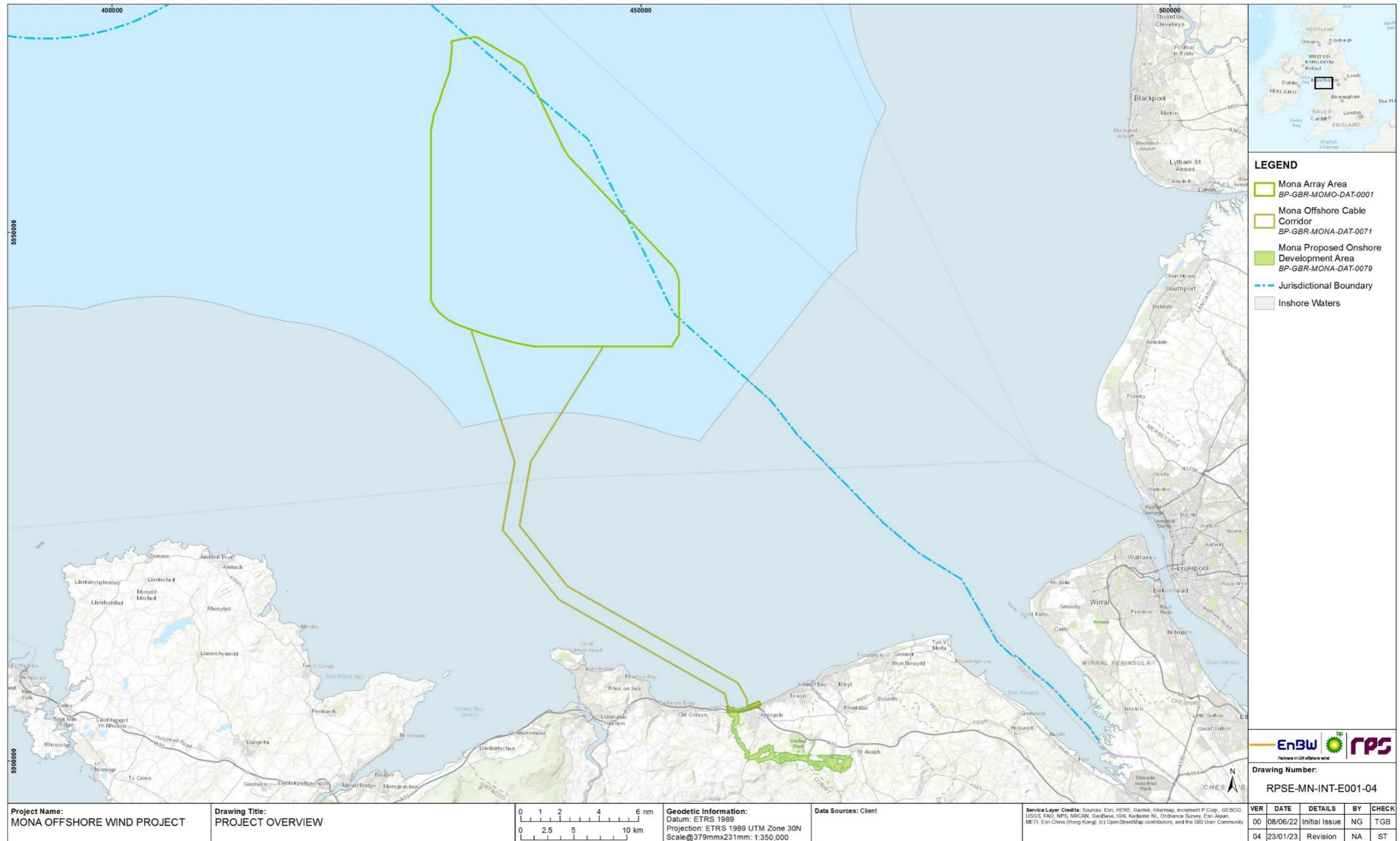


Figure 4.1: Mona Offshore Wind Project Boundary.

4.2 The Crown Estate

4.2.1 Offshore Wind Leasing Round 4

4.2.1.1 As described in Volume 1, Chapter 1: Introduction to the PEIR, Offshore Wind Leasing Round 4 was instigated by The Crown Estate (TCE) in September 2019, and four Bidding Areas were identified for the development of offshore wind in England and Wales. As part of a competitive tender, EnBW and bp were awarded Preferred Bidder status for two sites within the Northern Wales and Irish Sea Bidding Area.

4.2.1.2 As the manager of the seabed, TCE have a number of requirements that must be met to grant rights for cable routes which are identified in its Cable Route Protocol (described in Section 4.2.2) (The Crown Estate, 2021).

4.2.1.3 TCE is also the Competent Authority for the Offshore Wind Leasing Round 4 and undertook a Plan Level HRA for the Round 4 plan (described in Section 4.2.3).

4.2.2 TCE Cable Route Protocol

4.2.2.1 The Crown Estate’s Cable Route Protocol (CRP) (described within TCE Cable Route Identification and Leasing Guidelines, 2021) comprises a set of principles and requirements for offshore wind developers in the planning of export cable routes, with the specific purpose of reducing the direct and indirect impacts of cable routing on the marine environment. Compliance with the CRP is a requirement for entry into TCE’s transmission assets Agreement for Lease (AfL).

4.2.2.2 The Mona Offshore Wind Project has considered the CRP throughout the site selection process. Relevant requirements to the site selection process and how these principles have been met are described in Table 4.1.

Table 4.1: CRP requirements and how these have been addressed in the Site Selection chapter.

Requirement number	Requirement	Where this requirement has been addressed
2	Under this CRP, developers must undertake consultation with Statutory Nature Conservation Bodies (SNCBs) throughout the route selection and refinement process. The nature of this consultation will vary from project to project, but to be effective the consultation should be ongoing throughout the process and both parties must provide clear information and advice within the agreed timeframes. Developers must demonstrate...that clear information on the offshore export cable route has been provided for SNCBs at appropriate stages in cable route planning and that SNCB advice has been sought at appropriate stages (whether through formal or informal consultation). It is acknowledged that some elements of the cable planning process are time-constrained and that delays in receiving input from consultees can result in difficulties for developers.	The Applicant has sought to consult with SNCBs on the proposed cable routing. Details of consultation undertaken is described in Section 4.3.7.

Requirement number	Requirement	Where this requirement has been addressed
4	In planning survey work on potential cable routes (or exploratory works within a cable route Area of Search (AoS)), developers must consult with SNCBs to ensure that they have the opportunity to provide feedback on the scope and adequacy of the overarching survey plan. Consultation on the survey plan will be required in order to obtain individual survey licences.	The Applicant undertook export cable surveys in 2022, the results of which will be incorporated into the Environmental Statement (full data is not available for PEIR). The scope of export cable surveys was consulted on with relevant SNCBs.
5	Developers must demonstrate...that planned offshore cable routes are in alignment with the relevant policies and principles within the applicable National Policy Statements and relevant marine plan(s) (including draft marine plans). Particular note should be taken of cable-specific policies within marine plans.	See Section 4.3 of this document which documents how the relevant National Policy Statements and marine plans (Welsh National Marine Plan and North West Offshore Marine Plan) have been considered within the site selection process.
6	Developers must demonstrate... that planned cable corridors have taken into account the outcomes of the relevant plan-level HRA (where applicable) as described in the Report to Inform Appropriate Assessment. This includes any specific requirements on cable planning and any geographically-specific findings in which examples of appropriate project-level cable mitigations.	Section 4.2.3 of this site selection chapter demonstrates how the Applicant has taken into account the outcomes of the Plan Level HRA in site selection.
7	Developers must demonstrate... that they have had regard to documents and advice produced by SNCBs in relation to offshore export cabling, including current best practice guidance. Developers must also have regard to the outcomes of relevant research programmes which are available. This may include (amongst other things) research into the impacts of cabling, the recovery of habitats and the efficacy of mitigation measures.	Section 4.3.5 of this document demonstrates that the Applicant has had regard to the NRW export cable guidance for R4 developers.
9	Within the offshore AoS the developer must identify (and map where possible) the following, which are to be given significant weight in cable route planning: Habitats Regulations sites (SACs, SPAs and Ramsar sites, whether fully designated or not) MCZs and SSSIs (whether fully designated or not) Features of these Protected Sites (including priority habitats and species) Protected Sites with conservation objectives to recover features to favourable condition Areas of known Annex I habitat outside protected areas but within the AoS Habitats that are known to be irreplaceable or very difficult to replace (e.g. chalk reef) Having undertaken this exercise the developer must consult with SNCBs (and, where appropriate, other relevant non-statutory consultees) to ensure that the best available evidence about the environment and specific sensitivities has been incorporated into the AoS mapping,	The sites referred to within Requirement 9 have been mapped within Section 4.8 of this site selection chapter. The Applicant has an ongoing dialogue with SNCBs through the Evidence Plan Process (EPP) to ensure the most recent evidence around designated sites is being taken into assessments and that SNCBs have an opportunity to flag any concerns regarding the site selection process which have been given weight within cable route planning

Requirement number	Requirement	Where this requirement has been addressed
	and that the consultees have the opportunity to provide additional narrative information about particularly sensitive areas or areas of concern to them.	
10	<p>Developers must prepare an outline view of the possible cabling infrastructure requirements (acknowledging that this may change as the design of the project evolves). The outline should include the potential number and capacities of the export cables with their indicative spacing requirements and the additional structures (e.g. substations and converter stations) which the project is likely to require. Where there are uncertainties in the required infrastructure these should be set out (with reasons).</p> <p>Within the AoS, developers must identify (and where possible, map) hard engineering constraints such as existing infrastructure/licence areas, challenging ground conditions and sections of the coast where landfall is not possible.</p> <p>Developers should also form an initial view on the likely areas within the AoS where cable preparation works and/or cable protection may be needed (noting that this information is likely to change as survey work is undertaken). Where possible, this information should be presented alongside the environmental information from Requirement 9.</p> <p>The developer must consult with SNCBs (and, where appropriate, non-statutory consultees) to seek to ensure that they understand the likely infrastructure requirements and constraints and that they have the opportunity to raise any areas of concern about placement of infrastructure (including cable protection) and specific Protected Sites/features.</p>	<p>Volume 1, chapter 3: Project Description of the PEIR identifies cable infrastructure requirements for the Mona Offshore Wind Project.</p> <p>Hard engineering constraints have been considered throughout the site selection process and are described within this chapter.</p> <p>Details of discussions had with SNCBs on infrastructure requirements, cable preparation works and/or cable protection and any impacts on designated sites are captured in Section 4.3.7 of this chapter.</p>
11	Developers must demonstrate... that they have undertaken regular consultation with SNCBs as the cable route selection process progresses. In line with the requirements for pre-application consultation, communication should be comprehensively documented but need not take the form of formal reporting. The frequency of communication is a matter for agreement between developers and consultees, taking into account consultee resource constraints. The consultation must encompass the entire process from AoS to final route selection and should include communication of the evolving understanding of cabling infrastructure requirements (including cable protection) as well as the evolving understanding of environmental and technical constraints on the cable route. Consultees must be given the opportunity to comment on proposals.	Stakeholder engagement undertaken on the Mona Offshore Cable Corridor and Mona Proposed Onshore Development Area is described within Section 4.3.7 of this chapter.

Requirement number	Requirement	Where this requirement has been addressed
12	Where SNCBs provide advice and guidance during the cable route planning process this must be clearly documented and considered in cable route decision-making. The way in which SNCB advice has been incorporated into the cable route plan must be documented. If a developer chooses not to follow SNCB advice, or there a developer disagrees with the conclusions of the SNCB, it must provide clear and detailed justification of this.	SNCB advice has been sought throughout the site selection process and is described within this chapter.
13	The expectation is that the cable route should avoid the risk of harm to Habitats Regulations sites and other Protected Sites. Where this is not possible and a developer seeks to rely on mitigation measures for engineering or commercial reasons, the developer must be able to demonstrate that appropriate weight has been given to environmental considerations in the cable route evaluation process. In practice, this means that the developer must demonstrate that the potential impact of the route on Protected Sites has been carefully considered throughout the process and that all reasonable efforts have been made to avoid environmental impacts and adverse effects on the integrity of sites. If avoidance is not possible then this must be clearly justified (including reasons why alternative cable routes are unsuitable), only then can mitigation be considered. Advice given by SNCBs on the efficacy of proposed mitigation should be provided where available and the mitigation must be capable of being secured via the project consents.	Section 4.8 of this chapter describes how the Applicant has considered designated sites within the refinement of the Mona Offshore Cable Corridor and Mona Proposed Onshore Development Area.

4.2.3 TCE Plan Level Habitats Regulations Assessment (HRA)

- 4.2.3.1 As the Competent Authority under the Habitats Regulations, TCE is required to conduct a plan-level Habitats Regulations Assessment (HRA) for any leasing/licencing activity that constitutes a 'plan'. TCE completed a plan-level HRA (the Round 4 HRA) which assessed the potential impact of the preferred bidding areas that were selected through the Round 4 process on the UK's network of designated sites and protected habitats and species. The Round 4 HRA was finalised in November 2022 with preferred bidders entering into Agreements for Lease (AfL) in January 2023.
- 4.2.3.2 In the Round 4 HRA TCE identified mitigation and compensation measures to manage potential adverse effects on European Sites potentially affected by the Round 4 plan. The Round 4 HRA Plan supports decarbonisation and security of the UK's energy supply and government targets. The Crown Estate considered a range of alternative solutions and concluded that there are no feasible alternative solutions to the Round 4 Plan.
- 4.2.3.3 In addition to mitigation measures secured at the plan level, mitigation has been identified to be considered and implemented at the project level, where there is potential for a Likely Significant Effect (LSE) on a European site. Further information

	<p>on the potential impact of the Mona Offshore Wind Project on designated sites is described within the HRA Stage 1 screening and Information to Support Appropriate Assessment which accompanies the PEIR.</p>
4.2.3.4	<p>The key mitigation for offshore export cables within the Round 4 HRA is the consideration of the Export Cable Route Assessment (ECRA) undertaken by NIRAS (2022), described further in Section 4.2.4.</p>
4.2.4	Export Cable Region Assessment (ECRA)
4.2.4.1	<p>NIRAS (2022) undertook an ECRA for designated features of European Sites for which the Round 4 HRA LSE Screening Report identified a risk of LSE from an Export Cable Region. The ECRA took a risk-based approach (consideration of both the vulnerability of species and the vulnerability of the Protected Sites) to derive an overall risk score for the potential impacts arising from the installation of offshore wind farm export cables and their associated infrastructure.</p>
4.2.4.2	<p>The risk scores corresponded to a category of mitigation measures as below:</p> <ul style="list-style-type: none"> • Green (low risk): no specific measures but activities to be undertaken in line with industry best practice (e.g. application of an environmental management plan, pollution control plan and spillage response plan, and adherence to international conventions such as International Convention for the Prevention of Pollution from Ships (MARPOL) and International Regulations for Preventing Collisions at Sea (COLREGS)). • Amber (low-medium risk): specific detail must be provided to TCE at the route selection and refinement stage. Cable route selection studies should be undertaken with a detailed evidence document provided outlining the process completed to identify the proposed Supply Cable route(s) as well as feature specific information. • Red (high risk): the project must avoid irreparable damage (loss of a non-recoverable habitat) to red risk features. Evidence should be submitted to the TCE at the route selection and refinement stage outlining avoidance measures, mitigation and installation methods to reduce impacts depending on the type of risk. • Black (high risk): the affected project must spatially avoid these black risk features. Evidence should be submitted to the TCE at the route selection and refinement stage outlining the avoidance of these features.
4.2.4.3	<p>Section 4.84.8 of this site selection chapter describes how the ECRA measures have been considered for the Mona Offshore Wind Project.</p>
4.3	Policy Context
4.3.1	Climate change and renewable energy
4.3.1.1	<p>The UK government has an ambition to generate 50GW of clean, renewable energy from offshore wind by 2030. The Mona Offshore Wind Project has a critical role to play, both in helping the UK to achieve its net zero ambitions, and specifically, in reaching our offshore wind generation goals.</p>
	4.3.1.2
	<p>The UK's ambition is to lead the world in combatting climate change, reducing our reliance on fossil fuels and embracing a future where renewable energy powers our 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. 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 the UK Government needs to work with developers to support proposals to produce clean, renewable energy within the UK. The Welsh Government has recognised the need to support renewable energy to reduce carbon emissions as set out in Planning Policy Wales 11 and Future Wales: the National Plan 2040 (see Section 4.3.2). As the Mona Offshore Wind Project is planned to be operational by 2030 it would significantly contribute to reducing reliance of fossil fuels and reducing GHG emissions by at least 100% against the 1990 baseline.</p>
	4.3.1.3
	<p>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 strengthening the renewable National Policy Statements (NPSs) to reflect the importance of energy security and net zero. It proposes work with 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 50GW of offshore wind by 2030, an increase on previous targets of 40GW. The Mona Offshore Wind Project would bring clean, affordable, secure power to millions of homes and be a key project to deliver 50GW of offshore wind by 2030.</p>
	4.3.1.4
	<p>In July 2022, the UK Government published the Pathway to 2030 Holistic Network Design documents, which set out the approach to connecting 50GW of offshore wind to the UK electricity network (National Grid ESO, 2022).</p>
	4.3.1.5
	<p>There is, therefore, a clear urgent need and policy drivers to bring about secure, clean energy in order to meet the ambitious climate change and carbon reduction targets, through the development of offshore wind energy.</p>
	4.3.2
	National Policy Statements
	4.3.2.1
	<p>Planning policy on renewable energy infrastructure is presented in volume 1, chapter 2: Policy and legislation of the PEIR. Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to Site selection and consideration of alternatives, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1; DECC, 2011a), the NPS for Renewable Energy Infrastructure (EN-3, DECC, 2011b) and the NPS for Electricity Networks Infrastructure (EN-5, DECC, 2011c)</p>
	4.3.2.2
	<p>NPS EN-1 and NPS EN-3 include guidance on what matters are to be considered in the assessment. These are summarised in Table 4.1. NPS-5 includes guidance on what matters are to be considered in the onshore assessment of electrical networks. These are summarised in Table 4.2 below. NPS EN-5 also highlights a number of factors relating to the determination of an application and in relation to mitigation.</p>

4.3.2.3 Table 4.2 refers to the current NPSs, specifically NPS EN-1 (DECC, 2011) If the NPSs are updated prior to the application for Development Consent, the revised NPSs will be fully considered in relation to site selection and consideration of alternatives within the Environmental Statement.

Table 4.2: Summary of the NPS EN-1 and NPS EN-3 provisions relevant to Site Selection and Alternatives.

Summary of NPS EN-3 and EN-1 provision	How and where considered in the PEIR
EN-1	
NPS EN-1 paragraph 4.4.1 - As in any planning case, the relevance or otherwise to the decision-making process of the existence (or alleged existence) of alternatives to the proposed development is in the first instance a matter of law, detailed guidance on which falls outside the scope of this NPS. From a policy perspective this NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option.	The approach to alternatives is described within Section 0 of this chapter. The consideration of alternatives is covered throughout the chapter.
NPS EN-1 paragraph 4.4.2 - applicants are obliged to include in their ES... information about the main alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility	The approach to alternatives is described within Section 0 of this chapter. The consideration of alternatives is covered throughout the chapter.
NPS EN-1 paragraph 4.4.3 - Where there is a policy or legal requirement to consider alternatives the applicant should describe the alternatives considered in compliance with these requirements. Given the level and urgency of need for new energy infrastructure, the Secretary of State (SoS) should, subject to any relevant legal requirements (e.g. under the Habitats Directive) which indicate otherwise, be guided by the following principles when deciding what weight should be given to alternatives: <ul style="list-style-type: none"> the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner; the SoS should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security and climate change benefits) in the same timescale as the proposed development; where (as in the case of renewables) legislation imposes a specific quantitative target for particular technologies or there is reason to suppose that the number of sites suitable for deployment of a technology on the scale and within the period of time envisaged by the relevant NPSs is constrained, the SoS should not reject an application for development on one site simply because fewer adverse impacts would result from developing similar infrastructure on another suitable site, and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals; 	The approach to alternatives is described within Section 0 of this chapter. The consideration of alternatives is covered throughout the chapter.

Summary of NPS EN-3 and EN-1 provision	How and where considered in the PEIR
<ul style="list-style-type: none"> alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the SoS thinks they are both important and relevant to its decision; alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the SoS's decision it is intended that potential alternatives to a proposed development should, wherever possible, be identified before an application is made to the SoS in respect of it (so as to allow appropriate consultation and the development of a suitable evidence base in relation to any alternatives. 	
EN-3	
NPS EN-3 paragraph 2.6.81 - An assessment of the effects of installing cable across the intertidal zone should include information, where relevant, about: <ul style="list-style-type: none"> any alternative landfall sites that have been considered by the applicant during the design phase and an explanation for the final choice any alternative cable installation methods that have been considered by the applicant during the design phase and an explanation for the final choice. 	The selection process for landfall sites is described in Section 4.8 of this chapter. The project base case is to use HDD or another trenchless technique for the landfall but both trenchless and open cut techniques are retained as options in the PEIR.

Table 4.3: Summary of NPS EN-5 policy on decision making relevant to Site Selection and Alternatives.

Summary of NPS EN-5 provision	How and where considered in the PEIR
NPS EN-5 paragraph 2.2.5 - There will usually be some flexibility around the location of the associated substations and applicants will give consideration to how they are placed in the local landscape taking account of such things as local topography and the possibility of screening.	The siting process for the onshore substation is described within Section 4.8 of this chapter.

Welsh National Marine Plan

4.3.2.4 The site selection and alternatives chapter has also been developed with consideration of the specific policies set out in the Welsh National Marine Plan (Welsh Government, 2019). Whilst there is limited specific reference to consideration of alternatives within the Welsh National Marine Plan the plan outlines that the Welsh Government has considered alternatives to the need for large scale deployment of marine renewable technologies and concluded that there is a strategic need to support the development of marine renewable energy generation.

4.3.2.5 The Welsh National Marine Plan specifically recognises the need for offshore wind, in recognition that other technologies such as wave and tidal remain in relative infancy.

4.3.2.6 The Sector Policy on Subsea Cabling includes specific reference to cable landfall, considered further in Table 4.4.

Table 4.4: Welsh National Marine Plan policies of relevance to site selection and alternatives.

Policy	Key provisions	How and where considered in the PEIR
Sector Policy - Subsea Cabling (CAB_01, paragraph 449)	When selecting locations for landfall of power and telecommunications cables, developers and relevant public authorities should give consideration to utilising an existing landfall site (where appropriate) and ensure that any proposals are aligned with land planning policies	The selection process for landfall sites is described in Section 4.8 of this chapter. As part of this process, consideration was given to whether it would be possible to utilise an existing landfall site.

North West Offshore Coast Marine Plans

4.3.2.7 The site selection and alternatives chapter has also been developed with consideration to the specific policies set out in the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021). The North West Inshore and North West Offshore Marine Plans define the need for offshore renewable energy generation and Policy NW-REN1 states that proposals that enable the provision of renewable energy technologies will be supported.

4.3.2.8 Policies specific to cable infrastructure have not been referenced in this chapter as there is no export cable infrastructure associated with the Mona Offshore Wind Project located within the marine plan area.

Planning Policy Wales 11 and Future Wales: The National Plan 2040

4.3.2.9 The site selection and alternatives chapter has also been developed with consideration of the specific policies set out in Planning Policy Wales 11 and Future Wales: the National Plan 2040. Key provisions are set out in Table 4.5 along with details as to how these have been addressed within the assessment.

Table 4.5: Welsh Planning Policy of relevance to site selection and alternatives.

Policy	Key provisions	How and where considered in the PEIR
Planning Policy Wales 11 Development Management and Low Carbon Energy (paragraph 5.9.20)	<p>Planning authorities should also identify and require suitable ways to avoid, mitigate or compensate adverse impacts of renewable and low carbon energy development. The construction, operation, decommissioning, remediation and aftercare of proposals should take into account:</p> <ul style="list-style-type: none"> • the need to minimise impacts on local communities, such as from noise and air pollution, to safeguard quality of life for existing and future generations; • the impact on the natural and historic environment; • cumulative impact; • the capacity of, and effects on the transportation network; • grid connection issues where renewable (electricity) energy developments are proposed; and • the impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt to climate change impacts give rise to additional impacts. 	These matters have been considered in sections 4.3.5 Site Selection Principles, 4.4.2 Consideration of Alternatives and 4.4.3 Site Selection process of this chapter.
Future Wales: the National Plan 2040 Policy 24 – North West Wales and Energy	There are a number of opportunities for offshore renewable energy developments in this area (north Wales) and the role of development plans is to enable appropriate onshore development, including cable landfall sites.	The site selection process for onshore infrastructure is described throughout this chapter.

4.3.3 Planning Inspectorate Advice Note Seven

4.3.3.1 The Planning Act 2008 (as amended), and related secondary legislation, establishes the legislative requirements in relation to applications for orders granting development consent for NSIPs.

4.3.3.2 The Planning Inspectorate Advice Note Seven (Planning Inspectorate, 2020) suggests that the EIA needs to explain: “the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment”.

4.3.4 Horlock Rules

- 4.3.4.1 The relevance of planning and environmental considerations in the siting of onshore substations was set out by the Central Electricity Generating Board and more recently reviewed and adopted by NGET in the 'Horlock Rules'. The Horlock Rules are a set of guidelines produced by NGET to assist those responsible for siting and designing substations to mitigate the environmental effects of such developments (National Grid, 2003). They are still referred to and used by National Grid (and endorsed in ministerial decisions and at public inquiry) when undertaking planning studies for new infrastructure although they now have to be considered alongside the relevant policy set out in National Policy Statements, Development Plan documents and other sources.
- 4.3.4.2 The principles embedded in the Horlock rules are relevant to the Mona Onshore Development Area.
- 4.3.4.3 In the Horlock Rules, NGET states that it will encourage generators to adopt the guidelines when working with NGET on proposals for substations, sealing end compounds or line entries. These guidelines also confirm that consideration must be given to environmental issues at the earliest stage in order to keep adverse effects to a reasonably practical minimum in the planning of new substations.
- 4.3.4.4 Table 4.6 below summarises the Horlock Rules and the Mona Offshore Wind Project's approach to them.

Table 4.6: Mona Offshore Wind Project application of the Horlock Rules.

Overall system options and site selection	Mona Offshore Wind Project approach
In the development of system options including new substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.	Environmental issues have been considered since the commencement of the site selection process as described in Section 4.8.6.
Amenity, cultural or scientific value of sites	
The siting of new substations, sealing end compounds and line entries should as far as reasonably practical seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.	The site selection process has considered designated sites including those designated for ecological, landscape and historic environment reasons. All internationally and nationally designated sites have been avoided as part of onshore substation site selection.
Local context, land use and site planning	
Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.	The onshore substation options have sought to protect areas of local amenity value, important existing habitats and landscape features as far as reasonably possible Where impacts cannot be avoided. They are addressed through appropriate mitigation and design as described within this PEIR.

Overall system options and site selection	Mona Offshore Wind Project approach
The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.	The substation shortlisting process has considered opportunities to benefit from existing screening. Additional landscape screening will be identified within the outline Hydrological, Ecological and Landscape Management Plan that will be submitted with the Environmental Statement.
The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum.	Visual, noise and other environmental effects have been minimised as far as possible through the selection of the substation options. Further mitigation for noise and vibration impacts is considered in volume 3; chapter 22: Noise and Vibration of the PEIR.
The land use effects of the proposal should be considered when planning the siting of substations or extensions.	The use of existing land has been considered within the site selection process; further details on the consideration of land use are contained within Section 4.8.6.
Design	
In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum.	The effects associated with potential equipment within the substation have been taken into account in the development of site proposals and through the assessment of environmental effects.
Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.	The initial footprint of the substation has been determined based on the Applicants current view of land required. The design of the substation is at an early stage and will be subject to ongoing refinement as the project progresses.
The design of access roads, perimeter fencing, earth shaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.	The requirement for access roads, fencing, site levelling, planting and other works (including the need for attenuation ponds) has been taken into account throughout the site selection process.
Line Entry	
In open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance.	The Applicant has not included overhead lines within the project design envelope. All cables will be buried underground.
The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.	The Applicant has not included overhead lines within the project design envelope. All cables will be buried underground.

4.3.5 NRW Cable Advice for Round 4 Developers

4.3.5.1 Natural Resources Wales (NRW) have issued advice to inform the routing of offshore windfarm cabling within Round 4 leasing areas in relation to key marine ecosystem receptors (2019).

4.3.5.2 Key sensitivities and concerns are outlined for these different receptor groups along with pathways by which cable installation, operation and maintenance and decommissioning activities can interact with and impact these different receptor groups. This is then linked with NRW's detailed conservation advice for these receptors. NRW recommends early engagement from developers when identifying potential cable routes to ensure all key environmental effects and consenting risks are considered. NRW will work with developers to assist with the application of the avoid-reduce-mitigate hierarchy, if required.

4.3.6 Site Selection Principles

4.3.6.1 Alongside published principles and guidance the following site selection principles were developed and applied at the outset of the site selection process for the Mona Offshore Wind Project. These are drawn from the experience of the Applicant and technical expertise of consultants supporting the process and comprise:

- Shortest route preference to reduce impacts by minimising footprint for the Mona Offshore Cable Corridor and Mona Onshore Cable Corridor as well as considering cost (hence ultimately reducing the cost of energy to the consumer) and minimising transmission losses
- Avoidance of key sensitive features where possible, and where not, ensure mitigation of impacts
- Minimise the disruption to populated areas
- The need to accommodate the range of technology sought within the design envelope, such as air insulated or gas insulated switchgear for the onshore substation

4.3.6.2 Prior to starting each stage of the site selection process (described below), a series of transparent design principles and engineering assumptions were identified which governed the decisions made at each stage. These design principles and engineering assumptions covered environmental, physical, technical, commercial and social considerations and opportunities. Each step of the process involved gathering data from a number of different sources to define and assess the options for each component of project infrastructure. Internal project workshops were then held at key stages of the site selection process to collate and review the data gathered to date, and to reach cross-discipline decisions about refining the site selection options.

4.3.7 Consultation

4.3.7.1 Stakeholder engagement and public consultation is recognised as vitally important for shaping the approach to development. Early engagement has been undertaken with a wide range of stakeholders to refine the process, design and wider spatial constraints and considerations. Consultation on refinements in the Mona Offshore Wind Project site selection, layout and configurations has been undertaken through the informal and formal pre-application stages to date between submitting the Scoping

Report (Mona Offshore Wind Ltd, 2022) in May 2022 and the PEIR. The Applicant met with a range of stakeholders to discuss their feedback in more detail and to make any necessary amendments to the proposed approach ahead of formal consultation on the PEIR. Feedback received has been taken into consideration throughout the process, through a range of means including (but not limited to):

- Consultation events held at locations within and adjacent to the Mona Proposed Onshore Development Area and online webinars
- Direct discussions with landowners:
 - The Applicant and the Applicant's land agents have met potentially affected landowners and/or land agents
 - The Applicant has engaged with landowners regarding survey access through consultation meetings. Letters were sent to all potentially affected parties offering to meet to discuss the Mona Offshore Wind Project proposals
- Feedback reports shared with all registered participants, key local and community stakeholders, and on the Mona Offshore Wind Project website
- Town Council briefings
- Parish Council briefings
- Dedicated project e-mail address and freepost address to assist local communities in contacting the Applicant
- Provision of a dedicated Mona Offshore Wind Project website
- Regular and targeted discussion with regulators and other stakeholder bodies through various means, where the siting of onshore and offshore infrastructure was discussed in detail.

4.3.7.2 The Applicant has an ongoing dialogue with technical stakeholders through the Evidence Plan Process (EPP) to ensure the most recent evidence is being taken into assessments and that stakeholders have an opportunity to raise any issues and suggestions regarding the site selection process. The process provides an opportunity for stakeholders to advise on proposals at an early stage to help mitigate any potential significant effects. As part of this, a steering group has been established, as well as Expert Working Groups (EWGs) to discuss topic-specific issues with relevant stakeholders. EWGs have been established for the following topics:

- Physical processes, benthic ecology and fish and shellfish ecology
- Marine mammals
- Offshore ornithology
- Onshore ecology.

4.3.7.3 In addition to the Evidence Plan Process, a Maritime Navigation Engagement Forum (MNEF) and Archaeology Engagement Forum (AEF) have been established.

4.3.7.4 A summary of the key issues raised during consultation activities undertaken to date specific to site selection and consideration of alternatives is presented in Table 4.7 below, together with how these issues have been considered in the site selection process.

Table 4.7: Summary of key consultation issues raised during statutory and non-statutory consultation activities undertaken for the Mona Offshore Wind Project relevant to site selection and consideration of alternatives.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
June 2022	Denbighshire County Council – Scoping Opinion	<p>Planning Policy Wales (PPW 11) Section 3.58 and 3.59 obliges weight to be given to protecting land of grades 1, 2, and 3a quality in the Agricultural Land Classification (ALC).</p> <p>PPW 11 notes this land is considered to be the best and most versatile and justifies conservation as a finite resource for the future. It indicates that land of this quality should only be developed if there is an overriding need for the development, and either previously developed land or land of a lower grade is not available, or available lower grade land has an environmental value recognised by a landscape, wildlife, historic or archaeological designation which outweighs the agricultural considerations.</p>	<p>The Applicant has considered Agricultural Land Classification as a factor in the selection of the onshore substation location. The land for both substation options is ALC 3b. Further information on the land classification in the area is described in volume 3; Chapter 20: Land Use and Recreation of the PEIR.</p>
June 2022	Natural Resources Wales – Scoping Opinion	<p>NRW note in Part 3: Section 2.4 Ongoing siting and routing process, that the potential routes for offshore export cables and landfall are currently undergoing a process of review to refine the potential feasible options. NRW would welcome the opportunity to engage with the applicant in discussions on the potential environmental constraints of the offshore export cable route and landfall options once they have been refined further. In particular around potential interactions with sensitive features (Annex I habitats within SACs, Annex I habitats outside SACs, Section 7 habitats and OSPAR habitats).</p>	<p>The Applicant has engaged with NRW on the potential routes and route constraints for export cables and landfall options as described within this consultation table and throughout the chapter.</p>
July 2022	<p>Evidence Plan Steering Group Meeting with:</p> <ul style="list-style-type: none"> • Natural Resources Wales • JNCC • Planning Inspectorate • Natural England • Marine Management Organisation 	<ul style="list-style-type: none"> • Presentation and discussion on site selection process for offshore cable route including interaction with designated sites. • Feedback received from NRW on the preference to avoid the Constable Bank and the need to avoid reef features of the Menai Strait and Conwy Bay SAC. Feedback also received on the Traeth Pensarn SSSI and the need to consider this as a key environmental constraint. 	<p>Consideration of the Mona Offshore Cable Corridor route through Constable Bank, Menai Strait and Conwy Bay Special Area of Conservation (SAC) and Traeth Pensarn Site of Special Scientific Interest (SSSI) is described in Section 4.8 of this chapter.</p>
September 2022	<p>Site selection workshop with:</p> <ul style="list-style-type: none"> • Natural Resources Wales • Denbighshire County Council • Conwy County Borough Council • Cadw • Clwyd-Powys Archaeological Trust • Royal Commission on the Ancient and Historical Monuments of Wales 	<ul style="list-style-type: none"> • Presentation and discussion of areas of search and the background information used to inform the decision-making to date; • Presentation of the indicative long list of options; and • Agreement of site selection methodology, request for any missing datasets/ baseline data, and the opportunity for stakeholders to identify and indicate preferences for long list options. 	<p>Feedback received on landfall options is summarised in of this chapter.</p>
October 2022	<p>Targeted community consultation events seeking feedback on short list of onshore substations</p>	<ul style="list-style-type: none"> • Background information regarding the Mona Offshore Wind Project • Presentation of area of search for the onshore substation and the indicative short list of options; • Presentation of indicative onshore cable routes from landfall to onshore substation; • Presentation of constraints in the vicinity of the onshore substation including ecology, traffic & transport and historic environment; and • Opportunity for non-statutory consultees to identify and indicate preferences for preferred onshore substation locations for PEIR assessment. 	<p>Feedback received on onshore substation options is summarised in Table 4.20. Details on the preferred onshore substation options (for PEIR) are detailed in Section 4.8.6 which includes a summary of how the preferred onshore substation options (for PEIR) has taken account of responses received.</p>

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
December 2022	Site selection workshop with: <ul style="list-style-type: none"> • Natural Resources Wales • Denbighshire County Council • Conwy County Borough Council • Cadw • Clwyd-Powys Archaeological Trust • Royal Commission on the Ancient and Historical Monuments of Wales • Welsh Government 	<ul style="list-style-type: none"> • Provision of an update to the selected landfall in response to consultation responses received; • Presentation of the outcomes of the onshore substation targeted consultation and presentation of preferred onshore substation locations for comment; and • Provision of an update to the proposed onshore cable route – a request from stakeholders for an opportunity to provide comment in advance of the next site selection EWG. 	Details on the chosen landfall site, onshore cable route and onshore substation options are detailed in Sections 4.8.4, 4.8.5 and 4.8.6 respectively.
February 2023	Evidence Plan Steering Group Meeting with: <ul style="list-style-type: none"> • Natural Resources Wales • JNCC • Planning Inspectorate • Natural England • Marine Management Organisation 	Discussion on site selection for the Mona Offshore Cable Corridor.	Due to the timing of the workshop ahead of publishing the PEIR, discussion outputs will be incorporated into the Environmental Statement.

4.4 Site Selection Methodology

4.4.1 Overview

4.4.1.1 The Applicant has followed a staged site selection and design iteration process from inception to the point of submission of the PEIR to identify the most suitable locations and configuration, based on the criteria outlined above for the Mona Offshore Wind Project infrastructure. The process has taken account of environmental, physical, technical, commercial, and social considerations and opportunities as well as engineering requirements.

4.4.1.2 The aim is to identify sites and routes that will be 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. As described in Section 4.3.6 site selection principles were developed at the outset and these principles were followed as far as possible throughout the site selection process.

4.4.1.3 A multi-disciplinary team was formed to undertake the site selection process, which included input from engineers, planners, land advisors, legal and EIA/topic consultants whose expertise was drawn upon through the process.

4.4.2 Consideration of alternatives

4.4.2.1 This PEIR chapter provides a description of the reasonable spatial and geographical alternatives that have been considered by the Mona Offshore Wind Project, and, where appropriate, presents a comparison of the environmental effects between different options. This consideration of alternatives is captured within each of the sections below.

4.4.2.2 Strategic-level project design alternatives were also considered as part of the site selection and project design decision-making process. The strategic consideration of alternatives which fed directly into the Mona Offshore Wind Project’s site selection process includes:

Table 4.8: Strategic alternatives considered and project decisions.

Alternatives considered	Decision	Justification
Buried onshore cables or overhead lines	Buried onshore cables	From the outset the Applicant discounted the option of overhead lines to reduce potential environmental effects.
HDD at landfall or open cut trenching	HDD at landfall	Whilst both HDD and open cut trenching options are included within the design of the Mona Offshore Wind Project until further engineering feasibility studies are undertaken, the project base case is to bring cables onshore using trenchless techniques.

Alternatives considered	Decision	Justification
HDD or open cut trenching of all major crossings	Open cut trenching	The Applicant is looking to HDD all major crossings (including beneath Llanddulas Limestone and Gwrych Castle Wood SSSI and major roads) to minimise environmental impacts along the Mona Onshore Cable Corridor

4.4.3 Site selection process

4.4.3.1 As discussed in Section 4.1.1 the Applicant has followed a staged site selection and design iteration process from inception to the point of submission of the PEIR. The following key factors have driven the process:

- Review of environmental constraints and planning policy which led to site specific refinement of the Mona Offshore Wind Project site (see Section 4.7).
- The selection of the Irish Sea Zone within Offshore Leasing Round 4 by the Crown Estate, and subsequent award of the AfL to Mona Offshore Wind Limited (see Section 4.2.1 for further details).
- The Holistic Network Design (HND) which identified the Bodelwyddan National Grid substation as the grid connection point for the Mona Offshore Wind Project, and therefore enabled identification of the Mona Offshore and Onshore Cable Corridors and the onshore substation location (see Section 4.6).
- Consultation with statutory and non-statutory consultees from the outset of the Mona Offshore Wind Project. As described in Section 4.3.7 the Applicant has undertaken pre-application engagement with stakeholders, communities and landowners in order to seek input to refine the project design.
- Other proposed development in the area and managing consultation fatigue. Several development schemes are currently being promoted near to the Bodelwyddan National Grid substation including the Awel y Mor offshore wind project. To manage consultation fatigue in the area the Applicant has reviewed and considered feedback received by the Awel y Môr project within its consideration of site selection and alternatives. Feedback has been received by consultees that this helpful to avoid consultees having to duplicate feedback across the two schemes.
- The site selection process and consideration of alternatives for the Mona Offshore Wind Project included consideration of the proposed Morgan Offshore Wind Project Generation Assets, specifically in relation to the array layout and shipping and navigation considerations.

4.4.3.2 This Site selection and consideration of alternatives chapter details the work undertaken from project inception to the point of this PEIR submission. This chapter will be updated following the completion of Section 42, 47 and 48 consultation prior to application for development consent. The chapter is structured as follows:

- Stage 1 - Identification of the Mona AfL area
- Stage 2 - Identification of PoI

- Stage 3 - Identification of onshore and offshore areas of search for scoping (including substation zone)
- Stage 4 - Refinement of project for PEIR
 - Identification and refinement of landfall and offshore export cable route options
 - Refinement of the Mona Onshore Cable Corridor and onshore substation options to PEIR
- Stage 5 - Statutory consultation
- Stage 6 - Post Section 42 non-statutory stakeholder engagement
- Stage 7 - Application boundary

4.4.3.3 Each stage of the iterative site selection process is described in further detail below.

4.5 Stage 1: Identification of Mona Agreement for Lease area

4.5.1.1 The following section describes the process of identifying the Mona Offshore Wind Project AfL area which was the basis of the Mona Offshore Wind Project Scoping Report (Mona Offshore Wind Ltd, 2022).

4.5.2 Offshore Leasing Round 4 process

4.5.2.1 As described in Section 4.4.1 above, TCE launched the Offshore Wind Leasing Round 4 process in September 2019. 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 Northern Wales and Irish Sea Bidding Area covers an area of approximately 8,500km² and has water depths up to 50m, with an average water depth of 34m (shown in Figure 4.3).

4.5.2.2 A Bidding Area Report was prepared by TCE that identified the environmental designations within the Northern Wales and Irish Sea Bidding Area and the key species present (e.g. birds and fish). The report also identified a number of other constraints from activities such as fishing, oil and gas, NATS radar, defence and navigation.

4.5.2.3 In order to bid in Round 4, projects were required to meet certain criteria, including around the siting of bids. A summary of the relevant spatial siting requirements is summarized in Table 4.9 below.

Table 4.9: Offshore Wind Leasing Round 4 bidding rules (Crown Estate, 2019).

Offshore Wind Leasing Round 4 criteria	Mona Offshore Wind Farm compliance
All Projects must be located entirely within a single Bidding Area.	Mona Offshore Wind Project is located entirely within the North Wales and Irish Sea Bidding Area.
Projects must avoid certain constraints identified within the Bidding Areas, including IMO traffic separation schemes and deep-water channels, existing offshore wind farm agreements, marine aggregate licences, capital and navigation dredging areas and coastal outfalls (Hard Constraints).	The Mona Array Area is located to avoid all hard constraints as shown in Figure 4.3.

Offshore Wind Leasing Round 4 criteria	Mona Offshore Wind Farm compliance
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Projects may not be located within 7.5km of an existing offshore wind farm (meaning a wind farm at any stage of development which has been awarded an agreement for lease or lease from The Crown Estate unless the owner of the existing offshore wind farm has given its written consent).	The Mona Array Area is located at least 7.5km away from existing offshore wind farms as shown in Figure 4.3.
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4.5.3 AfL area

4.5.3.1 Prior to the submission of a bid to TCE, detailed consideration of key constraints was undertaken to identify potential project locations within the North Wales and Irish Sea Bidding Area. This was then refined to the Mona AfL area through further analysis of engineering, environmental, economic and consenting risks. Further study work was undertaken to understand key issues such as designated sites, shipping routes, other offshore industries and offshore ornithology.

4.5.3.2 The siting of the Mona Offshore Wind Project was undertaken considering likely constraints, including:

- Ecological designations:
 - Avoidance of overlap with European designated sites and the decision to maintain a 10km offset from the Liverpool Bay Special Protection Area (SPA)
 - Avoidance of Marine Conservation Zones
- Other Sea User considerations:
 - Avoidance of TCE defined 'hard constraints (described in Table 4.9)
 - Avoidance of oil and gas platforms
 - Avoidance of military disposal sites
 - Consideration of shipping and navigation routes
 - Consideration of pipelines and cables infrastructure
- Other constraint considerations:
 - Consideration of wrecks
 - Consideration of aviation constraints (both military and civil aviation)
 - Consideration of seascape, landscape and visual constraints

4.5.3.3 The Mona Offshore Wind Project extent was limited to the south by the requirement to maintain at least a 1nm offset from the International Maritime Organisation (IMO) vessel routing measure (Liverpool Traffic Separation Scheme (TSS)).

4.5.3.4 The Mona Offshore Wind Project extent was limited to the east by the presence of existing oil and gas infrastructure, the closest of which (Conwy platform, operated by eni) is located approximately 1.8km from the Mona Array Area. The Mona Array Area extent was also limited to the east and the south by the project decision to maintain a 10km offset from the Liverpool Bay SPA to align feedback from SNCBs within the Offshore Wind Leasing Round 4 Bidding Area Report (v2.0) (Crown Estate, 2020) that

projects within 10km of the Liverpool Bay SPA would face very significant consenting risks.

4.5.3.5 The AfL area for the Mona Offshore Wind Project is shown in Figure 4.2.

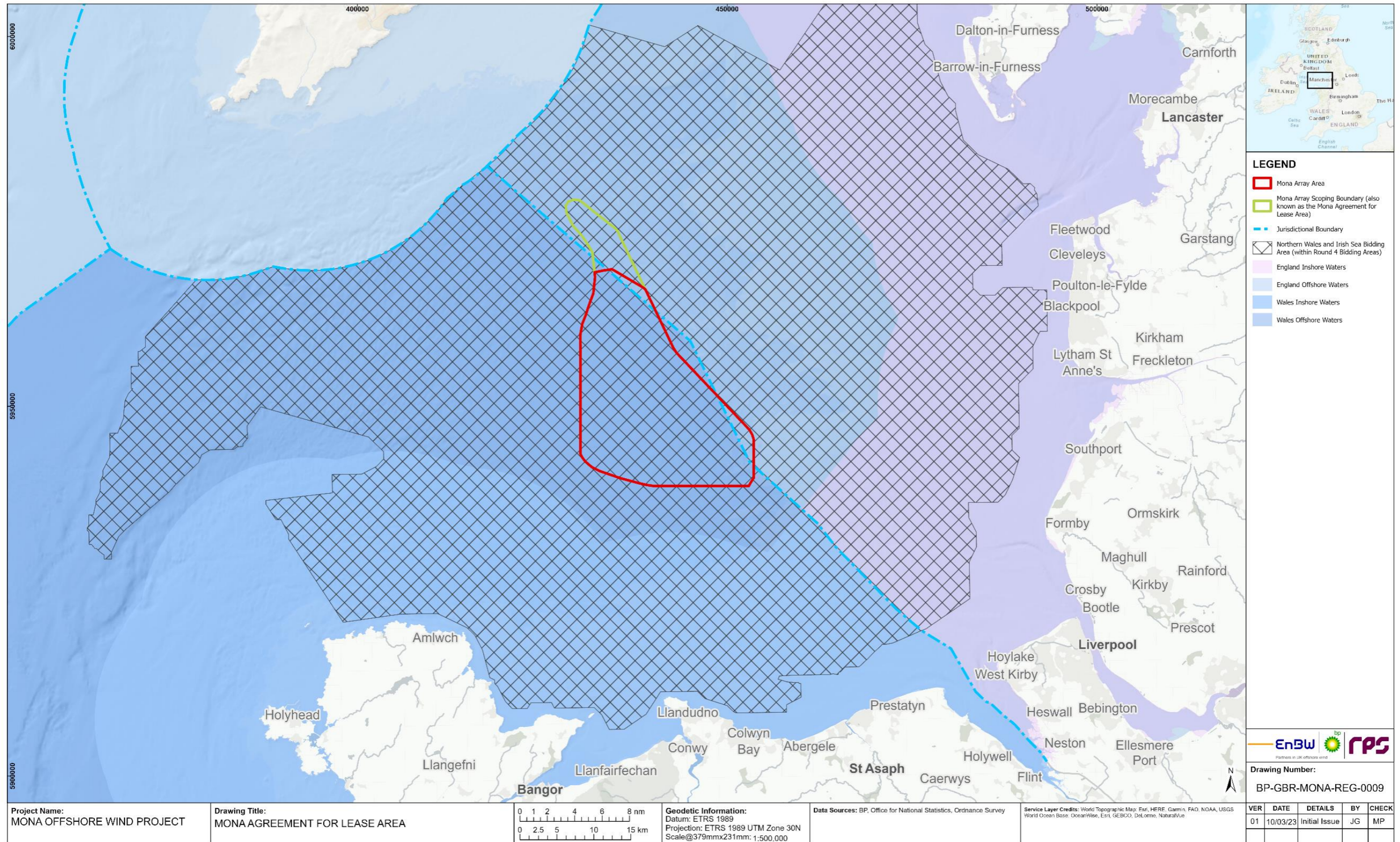


Figure 4.2: Mona Agreement for Lease Area.

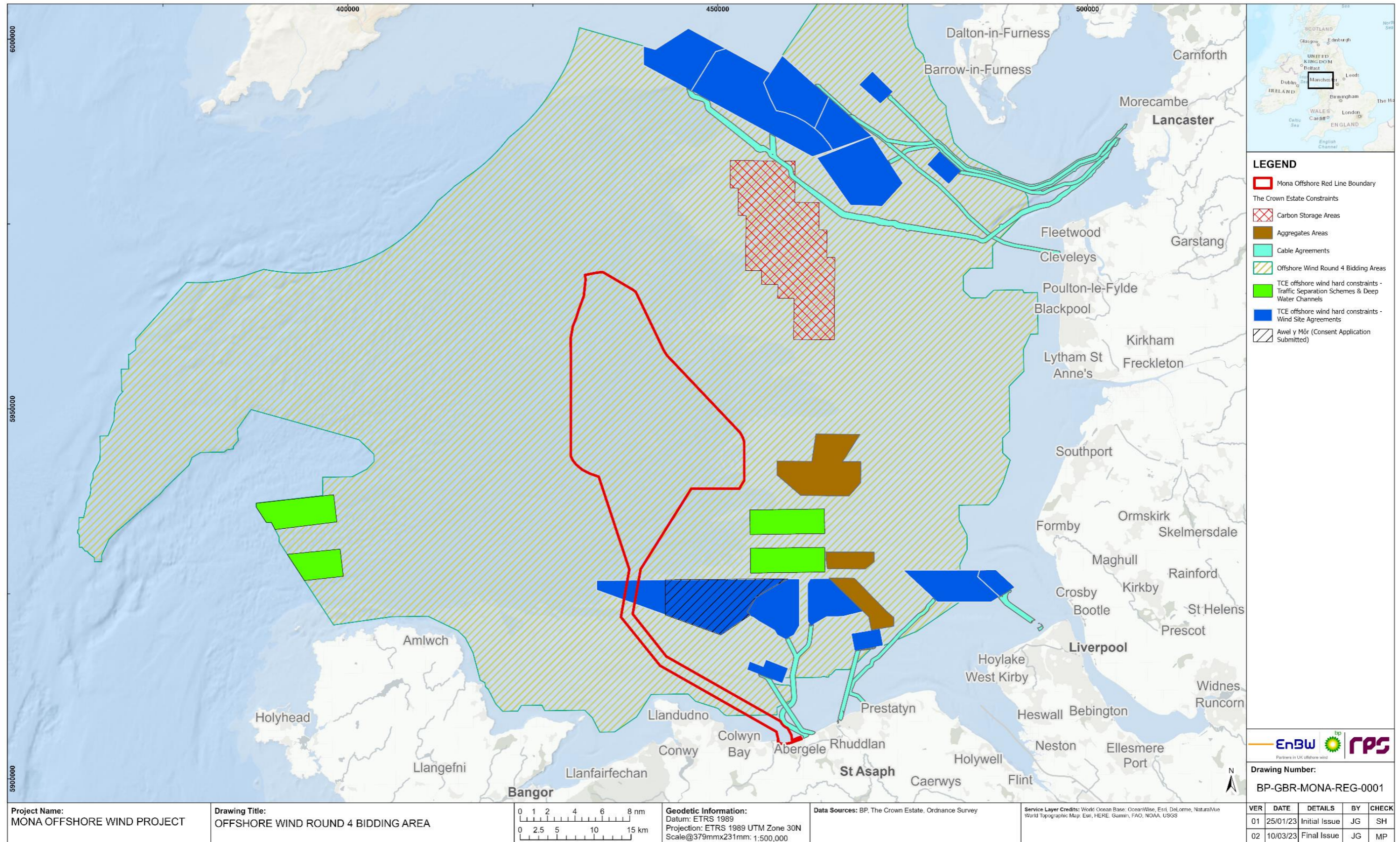


Figure 4.3: Offshore Wind Round 4 Bidding Area.

4.6 Stage 2: Identification of Point of Interconnection

- 4.6.1.1 Until 2021, National Grid Electricity System Operator (NGESO) used the Connection and Infrastructure Operations Note (CION) process to coordinate changes needed to the electricity network to accommodate new offshore connections from offshore energy infrastructure.
- 4.6.1.2 In its 2020 report to parliament, the Climate Change Committee called for government to develop a strategy to coordinate interconnectors and offshore networks for wind farms and their connections to the onshore network and bring forward any legislation necessary to enable coordination (Climate Change Committee, 2020). Following this, the UK government announced the Offshore Transmission Network Review (OTNR) to identify near-term actions and opportunities for offshore windfarm projects to coordinate and thereby address the barriers that the existing offshore transmission regime was considered to present to deployment of offshore wind; the intention being to develop an offshore transmission network that facilitates coordination between offshore wind developments.
- 4.6.1.3 The output of the OTNR was the Holistic Network Design (HND); an integrated approach for connecting new offshore wind infrastructure to the grid cohesively.
- 4.6.1.4 Mona Offshore Wind Project was scoped into the HND as a Pathway to 2030 Project. The recommended design for the Northwest Region is a combination of collaborative developer-led solutions and single radial connections.
- 4.6.1.5 A number of potential grid connection locations and options were considered by NGESO 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 forwards in the Irish Sea).
- 4.6.1.6 Whilst the decision for where projects connect to the grid ultimately sits with 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 and to provide input on environmental and consenting constraints of the Points Of Interconnection (POI) under consideration.
- 4.6.1.7 The Applicant undertook constraints analysis for six POI in the Irish Sea; Wylfa, Pentir, Bodelwyddan, Connah's Quay, Kirkby and Penwortham. A full analysis of the constraints at each of the potential POI is not presented within this document, but below are the key constraints identified for the five POIs not taken forward:
- **Wylfa:** areas of rocky seabed around coast, environmental constraints associated with Anglesey Terns SPA and North Anglesey Marine SAC
 - **Pentir:** very long intertidal area with strong currents, environmental constraints associated with Menai Strait and Conwy Bay SAC and Lavan Sands SSSI
 - **Connah's Quay:** significant offshore constraints associated with existing offshore wind, oil and gas infrastructure and cables and pipelines, limited potential landfall options avoiding designated sites (Dee Estuary SPA, SAC, Ramsar and SSSI), challenging route to site substation as immediately adjacent to Dee Estuary SPA, SAC, Ramsar and SSSI, substation sites in area of high flood risk

- **Kirkby:** close proximity to shipping lanes, significant number of offshore cable and pipeline crossings required, long intertidal zone, environmental constraints associated with Ribble and Alt Estuaries SPA and Ramsar and Sefton Coast SAC and SSSI at potential landfalls.
- **Penwortham:** potential crossing of Fylde MCZ, potential crossing of gas field, long intertidal zone, environmental constraints associated with Ribble and Alt Estuaries SPA and Ramsar and Lytham St Annes SSSI and National Nature Reserve (NNR) at potential landfall, complex HDD across river Ribble.

4.6.1.8 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.

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

4.7.1.1 Initial mapping and consideration of onshore and offshore constraints was undertaken to develop defined search areas (within which future infrastructure would be sited) for each project component (offshore cable corridor, landfall, onshore cable corridor and onshore substation) for the purposes of scoping and non-statutory consultation with the public and relevant statutory and non-statutory stakeholders.

4.7.1.2 The scoping boundaries defined included sufficient buffers to enable an iterative design refinement process (based on stakeholder feedback, further data acquisition and interrogation and engineering optimisation) for the evaluation of specific routes and infrastructure to take place as the Mona Offshore Wind Project progressed through the pre-application phase.

4.7.1.3 The search areas formed the basis of the Mona Array Scoping Boundary, the Mona Offshore Transmission Infrastructure Scoping Search Area and the Mona Onshore Transmission Infrastructure Scoping Search Area used within the Mona Offshore Wind Project EIA Scoping Report, submitted to the Planning Inspectorate in May 2022.

4.7.2 Identification of the Mona Array Area

4.7.2.1 Early in the Mona Offshore Wind Project development the Applicant identified the need to remove the northernmost part of the Mona Offshore Wind Project AfL area to mitigate potential impacts on shipping and navigation. This reduced area was identified as the Mona Potential Array Area within the scoping report submitted to the Planning Inspectorate in May 2022 and the Mona Array Area within this PEIR chapter.

4.7.3 Identification of an Offshore Scoping Search Area

4.7.3.1 The Mona Offshore Transmission Infrastructure Scoping Search Area was identified for the Mona Offshore Export Cable Corridor aimed at meeting the site selection principles (described in Section 4.4.1) and using environmental constraints and engineering development considerations.

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- 4.7.3.2 The distribution of 'hard constraints' including existing offshore wind farms (Burbo Bank, North Hoyle, Rhyl Flats, Gwynt y Mor and Awel y Môr AfL area), an existing anchorage area, pipeline and cable infrastructure and the 'Liverpool Bay' marine aggregate extraction Area 457 (see Figure 4.1) necessitated a wide Area of Search (AoS) for the Mona Offshore Cable Corridor.
- 4.7.3.3 This created an AoS from the southern extent of the Mona Array Area to the Welsh coastline which extended to the East to the boundary of the Burbo Bank extension lease area and to the west past the Awel y Môr AfL area.
- 4.7.3.4 The AoS sought to specifically avoid interactions with key ecological designations including the Aber Dyfrdwy/Dee Estuary SAC and SPA, Traeth Lafan/Lavan Sands, Conwy Bay SPA, Morwenoliaid Ynys Môn/Anglesey Terns SPA and the Gogledd Môn Forol/North Anglesey Marine SAC. The AoS looked to minimise interaction with ecological designations that could not be avoided, specifically Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC, for which only a small portion of the northeast corner overlapped with the AoS. However, the Bae Lerpwl/ Liverpool Bay/SPA extends from the east coast of Anglesey to Morecambe Bay making crossing the site unavoidable.

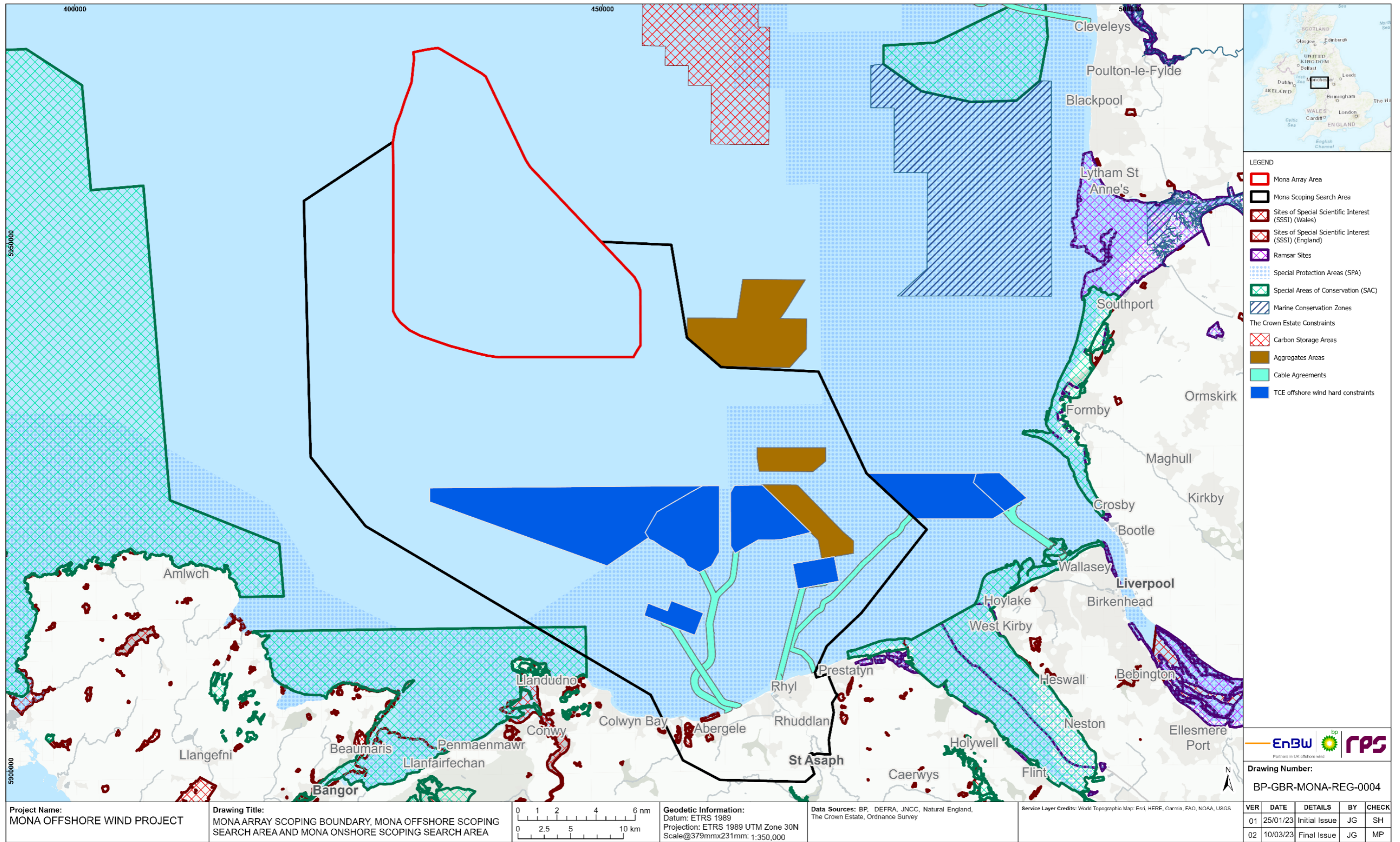


Figure 4.4: Mona Array Scoping Boundary, Mona Offshore Scoping Search Area and Mona Onshore Scoping Search Area.

4.7.4 Identification of a Landfall Area of Search

- 4.7.4.1 One of the key considerations in the identification of onshore and offshore cable routing options was the identification of landfall options in the vicinity of the National Grid substation at Bodelwyddan. An initial search area was identified for the landfall between the towns of Llanddulas and Prestatyn on the North Wales coast. The extent of the landfall search area was to accommodate feasible offshore export cable options and to avoid the ecological designations of the Dee Estuary SAC, SPA and Ramsar to the east, and the Menai Strait and Conwy Bay SAC to the west. This landfall search area was used to define the landfall boundary for scoping (approximate length of coastline of 16km) and avoids any direct impact to the ecological designations referenced above and protected features within them. The landfall search area is shown in Figure 4.5.
- 4.7.4.2 The landfall extent used for scoping was slightly less than the Area of Search as no feasible landfall options were identified west of Llanddulas or east of Prestatyn. During site selection the Awel y Môr Offshore Wind Farm identified a potential landfall option at Llandulas west which was considered as part of initial landfall discussions but was discounted as it would not allow a feasible HDD to be undertaken. As such, this option was not taken forward for further assessment by the Mona Offshore Wind Project. Options to the east of Prestatyn were discounted due to the overlap with the Dee Estuary SAC/SPA/Ramsar site.

4.7.5 Identification of the Mona Onshore Transmission Infrastructure Scoping Search Area

- 4.7.5.1 Following on from the landfall search area, the Mona Onshore Transmission Infrastructure Scoping Search Area was defined for the purposes of consultation and the EIA scoping Mona Offshore Wind Project. The key influences on the Mona Onshore Transmission Infrastructure Scoping Search Area (Figure 4.4) were the landfall search area along the Welsh coastline and an initial 3km area of search for the onshore substation (which was later expanded to 5km for the onshore substation area of search) placed around the identified National Grid connection point at the Bodelwyddan Substation (see Section 4.7.6 and Figure 4.6). A broad area of land was then identified to join these two geographical areas, which was then further refined to avoid the Bryniau Clwyd A Dyffryn Dyfrdwy/Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB) and the city of St. Asaph (Figure 4.7).
- 4.7.5.2 In parallel with the scoping phase of the Mona Offshore Wind Project, in March to June 2022, a long list of onshore cable corridors within the overall area of search was identified.

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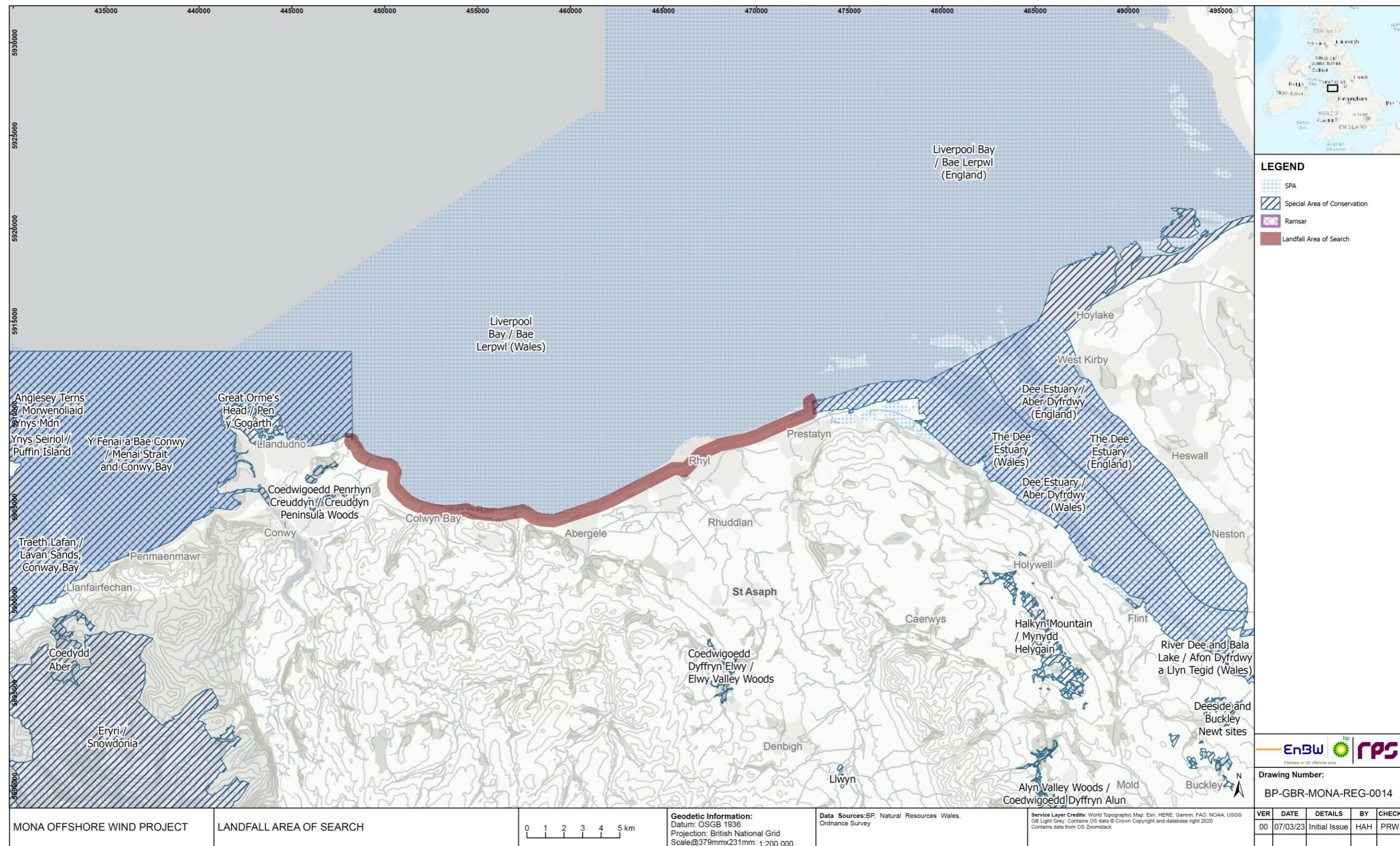


Figure 4.5: Landfall Area of Search for the Mona Offshore Wind Project.

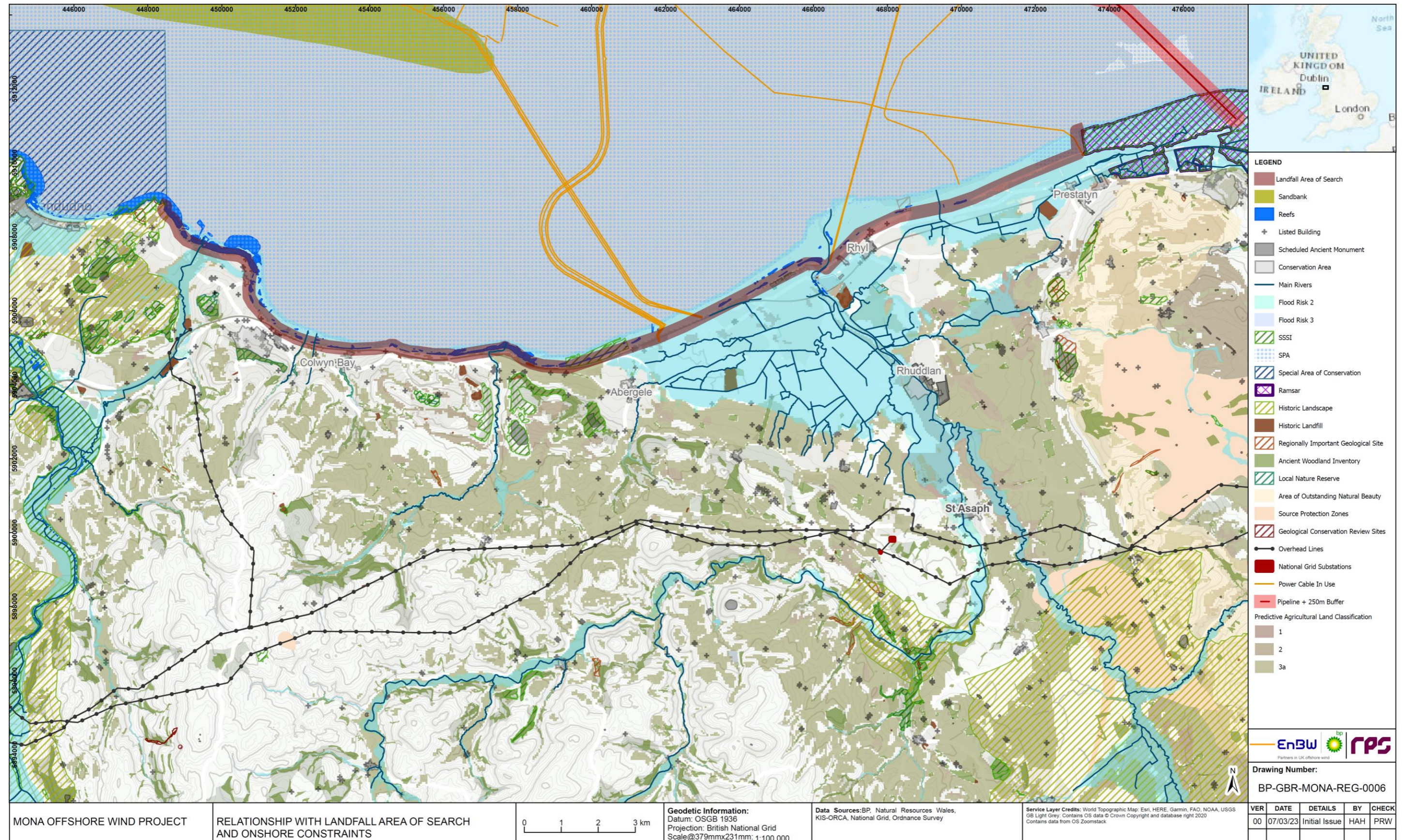


Figure 4.6: Relationship between Landfall Area of Search and Onshore Constraints.

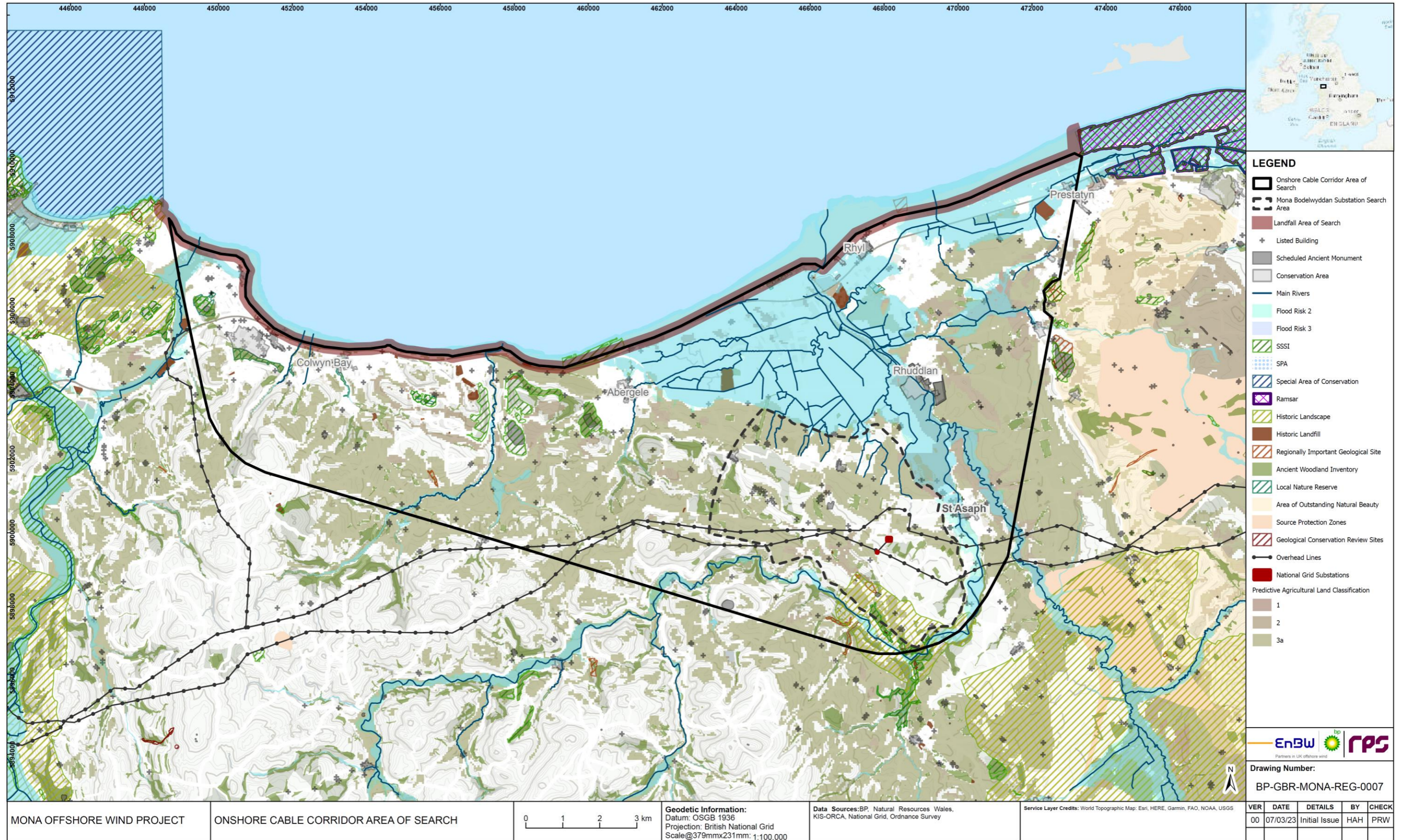


Figure 4.7: Onshore Cable Corridor Area of Search.

4.7.6 Identification of an Onshore Substation Area of Search

- 4.7.6.1 The guiding principles for locating the project's onshore substation are to achieve an economic and efficient connection (i.e. as close as possible to the National Grid connection point) whilst taking into account environmental constraints including siting principles in the Horlock Rules (described in 4.3.4). The onshore substation area of search (Figure 4.8) was initially defined as a 3km buffer around the grid connection point at Bodelwyddan National Grid Substation. As noted in Section 4.3.4 the Horlock Rules state "Consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum... Consideration at an early point of the study should be given to placing the electrical infrastructure as close as possible to the existing National Grid connection point (if feasible) in order to minimise the landscape and visual effects associated with introducing new electricity infrastructure to the environment."

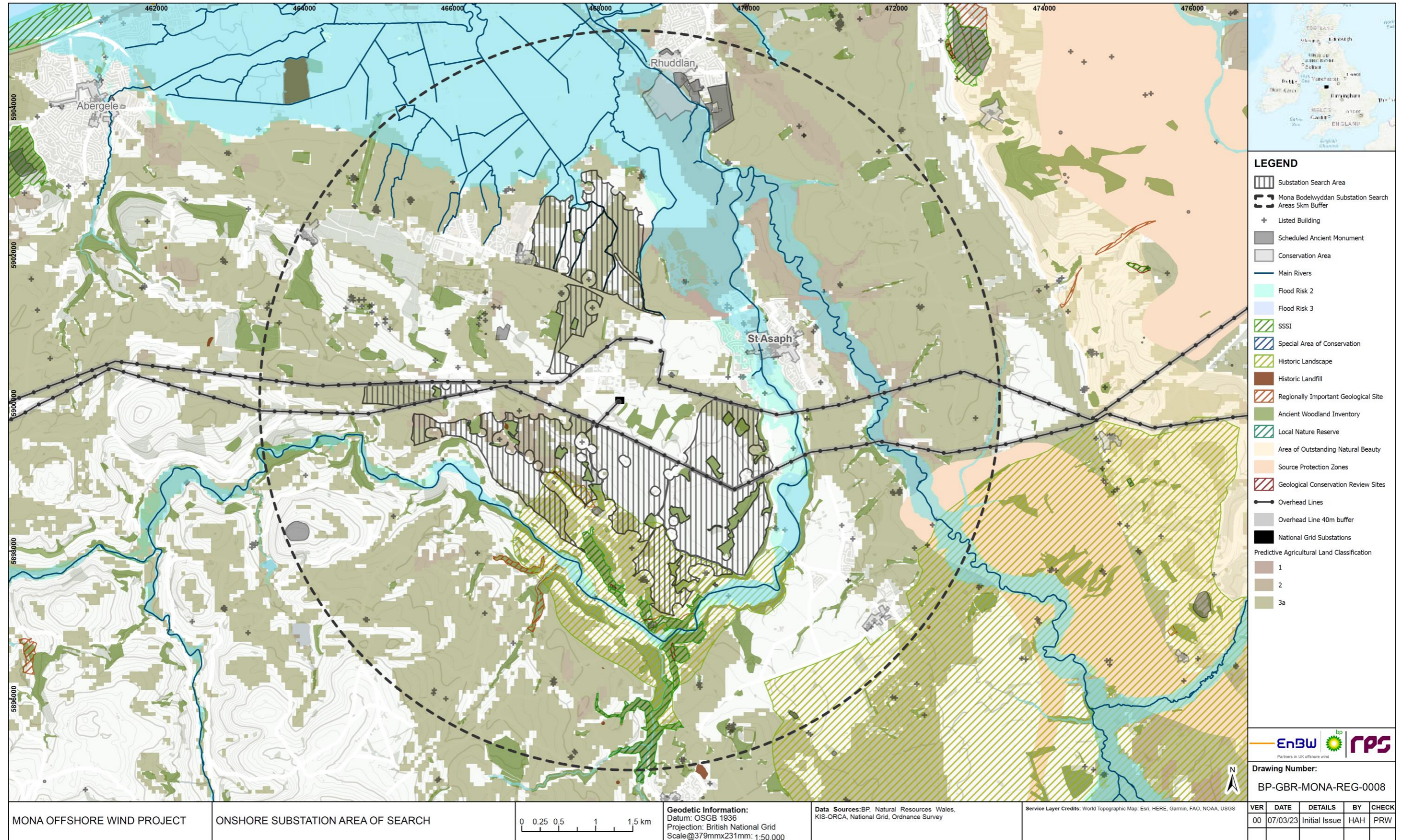


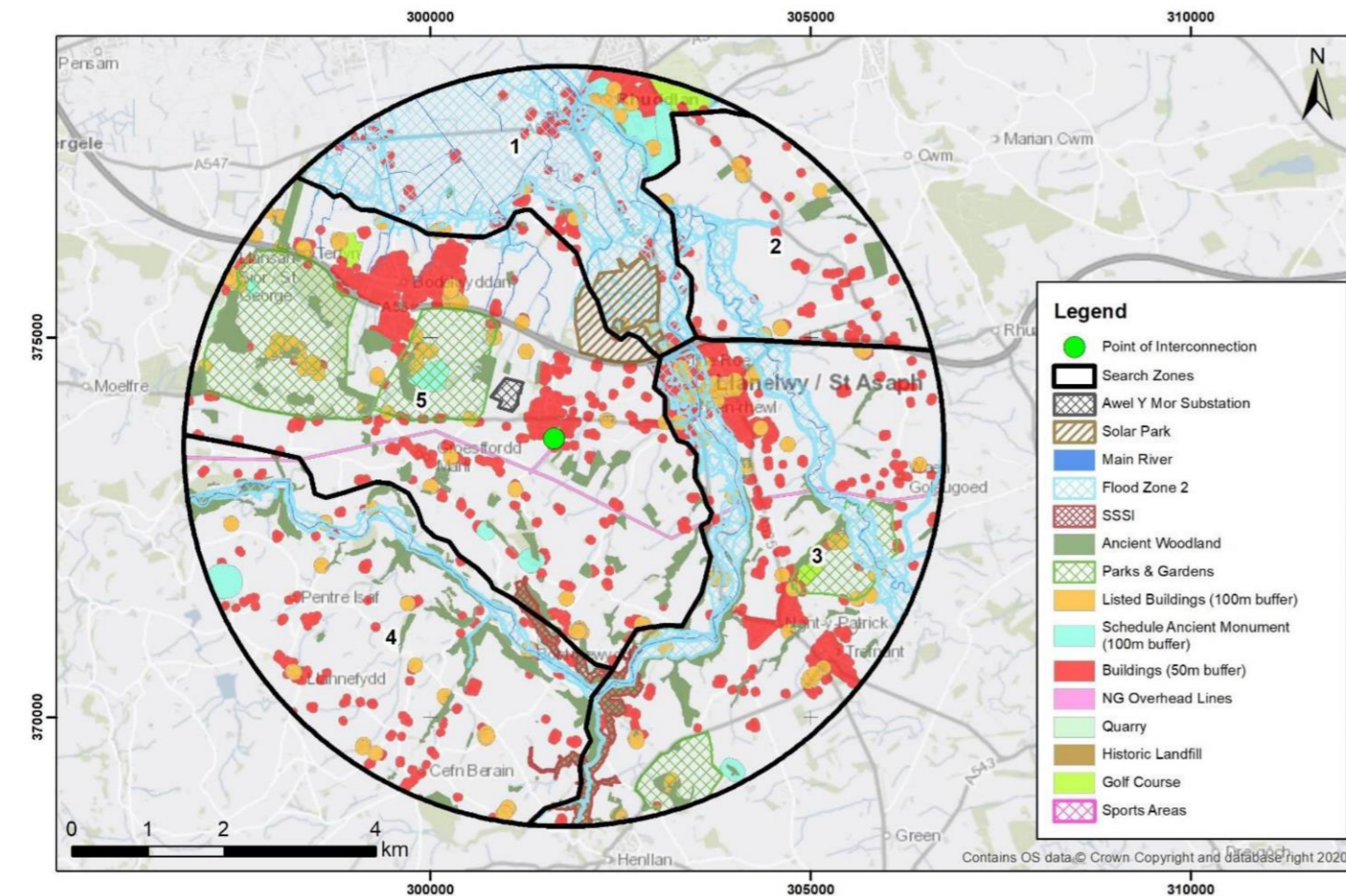
Figure 4.8 Onshore Substation Area of Search.

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4.7.6.2 The 3km buffer was subsequently expanded to 5km 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.

4.7.6.3 Hard constraints such as areas of infrastructure, landfills, roads, railways, overhead lines, etc. (as outlined in volume 5, annex 4.1: Site Selection Area of Search Identification) were plotted and removed from the onshore substation area of search. These are illustrated in Plate 4.1.

Plate 4.1: Mona Offshore Wind Project onshore substation search area and zones.



4.7.6.4 Five onshore substation search zones were identified (see Figure 4.11) with zone boundaries coinciding with the perimeters of hard constraint areas. The extents of Flood Zone 2 areas of higher risk flood zones were used to define the boundary of Zone 1, extending south as far as the A55. Continuing the line of the A55 to the east created Zone 2, an area of relatively sparse constraint but from which connection to the Bodelwyddan National Grid Substation would mean crossing two river crossings or circumnavigation of the planned Elwy Solar Energy park to the west (Note: planning application for the Elwy Solar Energy Park was refused after the completion of initial site selection work though is currently subject to judicial review. This does not affect the outcomes of the site selection process).

4.7.6.5 Zone 3, south of the A55, was defined by continuing the western limit of Zone 1 to the south, following the extent of Flood Zone 2 associated with the Afon Elwy. This zone is more densely constrained than Zone 2 to the north, and connection to the Bodelwyddan National Grid Substation is complicated by the town of St. Asaph in the northwest corner as well as the river running along the western edge. The final boundary broadly follows Afon Elwy west towards its source but is defined by an area (Zone 4) of high slopes around and to the south of the river. The remaining land in the middle, surrounding the Bodelwyddan National Grid Substation and extending to the east, is Zone 5.

4.7.6.6 An appraisal of each zone was made, with conclusions as to the viability of each summarised in Table 4.10. Only Zone 5 was retained for further assessment, the other four having been discounted from further consideration for the reasons outlined in Table 4.10.

Table 4.10: Onshore substation search zone appraisal.

Zone	Description	Status
1	Zone lies almost entirely within higher risk flood zones 2 and 3, going against Horlock rules as well as National Grid policy. The increased flood risk also presents a design and construction challenge.	Discounted
2	Access to the zone from the west is all but prevented by the planned development and solar farms within the southern portion of Zone 1. Access from the south is blocked by St. Asaph town and the necessity of crossing River Clwyd and Afon Elwy.	Discounted
3	South of the A55 the urban settlement of St. Asaph presents a barrier to cable connectivity and this barrier extends down the St. Asaph Road to Trefant effectively removing the land to the east of St. Asaph from further consideration. The western boundary of Zone 3 (where it adjoins Zone 5) runs along a ridge line in the topography. On the river Elwy side of this boundary there is a very long slope deemed to present a highly challenging cable laying prospect. The remaining part of Zone 3 to the west of this slope, up to the settlement of St. Asaph Road is removed from further consideration.	Discounted
4	There are large areas of land in Zone 4 which are potentially suitable based on the constraints screened thus far. However, the northern boundary of Zone 4 (where it abuts Zone 5) traverses the foot of a steep hill line with a north facing aspect. This line of hills rises steeply to the south and then falls down into the River Elwy valley, before rising again to the south towards Llanefydd. The sequence of steep topography along the boundary with Zone 5 is deemed to represent a significant cable laying challenge and renders Zone 5 inaccessible.	Discounted
5	This area is relatively flat with rising topography to the south along the B5381 Roman Road and towards Plas-yn-Cefn in the south. There are increasing areas of built development in the St. Asaph Business Park, Bodelwyddan town to the north and large inaccessible areas of Registered Parks and Gardens to the west of the zone. These existing features will limit flexibility for cable routing but nevertheless the zone is deemed accessible. The land to the south of the Pol is relatively unconstrained.	Retained

4.7.6.7 Key areas removed from the area of search were 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 further stretch of the River Elwy and its associated flood zones,

along with the Coedwigoedd Dyffryn Elwy/Elwy Valley Woods SAC, Coedydd Ac Ogofau Elwy A Meirchion SSSI and the Lower Elwy Valley Historic Landscape, which encompasses scattered listed buildings and Scheduled Monuments.

4.7.6.8 The area of search (Zone 5) then formed the basis for the selection of available parcels of land to site potential onshore substations 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.

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

4.8.1.1 The following sub-sections describe the process in evolution of the Mona Offshore Wind Project design from the scoping phase, through to the design in its current form in the PEIR, for the purposes of informing statutory consultation.

4.8.1.2 Once environmental constraints, engineering assumptions and the framework provided by relevant guidance had been applied to the offshore and onshore areas of search, the next step in the site selection process was to identify defined options for each element to take forward for further assessment and consultation.

4.8.1.3 The Mona Array Area was refined for PEIR to take into account feedback from key stakeholders. Further refinements of the Mona Array Area will take place between PEIR and application submission as described in paragraph 4.8.1.3 of this chapter.

4.8.1.4 Landfall options were identified and assessed to find a feasible option once engineering and environmental constraints were taken into account.

4.8.1.5 A longlist of offshore export cable route options was identified and subject to detailed assessment between the Mona Array Area and landfall location. This included consideration of feasible landfall options as described above.

4.8.1.6 It was not possible to undertake an options assessment for the Mona Onshore Cable Corridor as a number of planning, land, consenting and engineering constraints meant that there was limited optionality for the route between landfall and the Bodelyyddan National Grid Substation (see Section 4.8.4).

4.8.2 Mona Array Area refinement for PEIR

4.8.2.1 Further refinements to the Mona Array Area will be undertaken between PEIR and application submission, as described within volume 2, chapter 12: Shipping and navigation of the PEIR. The final Mona Array Area will be described in detail within the Environmental Statement that will accompany the application for consent.

4.8.3 Mona Offshore Cable Corridor selection

4.8.3.1 The location of the Mona Offshore Cable Corridor is driven by the location of the Mona Array Area and grid connection point. As noted in Section 4.7 the offshore environment between the Mona Array Area and potential landfall options is congested with the presence of key constraints including environmental designations and the need to route around existing offshore wind farms, anchorage areas, pipelines and cable infrastructure. This limited the number of viable offshore export cable route options.

4.8.3.2 As described in Section 4.7, a broad area of search was defined for the purposes of scoping, taking into consideration key constraints described above. In parallel the

Applicant undertook a process of refinement on the Mona Offshore Cable Corridor. This process began with consideration of the site selection principles (described in Section 4.3.6) and TCE Cable Route Protocol (described in Section 4.3.5).

4.8.3.3 The next step in the site selection process was to identify defined options for the Mona Offshore Cable Corridor to take forward for further assessment and consultation.

4.8.3.4 The Mona Offshore Cable Corridor was defined as being 1.5km wide for the majority of the Mona Offshore Cable Corridor with a defined separation distance of 200m between cables to be applied. The width of the required Mona Offshore Cable Corridor was defined by the requirement to have sufficient separation distance between the cables to avoid the risk of damage or sterilisation to neighbouring cables during installation and to mitigate the risk of damage sterilisation of neighbouring cables during maintenance or repair operations. It was also characterised by the need for cables to be able to enter the Mona Array Area at different points as the location of Offshore Substation Platforms (OSP) has not yet been defined within the Mona Array Area.

4.8.3.5 An initial list of four potential offshore export cable route options and associated landfall locations were identified which were subject to further assessment, as described in Table 4.11. These routes were identified by undertaking a Black, Red, Amber, Green (BRAG) assessment of environmental and technical constraints and comprised two routes to the west of the Awel y Môr offshore wind farm (West A and West B) and two routes between the eastern and western Gwynt y Mor array areas (East A and East B). Routes to the east of the eastern array of the Gwynt y Mor offshore windfarm were discounted from further consideration as it was identified early in the refinement process that it would not be feasible to route around the marine aggregate extraction lease area without encroaching on the large anchorage area located between Burbo Bank offshore windfarm and the marine aggregate extraction area (see Figure 4.9). Encroaching on the large anchorage area would present a significant technical and commercial risk for the offshore export cables due to the depth of burial required and thus the anchorage area was therefore considered a hard constraint by the Applicant.

4.8.3.6 Further options to the west of the proposed Awel y Môr, beyond those presented in Table 4.11, were considered by the Applicant but were not taken forward for shortlisting and further consideration. West A and West B were considered to minimise interaction with the Menai Strait and Conwy Bay SAC and Constable Bank Annex 1 sandbank feature whilst maintaining shortest route preference. Routes further to the west would still pass these designated features but would have a longer cable route which did not align with site selection principles (shortest route preference).

Table 4.11: Offshore export cable route options taken forward for further assessment.

Option	Description	Associated landfall option
West A	Offshore cable routeing south from Mona Array Area travelling to west of Gwynt y Mor and proposed Awel y Môr windfarms.	Llanddulas West
West B	Offshore cable routeing south from Mona Array Area travelling to west of Gwynt y Mor and proposed Awel y Môr windfarms.	Belgrano

Option	Description	Associated landfall option
East A	Offshore cable routeing south from Mona Array Area travelling between Gwynt y Mor offshore windfarm western and eastern arrays.	Belgrano
East B	Offshore cable routeing south from Mona Array Area travelling between Gwynt y Mor offshore windfarm western and eastern arrays.	Rhyl

4.8.3.7 After completion of the BRAG assessment and engineering feasibility studies, the East A and B offshore export cable routes between the Gwynt y Mor array areas (East A and East B in Table 4.11) were determined by the Applicant to have too great a technical and consenting risk associated with them due to the existing presence of the Douglas gas pipeline in the gap which runs between the Douglas Field and Point of Ayr terminal. This pipeline is likely to be repurposed as part of the Hynet scheme for CO₂ transportation.

4.8.3.8 The removal of East A and East B left only the West A and B offshore export cable route options under consideration. As described in 4.8.3 the Belgrano landfall option was discounted from further consideration due to the presence of nearshore constraints which meant that only West A was taken forward.

Offshore export cable corridor consultation and further consideration of designated sites

4.8.3.9 A key consideration for the Applicant within the design of the Mona Offshore Cable Corridor was the consideration of the output of the ECRA (described in 4.2.4) and the avoidance of key ecological designations where possible. As described in Section 4.7, the initial landfall area of search was identified to avoid interaction with the Dee Estuary SAC/SPA/Ramsar site and with designated features of the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC. The Applicant also had regard to the conclusions of the ECRA (described in further detail below) within the siting of the Mona Offshore Cable Corridor.

4.8.3.10 Key ecological designations in the vicinity of the Mona Offshore Cable Corridor are shown in Figure 4.11 listed in Table 4.12 below and described further in the following sections.

Table 4.12: Key designated sites and Annex 1 features in the vicinity of the Mona Offshore Cable Corridor.

Designated Site Name	Designated Site Type	Overlap
Liverpool Bay/Bae Lerpwl	SPA	Mona Offshore Cable Corridor goes through ~19km of the SPA
Y Fenai a Bae Conwy/Menai Strait and Conwy Bay	SAC	Mona Offshore Cable Corridor goes through ~2.5km of the corner of the SAC
Constable Bank	Annex 1 sandbank outside an SAC	Mona Offshore Cable Corridor goes through Constable Bank Annex 1 sandbank feature (avoids Constable Bank admiralty charted feature)

Designated Site Name	Designated Site Type	Overlap
Traeth Pensarn	SSSI	Mona Offshore Cable Corridor overlaps with 0.75km of western extent of Traeth Pensarn SSSI
<i>Sabellaria alveolata</i> reef	Annex 1 reef feature	Located to the west within the Mona Offshore Cable Corridor. Reef covers an area of 47,473m ²

Liverpool Bay/Bae Lerpwl SPA

4.8.3.11 The Mona Offshore Cable Corridor intersects the Liverpool Bay SPA. This large site extends from the east coast of Anglesey to Morecambe Bay making crossing the site with the Mona Offshore Cable Corridor unavoidable. The SPA is designated for red-throated diver *Gavia stellata*, common scoter *Melanitta nigra*, little gull *Hydrocoloeus minutus*, common tern *Sterna hirundo*, little tern *Sterna albifrons* and an internationally important waterbird assemblage.

4.8.3.12 The ECRA identified a number of medium and high risk species associated with the Liverpool Bay SPA including red-throated diver, little gull and Little tern. The Applicant has looked to take the shortest viable route through the SPA to minimise potential interaction with designated species.

4.8.3.13 Further information on the Mona Offshore Wind Project interaction with the Liverpool Bay SPA is detailed within the Information to Support the Appropriate Assessment (ISAA) and within volume 2; Chapter 10: Offshore Ornithology of the PEIR.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

4.8.3.14 A small portion of the Mona Offshore Cable Corridor overlaps with the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC as shown on Figure 4.11. The Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC is designated for the following features: sandbanks slightly covered by water at all time, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays, reefs and submerged or partially submerged sea caves.

4.8.3.15 The Mona Offshore Cable Corridor avoids mapped large shallow inlets and bays, submerged or partially submerged sea caves and reef features of the SAC (see Figure 4.14). This takes into account feedback received from NRW, described in Table 4.12.

4.8.3.16 The ECRA identified a low to medium vulnerability for the sandbanks which are slightly covered by seawater all the time and mudflats and sandflats not covered by seawater at low tide. The Mona Offshore Cable Corridor will avoid the mudflats and sandflats not covered by seawater at low tide feature of the SAC as the Mona Offshore Cable Corridor is located beyond one tidal excursion of the intertidal section of the SAC. The description of the feature (JNCC, 2015) refers specifically to Traeth Lafan, the shores of the Menai Strait and the Foryd Estuary, all of which have been avoided through the site selection process. The location of mud and sandflat features has also been assessed using the Data Map Wales (2023) which confirms that these features are limited to the Conwy Bay area.

4.8.3.17 The sandbanks slightly covered by seawater at all time features of the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC were mapped using Data Map Wales (2023)

which indicated that sandbank features are limited to Conwy Bay and do not interact with the Mona Offshore Cable Corridor. However, given the mobile nature of this feature the project has applied caution and has assumed that sandbank features could be present in the Mona Offshore Cable Corridor. Future refinement of the Mona Offshore Cable Corridor and assessment of mitigations may be undertaken following the receipt of survey data for the Mona Offshore Cable Corridor and will be submitted with the Environmental Statement.

4.8.3.18 Further information on the Mona Offshore Wind Project interaction with the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC is detailed within the ISAA and within volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR.

Constable Bank Annex 1 Sandbank Feature

4.8.3.19 Constable Bank is a designated Annex 1 sandbank feature that covers a large area off the north Wales coast.

4.8.3.20 As described in Table 4.13, feedback from NRW identified a preference for the Applicant to avoid the Constable Bank. However, the Applicant has not been able to identify a route that avoids the Constable Bank whilst also avoiding the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC (see Figure 4.10). The Applicant has routed the Mona Offshore Cable Corridor as far to the west as possible to avoid the charted Constable Bank feature, and the Mona Offshore Cable Corridor is located in an area of deeper water.

4.8.3.21 Further information on the Mona Offshore Wind Project interaction with the Constable Bank Annex 1 Sandbank is detailed within volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR.

Sabellaria alveolata reef

4.8.3.22 The intertidal survey of the Mona Offshore Cable Corridor identified an extensive mature *Sabellaria alveolata* reef, an Annex 1 habitat at the landfall. The Applicant has mapped this habitat and has committed to maintaining a 50m buffer from the reef at its current extent.

Consultation

4.8.3.23 The West offshore routes formed the basis of consultation undertaken with the project Evidence Plan Process Steering Group in July 2022. By the time the Steering Group meeting was undertaken the decision had been taken not to progress the Belgrano landfall (West B) due to existing infrastructure constraints. As such, only the Llanddulas options (West A) were presented.

4.8.3.24 The feedback received from the Steering Group is summarised in Figure 4.13 below.

Table 4.13: Feedback received on the Mona Offshore Cable Corridor during July 2022 Steering Group meeting.

Recommendation	Stakeholder
Offshore cable corridors crossing the Constable Bank sandbank feature should be avoided. Sandwave clearance should not occur on the bank and rock protection for cables should not be placed on the bank or in close vicinity.	NRW
Reef features of the Menai Strait and Conwy Bay SAC should be avoided by micro-siting of cables. No rock protection should be placed within the SAC.	NRW
The Traeth Pensarn SSSI should be considered as a key environmental constraint. The vegetative shingle bank feature should be considered as an Annex 1 feature.	NRW

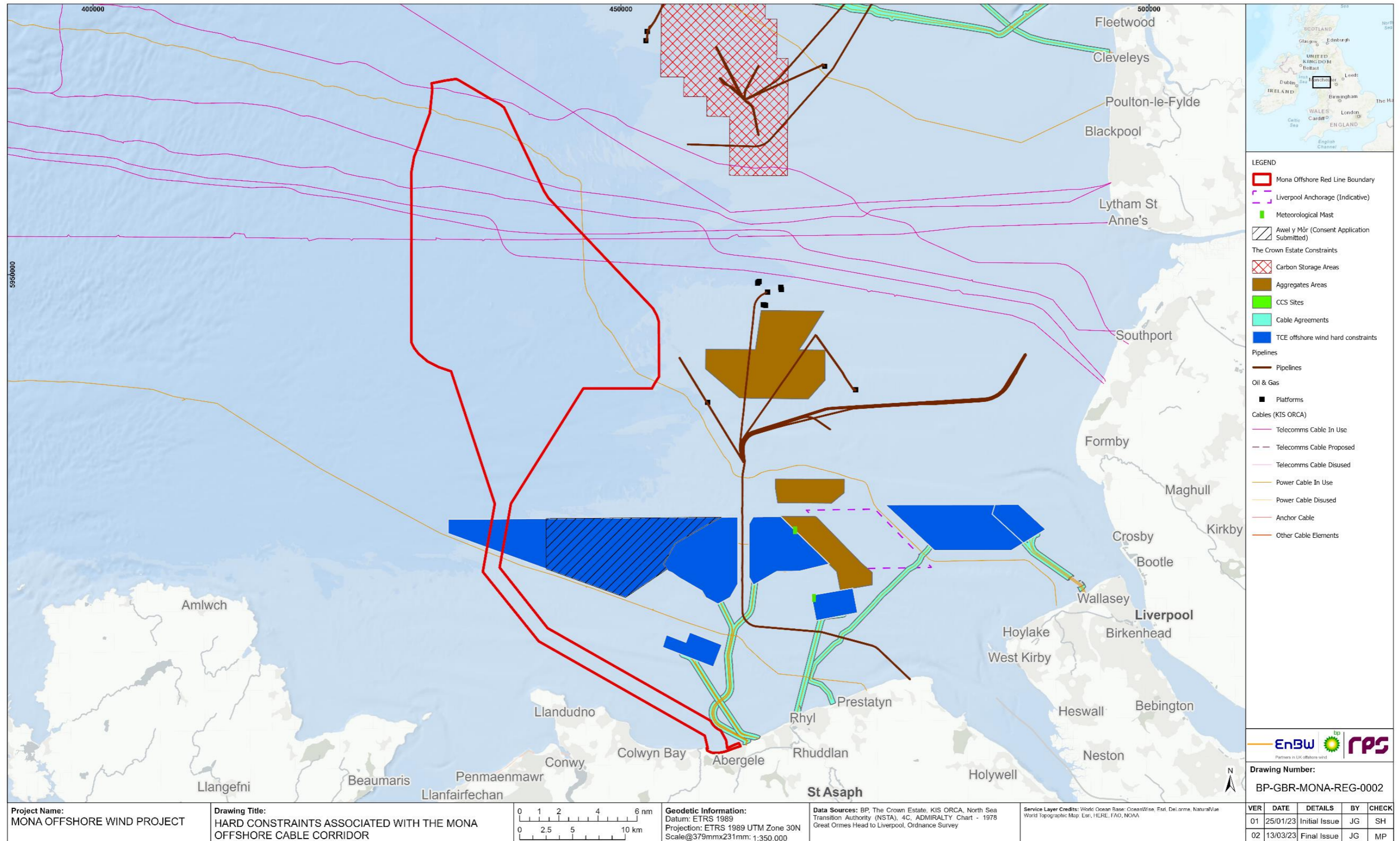


Figure 4.9: Hard constraints associated with the Mona Offshore Cable Corridor.

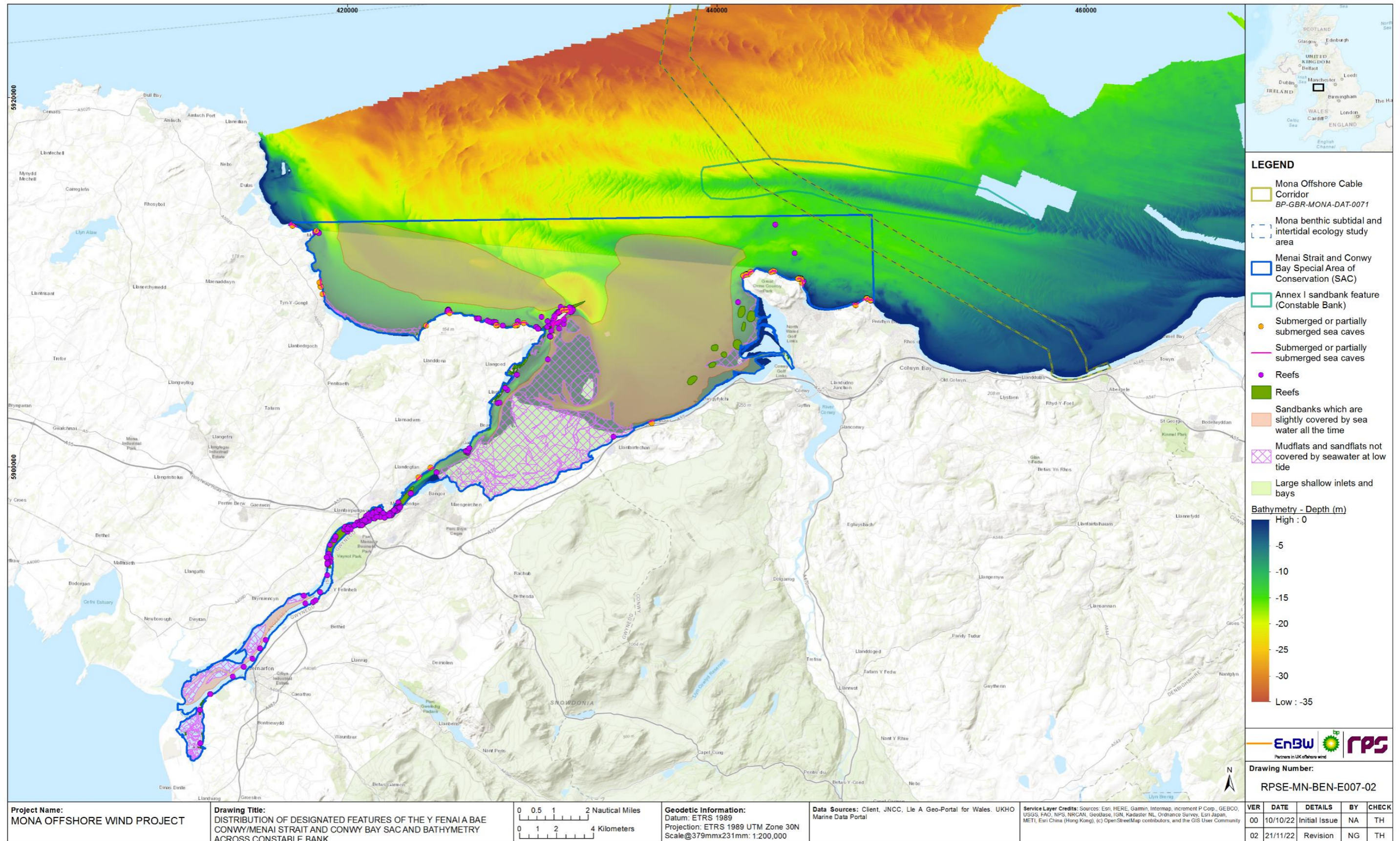


Figure 4.10: Distribution of designated features of the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC and bathymetry across Constable Bank.

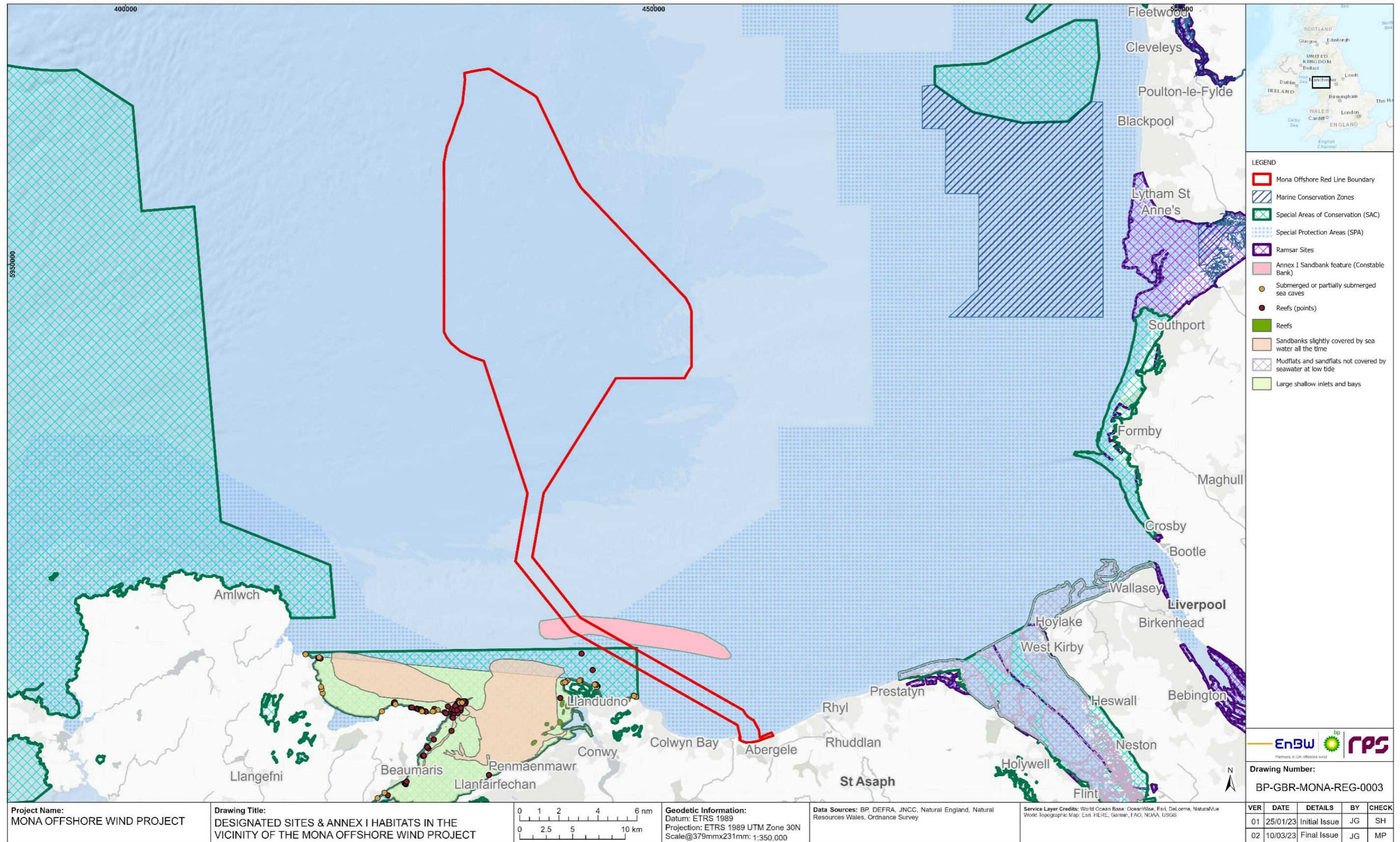


Figure 4.11: Designated sites and Annex 1 habitats in the vicinity of the Mona Offshore Wind Project.

4.8.4 Identification and Refinement of Landfall Options

- 4.8.4.1 The Applicant has undertaken a detailed site selection process to refine the Mona Offshore Wind Project to a single landfall in preparation for PEIR and statutory consultation. The Applicant was not able to apply a full BRAG process for the identification of a viable landfall due to a number of engineering constraints present in the offshore and intertidal environment.
- 4.8.4.2 However, the Applicant followed relevant site selection principles for the landfall location, ensuring:
 - Availability of adequate space and site suitability for landfall construction including adequate working areas for cable installation, jointing bays and cable pull-in
 - Availability of appropriate site access routes for construction and later operations and maintenance through proximity to existing highways
 - Consideration of the suitability of land for HDD (or other trenchless techniques) to cross intertidal areas, important coastal habitats and sea defenses.
- 4.8.4.3 Following the identification of the landfall area of search (described in Section 4.7), five zones were identified as areas where the offshore export cables could be brought onshore and where the landfall works to connect to the onshore export cabling could occur. The five options, with associated initial constraints, are described in outline in Table 4.14 and illustrated in Figure 4.12.

Table 4.14: Landfall options assessed for the Mona Offshore Wind Project

Landfall zone	Outline description	Initial environmental constraints analysis
Llanddulas	Situated between the coastal settlements of Llanddulas to the west and Abergele to the East. Key infrastructure concentrated along coastal strip includes A55, Railway line and the A547 Abergele Road.	Nearshore constraints identified from the mapping include a mature Sabellaria alveolata Annex 1 Reef habitat and the Traeth Pensarn SSSI. Onshore, along with the infrastructure identified above, was the presence of an historic landfill along the shoreline area, ancient woodland and historic landscape associated with Gwrych Castle (a Grade I listed country house, which stands in 250 acres of gardens and grounds and has extensive views over former parkland including a deer park). The area also contains the Llanddulas Limestone and Gwrych Castle Wood SSSI and Coed y Gopa SSSI.
Belgrano West	Situated between the coastal settlements of Pensarn and Belgrano, which are suburbs of Abergele. This landfall location is where the existing Gwynt y Môr Offshore Wind Farm cables reach land. Key infrastructure concentrated along coastal strip in this location include the A548 Towyn Road and the railway line.	Nearshore constraints identified from the mapping are the presence of Gwynt y Môr Offshore Wind Farm cables and Welsh Water sewage effluent outfall offshore. Also, the Traeth Pensarn SSSI to the west. Onshore, along with the infrastructure identified above, are the onshore Gwynt y Môr Offshore Wind Farm cables, a possible sewage effluent pumping station facility and the built-up settlements of Pensarn and Belgrano.

Landfall zone	Outline description	Initial environmental constraints analysis
Belgrano East	Situated between the coastal settlements of Belgrano and Towyn. This landfall location is to the east of where the existing Gwynt y Môr Offshore Wind Farm cables reach land and west of the current Rhyl Flats offshore wind farm come onshore. Key infrastructure concentrated along coastal strip in this location include the A548 Towyn Road and the railway line, along with a static caravan site to the north of the A548.	Nearshore the presence of Gwynt y Môr Offshore Wind Farm and Rhyl Flats OWF cables is the key constraint. Onshore, along with the infrastructure identified above, are the onshore Rhyl Flats OWF cables to the east. Along with the infrastructure identified above, is the presence of a large flood Zones 2 and 3 area associated with presence of main rivers.
Rhyl West	Situated between the coastal settlements of Rhyl and Prestatyn at Ffrith Beach. This landfall option, along with Rhyl East, are located in the most easterly stretch of the landfall AoS. Key infrastructure concentrated along the coastal strip in this location include the Rhyl Coastal Road (A548) and the railway line.	Nearshore constraints identified from the mapping are the presence of some Annex 1 Reef habitats (see Figure 4.12), and the presence of the North Hoyle offshore wind cables. Onshore, along with the infrastructure identified above, is the presence of a large flood Zones 2 and 3 area associated with presence of main rivers.
Rhyl East	Situated between the coastal settlements of Rhyl and Prestatyn at Ffrith Beach. This option, along with Rhyl West, is located along the most easterly stretch of the landfall AoS. Key infrastructure concentrated along the coastal strip in this location include the Rhyl Coastal Road (A548) and the railway line, along with the presence of built development along Victoria Road West.	Nearshore constraints include the presence of the North Hoyle offshore wind farm cables. Onshore, along with the infrastructure identified above, is the presence of a large flood Zones 2 and 3 area associated with presence of main rivers.

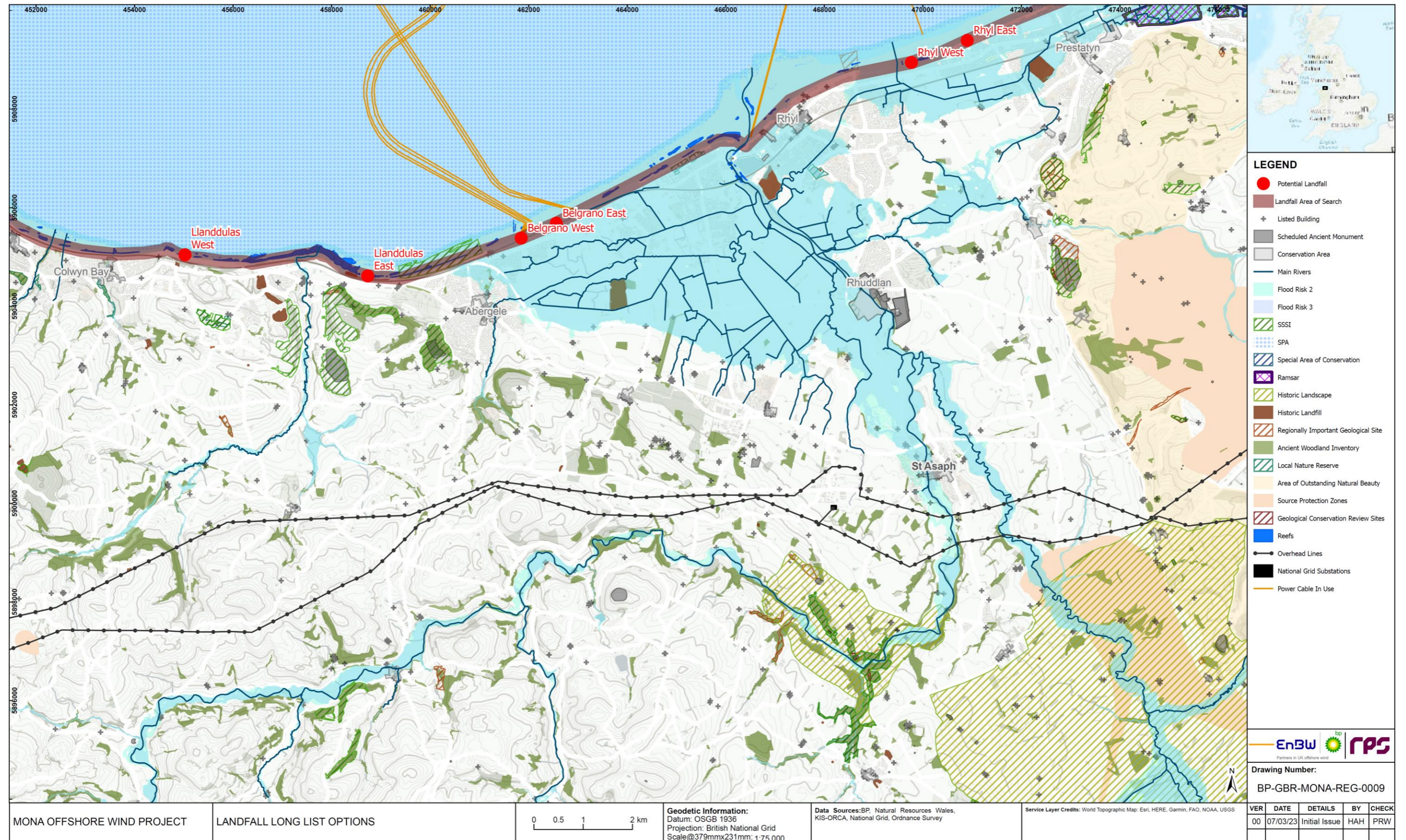


Figure 4.12: Long list of Landfall Options Considered for the Mona Offshore Wind Project.

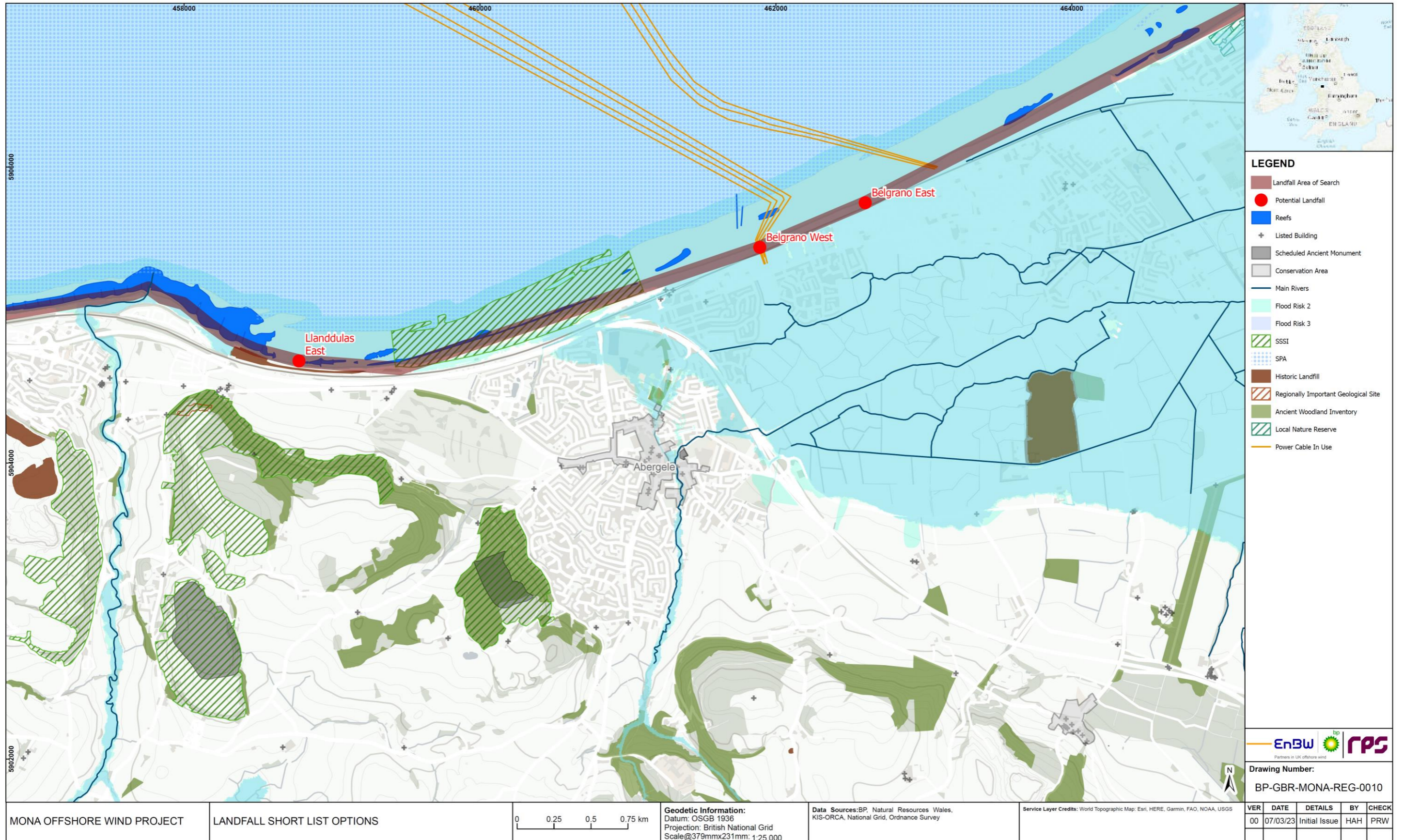


Figure 4.13: Shortlist of Landfall Options Considered for the Mona Offshore Wind Project.

4.8.4.4 The list of landfall options was then subject to further detailed analysis. A land, engineering, environmental and consents review was undertaken by the Applicant. The summary of this workshop is presented in Table 4.15.

Table 4.15: Summary of landfall review.

Landfall zone	Summary of review
Llanddulas	The environmental and consents review concluded overall a risk of medium and low impacts for this option. The results of the HDD feasibility study indicated the elevations involved would be challenging (passing beneath the historic landfill, coastal defences, railway and A55) but would allow a feasible HDD to be undertaken and that a HDD under the Gwrych Castle SSSI was also considered feasible. There are a number of engineering and consenting constraints associated with this zone but the review of options has determined that these can be overcome through design and consultation. As a result, the Llanddulas East zone was recommended to be taken forward for further assessment.
Belgrano West	The environmental and consents review identified a number of constraints including the Welsh water outfall and Gwynt y Môr Offshore Wind Farm cables coming onshore along this section of the coastline. The required width immediately parallel to the Gwynt y Môr Offshore Wind Farm cables meant that it is not feasible to engineer a route at this landfall location. Belgrano West zone was not recommended to be taken forward for further assessment.
Belgrano East	This option is viewed not to be feasible from an engineering perspective due to the requirement to cross the Rhyl Flats Offshore Wind Farm cables in the nearshore from the landfall locations. This would require a 'long HDD', which included the crossing of a railway asset and limited opportunity for successive 'short HDD' to mitigate the risk of HDD failure in the alluvial/ tidal flat deposits. Belgrano East zone was not recommended to be taken forward for further assessment.
Rhyl West	A number of constraints were identified at this location including Burbo Bank Extension Offshore Wind Farm and North Hoyle Offshore Wind Farm landfall cables, and other key infrastructure along this section of the more populated and designated coastal strip (including that of the Lyons Robin Hood Holiday Park Caravan Park). Awel y Môr Offshore Wind Farm has also selected this location for landfall. Due to the selection of this option by Awel y Môr there is not the required width to engineer a landfall for the Mona Offshore Wind Project at this location. As such, the feasibility of this location is discounted. Rhyl West zone was not recommended to be taken forward for further assessment.
Rhyl East	The environmental review concluded a range of potential impact scorings, from low for water, ecology and archaeology, to medium/high for tourism, recreation and traffic. The complexity and impact of the long HDD required at the residential properties at Prestatyn meant that Rhyl East zone was not recommended to be taken forward for further assessment.

4.8.4.5 As a result of the analysis presented in Table 4.14, one shortlisted zone was progressed for consultation and further analysis. Two specific locations within the Llanddulas zone were identified. The two landfalls progressed were re-named:

- Llanddulas West Landfall
- Llanddulas East Landfall

4.8.4.6 The consultation feedback received is summarised in Table 4.15.

Table 4.16: Consultation feedback – landfall.

Stakeholder	Recommendation
Cadw	Cadw notes that both landfall options will result in an onshore cable route that will pass through the Gwrych Castle Registered Park and Garden which has the potential to have significant settings impacts on the Gwrych Castle listed building. An onshore cable route from these locations would need to minimize, or avoid, any impacts on the Gwrych Castle woodland otherwise significant settings impacts would be unavoidable.
NRW	We note that the Llanddulas East landfall passes through the Traeth Beach SSSI and therefore may cause disruption at this site resulting in significant impacts. The Llanddulas West landfall has the potential to also cause disruption. NRW recommends removing the Llanddulas East landfall from consideration.
NRW	Similar to Cadw's statement, any onshore cable route from these landfall locations would need to minimize, or avoid, any impacts on the Llanddulas Limestone and Gwrych Castle Wood SSSI otherwise significant impacts would be unavoidable.

4.8.4.7 Following informal consultation, and receipt of the Scoping Opinion in June 2022, a further technical analysis and environmental and consenting review was undertaken. Of the shortlisted options, both were considered challenging from consenting, environmental and engineering perspectives.

4.8.4.8 Of the two shortlisted options, Llanddulas East was considered the most challenging due to the constrained (small) land parcel within which to locate the onshore transition joint bay, the presence of Abergele Golf Course to the immediate south of the landfall, and the need to potentially HDD below the golf course (which would have required the Mona Onshore Cable Corridor to double-back on itself to make sufficient room for the Onshore TJBs and entry/exit pit for this HDD within the small parcel of land).

4.8.4.9 Following further investigation, it was identified that Welsh Water had recently installed a pumping station in the western-most corner of the landfall land parcel and had also installed a water main along the southern boundary. The land parcel had also been put forward as a site of interest for development land due to its proximity to a housing development immediately east. It was also recognized that the Llanddulas East landfall was less than 200m from noise sensitive residential receptors.

4.8.4.10 The Llanddulas East landfall would also cross the Traeth Pensarn SSSI, which NRW had requested be avoided (as described in Table 4.15).

4.8.4.11 By comparison, it was recognized that while the Llanddulas West landfall would also need a HDD to pass beneath the railway, A55, coastal defences and historic landfill, there were significantly fewer space and environmental constraints. The presence of sensitive noise receptors and landing within the Gwrych Castle Registered Park and Garden was recognised, but mitigation could be developed to manage these short-term effects during construction. Furthermore, the Llanddulas West landfall was recognised as having limited sensitive ecological receptors within the intertidal and nearshore.

4.8.4.12 Further analysis was also undertaken for the potential onshore cable routes associated with each landfall option, to understand potential constraints and risks which may further influence the balance of landfall options. As a result of the analysis and consultation feedback detailed above, the Llanddulas East landfall was removed from the landfall options and the Llanddulas West landfall was progressed.

4.8.5 Onshore cable route refinement

- 4.8.5.1 Through reference to the identified area of search, combined with constraints analysis, a list of possible onshore cable route options were identified. The location of the onshore cable route is driven by the location of the Bodelwyddan National Grid substation and the location of the landfall to the proposed onshore substation site.
- 4.8.5.2 Key international and national environmental constraints sourced from the public domain were mapped (see volume 5, annex 4.1: Site Selection Area of Search Identification for a full list of data layers used). These included AONB, SSSIs, SACs, SPAs, Ancient Woodland, Scheduled Monuments and Grade I, II and II* Listed Buildings (including Historic Environment Records). Local environmental constraints were then identified including areas of mature woodland. Potential onshore cable routes, based on environmental constraints were identified.
- 4.8.5.3 In parallel, an engineering feasibility study considered how cables could, in practice, route around, through or under existing infrastructure.
- 4.8.5.4 An iterative and multidisciplinary approach incorporating engineering, constructability, cost, environmental, landowner, community, and stakeholder considerations was used in the development of onshore cable route options. A series of internal Mona Offshore Wind Project team workshops were held to ensure each of the factors were considered effectively.
- 4.8.5.5 Following identification of the long list of landfall options, a number of broad, 500m wide onshore cable corridors were identified, to create a long list of potential options. These onshore corridors were designed to connect the long list of landfall options to the Bodelwyddan National Grid substation (Figure 4.14 and Table 4.17).
- 4.8.5.6 Due to the width of these cable corridors, a number of constraints were identified within these broad areas, but during the process of refinement the constraints would be avoided where possible.
- 4.8.5.7 As with the offshore export cable corridor and landfall processes, the initial long list was subject to technical analysis to further refine the options and identify a short list for the purposes of consultation. Table 4.17 provides a summary of the onshore cable corridor options, with an initial appraisal.

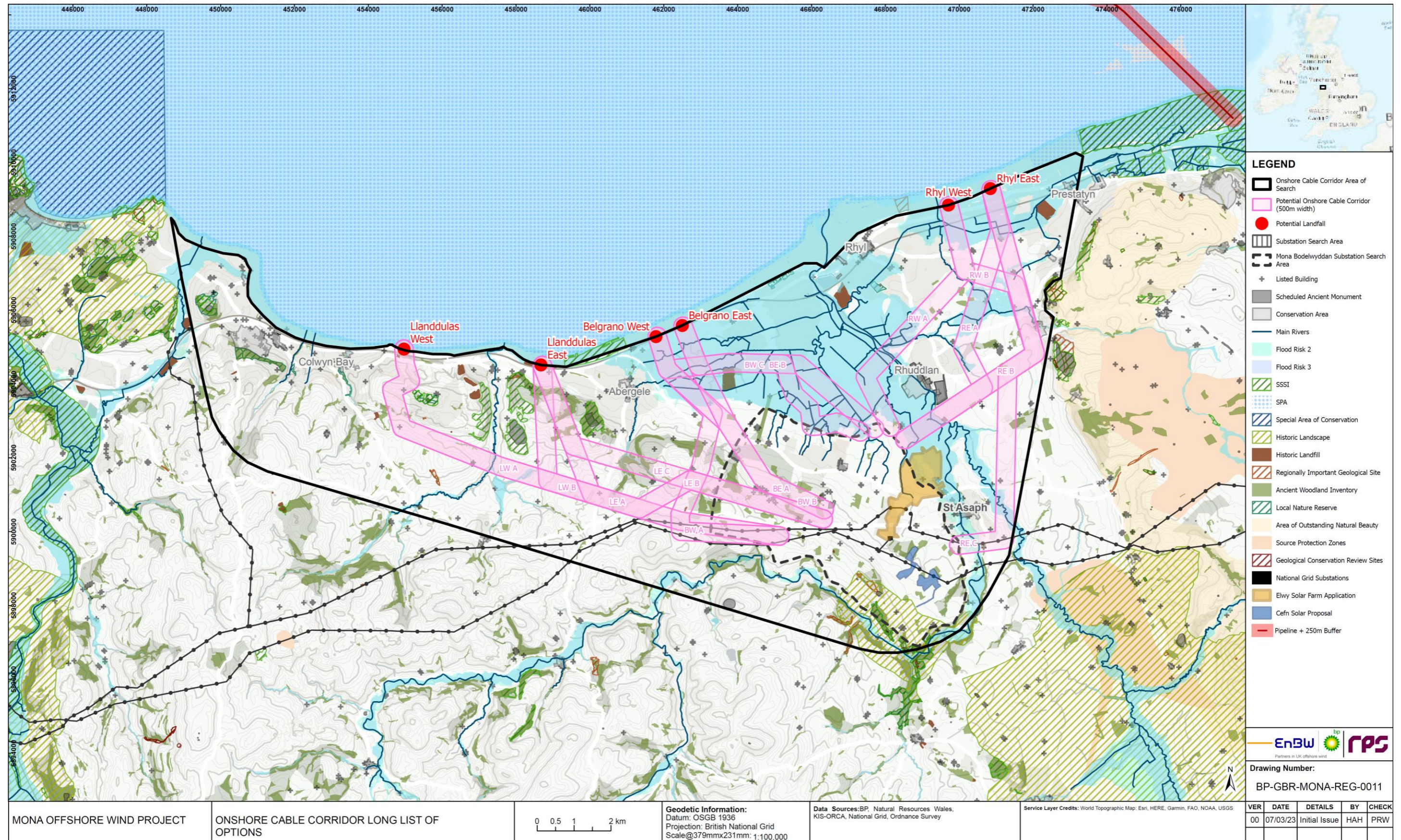


Figure 4.14: Onshore Cable Corridor Long List of Options.

Table 4.17: Onshore cable route summary of long list of options.

Onshore cable corridor option	Length (km)	General description	Summary of analysis
Llanddulas West - a	16.4	Most westerly corridor option, making landfall at Llanddulas West, heading in a south easterly direction near Raynes Quarry, passing key areas of Llysfaen, River Dulas, and Moelfre and entering the Bodelwyddan National Grid substation from the westerly side near Glascoed.	Option not progressed following parallel analysis screening landfall zone Llanddulas West from further consideration.
Llanddulas West - b	17.7	Most westerly corridor options, making landfall at Llanddulas West, heading in a south easterly direction, passing key areas of Llysfaen, River Dulas, and Moelfre and entering the Bodelwyddan National Grid substation from the westerly side near to Bodelwyddan Park, slightly further north than Option 1a.	Option not progressed following parallel analysis screening landfall zone Llanddulas West from further consideration.
Llanddulas East - a	12.4	Making landfall at Llanddulas East at Llanddulas Beach, heading in a south direction, passing key areas east of Abergele, before heading in a southeast direction crossing the River Gele, Moelfre and entering the Bodelwyddan National Grid substation from the westerly side near Glascoed, at the same location as Llanddulas West – a.	<p>Cable option taken forward to short list of options.</p> <p>Review of the onshore cable route resulted in high risk of potential impacts for archaeological considerations, due to designated assets present (Gwrych Castle Historic Park and Garden) with potential for archaeological remains to survive, however mitigation options are likely to be available due to the ability to micro-site.</p> <p>Further receptor groups subject to potential high impacts included ecology (ancient woodland and Llanddulas Limestone and Gwrych Castle Wood SSSI), setting of designated assets (Gwrych Castle and Kinmel Estate), with potentially moderate impacts to land use (some Agricultural Land Classification Grade 2 land south of Gwrych Castle and south of Groesffordd Marli), LVIA and traffic.</p>

Onshore cable corridor option	Length (km)	General description	Summary of analysis
Llanddulas East - b	12.5	Making landfall at Llanddulas East at Llanddulas Beach, heading in a south direction parallel to Llanddulas East - a, passing key areas east of Abergele, before joining the same route at the crossroads between Abergele Road and Glascoed Road, heading in a southeast direction crossing the River Gele, Moelfre and entering the Bodelwyddan National Grid substation from the westerly side near Glascoed, at the same location as Llanddulas West – a.	<p>Cable option taken forward to short list of options.</p> <p>Review of the onshore cable route is comparable with the onshore cable route option Llanddulas East – a.</p>
Llanddulas East - c		Making landfall at Llanddulas East at Llanddulas Beach, heading in a south direction until the southern extent of Abergele before heading in an easterly direction to skirt the southern extent of Abergele and then pass key areas of Belgrano and Pensarn before heading in a south easterly direction past Terfyn and Kimmel Park, entering the Bodelwyddan National Grid substation from the north westerly side near Bodelwyddan Park	<p>Review of the onshore cable route indicated high potential impact risk for ecology, due to potential impacts to ancient woodland, land use (some Agricultural Land Classification Grade 2 land south of Gwrych Castle) and planning due to the presence of Key Strategic Sites identified in the Conwy Replacement Local Plan immediately south of Abergele.</p> <p>In addition, the Awel y Môr Wind Farm has selected an onshore substation location immediately west of St. Asaph Business Park which means it is not feasible from an engineering perspective to route the Mona Offshore Wind Project onshore cable route through at that location.</p> <p>Other potential impacts were generally considered to be moderate, as a result of potential impacts to archaeology, water quality, and LVIA, or low for receptor groups such as traffic.</p>
Belgrano West - a	9.7	Making landfall at Belgrano West at Pensarn Beach, heading in a south easterly direction, passing key areas of Belgrano and Pensarn to the east and west, heading south through Kimmel Park and entering the Bodelwyddan National Grid substation from the north westerly side near Bodelwyddan Park, slightly further north than Llanddulas West – b.	Option not progressed following parallel analysis screening landfall zone Belgrano West from further consideration.

Onshore cable corridor option	Length (km)	General description	Summary of analysis
Belgrano West - b	10.0	Making landfall at Belgrano West at Pensarn Beach, heading in a south easterly direction, passing key areas of Belgrano and Pensarn to the east and west, before heading east, south of Towyn, then south easterly direction entering the Bodelwyddan National Grid substation from the north side near Pengwern, slightly further east than Belgrano East - b.	Option not progressed following parallel analysis screening landfall zone Belgrano West from further consideration.
Belgrano West - c	10.1	Making landfall at Belgrano West, this cable corridor heads south, and to the west of Kinmel Park, before making a right turn east toward the Bodelwyddan National Grid substation.	Option not progressed following parallel analysis screening landfall zone Belgrano West from further consideration.
Belgrano East - a	9.5	Making landfall at Belgrano East at Ty Gwyn Caravan Park, heading in a southerly direction, passing key areas of Belgrano before heading in a south easterly direction past Terfyn and Kimmel Park, entering the Bodelwyddan National Grid substation from the north westerly side near Bodelwyddan Park, at the same location as Belgrano West - a.	Option not progressed following parallel analysis screening landfall zone Belgrano East from further consideration.
Belgrano East - b	9.7	Making landfall at Belgrano East at Ty Gwyn Caravan park, heading in a southerly direction, passing key areas of Belgrano before heading in a easterly direction south of Towyn, then south, entering the Bodelwyddan National Grid substation from the north, northwest of Bodelwyddan, slightly further west than Belgrano West - b.	Option not progressed following parallel analysis screening landfall zone Belgrano East from further consideration.
Rhyl West - a	10.2	Making landfall at Rhyl West at Rhyl Golf Course, heading in a southerly direction between key areas of Prestatyn and Rhyl to the east and west, before heading in a south westerly direction between Rhyl and Rhuddlan, entering the Bodelwyddan National Grid substation from a north easterly direction near Pengwern, slightly further east than Belgrano West - b.	Option not progressed following parallel analysis screening landfall zone Rhyl West from further consideration.

Onshore cable corridor option	Length (km)	General description	Summary of analysis
Rhyl West - b	12.3	Making landfall at Rhyl West at Rhyl Golf Course, heading in a southerly direction between key areas of Prestatyn and Rhyl to the east and west, before heading further south east near Meliden, then heading in a south westerly direction near Dyserth, entering the Bodelwyddan National Grid substation from a north easterly direction at Pengwern, south east of Rhyl West - a.	Option not progressed following parallel analysis screening landfall zone Rhyl West from further consideration.
Rhyl West - c	14.7	Making landfall at Rhyl West, this corridor heads in a southerly direction, passing to the west of keys areas of Dyserth and east and then south of St Asaph where it enters the Bodelwyddan National Grid substation.	Option not progressed following parallel analysis screening landfall zone Rhyl West from further consideration.
Rhyl East - a	11.8	Most easterly corridor option, making landfall at Rhyl East at Ffrith Beach, heading in a southerly direction, passing keys areas of Prestatyn, Meliden and Dyserth before heading in a south westerly direction south of Rhuddlan and entering the Bodelwyddan National Grid substation to the north east at the same location as Rhyl West - b.	Option not progressed following parallel analysis screening landfall zone Rhyl East from further consideration.
Rhyl East - b	11.2	Most easterly corridor option, making landfall at Rhyl East at Ffrith Beach heading in a south westerly direction, passing keys areas of Rhyl and Rhuddlan entering the Bodelwyddan National Grid substation to the north east at the same location as Rhyl West - b.	Option not progressed following parallel analysis screening landfall zone Rhyl East from further consideration.
Rhyl East - c	14.0	Most easterly corridor option, making landfall at Rhyl East at Ffrith Beach, heading in a southerly direction, passing keys areas of Prestatyn, Meliden, Dyserth and St Asaph entering the Bodelwyddan National Grid substation to the east near Penrhewl.	Option not progressed following parallel analysis screening landfall zone Rhyl East from further consideration.

4.8.5.8 The review of the onshore cable route resulted in the following routes being put forward for further short list consultation:

- Llanddulas East – a
- Llanddulas East – b

4.8.5.9 Consultation feedback received focused primarily on the potential environmental sensitivities, a summary of which is presented in Table 4.18.

Table 4.18: Onshore cable route shortlist consultation feedback.

Recommendation	Stakeholder
Cadw notes that both landfall options will result in an onshore cable route that will pass through the Gwrych Castle Registered Park & Garden which has the potential to have significant settings impacts on the Gwrych Castle listed building. An onshore cable route from these locations would need to minimize, or avoid, any impacts on the Gwrych Castle woodland otherwise significant settings impacts would be unavoidable.	Cadw
Similar to Cadw’s statement, any onshore cable route from these landfall locations would need to minimize, or avoid, any impacts on the Llanddulas Limestone and Gwrych Castle Wood SSSI otherwise significant impacts would be unavoidable.	NRW

4.8.5.10 Of the two shortlisted options, the landfall for Llanddulas East – b was considered the most challenging due to the constrained (small) land parcel within which to locate the onshore transition joint bay and the presence of the Abergel Golf Course to the immediate south and the need to potentially HDD the golf course – this would have also required the cable route to double-back on itself to make sufficient room for this potential HDD.

4.8.5.11 Following further investigation, it was identified that Welsh Water had recently installed a pumping station in the western-most corner of the landfall land parcel and had also installed a water main along the southern boundary. The land parcel had also been put forward as a site of interest for development land due to its proximity to a housing development immediately east. As such, it was also recognize that the Llanddulas East landfall was less than 200m from noise sensitive residential receptors. It was also recognized through reference to the receive feedback that the Llanddulas East landfall would also cross the Traeth Pensarn SSSI, which NRW had requested be avoided (see Table 4.10).

4.8.5.12 Traeth Pensarn SSSI is designated for the value of the plant communities on the shingle and boulders above Mean High Water Springs (MHWS), a habitat type now considered fragmented and vulnerable around the coast.

4.8.5.13 During consultation NRW requested that the overlap with the SSSI be avoided and the Applicant has subsequently committed to not installing export cables within the SSSI. The SSSI will remain within the Mona Offshore Wind Project Boundary to facilitate access to the Landfall working area but impacts from construction access will be managed to minimise any effects on the SSSI.

4.8.5.14 By comparison, it was recognized that while the Llanddulas East - a landfall would also need an HDD to pass beneath the railway, A55, coastal defences and historic landfill, there were significantly fewer space and environmental constraints. The presence of sensitive noise receptors and landing within the Gwrych Castle Registered Park & Garden was recognised, but mitigation would be available to manage the short-term effect. Furthermore the Llanddulas East – a landfall was

recognised as having limited sensitive ecological receptors within the intertidal and nearshore.

4.8.5.15 Following analysis and consultation feedback (see Section X), the landfall for the Llanddulas East – b onshore cable route was removed from the design options. This means that the Llanddulas East – a onshore cable route will be progressed for design.

4.8.5.16 At this stage of the proposed development of the Mona Offshore Wind Project, it has been noted that the onshore cable route would pass through the Llanddulas Limestone and Gwrych Castle Wood SSSI and ancient woodland. It is recognized that open-cut trenching through this would likely result in:

- Cutting through SSSI woodland resulting in a likely significant ecological impact and additional scrutiny on site selection;
- A permanent change to the woodland within the Gwrych Castle Historic Park and Garden (i.e. removal of it) which would require compensatory land to be replace the losses;
- A very visible permanent change to the woodland resulting in a significant visual impact from the coastal footpath and A55 as trees cannot be planted over the onshore cable route; and
- A potential significant impact associated with a change to the historic setting of the Gwrych Castle.

4.8.5.17 As a responsible developer, the Applicant has made the early commitment to use trenchless techniques (HDD, micro-tunnelling, auger boring, etc. yet to be determined) to avoid these potential impacts.

4.8.5.18 Following detailed investigation of the section of the onshore cable route between the Abergele Road and Glascoed Road crossroad to the Bodelwyddan National Grid substation a number of significant utilities (such as high pressure gas main, water mains and overhead lines) have been identified that mean that a straight route cannot be optimized.

4.8.5.19 As such, the onshore cable route as assessed in the PEIR, as illustrated in volume 1, chapter 3: Project Description, contains optionality that will be refined following formal consultation. Within the identified Proposed Onshore Development Area are emerging routes of approximately 100m identified. At the point of final application, a single route of approximately 70m will be defined for the onshore cable corridor and a single route of approximately 60m for the 400kV cable corridor that will incorporate the results of ongoing studies and feedback received during consultation.

4.8.5.20 Following consultation on the PEIR, the onshore cable corridor and 400kV cable corridor will be reviewed and a final onshore cable route option produced for the Project and its environmental assessment to be set out in the ES.

4.8.6 Onshore substation refinement

4.8.6.1 To support the evaluation process, a number of potential onshore substation footprint locations were identified which followed the design principles and engineering assumptions set out in Section 4.3.6.

4.8.6.2 In order to ensure that the onshore substation options could also viably connect up with the onshore cable corridors, a number of indicative cable corridor connections

between the long list of onshore substation options and the onshore cable corridor options were identified.

- 4.8.6.3 Long listing of the onshore substation took place through reference to the onshore substation area of search, combined with the application of the design principles, engineering assumptions, and the relevant guidance relating to the siting of above-ground electrical infrastructure (e.g. Horlock Rules). At this early stage, 17 onshore substation locations were identified for further consideration (illustrated in Figure 4.15).

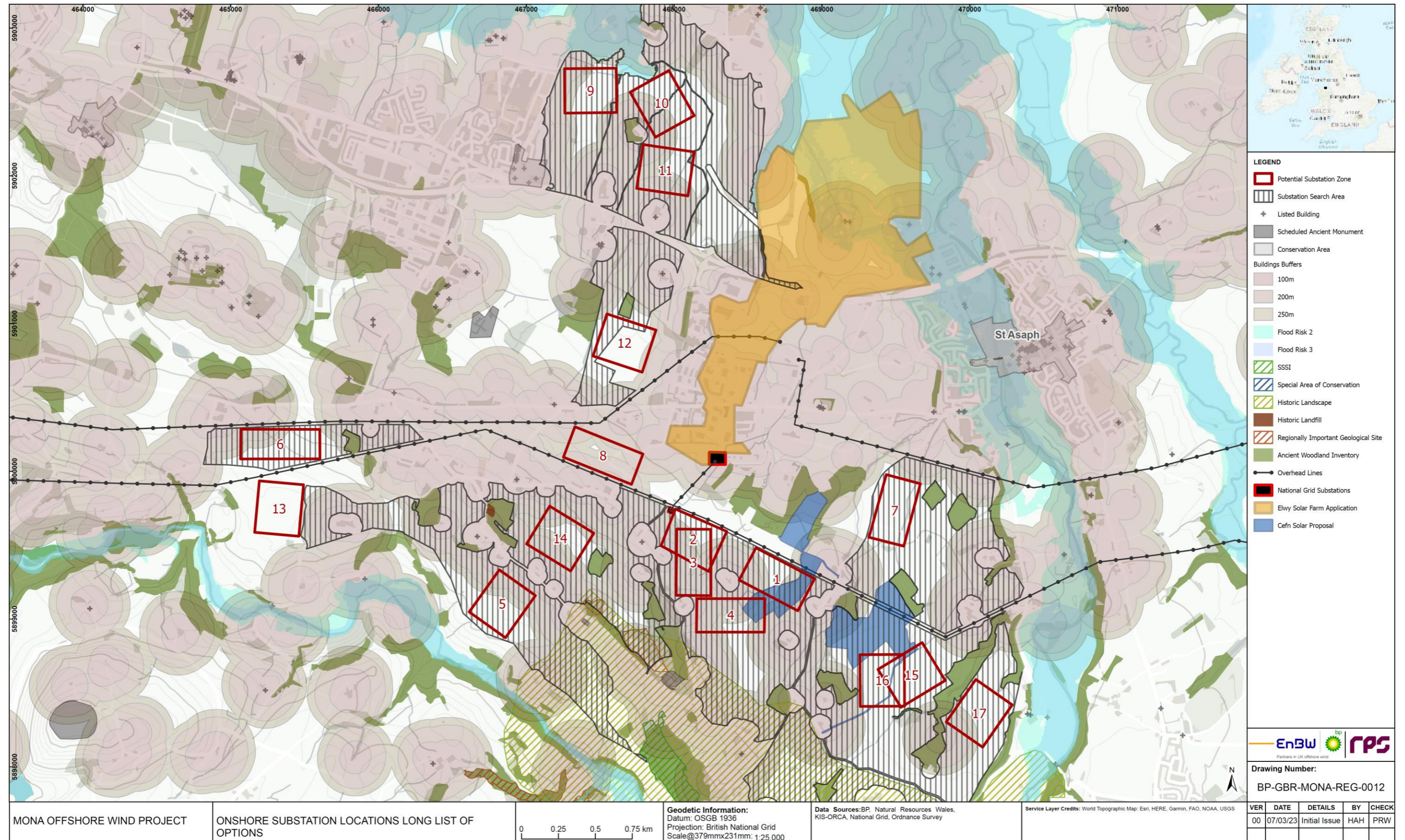


Figure 4.15: Onshore Substation Zones Long List of Options.

Onshore Substation Long List of Options

Onshore Substation Option 1

- 4.8.6.4 Onshore substation option 1 is located in the more central area of the area of search, with the current Bodelwyddan National Grid and existing GyM substations to the north, along with associated overhead lines.
- 4.8.6.5 It is located in agricultural fields with a slight gradient to the north east. It is clipped by the 250m buffer to the southern portions of the footprint. This option is in close proximity to a small watercourse/drainage and to areas of ancient woodland to the north, which could be used as screening/mitigation.
- 4.8.6.6 Potential access could be from the north via the B5381 and then minor (singletrack) roads. A new access road may be required from B5381 to avoid singletrack roads. Or an extension of the access for the existing GyM substation from the north.
- 4.8.6.7 Residential properties to the north-east and west are at close proximity.

Onshore Substation Option 2

- 4.8.6.8 Onshore substation option 2 is located in the more central area of the area of search, with the current Bodelwyddan National Grid and existing GyM substations to the north, along with associated overhead lines.
- 4.8.6.9 It is located in agricultural fields with a slight gradient to the north east. It is clipped by the 250m buffer to the southern portions of the footprint. This option is in close proximity to a small watercourse/drainage and to areas of ancient woodland to the north, which could be used as screening/mitigation.
- 4.8.6.10 Potential access could be from the north via the B5381 and then minor (singletrack) roads. A new access road may be required from B5381 to avoid singletrack roads. Or an extension of the access for the existing GyM substation from the north.
- 4.8.6.11 Residential properties to west and south are at close proximity.

Onshore Substation Option 3

- 4.8.6.12 Onshore substation option 3 is located in the more central area of the area of search, with the current Bodelwyddan National Grid and existing GyM substations to the north, along with associated overhead lines.
- 4.8.6.13 It is located in agricultural fields with a slight gradient to the northeast. It is clipped by the 250m buffer to the southern portions of the footprint. This option is in close proximity to a small watercourse/drainage and to areas of ancient woodland to the north, which could be used as screening/mitigation.
- 4.8.6.14 Potential access could be from the north via the B5381 and then minor (singletrack) roads. A new access road may be required from B5381 to avoid singletrack roads or an extension of the access for the existing GyM substation from the north.
- 4.8.6.15 Residential properties to west and south are at close proximity.

Onshore Substation Option 4

- 4.8.6.16 Onshore substation option 4 is located in the more central area of the area of search, with the current Bodelwyddan National Grid and existing GyM substations to the north, along with associated overhead lines.
- 4.8.6.17 It is located in agricultural fields with a slight gradient to the northeast. It is clipped by the 250m buffer to the southern portions of the footprint. This option is in close proximity to a small watercourse/drainage and to areas of ancient woodland to the north, which could be used as screening/mitigation.
- 4.8.6.18 Potential access could be from the north via the B5381 and then minor (singletrack) roads. A new access road may be required from B5381 to avoid singletrack roads. Or an extension of the access for the existing GyM substation from the north.
- 4.8.6.19 Residential properties to north and north-east are at close proximity.

Onshore Substation Option 5

- 4.8.6.20 Onshore substation option 5 is located in the southwest corner of the AoS, to the north of the Coedwigoedd Dyffryn Elwy / Elwy Valley Woods (SAC).
- 4.8.6.21 Located in agricultural fields with a gradient to the southwest above a steeper slope down to Afon Elwy. Although outwith the area of search, this option is in close proximity to a number of designated areas associated with the Coedwigoedd Dyffryn Elwy / Elwy Valley Woods (SAC).
- 4.8.6.22 A new potential access would be from the north from the B5381 via minor (singletrack) roads, which is likely to be difficult or unsuitable.
- 4.8.6.23 Residential properties to south-east and north-east at in close proximity. The option is overlooked by higher ground to the south. The option will appear to sit above the River Elwy and may impinge upon its character with a potential direct impact on small scale field pattern and hedgerow trees.

Onshore Substation Option 6

- 4.8.6.24 Onshore substation option 6 is located to the west of the area of search, south of the Ffordd Rufeinig Road near Glascoed, located between two sets of overhead lines.
- 4.8.6.25 It is located in agricultural fields with a slight slope to the northeast. Due to smaller field parcel sizes to the central/West and eastern end of the area of search, this option crosses field boundaries. It does however have areas of woodland to the east which could be extended to use as screening/mitigation.
- 4.8.6.26 A new access would be required from the north from the B5381. A potential construction compound would be in a 'remote' location due to space constraints. The onshore cable corridor route to the National Grid substation would be approximately 3km from this location.
- 4.8.6.27 Two storey properties are at close proximity to the west and north in farm clusters. Kinmel Hall and Park may have visibility from the northwest.

Onshore Substation Option 7

- 4.8.6.28 Onshore substation option 7 is located in the east corner of the AoS, near to Penrhewl.
- 4.8.6.29 It is located in agricultural fields with a slight gradient to the north. It is in close proximity to watercourses/drainage and ponds in this location. There are areas of ancient woodland to the east, which could be used as screening/mitigation.
- 4.8.6.30 Potential access could be taken from the north via the B5381 and then minor roads (narrow / singletrack). The onshore cable corridor route to the National Grid substation may be difficult for this location.
- 4.8.6.31 There is a caravan site to the south-east and a residential property in relatively close proximity to the northeast.

Onshore Substation Option 8

- 4.8.6.32 Onshore substation option 8 is adjacent to the east of Glan Clwyd Hospital and Sam Lane in Bodelwyddan, north of junction 26 of the A55 within the northern extent of the AoS.
- 4.8.6.33 It is Located within agricultural fields with a flat/slight gradient to the north. Listed buildings are to the south, footpaths and overhead lines to the north. Temporary construction compound options would be within the 250m residential buffers, but the operational footprint is not. There are small areas of woodland around the northwest and southeast of the option which could be used for screening/mitigation.
- 4.8.6.34 A new access would be required from the west (near Glan Clwyd Hospital) across agricultural land. It is very close to minor watercourse / drainage in the area, but would need to be sited over existing agricultural access track. The proposed onshore cable corridor route to the National Grid substation is approximately 2.5-3km from this location.
- 4.8.6.35 There are a small number of residential properties to northwest and northeast; and a PRoW to the east.

Onshore Substation Option 9

- 4.8.6.36 Onshore substation option 9 is adjacent to the east of Glan Clwyd Hospital and Sarn Lane in Bodelwyddan north of the A55 within the northern extent of the area of search.
- 4.8.6.37 It is located within agricultural fields with a flat / slight gradient to the north. This option slightly clips the 250m buffer placed around sensitive/residential properties in its north west corner. Main rivers are present to the east, with associated flood risk zones. The Bodelwyddan Conservation Area and associated Listed Buildings are present to the south of this option. Woodland to the north and east could be used for screening/mitigation. There is room for a temporary construction compound to the south.
- 4.8.6.38 A new access would be required from the west (near Glan Clwyd Hospital) across agricultural land. It is very close to or potentially encroaching on minor watercourse / drainage in the vicinity. The onshore cable corridor to the National Grid substation is approximately 2.5-3km from this location.

- 4.8.6.39 It has proximity to single storey housing on Marble Church Grove approximately 250m away. There is very little intervening screening. There is also proximity to 4 storey housing on Sarn Lane although there is screening by roadside planting. There is also proximity to Public Rights of Way (PRoW) immediately to the west of the site and potential compound location. There would be clear views from grounds and cemetery around Marble Church and Conservation Area; and views from Bodelwyddan Castle (Hotel). This option looks to be an aligned avenue to north through arboretum/garden which will require further investigation as well as other views from park/castle. 2/3 houses are at close proximity to the northwest but these are largely screened by intervening vegetation.

Onshore Substation Option 10

- 4.8.6.40 Onshore substation option 10 is adjacent to the east of Glan Clwyd Hospital and Sam Lane in Bodelwyddan, north of junction 26 of the A55 within the northern extent of the area of search.
- 4.8.6.41 It is located within agricultural fields with a flat/slight gradient to the north. There is a listed building to the south, with footpaths and overhead line to the north. A potential temporary construction compound would be within the 250m buffer of residential properties, but the operational footprint could be outside the 250m buffer with orientation adjustments. Small areas of woodland around the northwest and southeast of the option could be used for screening/mitigation.
- 4.8.6.42 A new access would be required from the west (near Glan Clwyd Hospital) across agricultural land. The option is very close to a minor watercourse/drainage in the area and would be sited over an existing agricultural access track. The onshore cable corridor to the National Grid substation would be approximately 2.5-3km from this location.
- 4.8.6.43 A small number of residential properties are to north-west and north-east; with a PRoW to the east.

Onshore Substation Option 11

- 4.8.6.44 Onshore substation option 11 is adjacent to the east of Glan Clwyd Hospital and Sarn Lane in Bodelwyddan, north of junction 26 of the A55 within the northern extent of the area of search.
- 4.8.6.45 It is located within agricultural fields with a flat / slight gradient to the north. Areas of flood risk are associated with Main Rivers to the north, overhead line to the eastern edge, and areas of woodland to the south which could be extended to use as screening/mitigation.
- 4.8.6.46 A new access would be required from the west (near Glan Clwyd Hospital) across agricultural land. It is very close to minor watercourses / drainage. The potential construction compound would be 'remote' from the location due to space constraints/presence of woodland.
- 4.8.6.47 There are a small number of residential properties to north-west and north-east with clear views from grounds and cemetery around Marble Church and Conservation Area; and views from Bodelwyddan Castle (Hotel). It looks to be parkland to the north through the arboretum/garden as well as other views from the park/castle. If the

potential construction compound is as for Option 2 then similar views would also apply from houses and Bodelwyddan Castle and park.

Onshore Substation Option 12

4.8.6.48 Onshore substation option 12 is located between Bodelwyddan Park and New Vision Business Park, situated between the A55 and the B5381.

4.8.6.49 It is located within agricultural fields, with a slight gradient to the north/northeast. Due to smaller field parcel sizes to the central/southern end of the area of search, this option crosses field boundaries. It does however have areas of woodland to the north and west which could be extended to use as screening/mitigation.

4.8.6.50 A new access would be required from the south from the B5381 or from the northeast off the link road to the A55.

4.8.6.51 Two storey properties are at close proximity to the south-southwest facing towards this option: with a PRoW to the north.

Onshore Substation Option 13

4.8.6.52 Onshore substation option 13 is located to the south of Option 6, and south of both sets of overhead lines in the Glascoed area.

4.8.6.53 It is located in agricultural fields with a slight slope to the northeast. Due to smaller field parcel sizes to the central/southern end of the area of search, this option crosses field boundaries.

4.8.6.54 A new access would be required from the north from the B5381 or from the B5381 via minor (singletrack) roads. The onshore cable corridor route to the National Grid substation approximately 3km from this location.

4.8.6.55 A two storey property is at close proximity to the east as part of a farm cluster. Kinmel Hall and Park may have visibility from the north-west. This location would appear to sit above the River Elwy and could impinge upon its character.

Onshore Substation Option 14

4.8.6.56 Onshore substation option 14 is located near to Groesffordd Marli.

4.8.6.57 It is located in agricultural fields with a gradient to the northeast, in an elevated position. This option does clip the edges of the 250m buffer. Due to smaller field parcel sizes to the central/southern end of the area of search, this option crosses field boundaries. It does however have areas of ancient woodland to the east and west which could be extended to use as screening/mitigation. A small area of historic landfill is situated to the west of this option within the ancient woodland. There are also Listed Buildings to the north, west and east.

4.8.6.58 Potential access from the north from the B5381 via a minor (singletrack) road is likely to be difficult or unsuitable.

4.8.6.59 This option will appear on land sitting above height of properties located at close proximity to the north which may make it more apparent. There are also properties in close proximity to the south; and a PRoW to north-east.

Onshore Substation Option 15

4.8.6.60 Onshore substation option 15 is located in the southeast corner of the area of search, near to Nant-y-Patrick.

4.8.6.61 It is located in agricultural fields with a slight gradient to the north east. It is in close proximity to watercourses/drainage and ponds in this location. Areas of ancient woodland surround it in all directions and could be used as screening/mitigation.

4.8.6.62 Potential access could be taken from the east from the B5381 but it would require a new access track approximately >0.5km long. The onshore cable corridor route to the National Grid substation may be difficult. Any potential construction compound would be 'remote' from location due to the space constraints.

4.8.6.63 Residential properties to the south-west are at relatively close proximity. There is potential for visibility from Wigfair Hall (country house hotel to south) and its grounds at relatively close proximity.

Onshore Substation Option 16

4.8.6.64 Onshore substation option 16 is located in the southeast corner of the area of search, near to Nant-y-Patrick.

4.8.6.65 It is located in agricultural fields with a very slight gradient to the northeast. It encroaches on ponds (as does any potential construction compound). Areas of ancient woodland are in all directions and could be used as screening/mitigation.

4.8.6.66 Potential access could be achieved from the east from the B5381 but it requires a new access track approximately >0.8km long. Access from the minor road (narrow /singletrack) to the west is unlikely to be viable. The onshore cable corridor to the National Grid substation may be difficult from this location.

4.8.6.67 Residential properties to the south-west are at relatively close proximity. There is potential for visibility from Wigfair Hall (country house hotel to south) and its grounds at relatively close proximity.

Onshore Substation Option 17

4.8.6.68 Onshore substation option 17 is located in the southeast corner of the area of search, near to Nant-y-Patrick. It extends from the overhead lines to the north, ancient woodland to the east and west, and roads to the south.

4.8.6.69 This option is surrounded by farmland with some irregular and some enlarged fields - some with intact hedges and mature hedgerow trees. It is situated on low lying land above lower valley, which it is separated from by a wooded scarp slope.

4.8.6.70 There is a medium risk from a gentle site gradient (approximately 1 in 49).

4.8.6.71 Potential access could be taken from the B5381 to the east of the site (or via minor road to the south).

4.8.6.72 Woodland blocks offer some containment of views particularly to the east and west.

4.8.6.73 Visibility at multiple residential properties, with some intervening trees and hedgerows.

Onshore Substation Options BRAG Summary

4.8.6.74 During the preliminary long listing BRAG assessment it was recognised that there were potentially significant constraints present for several of the onshore substation options, with associated engineering feasibility challenges. Table 4.19 below presents the conclusions of the analysis, with the justification for each of the onshore substation options taken forward for further consultation. Full details of the onshore substation BRAG is contained within volume 5, annex 4.2: Site Selection Shortlisting BRAG Report.

Table 4.19: Onshore substation preliminary review of long list constraints and LVIA risks.

Onshore substation option	Summary of analysis	Recommendation for taking forward to short list of options
1	<p>Large area around for mitigation although views from above would be more problematic to mitigate. LVIA therefore considered high risk of impact due to visual effects on nearby properties likely. Also considered higher risk of impact for traffic, archaeology (impacts associated with setting of designated assets). Generally moderate risk of impact for other receptor groups including ecology.</p> <p>No high risk engineering constraints were identified for this option. Medium risks are associated with local topography (a 1:30 drop across the site), local utilities connections, possibility of local geology issues from limestone dissolution and historic lead mining, vehicular access.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option is proposed to be taken forward to the short list of options for further assessment.</p> <p>Further consideration of access will be required during the site selection process to ensure this option is viable.</p>
2	<p>Large area around for mitigation although views from above would be more problematic to mitigate. LVIA therefore considered high risk of impact due to visual effects on nearby properties likely. Also considered higher risk of impact for traffic, archaeology (impacts associated with setting of designated assets). Generally moderate risk of impact for other receptor groups including ecology.</p> <p>No high risk engineering constraints were identified for this option. Medium risks are associated with local topography (a 1:30 drop across the site), local utilities connections, possibility of local geology issues from limestone dissolution and historic lead mining, vehicular access, and encroachment into Grade 3a agricultural land.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option is proposed to be taken forward to the short list of options for further assessment.</p> <p>Further consideration of access will be required during the site selection process to ensure this option is viable.</p>

Onshore substation option	Summary of analysis	Recommendation for taking forward to short list of options
3	<p>Large area around for mitigation although views from above would be more problematic to mitigate. LVIA therefore considered high risk of impact due to visual effects on nearby properties likely. Also considered higher risk of impact for traffic, archaeology (impacts associated with setting of designated assets). Generally moderate risk of impact for other receptor groups including ecology.</p> <p>No high risk engineering constraints were identified for this option. High risks are associated with local topography (a 1:30 drop across the site but needing to cut into the highest point), with medium risks associated with local utilities connections, possibility of local geology issues from limestone dissolution and historic lead mining, vehicular access.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option is proposed to be taken forward to the short list of options for further assessment.</p> <p>Further consideration of access and topography will be required during the site selection process to ensure this option is viable.</p>
4	<p>Large area around for mitigation although views from above would be more problematic to mitigate. LVIA therefore considered high risk of impact due to visual effects on nearby properties likely. Also considered higher risk of impact for traffic, archaeology (impacts associated with setting of designated assets). Generally moderate risk of impact for other receptor groups including ecology.</p> <p>No high risk engineering constraints were identified for this option. High risks are associated with local topography (a 1:30 ridgeline across the site), with medium risks associated with local utilities connections, possibility of local geology issues from limestone dissolution and historic lead mining, vehicular access.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option is proposed to be taken forward to the short list of options for further assessment.</p> <p>Further consideration of access and topography will be required during the site selection process to ensure this option is viable.</p>
5	<p>LVIA considered high risk of impact as visual effects on nearby properties highly likely, with mitigation challenging as landscape is unsuitable to accommodate development.</p> <p>High risk of impact also for traffic,</p>	<p>Due to the location of this option furthest away from larger scale residential areas, this site is potential preferable to minimise community impacts. This option is not preferable from an engineering, access or landscape perspective. Due to this.</p> <p>Option 5 is proposed to be taken forward to the short list of options for further assessment.</p> <p>Further consideration of access and topography will be required during the site selection process to ensure this option is viable.</p>

Onshore substation option	Summary of analysis	Recommendation for taking forward to short list of options
6	<p>Large scale modification of levels required and visibility and landform changes difficult to mitigate due to lower levels of surrounding land. This was therefore considered of highest potential LVIA Impact due to topography being highly unsuitable for accommodating development.</p> <p>Archaeology indicated potentially high impacts due to high potential for impacts associated with the setting of designated assets. Other receptor groups such as ecology, agricultural land (option is entirely in Grade 3a) and traffic considered at risk of moderate impacts.</p> <p>Engineering risk considered high to moderate due to lack of suitable drainage, ground conditions, new accesses required, and construction compounds likely subject to spatial constraints.</p>	<p>This location has the best access of all proposed locations. The site is constrained but has opportunity for engineering within existing infrastructure (overhead lines).</p> <p>This is not preferable from a landscape perspective due to the location of this option on a ridgeline with steep gradients and visibility across the valley.</p> <p>Option 6 is proposed to be taken forward to the short list of options for further assessment. Further consideration of landscape and topography will be required during the site selection process to ensure this option is viable.</p>
7	<p>Some tree copses offering visual containment, with site overall relatively flat, allowing mitigation in the form of screening. LVIA therefore relatively moderate risk of impact, with some capacity to accommodate development.</p> <p>Other receptor groups such as archaeology considered moderate risk of impact (designated asset setting) alongside land use impacts with encroachment into Grade 3a agricultural land, with traffic considered higher risk of impacts due to access challenges.</p> <p>Engineering risk high, reflecting uncertainty and challenge associated with access.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option was taken forward to the short list of options for further assessment.</p> <p>Further consideration of access will be required during the site selection process to ensure this option is viable.</p>
8	<p>LVIA and land use constraints (high associated with road user views and residential properties, and encroachment onto Grade 2 and 3a agricultural land), with other constraints such as archaeology, designated asset setting, considered at moderate risk of impact. Traffic and transport, water quality, ecology generally lower risk of impact.</p> <p>Few likely engineering risks aside from higher risk for drainage.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option is proposed to be taken forward to the short list of options for further assessment.</p>
9	<p>LVIA constraint (high) with potential impacts associated with the setting of designated assets. Moderate risk of impact for other receptor groups such as ecology (designated sites), traffic and transport, Planning application present for 1,700 dwellings.</p> <p>Few notable engineering risks.</p>	<p>Due to the outline planning application for 1,700 dwellings on the land around this option (as identified during ETG meeting) and the number of high risk BRAG scores, Option 9 was not taken forward to the short list.</p>

Onshore substation option	Summary of analysis	Recommendation for taking forward to short list of options
10	<p>LVIA constraint (high) with potential impacts associated with the setting of designated assets. Moderate impact potential for other receptor groups such as ecology (designated sites), traffic and transport, Planning application present for 1,700 dwellings.</p> <p>Few notable engineering risks.</p>	<p>Due to the outline planning application for 1,700 dwellings on the land around this option, Option 10 was not taken forward to the short list.</p>
11	<p>LVIA constraint (high) with potential impacts associated with dwellings and the setting of designated assets. High risk of potential impacts existing for archaeology and ecology. Moderate risk of potential impacts to other receptor groups such as traffic and transport, Planning application present for 1,700 dwellings.</p> <p>Higher engineering risk associated with presence of flood zone (2/3) and ground conditions.</p>	<p>Due to the outline planning application for 1,700 dwellings on the land around this option, Option 11 was not taken forward to the short list.</p>
12	<p>Lower LVIA impact risks due to capacity to accommodate development and potential to mitigate visibility with planting and earthworks. Potential high archaeology impacts due to designated asset setting, ecology and tourism both considered subject to potential moderate impacts, other receptor groups such as traffic considered subject to lower impact potential.</p> <p>Engineering risk generally low-medium, with new access noted as being required.</p>	<p>Due to the Development Consent Order application for the Awel y Môr Offshore Wind Farm on the land around this option, Option 12 was not taken forward to the short list.</p>
13	<p>LVIA constraint considered high due to landscape unsuitable to accommodate development. potential risk of high impacts also considered to exist for archaeology (setting of designated assets), land use (proximity to school and landfill). Other receptor groups such as ecology and traffic/transport and land use (for Grade 3a agricultural land) considered at risk of moderate impacts.</p> <p>Engineering risk considered high due to ground conditions (made ground and distance from watercourse), and moderate due to accesses</p>	<p>Due to the location of this option on a ridgeline with steep gradients, this is not preferable from an engineering, access or landscape perspective. Due to this, Option 13 was not taken forward to the short list of options.</p>

Onshore substation option	Summary of analysis	Recommendation for taking forward to short list of options
14	<p>Large scale modification of levels required and visibility and landform changes difficult to mitigate due to lower levels of surrounding land. LVIA considered to be of higher risk of impact, due to topography highly unsuitable for accommodating development.</p> <p>Other receptor groups such as traffic, ecology (ancient woodland), and land use (proximity to school and sited on Grade 2 agricultural land) also considered high risk of impact.</p> <p>Engineering risk considered High due to moderate (1 in 9) site gradient and drainage challenges. Moderate access risk.</p>	<p>Due to the location of this option on a ridgeline with steep gradients, this is not preferable from an engineering, access or landscape perspective. Due to this, Option 14 is not taken forward to the short list of options.</p>
15	<p>Some tree copses and lines provide visual containment. Small number of rural properties and minor road provide a degree of settled character. Relatively flat with some room for screen planting if moved back from road. Therefore, low risk of impact for LVIA. Low risk of impact also for land use, tourism and socioeconomics and water and sediment quality (no identified constraints). Archaeology and ecology considered moderate risk of impact (setting, and indirect effects on nationally designated sites, respectively).</p> <p>Moderate engineering risk, associated with access and remote construction compound options.</p>	<p>Due to the location of this option within the same area as Option 16, only one of the two options was considered relevant to take forward to the short list, as further micro-siting of the option would take place following the LVIA modelling. When compared against Option 16, Option 15 has similar risks, although has a more settled rural character and as such was identified as less favourable at this stage from a LVIA perspective. As such, Option 15 was not taken forward to the short list of options.</p>
16	<p>Relatively flat with good area to be able to add linked woodland belts to improve containment. Therefore, low LVIA risk of impact as some interaction with visual receptors and valued local landscapes, but capacity to accommodate development exists. High risk of impact for ecology (ancient woodland). Moderate risk of impact for archaeology (setting) Low risk of impact also for land use, tourism and socioeconomics and water and sediment quality (no identified constraints).</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option was taken forward to the short list of options for further assessment.</p> <p>Further consideration of access was noted as required during the site selection process to ensure this option is viable.</p>
17	<p>Low LVIA risk of impact as some interaction with visual receptors and valued local landscapes, but capacity to accommodate development exists.</p>	<p>Based upon the engineering feasibility and the BRAG assessment work, this option was taken forward to the short list of options for further assessment.</p> <p>Further consideration of access was noted as required during the site selection process to ensure this option is viable.</p>

4.8.6.75 The following onshore substation options were then put forward for the medium list:

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5
- Option 6
- Option 7
- Option 8
- Option 16
- Option 17

Consultation (and cross-referencing with Awel y Môr)

4.8.6.76 During the Mona Offshore Wind Project Site Selection EWG it was suggested by stakeholders that we cross-reference our locations against the Awel y Môr locations to identify synergies with comments previously submitted. The medium list was cross-referenced against the responses received by the Awel y Môr onshore substation site selection process for comments by the following consultees:

- CPAT
- Cadw
- NRW
- NMWTRA.

4.8.6.77 The consultation responses on the medium-listed onshore substation options are presented in Table 4.20: Onshore substation medium list statutory consultee responses. Table 4.20 below.

Table 4.20: Onshore substation medium list statutory consultee responses.

Onshore substation option	Recommendation	Stakeholder
All options	Require crossing of the A55	NMWTRA
1-4	An area of generally undefined surface and subsurface archaeological potential. Few recorded sites here and no prior surveys. Potential indirect visual impact on Lower Elwy Registered Historic Landscape - may need ASIDOHL2 assessment.	CPAT
	There are no designated heritage assets in this zone but could have adverse impact on setting of listed building Pentre	Cadw

Onshore substation option	Recommendation	Stakeholder
7	Lies immediately to east of Bodewlyddan Park RPG but possibly screened by trees – would need a setting impact assessment. Undefined sub-surface archaeological potential. Possible WWI practice trench earthworks or related sub-surface archaeology. Roman road on southern boundary which may be affected by access works	CPAT
	There are no designated heritage assets in this zone	Cadw
8	Undefined sub-surface potential. Potential for impact to Roman road on north boundary by access and cable works. A large number of recorded non-designated sites in this area (field system earthworks)	CPAT
	There are no designated heritage assets in this zone	Cadw
16	An area of generally undefined surface and subsurface archaeological potential. Few recorded sites here and no prior surveys. Non-designated sites recorded are limited to a number of ponds recognised on early OS mapping. Potential indirect visual impact on Lower Elwy Registered Historic Landscape – may need ASIDOHL2 assessment.	CPAT
	There are no designated heritage assets in this zone	Cadw
	Option 16 could have an impact on the Elwy Valley Woods SAC and Coedydd ac Ogofau Elwy a Meirchion SSSI to the south. This would need to be determined once further details about the preferred substation location are available.	NRW
17	An area of generally undefined surface and subsurface archaeological potential. Few recorded sites here and no prior surveys. Potential setting impacts for listed buildings to east which would need to be assessed. Potential indirect visual impact on Lower Elwy Registered Historic Landscape - may need ASIDOHL2 assessment.	CPAT
	There are no designated heritage assets in this zone	Cadw
	Option 17 could have an impact on the Elwy Valley Woods SAC and Coedydd ac Ogofau Elwy a Meirchion SSSI to the south. This would need to be determined once further details about the preferred substation location are available.	NRW

4.8.6.78 Following consultation, and further engineering analysis, the Awel y Môr site selection process discounted Onshore Substation Option 8 due to the potential impact on nearby residential receptors in terms of visual amenity, and the likelihood that mitigation would not be achievable given the local topography constraints.

4.8.6.79 Onshore Substation Options 16 and 17 were also not taken forward primarily due to consultee feedback with regards to designated site impacts, combined with access constraints.

4.8.6.80 The remaining options were all considered potentially viable options for the onshore substation. Therefore, following the discounting of the options outlined above, the following seven options comprise the short list for the onshore substation (Figure 4.16):

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5
- Option 6
- Option 7

MONA OFFSHORE WIND PROJECT

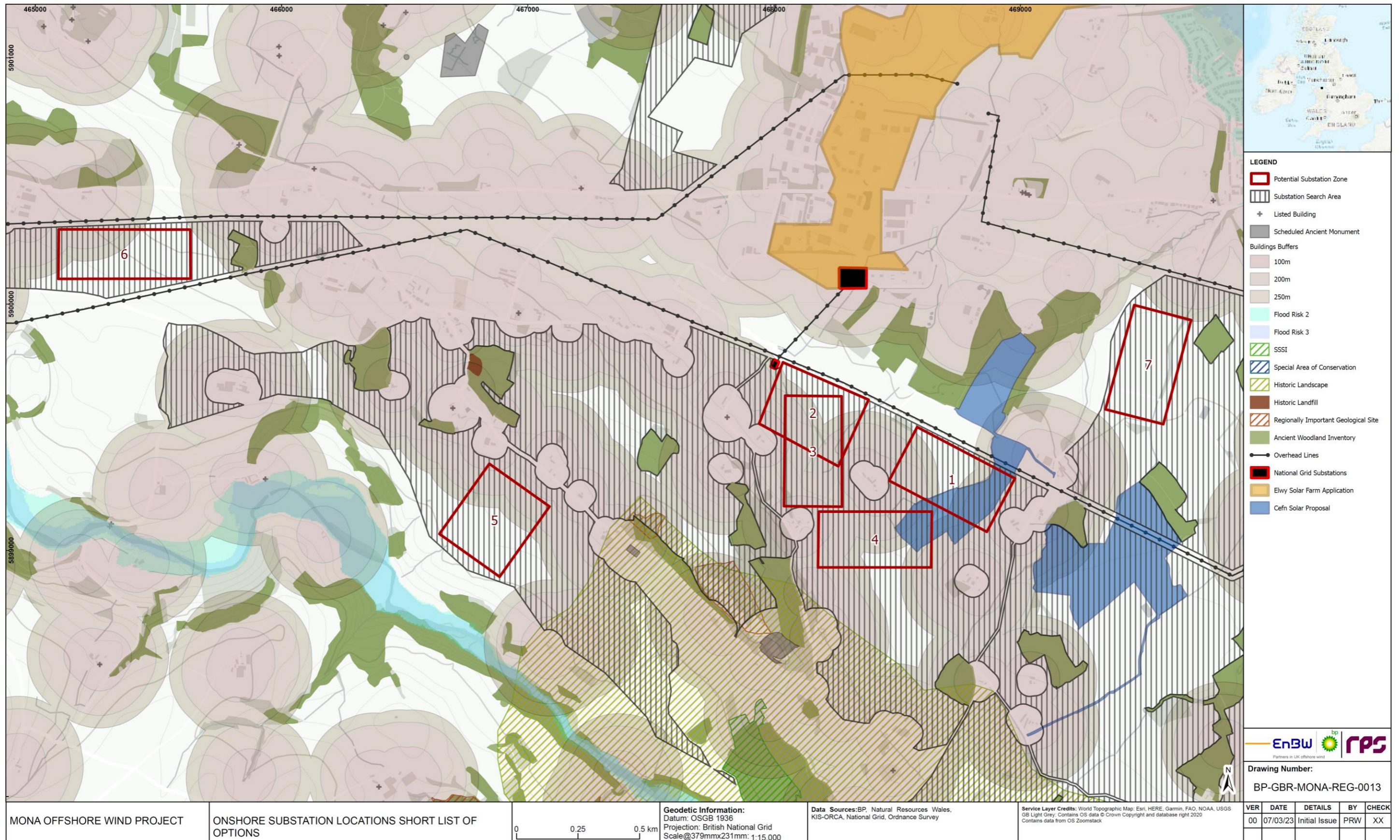


Figure 4.16: Onshore Substation Zones Short List of Options.

4.8.6.81 This short-list of onshore substation options was used to form the basis of a target 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; intending to combine the ongoing environmental assessment and technical studies with local knowledge to help narrow the location for the onshore substation for PEIR assessment. The intention of the consultation was to select one or more preferred onshore substation location(s) which would be the subject of PEIR to feed into the selection of a preferred onshore substation for ES. Events were held at Bodelwyddan Village Hall, as well as an online webinar, and feedback forms were available on the Mona Offshore Wind Project website – with the potential to email, use a written feedback form or freephone call.

4.8.6.82 The consultation responses on the short-listed onshore substation options are presented in Table 4.21 below. The full responses from the targeted consultation events will be reported in full in the Consultation Report.

Table 4.21: Onshore substation medium list community consultation responses.

Onshore substation option	Summary of consultation feedback
1	<ul style="list-style-type: none"> Rates low on concerns by the majority of residents Impacts on the environment, LVIA and cultural heritage were identified
2	<ul style="list-style-type: none"> Potentially favourable option due to the proximity to the existing National Grid substation Impacts on cultural heritage and the environment are identified (although the concerns are smaller in comparison to Onshore Substation Option 1) The site is the lowest above sea level and behind the business park so it is recognised as having a lower visual impact from the wider area
3	<ul style="list-style-type: none"> Varied responses, but closely aligned to the responses to Onshore Substation Option 2 Potential views from the adjacent highway network were identified Potential impacts on the close proximity watercourse and associated wildlife were identified Slightly favoured due to its location and proximity to the National Grid substation
4	<ul style="list-style-type: none"> Consultation responses generally acknowledged its positive / favourable location (predominantly due to the proximity to the existing National Grid substation) Concerns were raised around the environmental and visual impacts due to the proximity to homes and roads
5	<ul style="list-style-type: none"> Mixed responses but predominantly negative from residents and stakeholders Potential impacts on the Lower Elwdy Valley were identified due to potential visibility across the valley Potential impacts on wildlife, landscape and the surrounding designated Listed Buildings was also identified
6	<ul style="list-style-type: none"> Mixed feedback from residents and stakeholders Some responses preferred this location due to its accessibility and potential reduced impacts on the road network Potential LVIA impact is identified as the location has visibility from several directions and potential visibility across the valley

Onshore substation option	Summary of consultation feedback
7	<ul style="list-style-type: none"> Very mixed feedback with some describing this location as the best and some describing it as the worst Good access to the site was identified Potential impacts to amenity to surrounding residential properties were identified General comments received on the overdevelopment of the area (associated with connections into the National Grid substation) – this could be applicable to all onshore substation options

4.8.6.83 Following consultation responses, a further review of the preferred onshore substation options was undertaken. Responses to onshore substation options 1 and 2 were comparatively more favourable to those of onshore substation options 3 and 4 – despite their immediate proximity. As a result, onshore substation options 3 and 4 have been discarded. Due to the location of onshore substation options 1 and 2 being in close proximity to one another, only one of the two options has been considered relevant to take forward to the preferred list, as further micro-siting of the option would take place following the LVIA modelling. When compared against onshore substation 2, onshore substation 1 has similar risks, although has a slightly increased distance from the National Grid substation and pylons and therefore has a slightly more settled rural character and as such was identified as less favourable of the two locations at this stage from an LVIA perspective. In addition, onshore substation option 1 overlaps the proposed St Asaph Solar Farm footprint. As such onshore substation option 2 was selected as a preferred onshore substation location.

4.8.6.84 Consultation responses to onshore substation option 5 was the most negative and this option has been discounted as a result. Further engineering review of onshore substation option 6 identified that the location of this option on a ridgeline with steep gradients was not preferable from an engineering, access or landscape perspective. In addition, the Zone of Theoretical Visibility (ZTV) modelling confirmed that the onshore substation option 6 would be visible from the other side of the valley. Due to this, onshore substation option 5 was not taken forward to the preferred list of options. Onshore substation option 7 had mixed reviews but also very positive comments. Of the remaining onshore substation options, it is the most feasible with a potentially positive mitigation options.

4.8.6.85 Therefore, following the discounting of the options outlined above, the following two options comprise the preferred option(s) for the onshore substation:

- Onshore substation option 2
- Onshore substation option 7.

Onshore Substation Option 2

4.8.6.86 At this stage of the site selection process, further consideration was also given to the likely onshore cable routes connecting the landfall location with the proposed onshore substation options. Connectivity with the emerging preferred route (from Llanddulas) therefore influenced the decision with regards to onshore substation option 2, as the associated onshore cable routes had been identified as feasible. There is an

- anticipated high risk of potentially significant impacts for LVIA due to visual effects on nearby properties likely, with the closest property approximately 130m to the southeast, and mitigation opportunities being limited at these distances; stakeholder feedback had also indicated a potential impact on historic landscapes. Onshore substation option 2 also has higher risk of potentially significant impacts for traffic, archaeology, and a generally moderate risk of potential impacts for ecology receptor groups.
- 4.8.6.87 Connectivity between Onshore Substation Option 2 and the Bodelwyddan National Grid substation would follow a 400kV cable corridor directly north, avoiding the mature woodland blocks surrounding the Gwynt y Mor and National Grid substation. Due to its close proximity, the length of 400kV cable corridor required would be less than 500m.
- 4.8.6.88 Further consideration of access, landscape mitigation and impacts associated with operation and construction noise will need to be addressed as part of the ongoing project design, assessment and mitigation proposals.
- Onshore Substation Option 7**
- 4.8.6.89 For onshore substation option 7, stakeholder feedback was broadly positive, with limited constraints identified. The LVIA and wider receptor analysis indicated that this onshore substation option benefitted from some tree copses offering visual containment in an overall relatively flat setting, with site overall relatively flat, allowing mitigation in the form of screening. During the initial appraisal onshore substation option 7 was therefore considered to be moderate-lower risk of potentially significant impacts, with capacity to accept some development. Following further analysis, including preliminary ZTV analysis, it was considered to have two higher potential impacts in relation to landscape receptors. The preliminary ZTV assessment, noted views from a cluster of 18 properties within 400-500m of the option which could represent a high risk of impact to those receptors, given their proximity. Furthermore, visibility of the option from the St Asaph cathedral would also present a high risk of impact to the cathedral setting.
- 4.8.6.90 Connectivity with the emerging preferred route (from Llanddulas) is challenging from onshore substation option 7 due to the need to 'double-back' on the onshore cable route. The onshore cable route will approach from the west, passing south of the National Grid substation, and on to onshore substation option 7. This will mean that the 400kV cable corridor will need to return west along a similar alignment so that the mature woodland blocks surrounding the Gwynt y Mor and National Grid substation can be avoided.
- 4.8.6.91 Further consideration of cable routing, access, landscape mitigation and impacts associated with operation and construction noise will need to be addressed as part of the ongoing project design, assessment and mitigation proposals.
- Onshore Substation Conclusions**
- 4.8.6.92 These two preferred zones were considered, relative to one another, to determine preferred options for PEIR assessment and consultation. Further consideration was given to matters such as topography, access, landscape framework/screening, hydrology and ground conditions, with a particular focus on heritage, ecology, and LVIA assessment.
- 4.8.6.93 The constraints on the physical availability of the land at the two onshore substation options fed into the assessment of mitigation and access. It was determined that both options have a limited availability of land for potential mitigation to be implemented as they are constrained by existing woodland, properties to the west and east, and overhead lines. In addition, an assessment of the potential access to both options identified that both are constrained, with a need to include multiple options for access that could offer optionality – the PEIR consultation will seek comments on the most feasible and less impactful solution.
- 4.8.6.94 For PEIR consultation, assessments have been undertaken on the preferred onshore substation options within an Onshore Substation Zone. The indicative onshore substation footprints (of 105,000m² as identified in volume 5, annex 4.1: Site Selection Area of Search Identification) will contain the footprint of the main buildings and will be within the Onshore Substation Zone of 125,000m² (which will include grading and earthworks for levelling the onshore substation platform). The Onshore Substation Zones retain flexibility for the onshore substation footprints to be re-oriented for engineering design and mitigation of potential impacts.
- 4.8.6.95 Onshore Substation Option 7 retains the flexibility to orient along an east-west axis or a north-south axis and therefore has a larger Onshore Substation Zone identified. Assessment within the PEIR documentation will focus on the realistic worst case orientation for the MDS and this is the north-south axis orientation.
- 4.8.6.96 No conclusion has been drawn on the preferred onshore substation option for the Mona Offshore Wind Project. The indicative onshore substation areas provided for the purposes of PEIR will be further refined, subject to further site investigation, technical design work, ongoing EIA analysis, and any feedback received during the formal consultation at the PEIR stage. A decision will be made post-PEIR of the preferred onshore substation option, with an announcement to be made in mid-late 2023.
- 4.8.7 Identification of Potential Temporary Construction Compounds**
- 4.8.7.1 Construction activities will need to be supported by a series of temporary construction compounds along the onshore cable route close to the cable corridor. Further development of the onshore cable corridor area of search allowed for the identification of several potential locations within Conwy and Denbighshire. These areas are incorporated into the draft Works Plans and illustrated in detail in volume 1, chapter 3: Project Description.
- 4.8.8 Summary**
- 4.8.8.1 The Mona Offshore Wind Project site selection work (as informed through stakeholder engagement, landowner discussions and technical studies) has enabled the refinement of Mona Offshore Wind Project to the point of PEIR assessment. The following aspects of the proposed project have been identified and refined:
- A refined array boundary area
 - A single preferred offshore cable corridor search area of ~1km in width
 - A refined landfall at Llanddulas
 - A single preferred onshore cable corridor of 100m in width with emerging preferred route of approximately 70m

- Two feasible onshore HVAC substation sites (to be refined down to one for DCO application).

4.8.8.2 The Mona Offshore Wind Project considers that these options and refinements are sufficiently justified and narrowed down to enable stakeholders (through the consultation process) to meaningfully comment on the potential scheme and its potential effects on the receiving environment.

4.8.9 Next Steps

4.8.9.1 The Applicant will continue to develop and refine the project design as it progresses towards the final application for Development Consent and beyond this as it moves towards construction. The Mona Offshore Wind Project is currently at Stage 4 in the design process. Up to this point, the Applicant has engaged with a range of stakeholders in refining the project and identifying suitable options among the alternatives considered.

4.8.9.2 As the Mona Offshore Wind Project progresses past the statutory consultation stage, the Applicant will continue engagement with stakeholders, via the EWGs and other consultation as necessary. The Applicant will continue to keep stakeholders informed about the project design as it continues to evolve, and the selection process for preferred options where they remain in consideration.

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