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Supporting Information: Screening for Appropriate Assessment

Foreshore Licence Application - Helvick Head Offshore Wind

19 November 2021

1265586

ESB

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Glossary

Term	Definition
Application area	Export cable corridor(s) and portion of the array area which lies within 12 nm
Export cable corridor(s)	Area within which the export cable(s) will lie
Project	The proposed wind farm (export cable corridor(s) and Wind Turbine Generator array area)
Proposed site investigation work	Suite of survey work including geophysical surveys, geotechnical surveys, Metocean surveys and environmental/ecological surveys (detailed in Table 2.1)
WTG array area	Area within which the wind turbine generators will lie

Abbreviations and Acronyms

Abbreviation	Term in Full
AA	Appropriate Assessment
ADCP	Acoustic Doppler Current Profiler
CPT	Cone Penetration Testing
DEHLG	Department of Environment, Heritage and Local Government
DHLGH	Department of Housing, Local Government and Heritage (Formerly DCHG- Department of Culture, Heritage and the Gaeltacht)
EAF	East Atlantic Flyway
ESB	Electricity Supply Board
EIAR	Environmental Impact Assessment Report
FILA	Foreshore Investigation Licence Application
FWPM	Freshwater Pearl Mussel
IAMMWG	Inter-Agency Marine Mammal Working Group
INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resource
IWDG	Irish Whale and Dolphin Group
km	Kilometre
LSE	Likely Significant Effect
MAP	Maritime Area Planning
MBES	Multi Beam Echosounder
MHWS	Mean High Water Springs
m	Metre
nm	Nautical mile
NOAA	National Oceanic and Atmospheric Administration
O&M	Operation and Maintenance (phase)
OWF	Offshore Wind Farm
PCPT	Piezocene Penetration Test
ROI	Republic of Ireland
ROV	Remotely Operated Vehicle

Abbreviation	Term in Full
PTS	Permanent Threshold Shift
QI	Qualifying Interest
SAC	Special Area of Conservation
SBP	Sub-Bottom Profiler
SCANS	Small Cetacean Abundance in the North Sea
SCI	Special Conservation Interest
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSC	Suspended Sediment Concentrations
SSS	Side Scan Sonar
TTS	Temporary Threshold Shift
UHRS	Ultra-High Resolution Seismic
WTG	Wind Turbine Generator

1. Introduction

1.1. The Project

Helvick Head Offshore Wind, off the Republic of Ireland (ROI)'s Waterford coast, has been identified as potentially suitable for offshore wind development (Figure 1.1). The suitability criteria considered in identifying this potential development site included available area, water depth, seabed slope, designated nature conservation sites, planning/environmental constraints, access to the national grid, port facilities, navigation channels and cable landing locations.

This report has been prepared on behalf of ESB in support of an application for a Foreshore Licence under Section 3 of the Foreshore Act 1933, as amended, to carry out site investigation works within the Foreshore Licence Application Area as part of the preliminary assessment of the suitability of Helvick Head Offshore Wind for a fixed foundation offshore wind development. The overall area the subject of this Foreshore Licence application is 870 km².

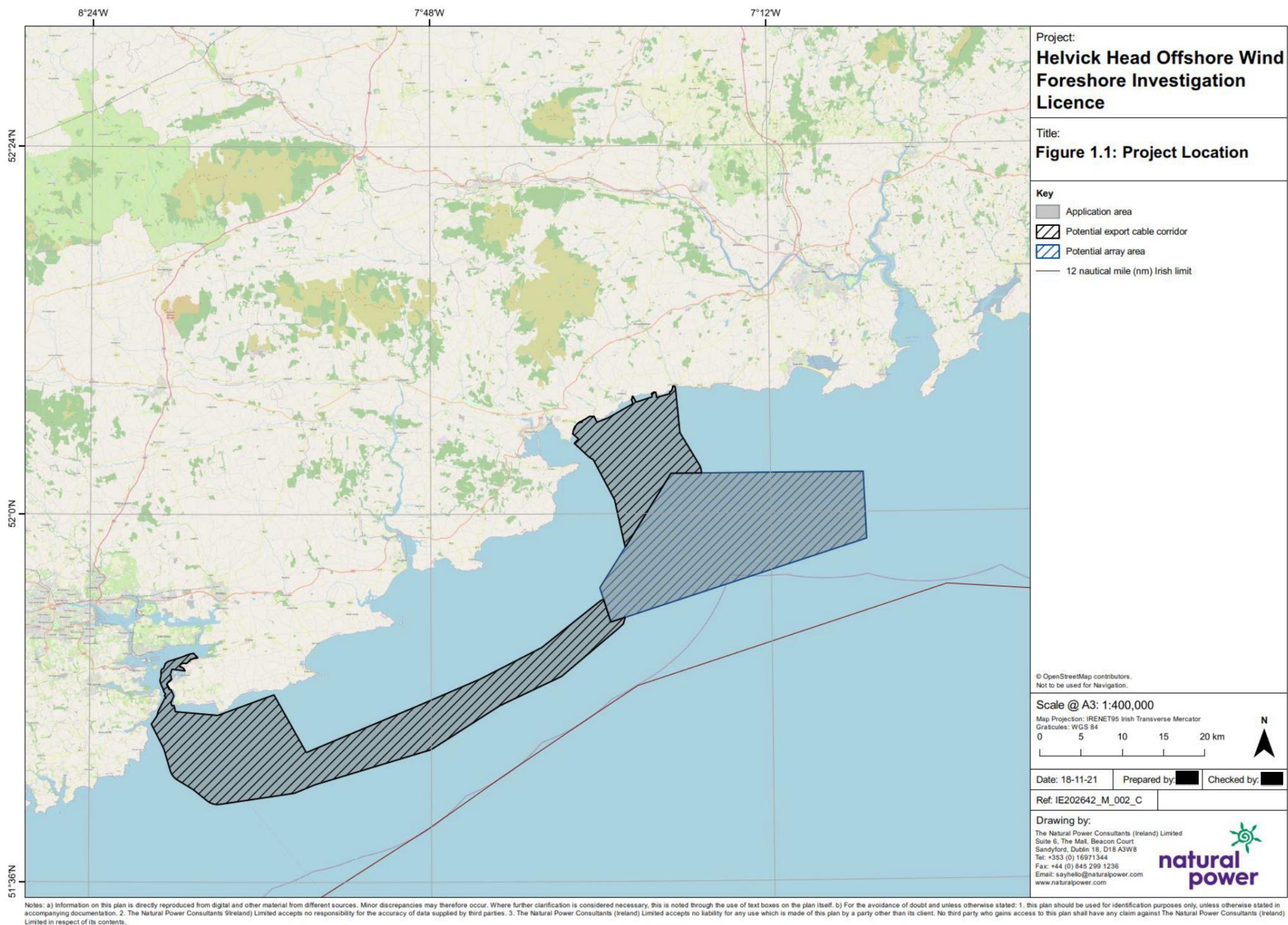


Figure 1.1: The Project area (export cable corridor(s) and WTG array area)/Application area

1.2. The Developer

Electricity Supply Board (ESB) are working to identify offshore wind farm sites suitable for the development of both fixed and floating foundation wind turbine technology in Ireland. It is the ambition of the ESB to explore opportunities for large scale wind projects towards commercial operation by 2030, thus contributing to the wider goals of the Irish Government on energy transition.

1.3. The Purpose of this Document

Appropriate Assessment (AA): An assessment carried out under Article 6(3) of the Habitats Directive of the implications of a plan or project, either individually or in combination with other plans and projects, on a Natura 2000 site in view of the site's conservation objectives (DEHLG, 2010).

The purpose of this document, which will accompany a Foreshore Licence Application, is to provide supporting information for Screening for AA in determining whether the proposed site investigation and baseline survey work, either alone and in combination with other plans or projects, is likely to have a significant effect on any Natura 2000 site. The effects of the site investigation and baseline survey work on Natura 2000 sites are considered specifically in relation to the habitats and species for which Natura 2000 sites have been designated.

Where significant effects are assessed as likely during the AA Screening process, a Natura Impact Statement will be required to provide supporting information to the Competent Authority in determining whether the project either alone, or in combination with other plans or projects, will affect the integrity of any Natura 2000 site(s).

Initially, the proposed site investigation and baseline survey work has been outlined (Section 2) and potential impacts and effects identified (Section 3).

In line with the Department of Environment, Heritage and Local Government (DEHLG), Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities (DEHLG, 2010), the following stages and steps are undertaken during Screening for AA:

- Stage 1 – AA Screening [Considered in this document]
 - Step 1 – ascertain the locations of the relevant Natura 2000 sites (Section 4.1)
 - Step 2 – compile information on the Qualifying Interests (QIs)/Special Conservation Interests (SCIs) (Section 4.1)
 - Step 3 – assessment of likely significant effects (Section 4.2)
 - Step 4 – consideration of 'in combination effects' (Section 4.2)
 - Step 5 – draw conclusion as to whether or not the project (either alone or in combination with other plans or projects) is likely to give rise to significant effects (Section 4.2)

2. Proposed Site Investigation and Baseline Survey Work

Pending receipt of the Foreshore Licence, ESB proposes to commence site investigation and baseline survey work on a phased approach in Q2/Q3 2022 with surveys proceeding over the course of the 5-year licence period. The exact dates are to be determined (pending enactment of the Maritime Area Planning (MAP) Bill and the appointment of survey contractors) but, based on the estimated scope of works to be conducted, the duration of the project scope has been estimated. ESB undertook pre-application consultation with the Foreshore Unit within the Department of Housing, Local Government and Heritage (DHLGH) in 2020 and 2021 and will consult with the Foreshore Unit and other relevant stakeholders where appropriate prior to the commencement of the site investigation and survey work outlined within this application.

A summary of the proposed site investigation and baseline survey work is presented in Table 2.1 below. Full details of the proposed site investigation work can be found in the “Site Investigation – Schedule of Works” document (Document No. QS-000306-01-R460-002-000) which has been prepared to accompany ESB’s application for a Foreshore Licence. Proposed (indicative) sampling locations are provided in Appendix A.

Table 2.1: Summary of the proposed site investigation and baseline survey work at Helvick Head Offshore Wind

Scope of work (duration ¹)	Purpose	Details
Geophysical surveys (3-4 months)	Provide significant seabed and sub-seabed information to assist in the consenting, design and installation phases of the OWF project	The foreseen scope of works will primarily consist of the following surveys but may also incorporate visual surveys (e.g. drop-down video, ROV etc.) pending the development of the project’s ground model: Multi beam echosounder (MBES) Sub-bottom profiler (SBP) Ultra-high resolution seismic (UHRS) Side scan sonar (SSS) Magnetometer
Geotechnical surveys (2-3 months)	Provide sufficient geotechnical data to allow the characterisation of the sub-seabed strata in order to refine a 3D soil model of the offshore windfarm site. These details will be used to initiate the design of the WTG and substation foundations and to carry out a comprehensive analysis of the installation methodology	The works will include the following: Seabed Piezocone Penetration Test (PCPT) testing at a pre-defined number of locations within seabed sediments, to refusal Sampling/coring boreholes at a pre-defined number of locations to a nominal depth

¹ Subject to change based on variables such as weather conditions onsite, unforeseen seabed conditions, unforeseen obstructions etc.

Scope of work (duration ¹)	Purpose	Details
<p>Metocean surveys (fixed 12- to 36-month period including the need for site access for data collection and maintenance as needed)</p>	<p>Collect accurate wind, wave, temperature, current and water level information from the project site that will be used to conduct energy yield assessments, feed into offshore sub-structure design and estimate workability range at offshore sites for defining the construction and O&M strategies</p>	<p>Vibro-coring at a pre-defined number of locations to a nominal depth</p> <p>Down-the-hole (or similar) Cone Penetration Testing (CPT) inside the boreholes at different depths as dictated by geotechnical conditions</p> <p>Grab sampling at a pre-defined number of locations</p> <p>Trial pits at specified locations within cable pull-in zone</p> <p>Offshore and onshore laboratory testing of recovered samples</p> <p>These works may include the following:</p> <ul style="list-style-type: none"> Acoustic Doppler Current Profiler (ADCP) Wave buoys Floating Lidar buoy
<p>Environmental/Ecological surveys (periodically across a 12- to 24-month period)</p>	<p>Collect baseline data which will be used to inform the Environmental Impact Assessment Report (EIAR)</p>	<p>These works may include the following:</p> <ul style="list-style-type: none"> Benthic sampling Static acoustic monitoring Walkover surveys Ornithology surveys* Marine mammal surveys* Fisheries, fish and shellfish surveys* Shipping and navigation surveys* Archaeological survey

* Outwith scope of Foreshore Investigation Licence application but included for completeness

3. Identification of Potential Impacts and Effects

3.1. Marine Ornithology

The potential routes to impact for SCIs or habitats supporting SCIs (within SPAs) from the proposed site investigation work are considered to be:

- Increased above-water noise from geophysical surveys and geotechnical works;
- Increased underwater noise from geophysical surveys, geotechnical works;
- Increased visual disturbance from geophysical surveys, geotechnical works and environmental walkover surveys and benthic intertidal surveys; and
- Impacts upon prey species from geophysical works and from geotechnical and environmental surveys.

All other surveys are considered to have no potential route to impact for birds, directly or indirectly.

SCIs are described as three main groups: seabirds and other coastal nesting species, wildfowl (inclusive of ducks, geese and grebes) and waders. The above impacts are not predicted to impact all SCI groups, rather each SCI is assessed where a potential route to impact exists (Table 3.1).

Table 3.1: Potential impacts and ornithological SCIs

Impact	Special Conservation Interest group
Above water noise	Seabirds and other coastal nesting species, wildfowl and waders.
Below water noise	Seabirds (but not other coastal nesting species) and diving wildfowl (little grebe, great crested grebe and red-breasted merganser only)
Visual disturbance	Seabirds and coastal nesting species, wildfowl and waders
Impacts upon prey species	Seabirds (but not other coastal nesting species), wildfowl and waders.

3.1.1. Above Water Noise

Activities from the surveys at landfall or at sea may result in additional anthropogenic noise. Birds vary in their responses and susceptibilities to noise, and each SCI group is assessed accordingly below.

Seabirds and other coastal nesting species

Different seabird species and other coastal nesting species such as peregrine and chough, show varied sensitivities to noise. Some species, such as herring gull, lesser black-backed gull, peregrine and to a lesser extent kittiwake, nest in urbanised landscapes and display habituated responses to additional anthropogenic noise. Other species, such as chough, being notably sensitive to anthropogenic disturbance (Furness *et al.*, 2012, Black *et al.*, 2015, Dierschke *et al.*, 2017, Fleissbach *et al.*, 2019, Kerbiriou *et al.*, 2009). Disturbance and displacement from anthropogenic above water noise may have consequences at individual and population levels (Joint SNCB note, 2017).

Wildfowl

Wildfowl display varied responses to anthropogenic noise, depending on the context, magnitude and predictability of the noise within the context of their surroundings. In addition, activity (i.e. foraging or roosting), as well as the time of day and flock size can affect how birds respond to sound disturbance (Cutts *et al.*, 2013). Disturbance and displacement from anthropogenic above water noise may have consequences at individual and population levels (Joint SNCB note, 2017).

Waders

Waders show mixed responses to anthropogenic noise, depending on species. Some species, such as sanderling, are highly tolerant, whilst others such as knot and redshank are highly sensitive (Cutts *et al.*, 2013). Recent work has suggested that the impact of noise on waders is already limited in industrialised areas (Goss-Custard *et al.*, 2019). Disturbance and displacement from anthropogenic above water noise may have consequences at individual and population levels (Joint SNCB note 2017).

3.1.2. Below Water Noise

Activities of surveys at sea and the vessel itself may result in underwater noise affecting seabird species and some species of diving wildfowl.

Seabirds

For some species of diving seabirds, underwater noise may be a disturbing factor, affecting prey acquisition, displacing them from habitat or otherwise evoking an escape flight response (Black *et al.*, 2015, Dierschke *et al.*, 2017). Other seabirds that may shallow dive, dip, dive or surface feed as their predominant method of foraging are unlikely to be impacted by below water noise, due to the brevity of exposure time and sensitivity to disturbance (Furness *et al.*, 2012, Fleissbach *et al.*, 2019). Disturbance and displacement from anthropogenic below water noise may have consequences at individual and population levels (Joint SNCB note 2017).

Wildfowl

For some species of diving wildfowl, underwater noise may theoretically be a disturbing factor, affecting prey acquisition, displacing them from habitat or otherwise evoking an escape flight response as has been observed for other diving bird species (Black *et al.*, 2015, Dierschke *et al.*, 2017). Disturbance and displacement from anthropogenic below water noise may have consequences at individual and population levels (Joint SNCB note 2017).

3.1.3. Visual Disturbance

Activities from the intertidal archaeological and environmental walkover surveys, vessel presence or presence of personnel all have the potential to result in disturbance of SCIs.

Seabirds and other coastal nesting species

Breeding seabirds and other species (such as peregrine and chough) nesting on shorelines or structures in proximity to human activities can be disturbed from their nests. Similarly, other seabird aggregations or individual birds may be disturbed on approach or by vessel presence (Althouse *et al.*, 2012, Furness *et al.*, 2012, Dierschke *et al.*, 2017, Fleissbach *et al.*, 2019). Disturbance and displacement from visual stimuli may have consequences at individual and population levels (Joint SNCB note 2017).

Wildfowl

Wildfowl differentially respond to visual disturbance, depending on their activity, species and context of the stimulus (Cutts *et al.*, 2013). In particular, foraging or roosting aggregations of dabbling ducks or geese may be sensitive to

visual disturbance. Disturbance and displacement from visual stimuli may have consequences at individual and population levels (Joint SNCB note 2017).

Waders

Waders respond differentially to visual disturbance, depending on factors that include the species, flock size and context of their location (i.e. industrialised areas) (Cutts *et al.*, 2013, Goss-Custard *et al.* 2019). Disturbance and displacement from visual stimuli may have consequences at individual and population levels (Joint SNCB note 2017).

3.1.4. Impacts upon prey species

Intertidal works and activities of surveys at sea may result in disturbance or displacement of certain prey species which, in turn, may affect their availability for SCIs.

Seabirds

Disturbance or displacement of hearing specialist fish prey species (by noise from geophysical surveys) or benthic fish prey species (by agitation of benthic habitat from geotechnical and environmental surveys) may reduce the availability of those prey species to piscivorous seabird species. Reductions in prey availability may adversely influence survival and productivity.

Wildfowl

Disturbance or displacement of hearing specialist fish prey species (by noise from geophysical surveys) or benthic fish and shellfish prey species (by agitation of benthic habitat from geotechnical and environmental surveys) may reduce the availability of those prey species to piscivorous diving waterfowl species. Reductions in prey availability may adversely influence individual condition and survival.

Waders

Disturbance or displacement of intertidal prey species which are foraged upon by wading bird species (by geotechnical and environmental surveys) may reduce the availability of those prey species to wading bird species. Reductions in prey availability may adversely influence individual condition and survival.

3.2. Marine Mammals

There is potential for marine mammals to be affected during the proposed site investigation work as a result of:

- Increased anthropogenic noise from geophysical survey and positioning equipment;
- Increased anthropogenic noise from geotechnical survey work; and
- Increased collision risk with vessels.

Potential effects on marine mammal QIs resulting from these potential impacts are considered to include:

- Disturbance or auditory injury from increased anthropogenic noise from geophysical survey and positioning equipment;
- Disturbance or auditory injury from increased anthropogenic noise from geotechnical survey work; and
- Mortality or injury from collision events.

These potential effects are expanded upon below.

3.2.1. Disturbance or auditory injury from increased anthropogenic noise from geophysical survey and positioning equipment

Use of geophysical survey and positioning equipment has the potential to disturb and/or injure marine mammals if the frequency/frequencies of the sound emitted fall within their hearing range (Table 3.2). Geophysical survey and positioning equipment emit pulsed sound.

Southall *et al.* (2007) provide thresholds for received sound levels that have the potential to induce the onset of auditory injury (Permanent Threshold Shift – PTS and Temporary Threshold Shift – TTS) in marine mammals (see Table 3.3). Although these thresholds have since been updated (by Southall *et al.* (2019) and NOAA (2018)), it is the Southall *et al.* (2007) thresholds, upon which the 2014 DAHG (now DHLGH) guidance (on managing the risk to marine mammals from man-made sound sources in Irish waters) is based, which have been used to undertake this assessment.

The “Site Investigation – Schedule of Works” document (Document No. QS-000306-01-R460-002) which was prepared to accompany ESB’s application for a Foreshore Licence provides typical frequencies and sound pressure levels of the suite of equipment (see Appendix B) thus allowing the potential for auditory injury to be assessed. SPL thresholds have been used because information on SPLs, rather than SELs, was available (both in the “Site Investigation – Schedule of Works” document and from equipment manufacturers).

Information (on disturbance of harbour porpoises as a result of commercial 2-D seismic surveys²) from Thompson *et al.* (2013) was used to assess the potential for disturbance.

Table 3.2: Auditory range for the functional hearing groups

Hearing group (NOAA, 2018)	Hearing group (Southall <i>et al.</i> , 2019)	Relevant species	Estimated auditory bandwidth (kHz)
Low frequency cetaceans	Low frequency cetaceans	Minke whale	0.007 – 3.5
Mid frequency cetaceans	High frequency cetaceans	Bottlenose dolphin, white-beaked dolphin and white-sided dolphin	0.15 – 160
High frequency cetaceans	Very high frequency cetaceans	Harbour porpoise	0.2 – 180
Phocid pinnipeds	Phocid carnivores in water	Harbour seal and grey seal	0.5 - 86

Source: NOAA (2018), Southall *et al.* (2019).

Table 3.3: Auditory injury thresholds – SPLs (dB re 1 µPa @ 1 m) – for assessing the potential for injury to occur instantaneously

Functional hearing group	Example species	Pulsed sound		Non-pulsed sound
		PTS	TTS	PTS
Low frequency cetaceans	Minke whale	230	224	230
Mid frequency cetaceans	Bottlenose dolphin Common dolphin			

² Thompson *et al.* (2013) observed harbour porpoise responses to commercial 2D seismic surveys in the Moray Firth over ranges of 5 to 10 km. The use of 10 km in this case would result in highly conservative estimates because the noise levels produced by the oil and gas exploration surveys described in Thompson *et al.* (2013) would have been well in excess of those produced during use of the equipment described here. Therefore, for the purposes of this assessment, a potential impact range of 5 km is considered appropriate to represent the worst-case scenario for audible systems.

Functional hearing group	Example species	Pulsed sound		Non-pulsed sound
		PTS	TTS	PTS
High frequency cetaceans	Risso's dolphin			
	Harbour porpoise			
Phocid pinnipeds	Grey seal	218	212	218
	Harbour seal			

Source: Southall *et al.* (2007), as per requirement of the Guidance on managing the risk to marine mammals from man-made sound sources in Irish waters (DAHG, 2014).

3.2.2. Disturbance or auditory injury from increased anthropogenic noise from geotechnical survey work

Geotechnical surveys have the potential to increase anthropogenic noise in the marine environment, which in turn has the potential to affect marine mammals. Geotechnical surveys emit non-pulsed (i.e. continuous) sound. Potential effects of geotechnical surveys are thought to be of low concern in relation to disturbance of marine mammals (JNCC, 2010) as any drilling/coring activity is generally short in duration and occurs over a small spatial scale.

The “Site Investigation – Schedule of Works” document provides typical frequencies and sound pressure levels of the suite of equipment (see Appendix B) thus allowing the potential for auditory injury to be assessed. Again, SPL thresholds have been used.

3.2.3. Mortality or injury from collision events

Vessel strikes are a known cause of mortality in marine mammals (Laist *et al.*, 2001; Wilson *et al.*, 2020). Non-lethal collisions have also been documented (Laist *et al.*, 2001; Van Waerebeek *et al.*, 2007; Wilson *et al.*, 2020). Injuries from such collisions can be divided into two broad categories: blunt trauma from impact and lacerations from propellers. Injuries may result in individuals becoming vulnerable to secondary infections. Slower vessels following a consistent trajectory allow animals the opportunity to avoid collisions. The risk of fatality is also reduced if vessels are moving slowly.

Avoidance behaviour by cetaceans is often associated with fast, unpredictable boats such as speedboats and jet-skis (Bristow and Reeves, 2001; Gregory and Rowden, 2001; Leung and Leung, 2003; Buckstaff, 2004), while neutral or positive reactions have been observed with larger, slower moving vessels such as cargo ships (Leung and Leung, 2003; Sini *et al.*, 2005).

3.3. Annex I Habitats

The potential routes to impact for Annex I habitat QIs from the proposed site investigation work are considered to be:

- Habitat disturbance/loss from geotechnical, benthic (and intertidal), fish/shellfish and Metocean/acoustic surveys; and
- Increased Suspended Sediment Concentrations (SSC)/smothering from geotechnical, benthic and Metocean/acoustic surveys.

Each of these impact pathways are described further below. Furthermore, whilst all marine surveys have the potential for direct effects on benthic habitats via pollution or littering pathways, there is considered to be no route to impact due to strict maritime regulations and survey protocols which would be in place. No impacts are predicted on the offshore benthic habitat during geophysical or ROV surveys as no contact is made with the seabed.

3.3.1. Habitat disturbance/loss

A number of different elements of the planned survey work have the potential to directly disturb and potentially cause habitat loss within the Application area, with both offshore and intertidal habitats potentially affected.

It is considered habitat disturbance and loss will only occur as a result of direct contact with the seabed (through e.g. benthic grabs, geotechnical works, deployment of metocean equipment) in those locations where potentially sensitive benthic QIs exist.

Vibro-coring will introduce vibration to the seabed and although benthic organisms have no auditory capabilities, they are susceptible to vibration (Rogers *et al.*, 2016), with responses including temporary retreat of tube dwelling species, and movement of mobile organisms from the source of disturbance.

3.3.2. Increased SSC/Smothering

Regional data (INFOMAR³) suggest that the most likely substrate type at the site is poorly sorted muddy sand with gravel, pebbles and shells in a patchy distribution surrounding the proposed site. All of which are exposed to the strong hydrodynamic movements in the area. There is likely to be a low proportion of fine fractions within the sediment and low organic carbon content (Wheeler *et al.*, 2009). Other notable habitats within the Application area include areas of finer sediments and silty clay/muds, particularly towards the inshore sheltered areas (e.g. near to and within Ballydowane Bay), and areas of rocky reef habitat with associated epifaunal communities.

A few broad potential landfall locations have been identified and the intertidal habitats within the Application area include areas of rocky coastline interspersed with small sections of sandy beaches. In more sheltered areas such as estuaries and bays, vegetated intertidal habitats such as seagrass beds and salt meadows can be present, in addition to some mudflats and sandflats.

Indirect effects may arise as a result of elevated SSC. Due to the coarse nature of the sediments across much of the Application area, no elevation in SSC beyond close proximity (1 km) of the works is predicted as any sediment mobilised by the work will settle almost immediately. In more sheltered areas where fine sediments may be more prevalent, water movements are much reduced and as such any increase in SSC is not considered to be transported any great distance, with all material likely to have settled within a few hundred metres of the work.

3.4. Annex II Diadromous Fish

The potential impacts on Annex II diadromous fish QIs from the proposed site investigation work are considered to be:

- Underwater noise from geophysical surveys; and
- Increased levels of SSC.

The potential effects on Annex II diadromous fish QIs resulting from these potential impacts are injury and disturbance from underwater noise, or disturbance from increased SSC. These effects are expanded upon below.

3.4.1. Underwater noise

Not all of the Annex II diadromous fish QIs are susceptible to underwater noise. Fish species are either hearing specialists (where intricate connections from the swim bladder to the inner ear allow the perception of underwater noise), or hearing generalists (where there is no connection with the swim bladder and therefore little or no perception of underwater noise). It is considered that only hearing specialist species are sensitive to underwater noise, and that no route to impact exists for hearing generalists.

³ <https://www.infomar.ie/maps/interactive-maps/seabed-and-sediment>

3.4.2. Increased SSC

The coarse nature of the sediments across much of the Application area mean that any potential increase in SSC will remain with close proximity to the works (see Section 3.3.2).

4. Stage 1: Appropriate Assessment (AA) Screening

4.1. Step 1 - 2: Identification of Designated Sites and Associated Interests

4.1.1. Marine Ornithology

Situated where the Atlantic Ocean meets North-western Europe, Ireland is a highly important breeding, wintering and migratory stopover destination for many species of birds. The coastline of Ireland and its associated islands and estuaries host nationally and internationally important assemblages of bird species throughout the year and as such several sites are designated as Special Protection Areas (SPAs). Many of the island and cliff SPAs provide important habitat for breeding seabird species, of which 24 species are recorded as breeding in Ireland (Mitchell *et al.*, 2004).

The East Atlantic Flyway (EAF) is a major migratory route for a number of bird species, which connects Arctic and Nearctic breeding grounds that extend from eastern Canada and central Siberia with wintering areas that stretch from western Europe and down into Sub-Saharan Africa. Ireland's location at the "gateway" between the northern reaches and central/southern extent of the EAF make it a critical stopover destination for migrating waterfowl, waders and passerines. The estuarine habitats provide important foraging and staging areas for resident and migratory species of waterfowl and waders (Crowe, 2005).

SPAs were included in screening based upon assessment of the potential for connectivity with their SCIs and the Project. There was considered to be potential connectivity with any SPA and its SCIs if the Application area overlapped the SPA or was within 15 km of the site boundary.

It is noted that, given their generally large foraging ranges, seabirds from other, more distant SPAs may occasionally forage in, pass through or undertake other behaviours within the Application area. On the basis that the frequency of birds from these more distant SPAs occurring within the Application area decreases as the distance between the Application area and those SPAs increases, it is considered that the Application area is beyond any core habitat use areas around these more distant sites. Given the highly localised, temporary and short duration of the proposed site investigation works, it is considered that only those SPAs with direct overlap, or within 15 km, have potential to be affected by the proposed activities. Any potential impacts to seabird SCIs from SPAs beyond 15 km from the Application area are therefore considered negligible and there is therefore no potential for any LSE on the SCIs of these sites.

Although wintering SCIs from estuarine SPAs (waders and waterfowl) do not generally forage as widely as seabird species, it is noted that wintering estuarine species (waders and waterfowl) may move between estuarine areas. Wintering SCIs from estuarine SPAs may therefore utilise estuarine habitats outside the SPAs in which they are listed as SCIs and, should this *ex situ* habitat use occur within or close to (within 1 km of) the Application area there is the possibility that proposed works may impact upon these SCIs. On the basis that such movements will happen most frequently between estuarine habitats which are in close proximity, a 15 km range for connectivity for screening for estuarine SPAs was considered appropriate. Given the highly localised, temporary and short duration of the proposed surveys, it is considered that only those SPAs with direct overlap, or within 15 km, have potential to be affected by the proposed activities. Any potential impacts to wintering estuarine SCIs from SPAs beyond 15 km from the Application area are considered negligible and there is therefore no potential for any LSE on the SCIs of these sites.

Those sites included in Screening are given in Table 4.1 and are shown in relation to the project in Figure 4.1.

Table 4.1: SPAs included in Screening

Site code	Site name	Special Conservation Interests	Distance from Application area (km)
[IE0004193]	Mid-Waterford Coast SPA	[A017] Cormorant (<i>Phalacrocorax carbo</i>)	0.0
		[A103] Peregrine falcon (<i>Falco peregrinus</i>)	
		[A184] Herring gull (<i>Larus argentatus</i>)	
		[A346] Chough (<i>Pyrrhocorax pyrrhocorax</i>)	
[IE0004030]	Cork Harbour SPA	[A004] Little grebe (<i>Tachybaptus ruficollis</i>)	0.0
		[A005] Great crested grebe (<i>Podiceps cristatus</i>)	
		[A017] Cormorant (<i>Phalacrocorax carbo</i>)	
		[A028] Grey Heron (<i>Ardea cinerea</i>)	
		[A048] Shelduck (<i>Tadorna tadorna</i>)	
		[A050] Wigeon (<i>Mareca penelope</i>)	
		[A052] Teal (<i>Anas crecca</i>)	
		[A054] Pintail (<i>Anas acuta</i>)	
		[A056] Shoveler (<i>Spatula clypeata</i>)	
		[A069] Red-breasted merganser (<i>Mergus serrator</i>)	
		[A130] Oystercatcher (<i>Haematopus ostralegus</i>)	
		[A140] Golden plover (<i>Pluvialis apricaria</i>)	
		[A141] Grey plover (<i>Pluvialis squatarola</i>)	
		[A142] Lapwing (<i>Vanellus vanellus</i>)	
		[A149] Dunlin (<i>Calidris alpina</i>)	
		[A156] Black-tailed godwit (<i>Limosa limosa</i>)	
		[A157] Bar-tailed godwit (<i>Limosa lapponica</i>)	
		[A160] Curlew (<i>Numenius arquata</i>)	
		[A162] Redshank (<i>Tringa totanus</i>)	
		[A179] Black-headed gull (<i>Chroicocephalus ridibundus</i>)	
[A182] Common gull (<i>Larus canus</i>)			
[A183] Lesser black-backed gull (<i>Larus fuscus</i>)			
[A193] Common tern (<i>Sterna hirundo</i>)			
[IE0004032]	Dungarvan Harbour SPA	[A005] Great crested grebe (<i>Podiceps cristatus</i>)	0.2
		[A046] Brent goose (<i>Branta bernicla hrota</i>)	
		[A048] Shelduck (<i>Tadorna tadorna</i>)	
		[A069] Red-breasted merganser (<i>Mergus serrator</i>)	
		[A130] Oystercatcher (<i>Haematopus ostralegus</i>)	
		[A140] Golden plover (<i>Pluvialis apricaria</i>)	
		[A141] Grey plover (<i>Pluvialis squatarola</i>)	
		[A142] Lapwing (<i>Vanellus vanellus</i>)	
		[A143] Knot (<i>Calidris canutus</i>)	
		[A149] Dunlin (<i>Calidris alpina</i>)	
[A156] Black-tailed godwit (<i>Limosa limosa</i>)			

Site code	Site name	Special Conservation Interests	Distance from Application area (km)
[IE0004192]	Helvick Head to Ballyquin SPA	[A157] Bar-tailed godwit (<i>Limosa lapponica</i>)	0.7
		[A160] Curlew (<i>Numenius arquata</i>)	
		[A162] Redshank (<i>Tringa totanus</i>)	
		[A169] Turnstone (<i>Arenaria interpres</i>)	
		[A017] Cormorant (<i>Phalacrocorax carbo</i>)	
		[A103] Peregrine falcon (<i>Falco peregrinus</i>)	
[IEC004022]	Ballycotton Bay SPA	[A184] Herring gull (<i>Larus argentatus</i>)	4.4
		[A188] Kittiwake (<i>Rissa tridactyla</i>)	
		[A346] Chough (<i>Pyrrhocorax pyrrhocorax</i>)	
		[A052] Teal (<i>Anas crecca</i>)	
		[A137] Ringed plover (<i>Charadrius hiaticula</i>)	
		[A140] Golden plover (<i>Pluvialis apricaria</i>)	
[IEC004027]	Tramore Back Strand SPA	[A141] Grey plover (<i>Pluvialis squatarola</i>)	10.5
		[A142] Lapwing (<i>Vanellus vanellus</i>)	
		[A156] Black-tailed godwit (<i>Limosa limosa</i>)	
		[A157] Bar-tailed godwit (<i>Limosa lapponica</i>)	
		[A160] Curlew (<i>Numenius arquata</i>)	
		[A169] Turnstone (<i>Arenaria interpres</i>)	
		[A182] Common gull (<i>Larus canus</i>)	
		[A183] Lesser black-backed gull (<i>Larus fuscus</i>)	
		[A046] Light-bellied brent goose (<i>Branta bernicla hrota</i>)	
		[A140] Golden plover (<i>Pluvialis apricaria</i>)	
[IEC004023]	Ballymacoda Bay SPA	[A141] Grey plover (<i>Pluvialis squatarola</i>)	12.4
		[A142] Lapwing (<i>Vanellus vanellus</i>)	
		[A149] Dunlin (<i>Calidris alpina</i>)	
		[A156] Black-tailed godwit (<i>Limosa limosa</i>)	
		[A157] Bar-tailed godwit (<i>Limosa lapponica</i>)	
		[A160] Curlew (<i>Numenius arquata</i>)	
		[A050] Wigeon (<i>Anas penelope</i>)	
		[A052] Teal (<i>Anas crecca</i>)	
		[A137] Ringed plover (<i>Charadrius hiaticula</i>)	
		[A140] Golden plover (<i>Pluvialis apricaria</i>)	
[A141] Grey plover (<i>Pluvialis squatarola</i>)			
[A142] Lapwing (<i>Vanellus vanellus</i>)			
[A144] Sanderling (<i>Calidris alba</i>)			
[A149] Dunlin (<i>Calidris alpina</i>)			
[A156] Black-tailed godwit (<i>Limosa limosa</i>)			
[A157] Bar-tailed godwit (<i>Limosa lapponica</i>)			
[A160] Curlew (<i>Numenius arquata</i>)			

Site code	Site name	Special Conservation Interests	Distance from Application area (km)
		[A162] Redshank (<i>Tringa totanus</i>)	
		[A169] Turnstone (<i>Arenaria interpres</i>)	
		[A179] Black-headed gull (<i>Chroicocephalus ridibundus</i>)	
		[A182] Common gull (<i>Larus canus</i>)	
		[A183] Lesser black-backed gull (<i>Larus fuscus</i>)	
[IEC004124]	Sovereign Islands SPA	[A017] Cormorant (<i>Phalacrocorax carbo</i>)	14.0

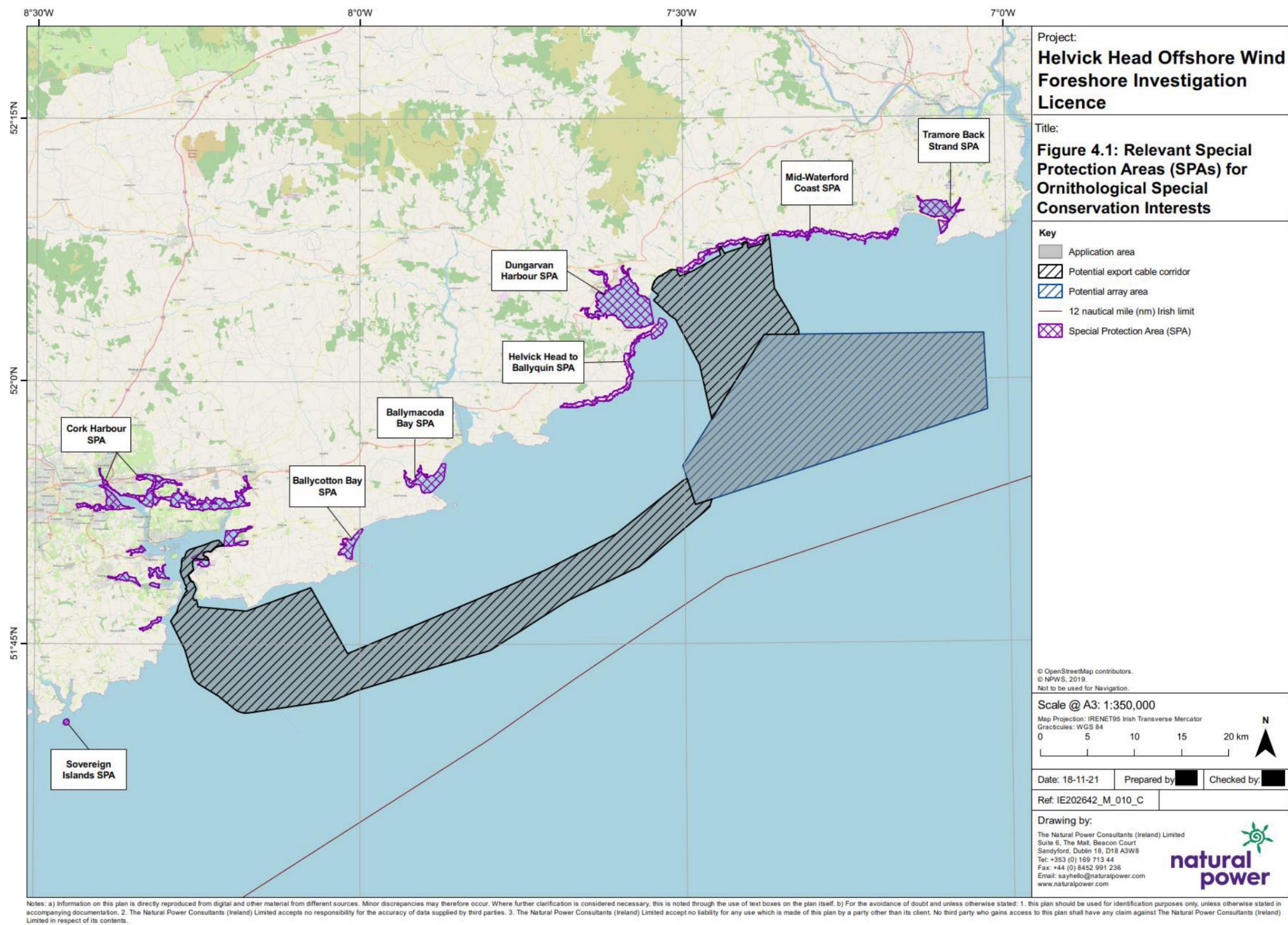


Figure 4.1: SPAs where there is potential for connectivity with the Application area

4.1.2. Marine Mammals

The following marine mammal species are listed under Annex II of the Habitats Directive (Council Directive 92/43/EEC) which means that they are “animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation (SACs)”:

- [1349] Bottlenose dolphin (*Tursiops truncatus*);
- [1351] Harbour porpoise (*Phocoena phocoena*);
- [1364] Grey seal (*Halichoerus grypus*); and
- [1365] Harbour or common seal (*Phoca vitulina*).

These species are all present in the Celtic Sea, and abundance and density information for these species is presented in Table 4.2 (cetaceans⁴) and Table 4.3 (seals).

No Celtic Sea density estimates or reference populations are available for grey seal or harbour seal. However, Russell *et al.* (2017)'s usage maps provide grey and harbour seal density across the WTG array area and export cable corridor, and Morris and Duck (2019)'s south Ireland counts may be corrected for the proportion of animals at sea when the count was made to indicate the likely size of an appropriate reference population.

Table 4.2: Cetacean species recorded in and around the proposed Helvick Head Offshore Wind site. Proposed reference population information taken from IAMMWG (2015) and information on density taken from Hammond *et al.* (2017) and Rogan *et al.* (2018)

Common name	Proposed reference population			ObSERVE (Stratum 4/8) density estimate (animals per km ²) ⁵
	Management Unit	Abundance	95% CI	
Bottlenose dolphin	Offshore Channel, Celtic Sea and South West England and Offshore Waters	16,779	9,573-32,313	1.161
Harbour porpoise	Celtic and Irish Seas	104,695	56,774-193,065	0.288

Table 4.3: Seal species recorded in and around the proposed Helvick Head Offshore Wind site

Common name	2017-2018 count for the south of Ireland ⁶		Minimum pup production estimate ⁷	All-age population size	Reference
		Reference			
Grey seal	1,013	Morris and Duck (2019)	151	529-680	Ó Cadhla <i>et al.</i> (2013)
Harbour seal	154	Morris and Duck (2019)	-	-	-

⁴ Information for other (non-Annex II) cetacean species has also been presented for context.

⁵ Includes highest densities recorded in either stratum 4 or 8.

⁶ Includes Counties Wexford, Waterford and Cork.

⁷ Includes County Wexford (Saltee Islands).

In order to assess the potential for connectivity between the proposed site investigation work and SACs with marine mammal QIs, a 5 km buffer (in line with JNCC, 2020) around the Export Cable Corridor(s) and WTG array area was created to represent the effective deterrence range for noise from geophysical surveys being conducted at Helvick Head Offshore Wind. This effective deterrence range (recommended for England, Wales and NI; JNCC, 2020) has been used in the absence of an equivalent recommendation for Ireland and is considered to represent the “worst case” (in terms of underwater noise impacts) for the site investigation work proposed.

Relevant SACs were identified based on an assessment of their potential for connectivity with the Project (export cable corridor(s) and WTG array area) plus the 5 km effective deterrence range buffer.

There was considered to be potential for connectivity with the SAC if the Project plus the 5 km effective deterrence range buffer fell within the “likely foraging range” of the seal species for which the site was designated. Equivalent information (on the “likely foraging range” of cetaceans) is not available because no telemetry studies have been conducted for cetaceans around the British Isles. Instead, there was considered to be potential for connectivity with the SAC if the Project plus the 5 km effective deterrence range buffer fell within the “likely population range” of the cetacean species for which it was designated.

SACs for which marine mammal species were either qualifying or non-qualifying interests, scoring either an “A”, “B” or “C” under the “site assessment (population)” category of Natura 2000 Standard Data forms were included.

An assessment of the potential for connectivity was conducted for each QI as follows. Relevant sites are shown in Figure 4.2.

4.1.2.1. Bottlenose dolphin

Likely population range information for bottlenose dolphins was derived using findings from individual identification (photo-ID) data.

Given the recent (2019) sightings off the east and west coasts of Ireland of individual bottlenose dolphins which use the Moray Firth SAC (IWDG, 2019) (the furthest bottlenose dolphin SAC from the proposed Helvick Head Offshore Wind site), all British Isles bottlenose dolphin SACs were considered to be relevant sites, namely:

- [UK0013117] Llyn Peninsula and the Sarnau SAC;
- [UK0012712] Cardigan Bay SAC;
- [IE0002165] Lower River Shannon SAC;
- [IE0002998] West Connacht Coast SAC;
- [IE0000495] Duvillaun Islands SAC;
- [IE0000328] Slyne Head Islands SAC;
- [IE0002074] Slyne Head Peninsula SAC; and
- [UK0019808] Moray Firth SAC.

4.1.2.2. Harbour porpoise

For harbour porpoises, the SCANS II model-based density surface (Hammond *et al.*, 2013) was used to assess whether there was potential for connectivity between SACs and the Project plus the 5 km effective deterrence range buffer⁸. SACs in Irish inshore waters were also included. The SCANS II data indicate a relatively high porpoise density area to the south of Ireland/off west Wales, south west England and the north of the Irish Sea (high density has been defined as 0.3 to 0.4 or more animals/km). It should be noted that the location, size, shape and scale of this relatively high porpoise density area is similar to that of the Celtic and Irish Seas Management Unit for harbour porpoise (IAMMWG, 2015). It is considered likely that the Project plus the 5 km effective deterrence range buffer

⁸ The SCANS III density surface is not yet available.

falls within the range of the population/populations of harbour porpoises which are QIs of the SACs in this area, namely:

- [IE0002172] Blasket Islands SAC;
- [IE0000101] Roaringwater Bay and Islands SAC;
- [IE0003000] Rockabill to Dalkey Islands SAC;
- [UK0030398] North Anglesey Marine SAC;
- [UK0030397] West Wales Marine SAC; and
- [UK0030396] Bristol Channel Approaches SAC.

4.1.2.3. Grey seal

Although grey seals are known to undertake long distance travel, the majority of their trips to sea are much shorter foraging trips (taking a small number of days), with seals generally returning to the same haul out sites from which they departed (McConnell *et al.*, 1999; Cronin *et al.*, 2011). For UK seals, the range of these foraging trips is generally in the region of 20-60 km from the haul out site (mean return-trip maximum extent = 39.8 km; McConnell *et al.*, 1999). The mean distance travelled by seals tagged off southwest Ireland was 50.85 km (Cronin *et al.*, 2011).

In the absence of telemetry information from grey seals tagged off the east coast of Ireland, the maximum foraging trip extent for grey seals recorded in Ireland (50 km) has been used. Grey seal SACs which lie within 50 km of the Project plus the 5 km effective deterrence range buffer therefore considered to be relevant sites, namely:

- [IE0000707] Saltee Islands SAC.

4.1.2.4. Harbour seal

Regional differences are apparent in the distances harbour seals travel from haul-out sites to likely foraging areas (Table 4.4). For example, seals off southwest Ireland, the Outer Hebrides and the Northern Isles (Orkney and Shetland) generally make short distance trips whereas animals off the east coast of the UK (Moray Firth, St Andrews Bay and The Wash) make more wide-ranging trips.

Table 4.4: Harbour seal foraging trip distance

Location	Mean foraging trip distance	Reference
Southwest Ireland	Foraging trips generally extended no further than 20 km from haul out sites; over half of these trips were less than 5 km	Cronin (2011)
Outer Hebrides	50% of trips were within 25 km of a haul out site	Cunningham <i>et al.</i> (2009)
Shetland, Orkney, The Thames	Between 11 km and 21 km	Sharples <i>et al.</i> (2012)
The Wash	86 km	
Moray Firth	100.6 km	

As no harbour seal SACs lie within 20 km of the Project (information from seals tagged off southwest Ireland has been used; see Table 4.4) plus the 5 km effective deterrence range buffer, there are considered to be no relevant sites for harbour seal.

4.1.2.5. Summary of relevant sites

Table 4.5 summarises the relevant SACs designated for marine mammals which are shown in Figure 4.2.

Table 4.5: Relevant SACs designated for marine mammals

Site Code	SAC	Country	Qualifying Interests	Distance from the Project plus the 5 km effective deterrence range buffer (km)
[IE0000707]	Saltee Islands	Ireland	Grey seal	19
[IE0000101]	Roaringwater Bay and Islands	Ireland	Harbour porpoise	85
[UK0030397]	West Wales Marine	Wales	Harbour porpoise	93
[UK0012712]	Cardigan Bay	Wales	Bottlenose dolphin	136
[UK0030396]	Bristol Channel Approaches	Wales/England	Harbour porpoise	140
[UK0013117]	Lleyn Peninsula and the Sarnau	Wales	Bottlenose dolphin	162
[IE0003000]	Rockabill to Dalkey Island	Ireland	Harbour porpoise	171
[UK0030398]	North Anglesey Marine	Wales	Harbour porpoise	194
[IE0002172]	Blasket Islands	Ireland	Harbour porpoise	196
[IE0002165]	Lower River Shannon	Ireland	Bottlenose dolphin	257
[IE0000328]	Slyne Head Islands	Ireland	Bottlenose dolphin	347
[IE0002074]	Slyne Head Peninsula	Ireland	Bottlenose dolphin	350
[IE0002998]	West Connacht Coast	Ireland	Bottlenose dolphin	354
[IE0000495]	Duvillaun Islands	Ireland	Bottlenose dolphin	424
[UK0019808]	Moray Firth	Scotland	Bottlenose dolphin	1012

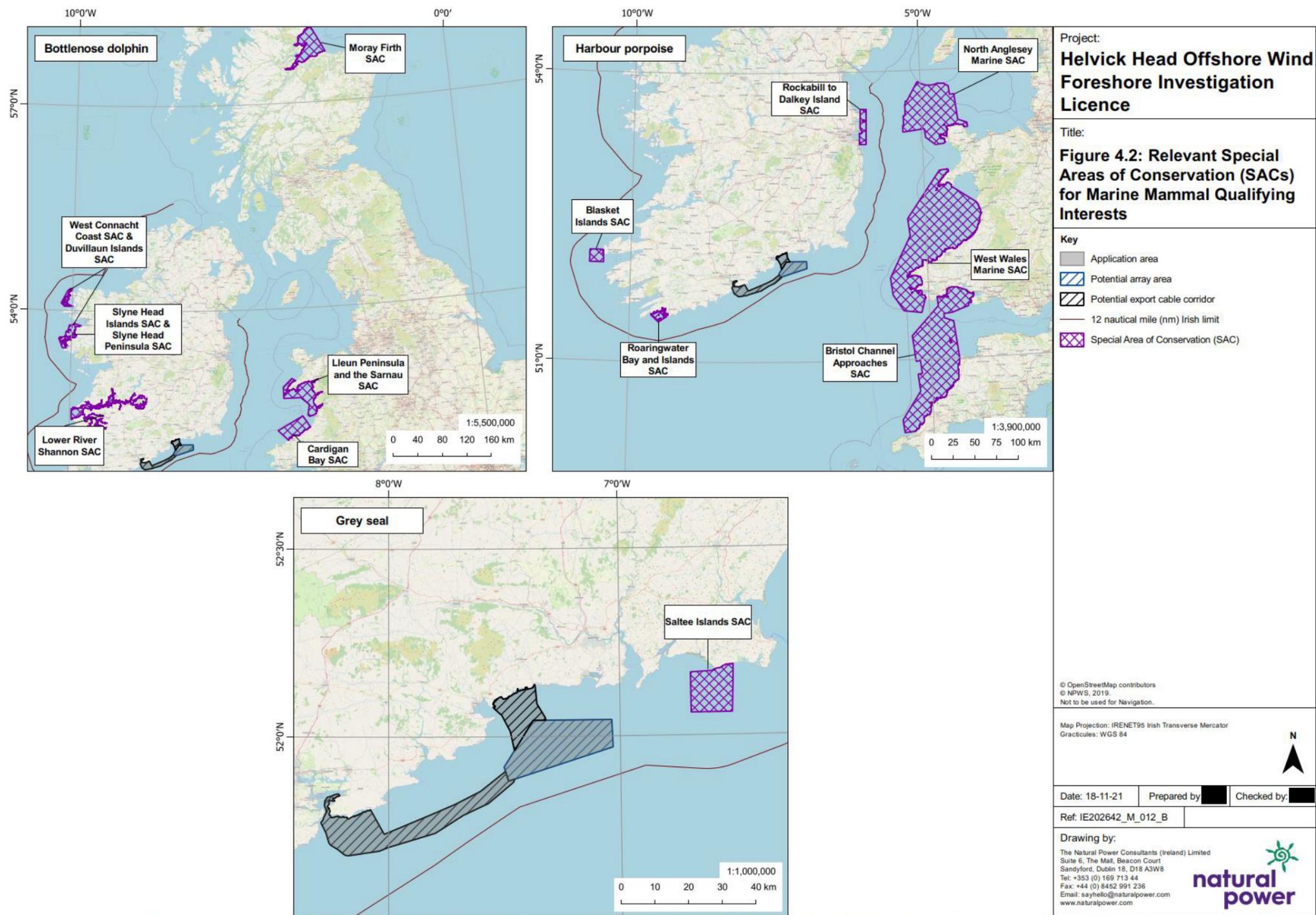


Figure 4.2: Relevant SACs with marine mammal QIs

4.1.3. Annex I Habitats

SACs were screened in or out based upon an assessment of their potential for connectivity with the Annex I habitat QIs and the Project.

There was considered to be potential connectivity with the SAC and its Annex I habitat QIs if the Application area overlapped the SAC (direct effects) or was within range of indirect impacts.

As the application area does not intersect with any of the SACs in the area, there is considered to be no route to impact from direct impacts (i.e. habitat loss or disturbance) and as such only indirect effects are considered further.

The only indirect effects that may arise are those resulting from elevated SSC. Due to the coarse nature of the sediments across much of the Application area, no elevation in SSC beyond close proximity of the works is predicted as any sediment mobilised by the work will settle almost immediately. In more sheltered areas where fine sediments may be more prevalent, water movements are much reduced and as such any increase in SSC is not considered to be transported any great distance, with all material likely to have settled within a few hundred metres of the work. As such, no connectivity beyond 1 km is envisaged.

Those sites screened in for consideration for indirect effects relating to elevated SSC are as follows:

- [IE0000764] Hook Head SAC; and
- [IE0001058] Great Island Channel SAC⁹

Two SACs within the area of potential connectivity contain onshore habitats only (i.e. those located above the Mean High-Water Spring (MHWS) mark), these are: Helvick Head SAC (IE0000665) and Ardmore Head SAC (IE0002123), both designated for:

- [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts; and
- [4030]; European dry heaths.

These have not been considered further as it is considered there is no connectivity or overlap with these habitats as a result of the activities proposed as part of the Foreshore Investigation Licence Application.

A list of sites that may be affected and their corresponding QIs are provided in Table 4.6 and illustrated in Figure 4.3.

Table 4.6: Relevant SACs designated for Annex I habitats

Site code	Site Name	Qualifying Interests	Distance from Application area (km)
[IE0000764]	Hook Head SAC	[1160] Large shallow inlets and bays; [1170] Reefs; [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts*	0.4
[IE0001058]	Great Island Channel SAC	[1140] Mudflats and sandflats not covered by seawater at low tide; [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	3.0

⁹ it is noted that this SAC is greater than 1 km from the works, but is included from a precautionary perspective due its close proximity within Cork harbour.

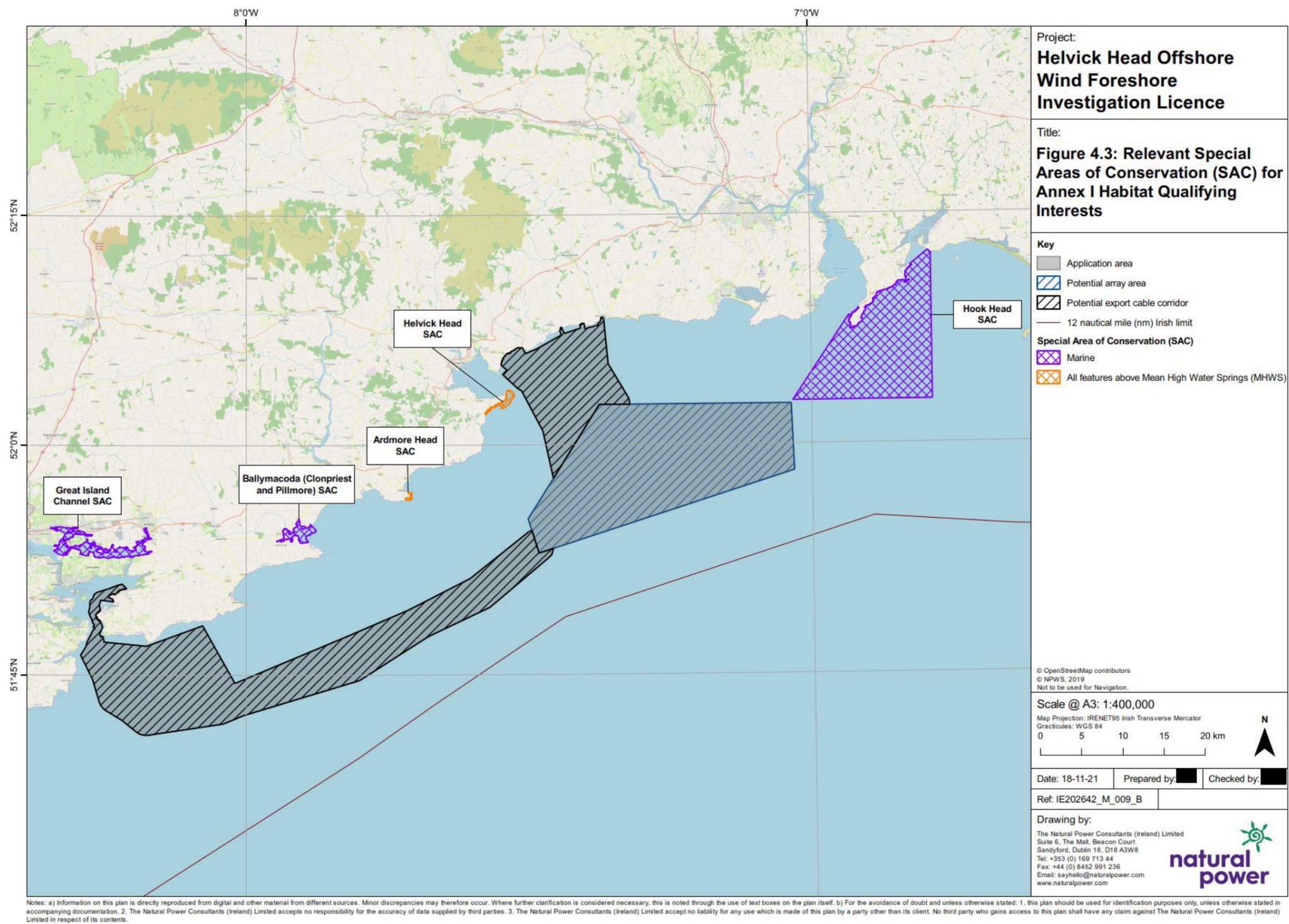


Figure 4.3: SACs designated for Annex I habitat Qis below MHWS where there is potential connectivity with the application area

4.1.4. Annex II Diadromous Fish

There are a number of SAC rivers on the south coast of Ireland which have been designated for Annex II migratory fish. These species are:

- [1095] Sea lamprey (*Petromyzon marinus*);
- [1103] Twaité shad (*Alosa Fallax*);
- [1106] Atlantic salmon (*Salmo salar*);
- [1096] River lamprey (*Lampetra fluviatilis*); and
- [1029] Freshwater pearl mussel¹⁰ (*Margaritifera margaritifera*) (FWPM).

Although these SAC rivers are not marine, the migratory fish for which they are designated have a marine phase of their lifecycle. These species rely on the sea to migrate to feeding grounds before returning to rivers to spawn. There is potential therefore, for one or a number of these species to be present in the Application area.

Although the FWPM lives its entire lifecycle in freshwater its larval stages are parasitic and rely on Atlantic salmon (and trout, *Salmo trutta*) as a host to colonise different areas of a river. It is considered therefore that any impact from the proposed surveys that effects Atlantic salmon may also affect FWPM.

SACs were screened in or out based upon an assessment of their potential for connectivity with the QIs and the Application area.

There was considered to be potential connectivity with the SAC if the Application area overlapped the potential migration routes of any Annex II diadromous fish QIs. Those sites screened in, as given in Table 4.7 and shown in Figure 4.4 below are as follows:

- [IE0002170] Blackwater River SAC;
- [IE0002162] River Barrow and River Nore SAC;
- [IE0000781] Slaney River Valley SAC; and
- [IE0002137] Lower River Suir SAC.

Table 4.7: SACs screened in, their QIs and distance from the Application area

Site Code	SAC	Country	Qualifying Interests	Distance from the Development Area and Offshore Export Cable Corridor (km)
[IE0002170]	Blackwater River (Cork/Waterford) SAC	Ireland	[1103] Twaité shad; [1106] Atlantic salmon; [1095] Sea lamprey; [1096] River lamprey; and [1029] FWPM	16.0
[IE0002162]	River Barrow and River Nore SAC	Ireland	[1103] Twaité shad; [1106] Atlantic salmon; [1095] Sea lamprey; [1096] River lamprey; and [1029] FWPM	15.0

¹⁰ Included here due to the important role of salmonid diadromous fish in this species reproductive cycle.

Site Code	SAC	Country	Qualifying Interests	Distance from the Development Area and Offshore Export Cable Corridor (km)
[IE0000781]	Slaney River Valley SAC	Ireland	[1103] Twaité shad; [1106] Atlantic salmon; [1095] Sea lamprey; [1096] River lamprey; and [1029] FWPM	66.0
[IE0002137]	Lower River Suir SAC	Ireland	[1103] Twaité shad; [1106] Atlantic salmon; [1095] Sea lamprey; [1096] River lamprey; and [1029] FWPM	27.0

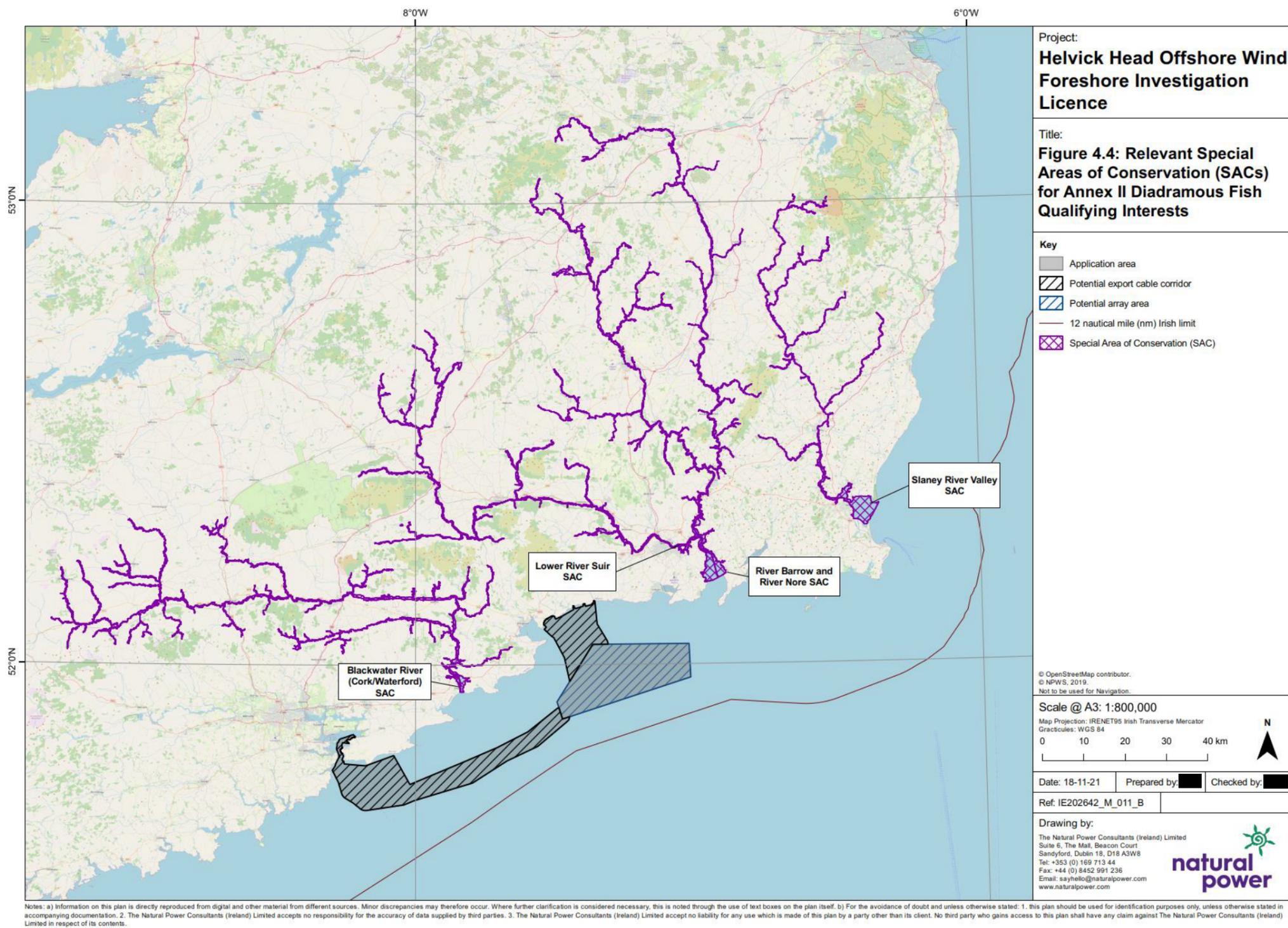


Figure 4.4: SACs designated for migratory fish QIs where there is potential connectivity with the application area

4.2. Step 3 - 4: Assessment of Likely Significant Effects

4.2.1. Marine Ornithology

Table 4.8 considers the potential for LSE on the marine ornithology SCIs of those sites identified in Section 4.1.1 with which there is potential for connectivity with the Project, based on potential impacts and effects identified in Section 3.1

4.2.1.1. Step 3: Project Alone Assessment

Table 4.8: Screening of NATURA 2000 sites with direct overlap of or within 15 km of the proposed Application area

SPA	Special Conservation Interest	Season	Route to Impact	Screened in/out	Justification if screened out	
Mid-Waterford Coast SPA [IE0004193]	[A103] Peregrine falcon	Resident	Above-water noise ^{*1}	In	Progress to NIS	
	[A346] Chough		Underwater noise ^{*2}	Out	Non-marine species. No route to impact. No LSE.	
			Visual impacts ^{*3}	In	Progress to NIS	
			Impacts upon prey species ^{*4}	Out	Non-marine species. No route to impact. No LSE.	
	[A184] Herring gull	Breeding	Above-water noise ^{*1}	In	Progress to NIS	
			Underwater noise ^{*2}	Out	Non-diving species. No route to impact. No LSE.	
			Visual impacts ^{*3}	In	Progress to NIS	
			Impacts upon prey species ^{*4}	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of this SCI is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.	
		[A017] Cormorant	Breeding	Above-water noise ^{*1}	In	Progress to NIS
				Underwater noise ^{*2}	In	Progress to NIS
				Visual impacts ^{*3}	In	Progress to NIS
				Impacts upon prey species ^{*4}	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of this SCI is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
Cork Harbour SPA [IE0004030]	[A048] Shelduck	Winter	Above-water noise ^{*1}	In	Progress to NIS	
	[A056] Shoveler		Underwater noise ^{*2}	Out	Non-diving species. No route to impact. No LSE.	
	[A050] Wigeon		Visual impacts ^{*3}	In	Progress to NIS	
	[A054] Pintail		Impacts upon prey species ^{*4}	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.	
	[A052] Teal					
	[A028] Grey Heron					
	[A130] Oystercatcher					
	[A142] Lapwing					
	[A140] Golden plover					
	[A141] Grey plover					
	[A160] Curlew					
	[A157] Bar-tailed godwit					
	[A156] Black-tailed godwit					
[A149] Dunlin						
[A162] Redshank						

SPA	Special Conservation Interest	Season	Route to Impact	Screened in/out	Justification if screened out
	[A179] Black-headed gull				
	[A182] Common gull				
	[A183] Lesser black-backed gull				
	[A069] Red-breasted merganser	Winter	Above-water noise ^{*1}	In	Progress to NIS
	[A004] Little grebe		Underwater noise ^{*2}	In	Progress to NIS
	[A005] Great crested grebe		Visual impacts ^{*3}	In	Progress to NIS
	[A017] Cormorant		Impacts upon prey species ^{*4}	Out	Potential for displacement of prey species by proposed works considered limited, also localised and short-term nature of proposed works would mean that almost all individuals from prey species unimpacted at any given time. Any impacts negligible. No LSE.
	[A193] Common tern	Breeding	Above-water noise ^{*1}	In	Progress to NIS
			Underwater noise ^{*2}	Out	Surface foraging species. No route to impact. No LSE.
			Visual impacts ^{*3}	In	Progress to NIS
			Impacts upon prey species ^{*4}	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of this SCI is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
Dungarvan Harbour SPA [IE0004032]	[A046] Brent goose	Winter	Above-water noise ^{*1}	Out	The nearest part of the Dungarvan Harbour SPA to proposed works (c.200 m separation) is subsite 0M422, Helvick Pier – Ballynacourtny Pt (NPWS, 2011). This subsite is not considered to support high numbers of foraging or roosting individuals from these species, which typically utilise intertidal mud and sandflats and shallow water areas elsewhere within the SPA, and further from the proposed works. Given this larger separation distance (>1km) from proposed works, in addition to that any above-water noise from survey activities is expected to be no greater than existing background or vessel levels (Merchant <i>et al.</i> , 2016), there is considered to be no route to impact upon these SCIs. No LSE.
	[A048] Shelduck				
	[A130] Oystercatcher				
	[A140] Golden plover				
	[A141] Grey plover				
	[A160] Curlew		Underwater noise ^{*2}	Out	
	[A157] Bar-tailed godwit		Visual impacts ^{*3}	Out	
	[A156] Black-tailed godwit				
	[A169] Turnstone				
	[A143] Knot				
	[A149] Dunlin		Impacts upon prey species ^{*4}	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
	[A142] Lapwing	Winter	Above-water noise ^{*1}	In	The nearest part of the Dungarvan Harbour SPA to proposed works (c.200 m separation) is subsite 0M422, Helvick Pier – Ballynacourtny Pt (NPWS, 2011). This subsite is considered to support high numbers of intertidal foraging lapwing and very high numbers of roosting redshank. Progress to NIS.
	[A162] Redshank				
			Underwater noise ^{*2}	Out	
			Visual impacts ^{*3}	In	The nearest part of the Dungarvan Harbour SPA to proposed works (c.200 m separation) is subsite 0M422, Helvick Pier – Ballynacourtny Pt (NPWS, 2011). This subsite is considered to support high numbers of intertidal foraging lapwing and very high numbers of roosting redshank. Progress to NIS.

SPA	Special Conservation Interest	Season	Route to Impact	Screened in/out	Justification if screened out
			Impacts upon prey species* ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
	[A069] Red-breasted merganser [A005] Great crested grebe	Winter	Above-water noise ¹	In	The nearest part of the Dungarvan Harbour SPA to proposed works (c.200 m separation) is subsite 0M422, Helvick Pier – Ballynacourtny Pt (NPWS, 2011). This subsite is considered to support high numbers of subtidal foraging red-breasted merganser and very high numbers of subtidal foraging great crested grebe. Progress to NIS.
			Underwater noise ²	In	Diving species. Progress to NIS.
			Visual impacts ³	In	The nearest part of the Dungarvan Harbour SPA to proposed works (c.200 m separation) is subsite 0M422, Helvick Pier – Ballynacourtny Pt (NPWS, 2011). This subsite is considered to support high numbers of subtidal foraging red-breasted merganser and very high numbers of subtidal foraging great crested grebe. Progress to NIS.
			Impacts upon prey species* ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
Helvick Head to Ballyquin SPA [IE0004192]	[A188] Kittiwake [A184] Herring gull	Breeding	Above-water noise ¹	In	Progress to NIS
			Underwater noise ²	Out	Non-diving species. No route to impact. No LSE.
			Visual impacts ³	In	Progress to NIS
			Impacts upon prey species* ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
	[A017] Cormorant	Breeding	Above-water noise ¹	In	Progress to NIS
			Underwater noise ²	In	Diving species. Progress to NIS
			Visual impacts ³	In	Progress to NIS
			Impacts upon prey species* ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of this SCI is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
	[A103] Peregrine falcon [A346] Chough	Resident	Above-water noise ¹	In	Progress to NIS
			Underwater noise ²	Out	Non-diving species. No route to impact. No LSE.
			Visual impacts ³	In	Progress to NIS
			Impacts upon prey species* ⁴	Out	Non-marine species. No route to impact. No LSE.
Ballycotton Bay SPA [IEC004022]	[A052] Teal [A137] Ringed plover [A140] Golden plover	Winter	Above-water noise ¹	In	Potential connectivity with ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. Progress to NIS.
			Underwater noise ²	Out	Non-diving species. No route to impact. No LSE.

SPA	Special Conservation Interest	Season	Route to Impact	Screened in/out	Justification if screened out			
Tramore Back Strand SPA [IEC004027]	[A141] Grey plover	Winter	Visual impacts ³	In	Potential connectivity with ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. Progress to NIS.			
	[A142] Lapwing							
	[A156] Black-tailed godwit		Impacts upon prey species ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.			
	[A157] Bar-tailed godwit							
	[A160] Curlew							
	[A169] Turnstone							
	[A182] Common gull							
	[A183] Lesser black-backed gull							
[A046] Light-bellied brent goose	Winter	Above-water noise ¹	Out	No ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. No connectivity. No LSE.				
[A140] Golden plover		Underwater noise ²	Out	Non-diving species. No route to impact. No LSE.				
[A141] Grey plover		Visual impacts ³	Out	No ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. No connectivity. No LSE.				
[A142] Lapwing		Impacts upon prey species ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.				
[A149] Dunlin								
[A156] Black-tailed godwit								
[A157] Bar-tailed godwit								
[A160] Curlew	Winter	Above-water noise ¹	In	Potential connectivity with ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. Progress to NIS.				
[A050] Wigeon								
[A052] Teal								
[A137] Ringed plover					Underwater noise ²	Out	Non-diving species. No route to impact. No LSE.	
[A140] Golden plover					Visual impacts ³	In	Potential connectivity with ex-situ estuarine habitats within 1km of Application Area within 15 km of SPA. Progress to NIS.	
[A141] Grey plover					Impacts upon prey species ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of these SCIs is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.	
[A142] Lapwing								
[A144] Sanderling								
[A149] Dunlin								
[A156] Black-tailed godwit								
[A157] Bar-tailed godwit								
[A160] Curlew					Breeding	Above-water noise ¹	In	Progress to NIS
[A162] Redshank								
[A169] Turnstone								
[A179] Black-headed gull								
[A182] Common gull								
[A183] Lesser black-backed gull								
[A017] Cormorant	Breeding	Above-water noise ¹	In	Progress to NIS				
Sovereign Islands SPA [IEC004124]					Cormorant	Underwater noise ²	In	Progress to NIS
						Visual impacts ³	In	Progress to NIS
						Impacts upon prey species ⁴	Out	Given the nature of proposed site investigation works, the potential for displacement of prey species of this SCI is considered limited. Furthermore, as proposed works are localised and would take place only for short durations in any particular location, should any displacement of SCI prey species occur as a result of proposed works, any such impacts would be spatially and

SPA	Special Conservation Interest	Season	Route to Impact	Screened in/out	Justification if screened out
					temporally very limited. At any given time during the course of proposed works the vast majority of SCI prey species would experience no impacts in association with the works. Any impacts upon prey species would therefore be negligible. No LSE.
	*1 Above water noise resultant from geophysical surveys, geotechnical surveys, metocean surveys and environmental/ecological surveys. Includes: above water noise resultant from survey vessel activity for all boat-based surveys, above water noise resultant from all terrestrial and intertidal survey activity (on foot and vehicular), above water mechanical noise associated with surveys.				
	*2 Underwater noise resultant from geophysical surveys, geotechnical surveys, metocean surveys and environmental/ecological surveys. Includes: underwater noise resultant from survey vessel activity for all boat-based surveys, underwater mechanical noise associated with surveys, underwater noise associated with geophysical surveys (In particular lower frequency noise from SBP activities. This is potentially within audible range of diving bird species and these lower frequency noises attenuate less with distance than higher frequency noise).				
	*3 Visual impacts resultant from geophysical surveys, geotechnical surveys, metocean surveys and environmental/ecological surveys. Includes visual impacts resultant from survey vessel activity for all boat-based surveys and visual impacts resultant from all terrestrial and intertidal survey activity (on foot and vehicular).				
	*4 Indirect effects upon prey species resultant from geophysical surveys, geotechnical surveys and environmental/ecological surveys.				

4.2.1.2. Step 4: In Combination Assessment

Table C.1, Appendix C, lists all plans and projects in the vicinity of proposed site investigation works which have been considered in screening with regard to potential in combination effects upon SCIs from SPAs. The following section considers which of those other plans and projects have potential to act in combination with the proposed works in regard to each designated site assessed, and whether that in-combination effect has the potential to lead to LSE.

Mid-Waterford Coast SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on the Mid-Waterford Coast SPA resulting from the proposed site investigation works alone.

- Energia Site Investigation – Site Investigation works to inform on possible construction of a windfarm off the Wexford coast;
- Energia – Application for Site Investigation Licence for Windfarm off Helvick Head; Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures;
- SSE Renewables – Celtic Sea; Geophysical, Geotechnical and Environmental Site Investigation works;
- DP Energy – Site Investigations relating to a possible windfarm at Inis Ealga, Cork;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald);
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-marine or non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Mid-Waterford Coast SPA for the SCI/impact combinations which are screened out.

Cork Harbour SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Cork Harbour SPA resulting from the proposed site investigation works alone.

- Celtic Offshore Wind – Site investigations relating to possible offshore wind farms off the Cork coast;
- DP Energy – Site Investigations relating to a possible windfarm at Inis Ealga, Cork;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald);
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys;
- Irish Water Whitegate – Marine Site Investigation works associated with the construction of a proposed wastewater Treatment Plant in Whitegate, Aghada. This treatment plant will include the construction of a sea outfall, approximately 500 metres long

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Cork Harbour SPA for the SCI/impact combinations which are screened out.

Dungarvan Harbour SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Dungarvan Harbour SPA resulting from the proposed site investigation works alone.

- Irish Water Dungarvan Wastewater Treatment Plant – Foreshore Licence application for an outfall pipe in connection with Dungarvan wastewater treatment plant;
- Energia Site Investigation – Site Investigations to inform on possible construction of a windfarm off the Wexford coast;
- Energia – Application for Site Investigation Licence for Windfarm off Helvick Head; Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures;
- SSE Renewables – Celtic Sea; Geophysical, Geotechnical and Environmental Site Investigation works;
- DP Energy – Site Investigations relating to a possible windfarm at Inis Ealga, Cork;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald);
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys; and
- Irish Water – Installation of a water main across the River Brickey.

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Dungarvan Harbour SPA for the SCI/impact combinations which are screened out.

Helvick Head to Ballyquin SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Helvick Head to Ballyquin SPA resulting from the proposed site investigation works alone.

- Energia Site Investigation – Site Investigations to inform on possible construction of a windfarm off the Wexford coast;
- Energia – Application for Site Investigation Licence for Windfarm off Helvick Head; Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures;
- SSE Renewables – Celtic Sea; Geophysical, Geotechnical and Environmental Site Investigation works;

- DP Energy –Site Investigations relating to a possible windfarm at Inis Ealga, Cork;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald); and
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys.

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-marine or non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Helvick Head to Ballyquin SPA for the SCI/impact combinations which are screened out.

Ballycotton Bay SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Ballycotton Bay SPA resulting from the proposed site investigation works alone.

- Celtic Offshore Wind – Site investigations relating to possible offshore wind farms off the Irish south coast
- Eirgrid PLC: Ballinwilling Strand - Foreshore Licence application for geophysical marine survey works;
- Irish Water: Ballycotton - Foreshore Licence application for ground investigation works and sampling;
- Ballycotton Coastal Protection: Pierce Flynn - Foreshore application for the construction of a rock armour revetment; and
- DP Energy – Site Investigations relating to a possible windfarm at Inis Ealga, Cork.

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Ballycotton Bay SPA for the SCI/impact combinations which are screened out.

Tramore Back Strand SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Tramore Back Strand SPA resulting from the proposed site investigation works alone.

- Energia Site Investigation – Site Investigations to inform on possible construction of a windfarm off the Wexford coast;
- Energia – Application for Site Investigation Licence for Windfarm off Helvick Head; Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures;

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Tramore Back Strand SPA for the SCI/impact combinations which are screened out.

Ballymacoda Bay SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Ballymacoda Bay SPA resulting from the proposed site investigation works alone.

- Eirgrid PLC: Redbarn Beach and Claycastle Beach - Foreshore Licence application for geophysical marine survey works; and
- DP Energy – Site Investigations relating to a possible windfarm at Inis Ealga, Cork.

For SCIs where potential underwater noise impacts are scoped out on account of those SCIs being non-diving species, and where there is consequently considered to be no route to impact, as there is no impact to these SCIs there is no potential for in combination effects with any projects listed above.

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Ballymacoda Bay SPA for the SCI/impact combinations which are screened out.

Sovereign Islands SPA

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on Sovereign Islands SPA resulting from the proposed site investigation works alone.

- Celtic Offshore Wind – Site investigations relating to possible offshore wind farms off the Irish south coast
- Irish Water Storm Outfall Pipe at Gibbon's Quay - Irish Water Storm Outfall Pipe at Gibbon's Quay;
- Irish Water Site Investigation for Storm Water Outfall Extension - Site Investigation - a geotechnical investigation to inform the proposed extension of a storm water outfall at Gibbon's Quay; and
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald).

With regard to impacts upon prey species which were scoped out for all SCIs, and where potential impacts to SCIs due to proposed works are considered negligible, these impacts are considered to also be negligible in relation to in combination effects with any projects listed above.

Therefore, it is possible to conclude no LSE for in combination effects upon Sovereign Islands SPA for the SCI/impact combinations which are screened out.

4.2.2. Marine Mammals

This section considers the potential for LSE on the marine mammal QIs of the relevant SACs identified in Section 4.1.2 based on potential impacts and effects identified in Section 3.2. These 15 relevant SACs have been grouped and considered together for each species; the species have also been grouped and considered together for each potential effect because there is little difference in susceptibility between species (Table 4.9).

4.2.2.3. Step 3: Project Alone Assessment

Table 4.9: Assessment of LSE for marine mammals

Potential effect	Qualifying Interest	Site	Screened in/out	Justification if screened out
Auditory injury	[1349] Bottlenose dolphin (<i>Tursiops truncatus</i>)	[UK0013117] Llyn Peninsula and the Sarnau SAC; [UK0012712] Cardigan Bay SAC; [IE0002165] Lower River Shannon SAC; [IE0002998] West Connacht Coast SAC; [IE0000495] Duvillaun Islands SAC; [IE0000328] Slyne Head Islands SAC; [IE0002074] Slyne Head Peninsula SAC; and [UK0019808] Moray Firth SAC.	Screened out*	Noise from geophysical survey and positioning equipment: The (high) frequencies of the sound emitted by the MBES and SSS fall outside the range that marine mammals can hear therefore there is no potential for hearing impairment as a result of activation of these sources. The sound pressure levels of both the SBP and UHRS (boomer and sparker) fall below the pulsed sound threshold for PTS onset for cetaceans (230 dB re 1 µPa at 1 m). Although the SPL of the UHRS sparker exceeds the pulsed sound threshold for PTS onset for seals (and the pulsed sound threshold for TTS), the presence of the survey vessel is likely to lead to small-scale temporary displacement of animals resulting in them being a sufficient distance from the survey equipment so as not to be susceptible to the onset of either PTS or TTS.
	[1351] Harbour porpoise (<i>Phocoena phocoena</i>)	[IE0002172] Blasket Islands SAC; [IE0000101] Roaringwater Bay and Islands SAC; [IE0003000] Rockabill to Dalkey Islands SAC; [UK0030398] North Anglesey Marine SAC; [UK0030397] West Wales Marine SAC; and [UK0030396] Bristol Channel Approaches SAC	Screened out*	The potential for auditory injury as a result of the proposed geophysical survey work is therefore considered to be nil or negligible.
	[1364] Grey seal (<i>Halichoerus grypus</i>)	[IE000707] Saltee Islands SAC	Screened out*	Noise from geotechnical survey work: The sound pressure levels of all equipment do not have the potential to induce the onset of PTS even at very close range. The SPLs are unlikely to exceed 190 dB re 1 µPa at 1 m (this is the greatest SPL – for rotary boreholes) and therefore fall below the non-pulsed sound threshold for PTS onset (230 dB re 1 µPa at 1 m for cetaceans, 218 dB re 1 µPa at 1 m for seals). Therefore, no LSE as a result of auditory injury can be concluded for the Project alone.
Disturbance	[1349] Bottlenose dolphin (<i>Tursiops truncatus</i>)	[UK0013117] Llyn Peninsula and the Sarnau SAC; [UK0012712] Cardigan Bay SAC; [IE0002165] Lower River Shannon SAC; [IE0002998] West Connacht Coast SAC; [IE0000495] Duvillaun Islands SAC; [IE0000328] Slyne Head Islands SAC; [IE0002074] Slyne Head Peninsula SAC; and [UK0019808] Moray Firth SAC.	Screened out	Noise from geophysical survey and positioning equipment: The sound emitted by some geophysical survey and positioning equipment has the potential to disturb marine mammals if the frequency/frequencies used fall within their hearing range. With the exception of the SBP and UHRS, the sound emitted by the geophysical survey equipment will not be audible to marine mammals because the frequencies over which it operates are greater than the higher frequency hearing cut-offs for each of the functional hearing groups. Using information on animal density (Table 3.1), and the equation πr^2 (where $r = 5$ km as per Thompson et al., 2013) to calculate the area of the zone of potential effect, it has been estimated that there is potential for disturbance of a very small number of individuals of some species (less than 1% of their reference populations). Furthermore, any effects are likely to be temporary and reversible (animals are likely to return to affected sites within a few hours as documented by Thompson et al., 2013) with suitable alternative local habitat being available in the meantime.
	[1351] Harbour porpoise (<i>Phocoena phocoena</i>)	[IE0002172] Blasket Islands SAC; [IE0000101] Roaringwater Bay and Islands SAC; [IE0003000] Rockabill to Dalkey Islands SAC; [UK0030398] North Anglesey Marine SAC; [UK0030397] West Wales Marine SAC; and [UK0030396] Bristol Channel Approaches SAC	Screened out	Noise from geotechnical survey work: The sound produced as a result of the proposed geotechnical survey work is low frequency and falls within marine mammal species' hearing ranges. There is therefore potential for disturbance of a very small number of individuals. However, any effects are likely to be temporary and reversible with suitable alternative local habitat being
	[1364] Grey seal (<i>Halichoerus grypus</i>)	[IE000707] Saltee Islands SAC	Screened out	

Potential effect	Qualifying Interest	Site	Screened in/out	Justification if screened out
Collision	[1349] Bottlenose dolphin (<i>Tursiops truncatus</i>)	[UK0013117] Lleyn Peninsula and the Sarnau SAC; [UK0012712] Cardigan Bay SAC; [IE0002165] Lower River Shannon SAC; [IE0002998] West Connacht Coast SAC; [IE0000495] Duvillaun Islands SAC; [IE0000328] Slyne Head Islands SAC; [IE0002074] Slyne Head Peninsula SAC; and [UK0019808] Moray Firth SAC.	Screened out	available in the meantime. In addition, sound from the geotechnical survey work will be intermittent, short in duration and occur over a small spatial scale. Therefore, no LSE as a result of disturbance can be concluded for the Project alone.
	[1351] Harbour porpoise (<i>Phocoena phocoena</i>)	[IE0002172] Blasket Islands SAC; [IE0000101] Roaringwater Bay and Islands SAC; [IE0003000] Rockabill to Dalkey Islands SAC; [UK0030398] North Anglesey Marine SAC; [UK0030397] West Wales Marine SAC; and [UK0030396] Bristol Channel Approaches SAC	Screened out	Vessel strikes are a known cause of mortality and physical injury (with potential for subsequent infection) in marine mammals, particularly large whales. The species under consideration are considered to be more agile than the large whales and have been shown to avoid ships e.g. Palka and Hammond (2001). Due to the nature of the proposed site investigation work, the vessels will either be: Following a pre-defined linear route at low to moderate working speeds (geophysical survey); Stationary (geotechnical survey when sampling); or Transiting in a predictable manner (geotechnical survey when travelling between sampling locations). Therefore, it will be easy for animals to predict their path and avoid them, which will greatly reduce the risk of collision.
	[1364] Grey seal (<i>Halichoerus grypus</i>)	[IE0000707] Saltee Islands SAC	Screened out	Therefore, no LSE as a result of collision can be concluded for the Project alone.

* See consideration for additional mitigation to be implemented in section 4.2.2.5 below.

4.2.2.4. Step 4: In Combination Assessment

Given the extremely localised and short duration nature of the proposed site investigation work, it is considered that there is negligible potential for in combination effects on the marine mammal QIs of the relevant sites. Where routes to impact have been identified, and under a precautionary approach no LSE concluded, it is considered that any potential effects are so negligible in scale that no potential for in combination effects with any other relevant plans or projects exists (see Appendix C for details of the plans/projects considered).

4.2.2.5. Departmental Guidance

Guidance for risk mitigation of maritime sound-producing activities including geophysical acoustic surveys was issued by the Department of Arts, Heritage and the Gaeltacht (DAHG, now DTCAGSM) in 2014. The AA screening process concluded that there was nil or negligible likelihood of significant effects from the proposed site investigation survey work. Therefore, with (or without) mitigation measures outlined within the DAHG guidelines, the proposed site investigation work will not adversely affect the conservation objectives of any of the 15 relevant SACs with marine mammal as a QI.

However, with due regard to the precautionary principle there is a potential for pressure on the QIs of the 15 relevant SACs during the start-up of acoustic equipment. Therefore, the Project will comply with mitigation measures regarding pre-start monitoring and ramp-up as recommended in the guidance (DAHG, 2014) to eliminate the potential for pressure.

Consequently, the relevant SAC's will be progressed to Stage 2 (NIS) for this potential pressure.

4.2.3. Annex I Habitats

Table 4.10 considers the potential for LSE on the Annex I habitat QIs of those sites with which there is potential for connectivity, based on potential impacts and effects identified in Section 3.3.

4.2.3.6. Step 3: Project Alone Assessment

Table 4.10: LSE screening for Annex I habitats

Site	Qualifying Interest	Potential effect	Screened in/out	Justification if screened out
Hook Head SAC [IE0000764]	[1160] Large shallow inlets and bays; [1170] Reefs,	Increased SSC/smothering*	Screened Out	<p>It should be noted that due to the coarse nature of the sediments across much of the Application area, no elevation in SSC beyond close proximity of the works is predicted as any sediment mobilised by the work will settle almost immediately.</p> <p>The reef feature is c. 2 km from the western edge of the SAC and as such likely to be outwith the area of effect (estimated as 1km) from the proposed works.</p> <p>Therefore, due to the temporary and highly localised nature of the work, and the limited magnitude and spatial scale of the effect, no LSE will arise as a result of an increase in SSC on the QIs of this SAC.</p>
Great Island Channel SAC [IE0001058]	[1140] Mudflats and sandflats not covered by seawater at low tide; [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)	Increased SSC/smothering*	Screened out	<p>Mudflats and sandflats form in areas of overall sediment accretion and experience high levels of SSC naturally through tidal and wave induced movements. As such these habitats are tolerant of high levels of SSC and associated smothering. Similarly, Atlantic and Mediterranean salt meadows form in areas of overall sediment accretion and experience high levels of SSC naturally through tidal movements. As such these habitats are tolerant of relatively high levels of SSC and associated smothering.</p> <p>In sheltered areas where such fine sediments may be more prevalent, water movements are much reduced and as such any increase in SSC would not be transported any great distance and would be negligible in scale in the context of the local sediment regime in such habitats. This designated SAC is only present in the lee of Great Island, with limited connectivity with the potential cable route predicted.</p> <p>Therefore, due to the lack of sensitivity to the potential effects of the QI's present, and considerable distance to the site from the works which are predicted to only result in small and localised increases in SSC, there is no potential for LSE.</p>

* Increase in SSC/Smothering resultant from geotechnical sampling, Metocean survey equipment and environmental surveys

4.2.3.7. Step 4: In Combination Assessment

Table C.1, Appendix C, lists all plans and projects on the south coast of Ireland which have been considered at screening stage with regard to potential in combination effects upon Annex I habitat QIs of relevant SACs. In combination assessments are required for any QIs which have been screened out for Project effects alone and where connectivity exists. The following section considers which of those other plans and projects have potential to act in combination with the proposed works in regard to each designated site assessed, and whether that in-combination effect has the potential to lead to LSE.

Hook Head SAC

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on the Hook Head SAC resulting from the proposed site investigation works alone.

- Energia Site Investigation – Site Investigation works to inform on possible construction of a windfarm off the Wexford coast;
- Energia – Application for Site Investigation Licence for Windfarm off Helvick Head; Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures;
- SSE Renewables – Celtic Sea; Geophysical, Geotechnical and Environmental Site Investigation works;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald); and
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys.

It is considered that these projects also have the potential to lead to increases in SSC in the vicinity of the SAC due to their potential interaction with the seabed in this area, however any potential SSC arising from the site investigation work would be small due to the standard equipment and methodologies used. Furthermore, regional data (<https://www.infomar.ie/>) suggests the sediment in the area is coarse gravels, shell materials and sands (with limited fines) exposed regularly to strong hydrodynamic movements. As such, no elevation in SSC beyond close proximity of the works from any of the above projects is predicted as any such sediment mobilised by the work will settle almost immediately. Therefore, considering the temporary and highly localised nature of the work, and the limited magnitude and spatial scale of the effect, it is considered that there is no potential for in combination LSE to arise as a result of an increase in SSC on reefs and large shallow inlets and bays

Great Channel Island SAC

The following projects are considered to have potential to lead to effects which may overlap spatially and temporally with effects on the Great Channel Island SAC resulting from the proposed site investigation works alone.

- Celtic 1 and Celtic 2 – Site investigations relating to possible offshore wind farms off the Cork coast;
- Simply Blue Group – Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale (Emerald);
- Site Investigation to assess the proposed Inis Ealga site and associated seabed – Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean surveys;
- Irish Water Whitegate – Marine Site Investigation works associated with the construction of a proposed wastewater Treatment Plant in Whitegate, Aghada. This treatment plant will include the construction of a sea outfall, approximately 500 metres long; and
- Various port and harbour works within Cork Harbour (Table C.1. Appendix C)

It is considered that these projects also have the potential to lead to increases in SSC in the vicinity of the SAC, although in the sheltered areas where fine sediments may be more prevalent, water movements are much reduced and as such any increase in SSC would not be transported any great distance and would be negligible in scale in the context of the local sediment regime in such habitats. The Annex I habitat QIs of the SAC under consideration (Mudflats and sandflats, and Atlantic and Mediterranean salt meadows) form in areas of overall sediment accretion and experience high levels of SSC naturally through tidal movements. As such these habitats are tolerant of relatively high levels of SSC and associated smothering. Therefore, due to the temporary and highly localised nature of the works, and the limited magnitude and spatial scale of the effect which the receiving environment will be highly tolerant of, it is considered that no LSE in combination with other plans or projects will arise as a result of an increase in SSC.

4.2.4. Annex II Diadromous Fish

Table 4.11 considers the potential for LSE on the Annex II diadromous fish QIs of those sites with which there is potential for connectivity (based on potential impacts and effects identified in Section 3.4).

4.2.4.8. Step 3: Project Alone Assessment

Table 4.11: LSE screening for Annex II diadromous fish

Potential effect	Qualifying Interest	Site	Screened in/out	Justification if screened out
Injury and Disturbance from underwater noise*1	[1103] Twaite shad	Blackwater River (Cork/Waterford) SAC [IE002170] River Barrow and River Nore SAC [IE002162] Slaney River Valley SAC [IE000781] Lower River Suir SAC [IE002137]	Screen out	Twaite shad are a member of the herring family (<i>Clupeidae</i>) and are considered to be hearing specialists due to the coupling of the ear to the swim bladder. Mann <i>et al.</i> (2001) suggests this species has a hearing range between 10 Hz and 180 kHz. Popper <i>et al.</i> (2014) recommended guidelines for low- and mid-frequency naval sonar, with geophysical survey methods considered to fall within this category. Fish with a swim bladder involved in hearing such as twaite shad are considered to experience either mortality/ potential mortal injury, recoverable injury or behavioural disturbance effects from this sound source depending on amplitude. The risk of injury or disturbance however is negligible as shad generally inhabit coastal and estuarine areas which are outside the main area of survey effort which will be focussed on the array site. They are also highly mobile and will move away from the impact before injury can occur due to other noise sources associated with the work such as vessel noise. As such interaction is unlikely and any behavioural response to noise will not affect SAC populations as none of the work will affect key areas for their life cycle. Therefore, no LSE as a result of underwater noise (from geophysical survey work) can be concluded for the project alone.
	[1095] Sea lamprey	River Boyne and River Blackwater SAC [IE002299]	Screen out	These Annex II migratory fish QIs are considered to have no sensitivity to underwater noise and there is no potential for significant effects to arise as a result of underwater noise. Therefore, no LSE as a result of underwater noise (from geophysical survey work) can be concluded.
	[1106] Atlantic salmon [1029] FWPM	Blackwater River (Cork/Waterford) SAC [IE002170] River Barrow and River Nore SAC [IE002162] Slaney River Valley SAC [IE000781] Lower River Suir SAC [IE002137]		As there is no LSE on Atlantic Salmon, no LSE can be concluded to FWPM.
	[1096] River lamprey	River Boyne and River Blackwater SAC [IE002299] Blackwater River (Cork/Waterford) SAC [IE002170] River Barrow and River Nore SAC [IE002162] Slaney River Valley SAC [IE000781] Lower River Suir SAC [IE002137]	Screen out	River lamprey are only found in rivers or estuaries and do not undertake lengthy at sea migrations or movements. Therefore, due to the distance from the SACs to the work, there is no connectivity (and thus no potential for LSE) in relation to effects on river lamprey.
Disturbance from increased Suspended Sediment Concentrations (SSC)*2	[1103] Twaite shad	River Boyne and River Blackwater SAC [IE002299]	Screen out	Migratory species are highly tolerant of increased SSC, migrating as they do through highly turbid estuarine and coastal environments. The low levels and limited extents of the increases in SSC which could be produced by the work are insufficient to lead to disturbance. Furthermore, these species are highly mobile and can avoid the affected areas if required. Therefore, no LSE as a result of increased SSC from the project alone can be concluded. As there is no LSE on Atlantic Salmon, no LSE can be concluded to FWPM.
	[1106] Atlantic salmon	Blackwater River (Cork/Waterford) SAC [IE002170]		
	[1095] Sea lamprey	River Barrow and River Nore SAC [IE002162] Slaney River Valley SAC [IE000781] Lower River Suir SAC [IE002137]		
	[1029] FWPM			
	[1096] River lamprey	River Boyne and River Blackwater SAC [IE002299] Blackwater River (Cork/Waterford) SAC [IE002170] River Barrow and River Nore SAC [IE002162] Slaney River Valley SAC [IE000781] Lower River Suir SAC [IE002137]	Screen out	River lamprey are only found in rivers or estuaries and do not undertake lengthy at sea migrations or movements. Therefore, due to the distance from the SACs to the work, there is no connectivity (and thus no potential for LSE) in relation to effects on river lamprey.

*1 injury and disturbance from underwater noise resultant from geophysical surveys

*2 Increase in disturbance from SSC resultant from geotechnical survey sampling, metocean survey equipment and environmental surveys (benthic sampling)

4.2.4.9. Step 4: In Combination Assessment

Given the extremely localised and short duration nature of the proposed site investigation work, it is considered that there is negligible potential for in combination effects on the Annex II diadromous fish QIs of the relevant sites. Where routes to impact have been identified, and under a precautionary approach no LSE concluded, it is considered that any potential effects are so negligible in scale that no potential for in combination effects with any other relevant plans of projects exists (see Appendix C for details of the plans/projects considered).

4.3. Step 5: Summary of AA Screening

4.3.1. Marine Ornithology

For the project alone or in combination with other plans or projects, LSE as a result of the proposed site investigation work (without the use of mitigation measures) could not be ruled out for the Natura 2000 site/effect/SCI combinations shown in Table 4.12.

Table 4.12: SPA, Effect and SCI combinations

Site	Effect	Special Conservation Interest
Mid-Waterford Coast SPA [IE0004193]	Disturbance and displacement (by above water noise and visual impacts)	[A103] Peregrine falcon (resident)
		[A346] Chough (resident)
Cork Harbour SPA [IE0004030]	Disturbance and displacement (by above water noise, under water noise and visual impacts)	[A184] Herring gull (breeding)
		[A017] Cormorant (breeding)
Cork Harbour SPA [IE0004030]	Disturbance and displacement (by above water noise and visual impacts)	[A048] Shelduck (wintering)
		[A056] Shoveler (wintering)
		[A050] Wigeon (wintering)
		[A054] Pintail (wintering)
		[A052] Teal (wintering)
		[A028] Grey Heron (wintering)
		[A130] Oystercatcher (wintering)
		[A142] Lapwing (wintering)
		[A140] Golden plover (wintering)
		[A141] Grey plover (wintering)
		[A160] Curlew (wintering)
		[A157] Bar-tailed godwit (wintering)
		[A156] Black-tailed godwit (wintering)
		[A149] Dunlin (wintering)
		[A162] Redshank (wintering)
[A179] Black-headed gull (wintering)		
[A182] Common gull (wintering)		
[A183] Lesser black-backed gull (wintering)		
[A193] Common tern (breeding)		
	Disturbance and displacement	[A069] Red-breasted merganser (wintering)

Site	Effect	Special Conservation Interest
	(by above water noise, under water noise and visual impacts)	[A004] Little grebe (wintering) [A005] Great crested grebe (wintering) [A017] Cormorant (wintering)
Dungarvan Harbour SPA [IE0004032]	Disturbance and displacement (by above water noise and visual impacts)	[A142] Lapwing (wintering) [A162] Redshank (wintering)
	Disturbance and displacement (by above water noise, under water noise and visual impacts)	[A069] Red-breasted merganser (wintering) [A005] Great crested grebe (wintering)
Helvick Head to Ballyquin SPA [IE0004192]	Disturbance and displacement (by above water noise and visual impacts)	[A103] Peregrine falcon (resident) [A346] Chough (resident) [A188] Kittiwake (breeding) [A184] Herring gull (breeding)
	Disturbance and displacement (by above water noise, under water noise and visual impacts)	[A017] Cormorant (breeding)
Ballycotton Bay SPA [IEC004022]	Disturbance and displacement (by above water noise and visual impacts)	[A052] Teal (wintering) [A137] Ringed plover (wintering) [A140] Golden plover (wintering) [A141] Grey plover (wintering) [A142] Lapwing (wintering) [A156] Black-tailed godwit (wintering) [A157] Bar-tailed godwit (wintering) [A160] Curlew (wintering) [A169] Turnstone (wintering) [A182] Common gull (wintering) [A183] Lesser black-backed gull (wintering)
Ballymacoda Bay SPA [IEC004023]	Disturbance and displacement (by above water noise and visual impacts)	[A050] Wigeon (wintering) [A052] Teal (wintering) [A137] Ringed plover (wintering) [A140] Golden plover (wintering) [A141] Grey plover (wintering) [A142] Lapwing (wintering) [A144] Sanderling (wintering) [A149] Dunlin (wintering) [A156] Black-tailed godwit (wintering) [A157] Bar-tailed godwit (wintering) [A160] Curlew (wintering) [A162] Redshank (wintering) [A169] Turnstone (wintering) [A179] Black-headed gull (wintering) [A182] Common gull (wintering)

Site	Effect	Special Conservation Interest
Sovereign Islands SPA [IEC004124]	Disturbance and displacement (by above water noise, under water noise and visual impacts)	[A183] Lesser black-backed gull (wintering) [A017] Cormorant (breeding)

For all remaining Natura 2000 site/effect/SCI combinations, no LSE, either alone or in combination with other plans or projects, can be concluded.

4.3.2. Marine Mammals

No LSE as a result of any of the potential effects (auditory injury, disturbance and collision) can be concluded for all of the marine mammal QIs of all of the relevant SACs for the Project, both alone and in combination with other plans/projects.

However, although no LSE was concluded for all of the marine mammal QIs of all 15 relevant SACs for the Project both alone and in combination with other plans/projects, a NIS is required to account for the mitigation measures which will be implemented to negate effects of auditory injury resulting from noise arising from survey works. As such, these SAC's will be progressed to Stage 2 (NIS).

4.3.3. Annex I Habitats

No LSE as a result of the potential effects (increased SSC) can be concluded for all of the Annex I habitat QIs of all of the relevant SACs for the Project, both alone and in combination with other plans/projects

4.3.4. Annex II Diadromous Fish

No LSE as a result of any of the potential effects can be concluded for all of the Annex II diadromous fish QIs of all of the relevant SACs for the Project, both alone and in combination with other plans/projects.

5. Summary of Screening

The purpose of this document, which will accompany a Foreshore Licence Application, is to provide supporting information to the Competent Authority to inform the AA process in determining whether the proposed site investigation and baseline survey work, either alone and in combination with other plans or projects, is likely to have a significant effect on any Natura 2000 site.

Stage 1, Screening found that LSE could not be ruled out for the following Natura 2000 sites as a result of site investigation work alone (without mitigation):

- [IE0004193] Mid-Waterford Coast SPA;
- [IE0004030] Cork Harbour SPA;
- [IE0004032] Dungarvan Harbour SPA;
- [IE0004192] Helvick Head to Ballyquin SPA;
- [IE0004022] Ballycotton Bay SPA;
- [IE0004023] Ballymacoda Bay SPA; and
- [IE0004124] Sovereign Islands SPA.

Therefore, it is recommended that a Natura Impact Statement be prepared to assist the Competent Authority in determining whether the LSE identified in this report will affect the integrity of these of any Natura 2000 site(s).

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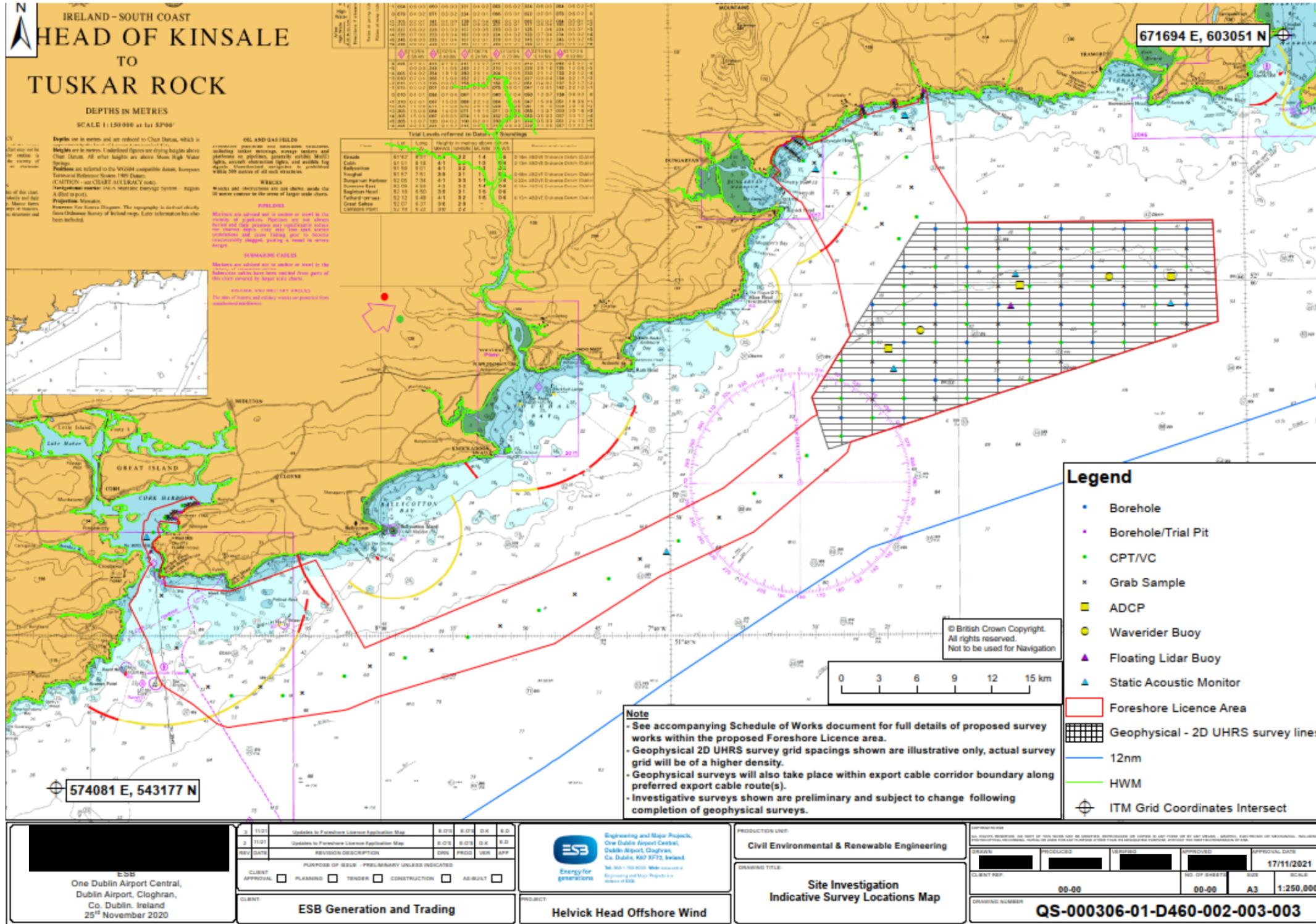
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Appendices

Appendix A - Proposed (Indicative) Sampling Locations



Appendix B - Summary of Noise Sources

From "Site Investigation – Schedule of Works" document (Document No. QS-000306-01-R460-002-000)

Table B: Summary of noise sources

Noise Source	Typical Frequency	Typical Sound Pressure Level (dB re 1µPa @ 1m)
Survey Vessel	maximum 100 kHz	118 -145 dB
MBES	400 to 700 kHz	200-228 dB
SSS	300 to 900 kHz	228 dB
SBP – Pinger/Chirp	2 to 16 kHz	200 dB
UHRS – Boomer	0.3 – 2.5 Hz	212 – 215 dB
UHRS – Sparker	0.3 – 1.5kHz	226 dB
Rotary Boreholes	maximum 600 Hz (low frequency)	145-190 dB
CPT	-	118 -145 dB
Vibrocorer	50 Hz (low frequency)	188 dB

Appendix C - Plan/Project List for In-Combination Assessment

The following list is based on plans/projects that may have similar activities occurring over a similar timescale to those assessed as part of the project alone and that may affect SCIs or QIs which are present within the vicinity of the proposed Works (i.e. south-east coast of Ireland).

Table : Plan/project list for in-combination assessment

Plan/project	County	Description
Offshore Wind Farms (OWF) and Subsea Cables and Pipelines		
Codling Wind Park Ltd	Wicklow	Codling Wind Park - Site Investigation Licence Application to inform the design of a possible windfarm at this site
Codling Wind Park II Ltd	Wicklow	CWP II original foreshore lease for OWF
Sure Partners Site Investigation at Arklow Bank	Wicklow	Site Investigations to inform the engineering and design of an offshore wind farm
Bord Gais Eireann	Wexford	Foreshore lease application to install a gas pipeline to connect the national gas network to the Great Island Power Station
Energia Site Investigation	Wexford	Site Investigations to inform on possible construction of a windfarm off the Wexford coast
Greenlink Interconnector	Wexford	Subsea and underground electricity interconnector cable between Irish and UK electricity grids; connection between Eirgrid's Great Island substation (Republic of Ireland) and National Grid's substation in Pembrokeshire (Wales)
Hibernian Wind Power	Wexford	Foreshore licence application to undertake surveys and investigations in order to further assess the site and seabed, in order to select an optimum route for the submarine electricity cables required for the development of an offshore wind farm to acquire baseline data to allow cable design and the development of cable installation methodologies, to acquire baseline data to optimise the windfarm layout design and finalise offshore foundation locations, to acquire baseline data on the wind resource and baseline information for environmental studies of the area
Eir	Waterford	Site investigation works for the proposed Eir fibre optic cable
Energia- Application for Site Investigation Licence for Windfarm off Helvick Head	Waterford	Geophysical, Geotechnical, Archaeological, Ecological, Oceanographic and Meteorological investigations to determine optimum design for windfarm, cabling and associated structures
SSE Renewables Celtic Sea	Waterford	Geophysical, Geotechnical and Environmental Site Investigation works
Celtic 1 and Celtic 2	Cork	Site Investigations to inform the engineering and design of an offshore wind farms. Cable routes to Cork Harbour.
Eirgrid PLC – Ballinwilling Strand, Redbarrn Beach	Cork	Foreshore Licence application for geophysical marine survey works

Plan/project	County	Description
and Claycastle Beach		
Irish Water – Ballycotton	Cork	Foreshore Licence application for ground investigation works and sampling
Simply Blue Emerald Site	Cork	Site investigations to inform the design of a possible deep-water offshore wind power generation project off Kinsale
Investigations for possible Floating Offshore Wind project off Kinsale		
Site Investigation to assess Windfarm of Inis Ealga	Cork	Site Investigation to assess the proposed Inis Ealga site and associated seabed Investigations will include Geotechnical, Geophysical, Archaeological, Benthic, Intertidal, Bird, Mammal, Wind and Metocean Surveys
Port and Harbour Activities		
Arklow Sewerage Scheme-South Quay Wall	Wicklow	Foreshore Licence application for 2 permanent and 2 temporary outfalls to the Avoca River
Arklow Wastewater Treatment Plant	Wicklow	The proposed Arklow Wastewater Treatment Plant Project comprising a new Wastewater Treatment Plant, associated infrastructure including sewer network and marine outfalls as well as an upgrade to existing coastal revetment
Wexford County Council (Trinity Wharf)	Wexford	Proposed mixed-use urban quarter development totalling 5.5 ha and including the development of a 3.6 ha brownfield site; a floating boom marina; sea wall and rock armour development; a bridge/boardwalk; a new access road and junction to Trinity Street; and all other ancillary works
Cheekpoint Boat Owners Association Pontoon and Gangway	Waterford	Application for consent for installation of a 63m x 3m floating pontoon with a connecting 21m x 1.5m wheelchair accessible gangway. Associated works include 7 x round piles (permanent), plus navigation and accessibility facilities. Total size of proposed facility expected to be 713m/sq
Port of Waterford Company	Waterford	Deployment of five Acoustic Wave and Current (AWAC) Profilers at specific locations in Waterford Estuary
Irish Water Dungarvan Wastewater Treatment Plant	Waterford	Foreshore Licence application for an outfall pipe in connection with Dungarvan wastewater treatment plant
Irish Water	Waterford	Installation of a watermain across the River Brickey
Enniscorthy Flood Defence Scheme	Wexford	Foreshore application in respect of dredging, the construction of flood defences, the construction of a new pedestrian bridge and the replacement the existing Seamus Rafter Bridge with a new bridge further downstream
Irish Water Kilgoley Enniscorthy	Wexford	Foreshore licence application for a proposed outfall from the Enniscorthy Wastewater Treatment Plant

Plan/project	County	Description
Irish Water River Slaney	Wexford	Foreshore licence application for the upgrading of an outfall to the River Slaney
Irish Water St Johns Enniscorthy	Wexford	Foreshore licence application for a proposed emergency outfall from the St John's pumping station, Enniscorthy
Bord Gais Eireann - Whitegate	Cork	Foreshore Licence application for an effluent discharge pipeline
Irish Water Storm Outfall Pipe at Gibbon's Quay	Cork	40 m extension of an existing public storm water outfall pipe to move the outfall location from the High Water Mark (HWM) to below Mean Low Water Spring (MLWS)
Irish Water Whitegate	Cork	Marine Site Investigation works associated with the construction of a proposed Waste Water Treatment Plant in Whitegate - Aghada. This treatment plant will include the construction of a sea outfall, approximately 500 metres long
Irish Water Site Investigation for Storm Water Outfall Extension	Cork	Site Investigation - a geotechnical investigation to inform the proposed extension of a storm water outfall at Gibbon's Quay
Comharchumann Chleire Teo	Cork	Foreshore licence application for the installation of outfall pipes from a proposed distillery development
Cork City Council – Flood Defence Works	Cork	Foreshore application for flood defence works and a public amenity area
Department of Defence- Alexandra Breakwater Repairs	Cork	Foreshore Consent application for the carrying out of remediation works to the Alexandra Breakwater
Ballycotton Coastal Protection - Pierce Flynn	Cork	Foreshore application for the construction of a rock armour revetment
Cork County Council Dredging at Courtmacsherry Pier, Cork	Cork	Maintenance dredging at Courtmacsherry Pier
Ahakista Community Association Ltd	Cork	Foreshore Lease application for the installation of a floating pontoon attached to Ahakista Pier
Cork County Council Youghal Pontoon	Cork	Foreshore application for the installation of floating pontoon and visitor moorings
Cork County Council-Dredging at Courtmacsherry Pier	Cork	The bed under the footprint of the pontoon and the immediate area are to be dredged to -7.0mODM. Dredge spoil is to be removed off-site for disposal. Pontoon will be removed temporarily for the duration of the works

Plan/project	County	Description
Cork County Council Dredging at Glengarriff Pier	Cork	Dredging of the bed around the western and southern sides of the pontoon at Glengarriff Pier to -5.00mODM. Dredge spoil to be removed off-site for disposal. Pontoon will be removed temporarily for the duration of the works
Cove Sailing Club	Cork	Foreshore lease application for the installation of a 74-berth marina with access platform, gangway and associated infrastructure
Maintenance dredging at Reen, Skibbereen	Cork	Dredging around pier at Reen, Skibbereen
Skibbereen Rowing Club	Cork	Construction of concrete wall, floating pontoon and three gangways



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