Proposed Installation of Meteorological Stations, Deployment of Tide and Flow Gauges, Bed-mounted Current Meters and Utilisation of Drones and a Remotely Controlled Boat (ARCBoat) in Newport Bay and Clew Bay, Co. Mayo

Supporting Information for Screening for Appropriate Assessment

Produced by

AQUAFACT

On behalf of

Mott MacDonald

December 2024

AQUAFACT – APEM Group,

[redacted]

Table of Contents

List of Figures

List of Tables

1. Introduction

1.1. Background

This report has been prepared by AQUAFACT – APEM Group to provide the relevant information to the competent authority to inform the Screening for Appropriate Assessment (AA) for a Maritime Usage Licence. The MUL is being submitted for the proposed installation of meteorological stations and pontoons, deployment of tide and flow gauges and utilisation of drones and a remotely controlled boat (ARCBoat) at Newport Bay and Clew Bay, Co. Mayo (the 'Project'). The objective of the Project is to obtain environmental data within Newport Bay and Clew Bay areas to inform detailed modelling of the hydrographic conditions of the area to ultimately inform the outfall discharge location for a proposed new Wastewater Treatment Plant (WWTP) to serve the Newport agglomeration in County Mayo. The locations of the meteorological (weather) station installations, current meter deployments, tide and flow gauge deployments are shown in **Figure 1-1**. The aerial and hydro drone survey extent for Light Detection and Ranging (LiDAR), Multi Beam Echo Sounder (MBES), and dye tracing surveys will occur within the red line boundary shown in **Figure 1-2**. The locations of survey sites for water quality data are shown in **Figure 1-3** and **Figure 1-4**.

A MBES survey may be undertaken to complement the LiDAR dataset for areas of the seabed that are not prone to drying during low water on a spring tide. Regarding the collection of samples for water quality analysis, additional *Escherichia coli* and *Intestinal enterococci* sampling will occur upstream of the tidal limit of the Newport River. Depending on accessibility either an automatic sampler will be deployed to collect water samples or manual sampling may occur. In addition to deploying a drone for dye tracing, a hydro-drone will be deployed with a mounted GPS system to monitor the concentration of the dye plume in-situ, as well as its development and variation over time. Temperature and salinity sensors will be integrated into bed-mounted current meters. The marine surveys are not seasonally constrained, as spring and neap tides occur bi-monthly. The current gauge, tide meter and CTDs (conductivity, temperature, depth profiler) will be deployed for a minimum period of 35 days (up to 12 weeks dependent upon weather conditions) to cover spring and neap tides. Fixed river flow gauges will be placed for 12 months, mounted from dry land and removed thereafter. Spot gauging will be completed in the river and a cross-section will be taken of the river at the point of measurement. There will be no permanent removal of habitat in the scope of the works.

The programme for collecting data on meteorological conditions, river and tidal levels and water quality will take place for a period of 12 months. The licence is sought for a period of five years to enable works to be scheduled and completed in favourable weather conditions. The commencement of the surveying will be dependent upon the issuing of the maritime usage licence.

The marine survey equipment is either drone operated, or comprises floating instrumentation deployed from a boat.

The aims of the Project can be summarised as follows:

The proposed marine surveys are required as part of data collection to provide quantitative inputs for a hydrodynamic model which is required to profile Clew, Newport and Westport Bay to aid the selection of a new discharge outfall for a proposed wastewater treatment plant for the settlement of Newport. The principal objective of the marine surveys is to help ensure robust assessments can be completed for the design of a new wastewater treatment plant which provides treated discharges in compliance with the Urban Waste Water Treatment Directive and with the conditions set in the extant Waste Water Discharge Authorisation licence. The benefits resulting from the completion of the Project would include:

- In-depth understanding of hydrographic conditions and water quality within Newport Bay and Clew Bay
- Validate pre-existing datasets, and provide the necessary dataset to conduct detailed modelling and highlight data gaps to be addressed to aid the development of WWTP

The works proposed include:

- Installation of 2no. weather stations to aid validation of data
- Installation of 6no. tidal gauges
- Installation of 5no. current meters with vertical profiles and conductivity, temperature, and depth (CTD) device
- Installation of 4no. river flow and stage gauges
- Deployment of a drone to conduct a Light Detection and Ranging (LiDAR) survey to establish bathymetry of site
- Deployment of Multi Beam Echo Sounder (MBES) to complement the LiDAR dataset
- Deployment of an ARCBoat or installation of 8no pontoons mounted to Buoys which will be temporarily anchored to aid water sample collection
- Deployment of drone and hydro-drone to conduct dye and microbial tracing survey to understand dispersion pattern of effluent and to aid conceptual model calibration and verification processes under different conditions
- Water quality sampling within the bay and rivers
- Maintenance of the tidal and flow gauges, weather stations at site
- Decommissioning/removal of all surveying equipment at the end of the survey period

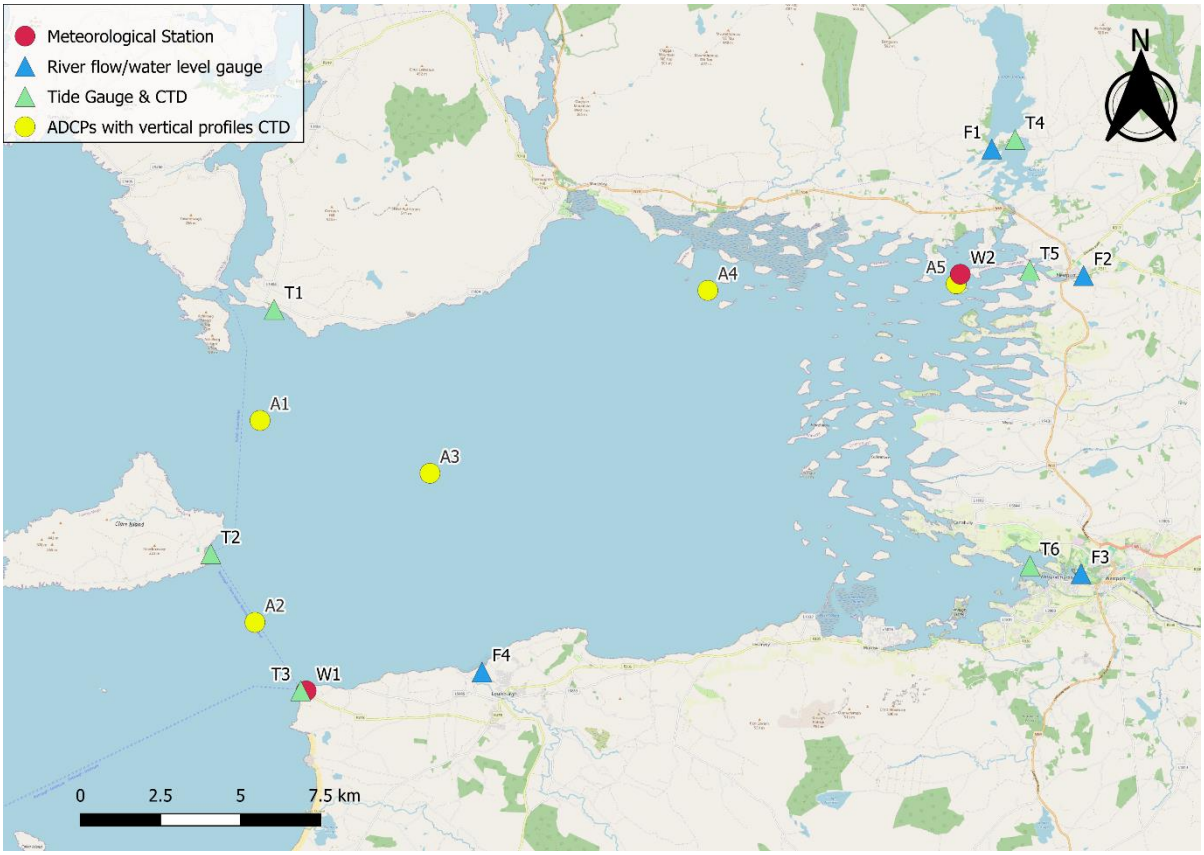

Figure 1-1: Proposed Instrument Locations in the Clew Bay and Newport Bay area.

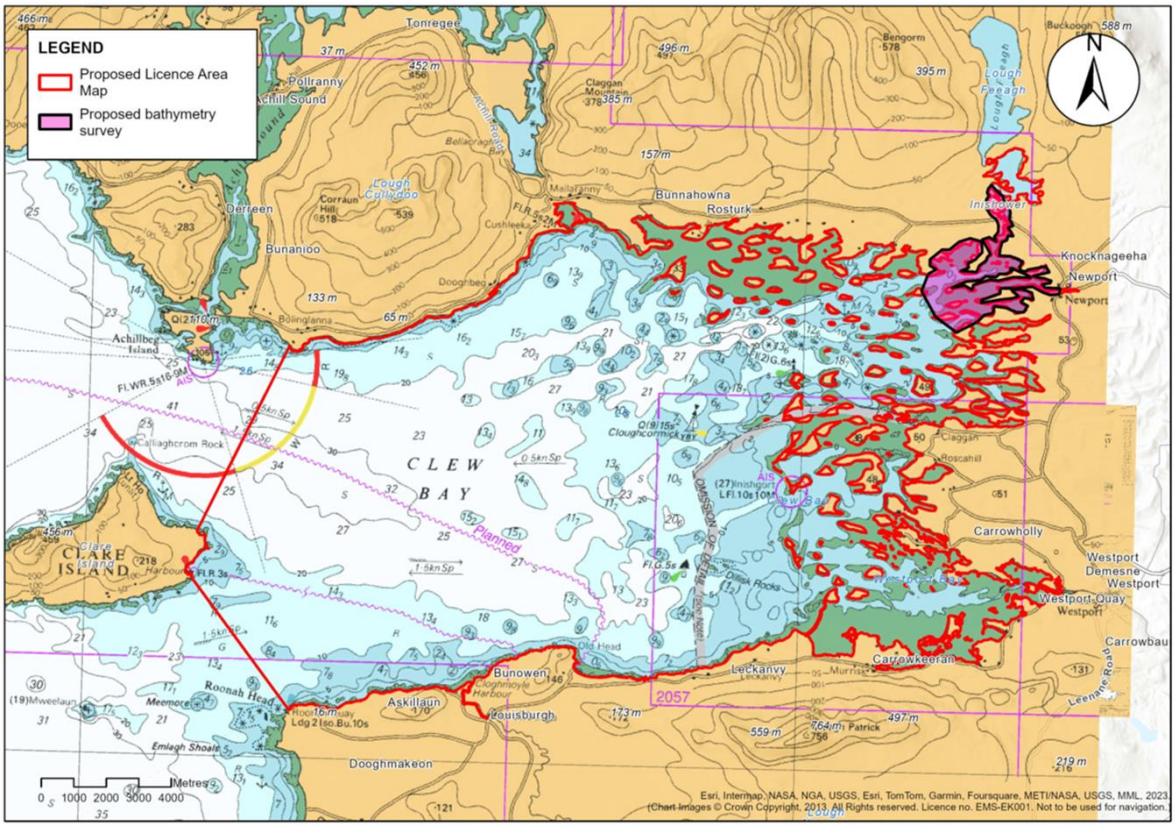

Figure 1-2: Proposed extent for bathymetric and water quality surveys in Clew Bay.

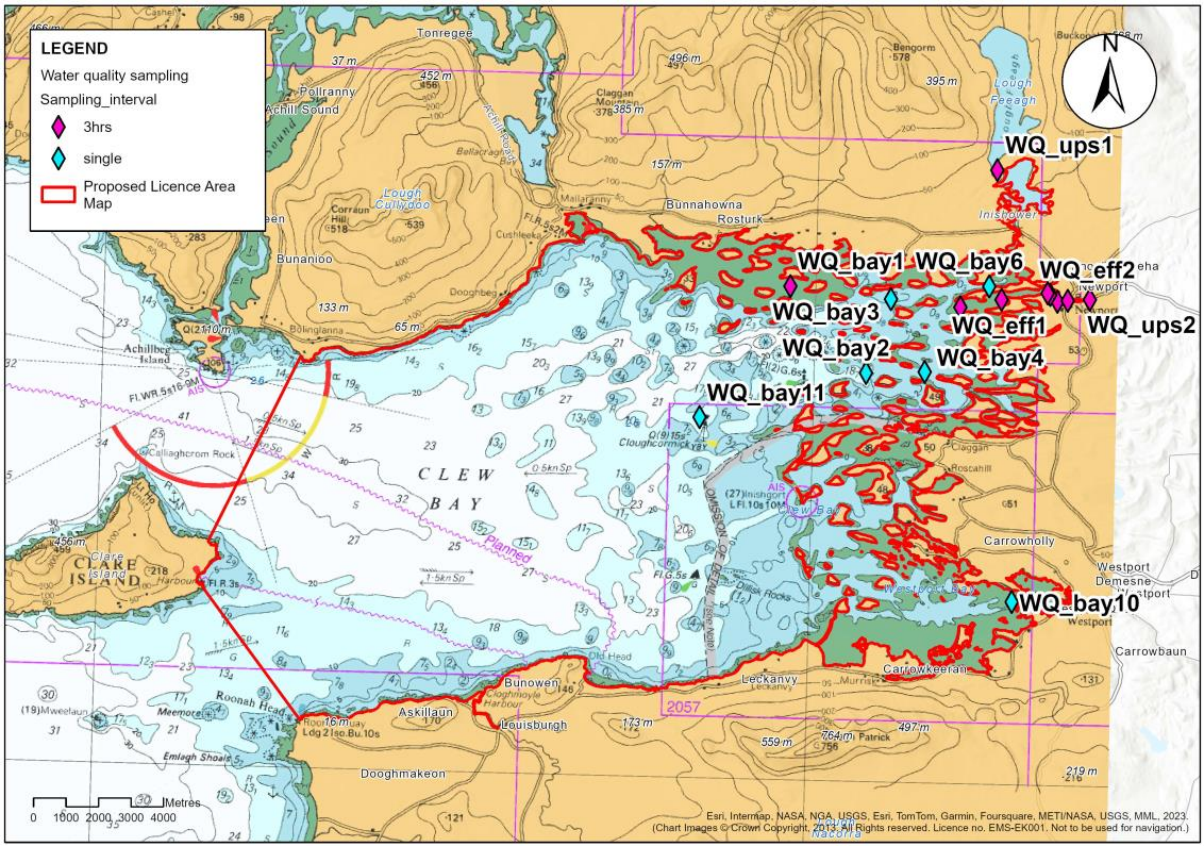

Figure 1-3: Proposed sampling locations for water quality surveys in Clew Bay.

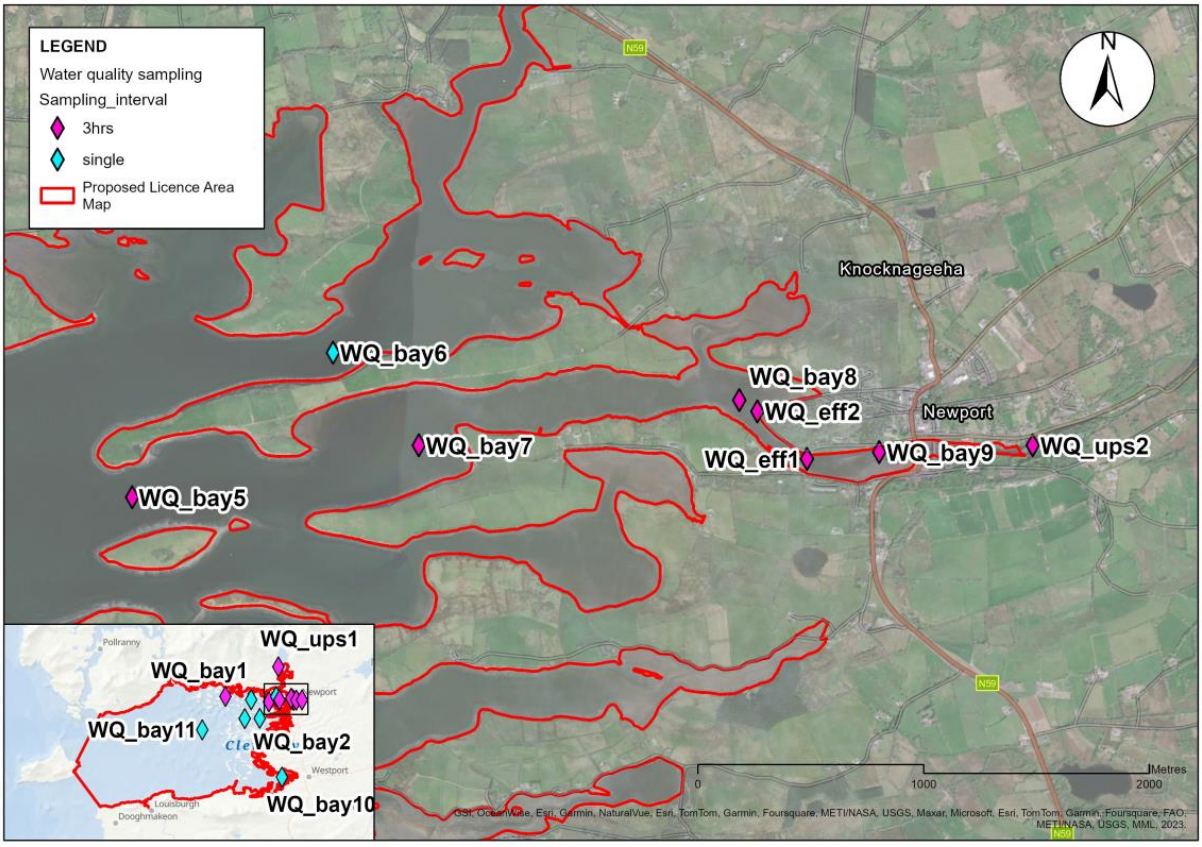

Figure 1-4: Close up of proposed sampling locations for water quality surveys in inner bay Clew Bay.

1.2. Purpose of this report

This report has been prepared to address Article 6(3) obligations under the European Community (EC) Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (commonly known as the Habitats Directive), which is transposed into Irish legislation under the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

1.3. Guidance

This report has been prepared in accordance with the following guidance:

- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice (2018)
- OPR (2021). Practice Note PN01 Appropriate Assessment Screening for Development Management
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010)
- EC (2001) Managing Natura 2000 Sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC
- Department of Arts, Heritage and the Gaeltacht – National Parks and Wildlife Service DAHG - NPWS (2012) Marine Natura Impact Statements in Ireland Special Areas of Conservation, A Working Document

This assessment includes a desk-based review of available records of protected QIs and SCIs including the following sources:

- Conservation Status Assessment Reports, Backing Documents and Maps prepared to inform national reporting[1] required under Article 17 of the Habitats Directive
- Site Synopsis, Conservation Objective Reports and Natura 2000 Forms available from NPWS
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Species Action Plans, and Conservation Management Plans
- Existing relevant mapping and databases *e.g.* waterbody status, species and habitat distribution *etc.* (sourced from the Environmental Protection Agency - http://gis.epa.ie/, the National Biodiversity Data Centre - http://maps.biodiversityireland.ie and the NPWS - http://www.npws.ie/mapsanddata/)

[1] The most recent Article 17 report (2019) is available at https://www.npws.ie/publications/article-17-reports/article-17-reports-2019

1.4. Structure of this Report

The remainder of this report is structured as follows:

- **Section 2. Legislation**
- **Section 3. Assessment Methodology**
- **Section 4. Receiving Environment**
- **Section 5. Potential Environmental Impacts**
- **Section 6. Screening For Appropriate Assessment**
- **Section 7. Conclusion**

2. Legislation

2.1. Legislative Background

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (commonly known as the Habitats Directive) is European Community legislation regarding nature conservation established to ensure biodiversity is conserved through the conservation of natural habitats and wild fauna and flora in Europe.

The Habitats Directive was originally transposed into Irish law by the *European Communities (Natural Habitats) Regulations, 1997* (S.I. No. 94 of 1997). The 1997 Regulations were subsequently revoked and replaced by the *European Communities (Birds and Natural Habitats) Regulations 2011*, as amended (herein referred to as the 2011 Birds and Natural Habitats Regulations).

Under Regulation 42 of the 2011 Birds and Natural Habitats Regulations all competent authorities are required to conduct a screening for Appropriate Assessment (AA) and, if necessary, an AA on any plan or project on the foreshore for which it receives an application for consent, or which the authority itself wishes to undertake or adopt. This obligation derives from Articles 6(3) and 6(4) of the Habitats Directive.

The AA provision of the Habitats Directive is transposed in Ireland by the Planning and Development Act 2000 (as amended) in respect of land use plans and proposed developments requiring development consent. The Planning and Development Act, 2000 (as amended) is the basis for the Irish planning code, setting out the detail of regional planning guidelines, development plans and local area plans as well as the basic framework of the development management and consent system.

A network of sites of conservation importance hosting habitats and species as needing to be either maintained at or restored to favourable conservation status have been identified by each Member State. These sites are known as European sites within the Natura 2000 network.

European sites in Ireland that form part of the Natura 2000 network of protected sites comprise Special Areas of Conservation (SAC) sites designated due to their significant ecological importance for habitats and species protected under Annex I and Annex II respectively of the Habitats Directive, and Special Protection Area (SPA) sites designated for the protection of populations and habitats of bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC). The sites are formally designated by the relevant minister under a statutory instrument. Candidate SAC and candidate SPA

sites (*i.e.* cSAC or cSPA) have the same level of protection as fully designated sites under Irish Law[2]. The specific named habitats and/or (non-bird) species for which an SAC or SPA are selected are called the 'Qualifying Interests' (QIs), of the site. The specific named bird species for which an SPA is selected are called the 'Special Conservation Interests' (SCIs) (OPR 2021).

Following the requirements of Article 6(3) of the Habitats Directive, under Regulation 42 of the 2011 Birds and Natural Habitats Regulations, if a plan or project is not connected with, or necessary for the management of a European site and is likely to have a significant effect on the QIs or SCIs for which a site is designated either individually or in combination with other plans or projects, an AA is required to assess whether a plan or project will have any adverse effect on the integrity of a European site(s) in view of the Conservation Objectives set for the designated QIs or SCIs.

2.2. Appropriate Assessment (AA) Process

The **first stage of the AA process is Screening**; where the risk of a significant effect to a conservation feature (*i.e.* QI or SCI) from an impact mechanism can be **excluded** on the basis of objective evidence, the designated feature and impact mechanism combination is **screened out** of further assessment. The assessments undertaken as part of the first stage of AA process are documented in a Screening Statement for AA.

Where the Screening for AA identifies that a significant effect to a conservation feature from an impact mechanism is likely to occur, the conservation feature and the impact mechanism combination is brought forward for a detailed consideration of the potential for adverse effects. This detailed assessment of the potential for adverse effects is the second stage of the AA process. The assessments undertaken as part of the **second stage of the AA process are documented in a Natura Impact Statement** (NIS).

This report has been prepared to provide the relevant information to inform the assessments to be undertaken for the Screening Statement for AA for the Project and has been prepared to address Article 6(3) obligations under the Habitats Directive and to inform the AA determination of the competent authorities. Specifically, this report focuses on the potential effects of the proposed development to European sites.

[2] Candidate sites are those that have been submitted to the European Commission, but not yet formally adopted under Ministerial Statutory Instrument (S.I.). Legal protection, and therefore, the requirement for AA, arises from the date that the Minister gives notice of his/her intention to designate the site.

3. Assessment Methodology

3.1. Source-Pathway-Receptor and Impact Assessment

3.2. Overview

A key factor in the consideration as to whether a QI or an SCI (collectively referred to herein as conservation features) is likely to be affected by a proposed project is the existence of connectivity (or interaction/or impact pathway) between the feature and the impact mechanisms associated with the Project. National guidance (DEHLG, 2009) outlines that screening for AA should be carried out for any European Site within the likely Zone of Impact (ZoI) of a plan or project.

For projects, the guidance outlines that the ZoI must be evaluated on a case-by-case basis with reference to the nature, size and location of the Project, the sensitivities of the ecological receptors and the potential for in-combination effects. **Section 6.2** considers the potential effects due to the proposed Project, while **Section 6.3** considers potential in-combination effects with other plans and projects.

3.3. Methodology

This report has been prepared to assist authorities in addressing Article 6(3) obligations under the Habitats Directive and focuses on the potential effects of the Project to European sites.

In order to establish the ZoI of the proposed Project, the assessment of connectivity between project impact mechanisms (or source) and a conservation feature (*i.e.* QIs and SCIs) considers the location of the Project relative to:

- habitats and non-mobile species
- species foraging distances and migration routes
- the proximity of the Project to foraging and breeding areas
- potential changes in species behaviour
- effects on prey species resulting in alteration in interactions and associated impacts

To inform the assessment, nationally available data on protected habitats and species was mapped using a Geographic Information System (GIS) and interrogated to identify for source-pathway-receptor connectivity. The source (potential project impact mechanisms), pathways (hydrological, physical or ecological connectivity) and receptors (conservation features) were identified using GIS software and through the examination of aerial photography and a review of ecological surveys undertaken in the

area. Any conservation feature identified to have a viable source-pathway-receptor link to the proposed Project were then examined further to determine the potential for significant effects.

The assessment of project impact sources (or mechanisms) considers all relevant aspects of the proposed Project that have the potential to directly or indirectly effect conservation features.

The assessment of potential effects of the Project on conservation features of SACs and SPAs are presented in **Section 6.2** while the assessment of in-combination effects are outlined in **Section 6.3.**

4. Receiving Environment

4.1. Marine Benthic Area

Data available (INFOMAR, 2024[3]) indicates that water depths at the deployment in the outer area of the bay ranges from 5–30m in depth, with the inner reaches of the bay, particularly around the drumlin islands, being particularly shallow with relatively greater depths located in the waters due east and west of Clare Island. A review of Conservation Objectives for Clew Bay Complex SAC (NPWS, 2011), indicates that the substrate underlying the deployment locations are comprised primarily of sands and muds at the proposed moorings at A1, A2, A3, A4 and A5. A review of benthic subtidal communities by NPWS, 2011, indicates that the moorings A4 and A5 overlap a muddy substrate dominated with polychaete and bivalve communities.

4.2. Marine Aerial Environment

The proposed aerial range for the LiDAR survey covers a small spatial extent adjoining the mouth of the Newport River and covering nearshore areas of Newport. For the dye tracing survey, the aerial range extends throughout the Clew Bay area. The aerial range for both surveys overlap with Clew Bay Complex SAC, which supports a good diversity of wintering waterfowl. Deployment of a drone will be required to conduct these surveys.

4.3. Coastal Habitat

The coastal boundary of Clew Bay Complex SAC is comprised of a number of Annex I coastal habitats, namely 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)', 'Embryonic shifting dunes', 'Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)' and 'Machairs (* in Ireland)'. The proposed installation of one weather station W2 is located within Clew Bay Complex SAC, while W1 is located just outside the West Connacht Coast SAC.

The tide gauges (code: T1-T6) will be attached to substrate along the coastline to be submerged in water for recording tidal data. The proposed sites for T4, T5 and T6 overlaps with Clew Bay Complex SAC, T2 and T3 will overlap with West Connacht Coast SAC. Tide gauge T1 does not overlap with an SAC or SPA.

[3] https://www.infomar.ie/index.php/maps/interactive-maps/seabed-and-sediment (Accessed 30/04/2024)

4.4. Marine Mammal Habitat

Important Otter and Common (Harbour) Seal populations are found in Clew Bay. The proposed installation of pontoons and deployment of an ARCBoat, MBES and hydro-drone would occur throughout the area of Clew Bay. Similarly, the proposed dye dispersion survey will be conducted throughout the area where high numbers of Annex II marine mammals have been recorded.

4.5. Natura 2000 Sites

4.5.1. Special Conservation Interests (SCI) Birds

The Source Pathway Receptor (SPR) model identified the European sites within the ZOI of the proposed Project which were considered in this screening for AA. There are 2 SPA sites within the ZOI of the Project (see **Figure 4-1**); the sites are:

- Owenduff/Nephin Complex SPA (Site code: 004098) (4.9km north of Project)
- Clare Island SPA (Site code: 004136) (6.3km west of Project)

The conservation features (*i.e.* SCIs) of the above SPAs are listed in **Table 4.1** alongside conservation objectives set for the conservation features. A brief description of the SPAs is provided below.

Clare Island SPA (Site code: 004136)

Clare Island lies at the entrance to Clew Bay, Co. Mayo and some 5 km from the mainland. The site comprises all the cliffs on the island, a length of approximately 10 km, as well as the land adjacent to the cliff edge (inland for 300 m) and the adjacent marine waters (to distances of 200 m or 500 m, depending on auk distribution). The site is designated for the following species: Fulmar (*Fulmarus glacialis*) [A009], Shag (*Phalacrocorax aristotelis*) [A018], Common Gull (*Larus canus*) [A182], Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge*) [A199], Razorbill (*Alca torda*) [A200] and Chough (*Pyrrhocorax pyrrhocorax*) [A346]. The conservation objectives for this site's SCIs can be found in **Table 4.1**.

Owenduff/Nephin Complex SPA (Site code: 004212)

This large area of relatively intact blanket bog and mountains incorporates the catchment of the Owenduff River and much of the Nephin Beg Mountain range in Co. Mayo. Lough Feeagh, which is located approximately 5 km north-northwest of Newport, lies at the south-east corner of the site. From here, the site extends northwards to the Owenmore River and almost to the town of Bangor Erris and westwards to the townland of Ballycroy. The site is designated for the following species: Merlin (*Falco columbarius*) [A098] and Golden Plover (*Pluvialis apricaria*) [A140]. Conservation objectives for this site's SCIs can be found in **Table 4.1**.

Table 4.1: Special Protection Areas and Special Conservation Interests and Qualifying Interests

Clare Island SPA **			
Qualifying Interest	**Ecological Group**	**Conservation Objective**	**Foraging Behaviour**
Fulmar (*Fulmarus glacialis*) [A009]	Annex I bird species	To maintain or restore favourable conservation condition	Largely breeding on sea cliffs but will also nest on level ground including on buildings. Winters at sea with sporadic visits to colonies.
Shag (*Phalacrocorax aristotelis*) [A018]	Annex I bird species	To maintain or restore favourable conservation condition	Colonial nester, breeding on all Irish coasts where suitable cliffs exist. Preys on small fish taken from just below the water's surface.
Common Gull (*Larus canus*) [A182]	Annex I bird species	To maintain or restore favourable conservation condition	Breeds on inland and coastal areas of the west of Ireland where it predates on terrestrial and aquatic insects, invertebrates and fish.
Kittiwake (*Rissa tridactyla*) [A188]	Annex I bird species	To maintain or restore favourable conservation condition	A summer visitor where it can be found on steep coastal cliffs on all Irish coasts. Preys on fish including waste from commercial fishing and invertebrates.
Guillemot (*Uria aalge*) [A199]	Annex I bird species	To maintain or restore favourable conservation condition	A highly marine species only found on land in the breeding season (May–August). Surface dives for small fish and some invertebrates.
Razorbill (*Alca torda*) [A200]	Annex I bird species	To maintain or restore favourable conservation condition	A resident auk species, highly marine though inland during the breeding season (March–August). Surfaces dives for mainly fish, sometimes invertebrates.
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	Annex I bird species	To maintain or restore favourable conservation condition	A resident of rocky coasts in the north, west and south where it feeds on insects, worms, berries, small mammals; a relatively indiscriminate feeder.

Owenduff/Nephin Complex SPA **			
Merlin (*Falco columbarius*) [A098]	Annex I bird species	To maintain or restore favourable conservation condition	A rare breeding bird in Ireland, it rests on moorlands and bogs and can be found primarily in the west but are more distributed in the winter than the breeding season. Prey includes Skylark and Meadow Pipits.
Golden Plover (*Pluvialis apricaria*) [A140]	Annex I bird species	To maintain or restore favourable conservation condition	A summer visitor from central and southwest Europe and winter visitor from Iceland. Breeds on moors, bogs and grasslands where they feed on invertebrates, beetles and earthworms but also berries and seeds.
** Generic Conservation Objectives			

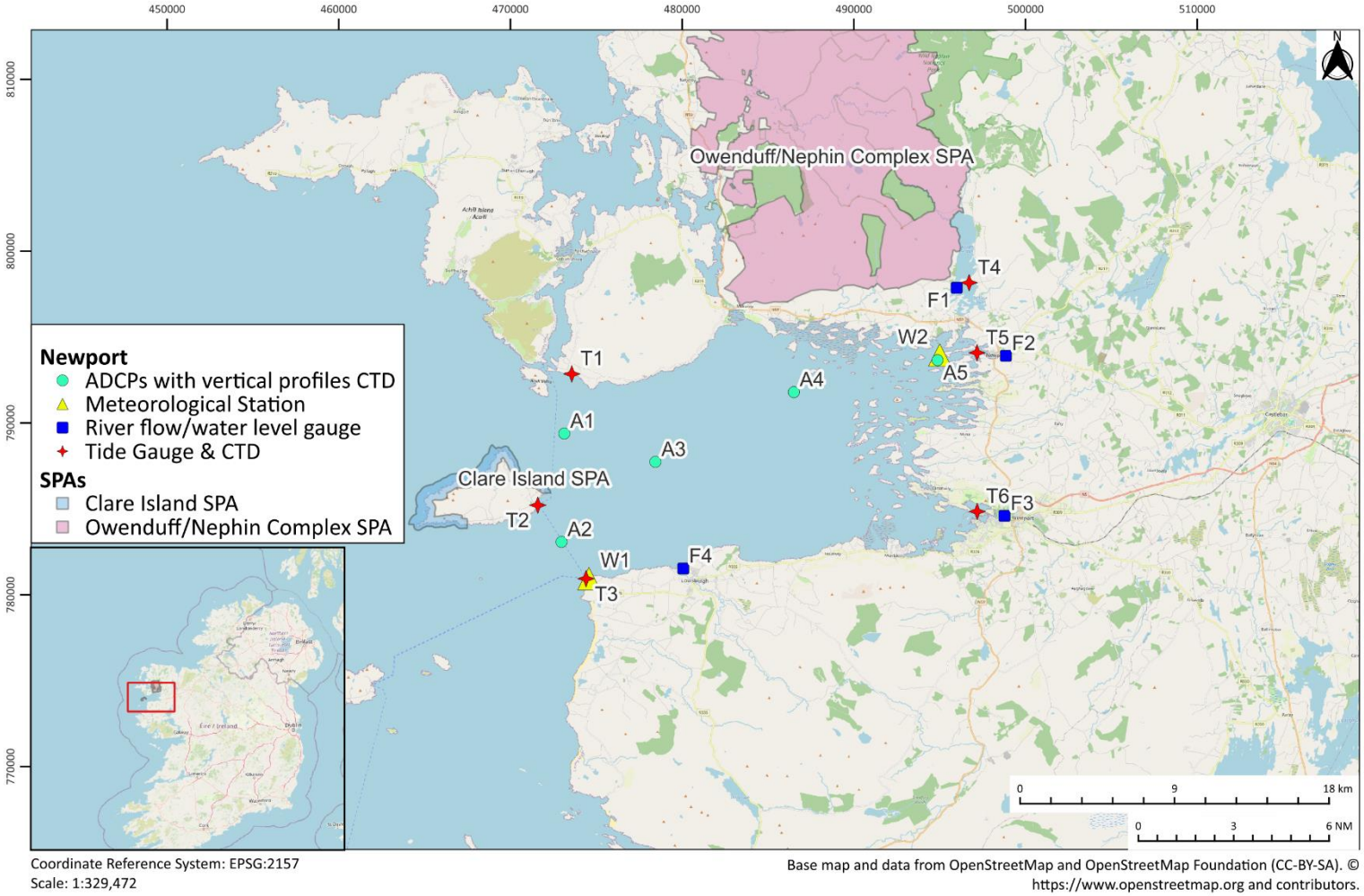

Figure 4-1: SPAs within the ZoI of the Project.

4.5.2. Qualifying interests (QIs) Annex I Habitats and Annex II Species

The SPR model identified the European sites within the ZOI of the proposed Project which were considered in this screening for AA. There are 7 SAC sites within the ZOI of the Project (see **Figure 4-2**); these sites are:

- Clew Bay Complex SAC (Site code: 001482)
- West Connacht Coast SAC (Site code: 002998)
- Corraun Plateau SAC (Site code: 000485)
- Oldhead Wood SAC (Site code: 002144)
- Owenduff/Nephin Complex SAC (Site code 000532)
- Newport River SAC (Site code: 002144)
- Clare Island Cliffs SAC (Site cod: 002243)

The conservation features (*i.e.* QIs) of the above SACs are listed in **Table 4.2** alongside conservation objectives set for the conservation features. Brief description of the SACs are provided below.

Clare Island Cliffs SAC (Site code: 002243)

Clare Island lies at the entrance to Clew Bay, Co. Mayo approximately 5 km from the mainland. Much of the low-lying ground is covered by boulder clay and glacial drift. The site comprises the coastal fringe of the island extending from Kinnacorra in the east moving westwards along the north coast and around the southwestern corner of the island as far east as Bunnamohaun. The site extends inland in the western area of the site; on the northwest flanks of Knockmore Mountain. The site is an SAC selected for the following habitats listed on Annex I of the E.U. Habitats Directive: Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Calcareous rocky slopes with chasmophytic vegetation [8210], Siliceous rocky slopes with chasmophytic vegetation [8220].

Clew Bay Complex SAC (Site code: 001482)

Clew Bay is a wide, west-facing bay on the west coast of Co. Mayo. It is open to the westerly swells and winds from the Atlantic, with Clare Island giving only a small amount of protection. The geomorphology of the bay has resulted in a complex series of interlocking bays creating a wide variety of marine and terrestrial habitats. The site is an SAC selected for the following habitats and/or species listed on Annex I/II of the E.U. Habitats Directive: Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120], Machairs (* in Ireland) [21A0], Old sessile oak woods with *Ilex* and *Blechnum* in

the British Isles [91A0], Geyer's Whorl Snail (*Vertigo geyeri*) [1013], Otter (*Lutra lutra*) [1355] and Harbour Seal (*Phoca vitulina*) [1365].

Corraun Plateau SAC (Site code: 000485)

The site is situated on the Corraun Peninsula to the south-east of Achill Island, Co. Mayo. The site is dominated by heath-type vegetation, in combination with pockets of peat and rock and a scattering of small lakes. As the site is bounded to the south by the sea, it displays an interesting range of habitats in a continuum from shore to mountain summit. The site is an SAC selected for the following Annex I habitats listed on the E.U. Habitats Directive: Northern Atlantic wet heaths with *Erica tetralix* [4010], European dry heaths [4030], Alpine and Boreal heaths [4060], *Juniperus communis* formations on heaths or calcareous grasslands [5130], Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] and Siliceous rocky slopes with chasmophytic vegetation [8220].

Newport River SAC (Site code: 003255)

The Newport River is a relatively short, low-level river and flows to the sea at Newport from Beltra Lough. The site consists of the lough and Newport River as well as tributaries of the Skerdagh, Glenisland Crumpaun/Boghadoon and Bracklagh/Cloondaff. The Newport River flows through wet grassland and wet heath areas with a small section in the east of the site flowing through blanket bog with areas of the riverbank being wooded with deciduous trees and coniferous afforestation occurring close to the river in areas. The Newport River is a renowned salmonid river hosting Atlantic Salmon and is of particular interest due to the presence of a significant population of Freshwater Pearl Mussel. The site is an SAC for the following Annex II species of the E.U. Habitats Directive: Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029] and Salmon (*Salmo salar*) [1106].

Oldhead Wood SAC (Site code: 000532)

Oldhead Wood is situated on the sheltered eastern slopes of two low hills, 2 km north-east of Louisburgh on the southern shore of Clew Bay, Co. Mayo. The site contains old oak woodland and dry heath, and most of the woodland on the site was designated as a Nature Reserve in 1984. The site has been selected as an SAC for the following Annex I terrestrial habitats listed under the EU Habitats Directive: European dry heaths [4030] and Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0].

Owenduff/Nephin Complex SAC (Site code: 00534)

This large area of relatively intact blanket bog and mountains incorporates the catchment of the Owenduff River and much of the Nephin Beg Mountain range and is situated in Co. Mayo. Lough Feeagh, which is located approximately 5 km northwest of Newport Town, lies in the south-east corner of the site. From here the site extends northwards to the Owenmore River and almost to the town of Bangor Erris and westwards to the townland of Ballycroy. The site is an SAC selected for the following habitats and/or species listed on Annex I/II of the E.U. Habitats Directive: Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110], Natural dystrophic lakes and ponds [3160], Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260], Northern Atlantic wet heaths with *Erica tetralix* [4010], Alpine and Boreal heaths [4060], *Juniperus communis* formations on heaths or calcareous grasslands [5130], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], Salmon (*Salmo salar*) [1106], Otter (*Lutra lutra*) [1355], Slender Green Feather-moss (*Drepanocladus vernicosus*) [1393] and Marsh Saxifrage (*Saxifraga hirculus*) [1528].

West Connacht Coast SAC (Site code: 002998)

This site consists of a substantial area of marine waters lying off the coasts of Counties Mayo and Galway in the west of Ireland. Comprising two parts, in its northern component the site extends from the coastal waters off Erris Head westwards beyond Eagle Island and the Mullet Peninsula in Co. Mayo. From there it extends southwards immediately off the coast as far as the entrance to Blacksod Bay. In its southern component, the site stretches from Clare Island and the outer reaches of Clew Bay at Old Head and continues southwards off the Mayo coast to the Connemara coast near Clifden and Ballyconneely, Co Galway. Predominantly coastal in nature, the site extends westwards into Atlantic continental shelf waters up to approximately 7-11 km from the mainland, although in its southern component it remains mostly inshore of the main islands: Clare Island, Inishturk, Inishbofin and Inishshark. The site has been selected as an SAC for the Annex II marine mammal species listed under the EU Habitats Directive: Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351].

Table 4.2: Special Areas of Conservation and Qualifying Interests.

Qualifying Habitat (*=Priority Habitat)	Ecological Group	Conservation Objective
Clare Island Cliffs SAC		
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Annex I coastal habitat	To maintain favourable conservation condition
Calcareous rocky slopes with chasmophytic vegetation [8210]	Annex I coastal habitat	To maintain favourable conservation condition
Siliceous rocky slopes with chasmophytic vegetation [8220]	Annex I coastal habitat	To maintain favourable conservation condition
Clew Bay Complex SAC		
Annual vegetation of drift lines [1210]	Annex I coastal terrestrial habitat	To maintain favourable conservation condition
Perennial vegetation of stony banks [1220]	Annex I coastal terrestrial habitat	To maintain favourable conservation condition
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Annex I coastal terrestrial habitat	To restore favourable conservation condition
Embryonic shifting dunes [2110]	Annex I coastal terrestrial habitat	To restore favourable conservation condition
Marram Dunes (white dunes) [2120]	Annex I coastal terrestrial habitat	Not defined therefore generic objectives apply; to restore or maintain conservation condition
Machairs (* in Ireland) [21A0]	Annex I coastal terrestrial habitat	Not defined therefore generic objectives apply; to restore or maintain conservation condition
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	Annex I terrestrial habitat	Not defined therefore generic objectives apply; to restore or maintain conservation condition
Geyer's Whorl Snail (*Vertigo geyeri*) [1013]	Annex II terrestrial mollusc species	Not defined therefore generic objectives apply; to restore or maintain conservation condition
Coastal lagoons [1150]	Annex I coastal marine habitat	To maintain favourable conservation condition
Mudflats and sandflats not covered by seawater at low tide [1140]	Annex I coastal marine habitat	To maintain favourable conservation condition
Large shallow inlets and bays [1160]	Annex I marine habitat	To maintain favourable conservation condition
Harbour seal (*Phoca vitulina*) [1365]	Annex II marine mammal	To maintain favourable conservation condition
Otter (*Lutra lutra*) [1355]	Annex II marine mammal	To restore favourable conservation condition
Corraun Plateau SAC		
Northern Atlantic wet heaths with *Erica tetralix* [4010]	Annex I terrestrial habitat	To restore favourable conservation condition
European dry heaths [4030]	Annex I terrestrial habitat	To restore favourable conservation condition
Alpine and Boreal heaths [4060]	Annex I terrestrial habitat	To restore favourable conservation condition
Juniperus communis formations on heaths or calcareous grasslands [5130]	Annex I terrestrial habitat	To restore favourable conservation condition
Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)	Annex I terrestrial habitat	To restore favourable conservation condition

Newport River SAC		
Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029]	Annex II freshwater species	To restore favourable conservation condition
Salmon (*Salmo salar*) [1106]	Annex II diadromous fish species	To maintain favourable conservation condition
Oldhead Wood SAC		
European dry heaths [4030]	Annex I terrestrial habitat	To restore favourable conservation condition
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	Annex I terrestrial habitat	To restore favourable conservation condition
Owenduff/Nephin Complex SAC		
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]	Annex I coastal habitat	To maintain favourable conservation condition
Natural dystrophic lakes and ponds [3160]	Annex I freshwater habitat	To maintain favourable conservation condition
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Calliticho-Batrachion* vegetation [3260]	Annex I freshwater habitat	To maintain favourable conservation condition
Northern Atlantic wet heaths with *Erica tetralix* [4010]	Annex I terrestrial habitat	To restore favourable conservation condition
Alpine and Boreal heaths [4060]	Annex I terrestrial habitat	To restore favourable conservation condition
Juniperus communis formations on heaths or calcareous grasslands [5130]	Annex I terrestrial habitat	To maintain favourable conservation condition
Blanket bogs (* if active bog) [7130]	Annex I terrestrial habitat	To restore favourable conservation condition
Transition mires and quaking bogs [7140]	Annex I terrestrial habitat	To restore favourable conservation condition
Salmon (*Salmo salar*) [1106]	Annex II diadromous fish species	To restore favourable conservation condition
Otter (*Lutra lutra*) [1355]	Annex II freshwater/terrestrial mammal	To maintain favourable conservation condition
Marsh Saxifrage (*Saxifraga hirculus*) [1528]	Annex II terrestrial plant species	To maintain favourable conservation condition
Slender Green Feather-moss (*Hamatocaulis* vernicosus) [6216]	Annex II terrestrial plant species	To maintain favourable conservation condition
West Connacht Coast SAC		
Common Bottlenose Dolphin (*Tursiops truncatus*) [1349]	Annex II marine mammal	To maintain favourable conservation condition
Harbour porpoise (*Phocoena phocena*) [1351]	Annex II marine mammal	To maintain favourable conservation condition

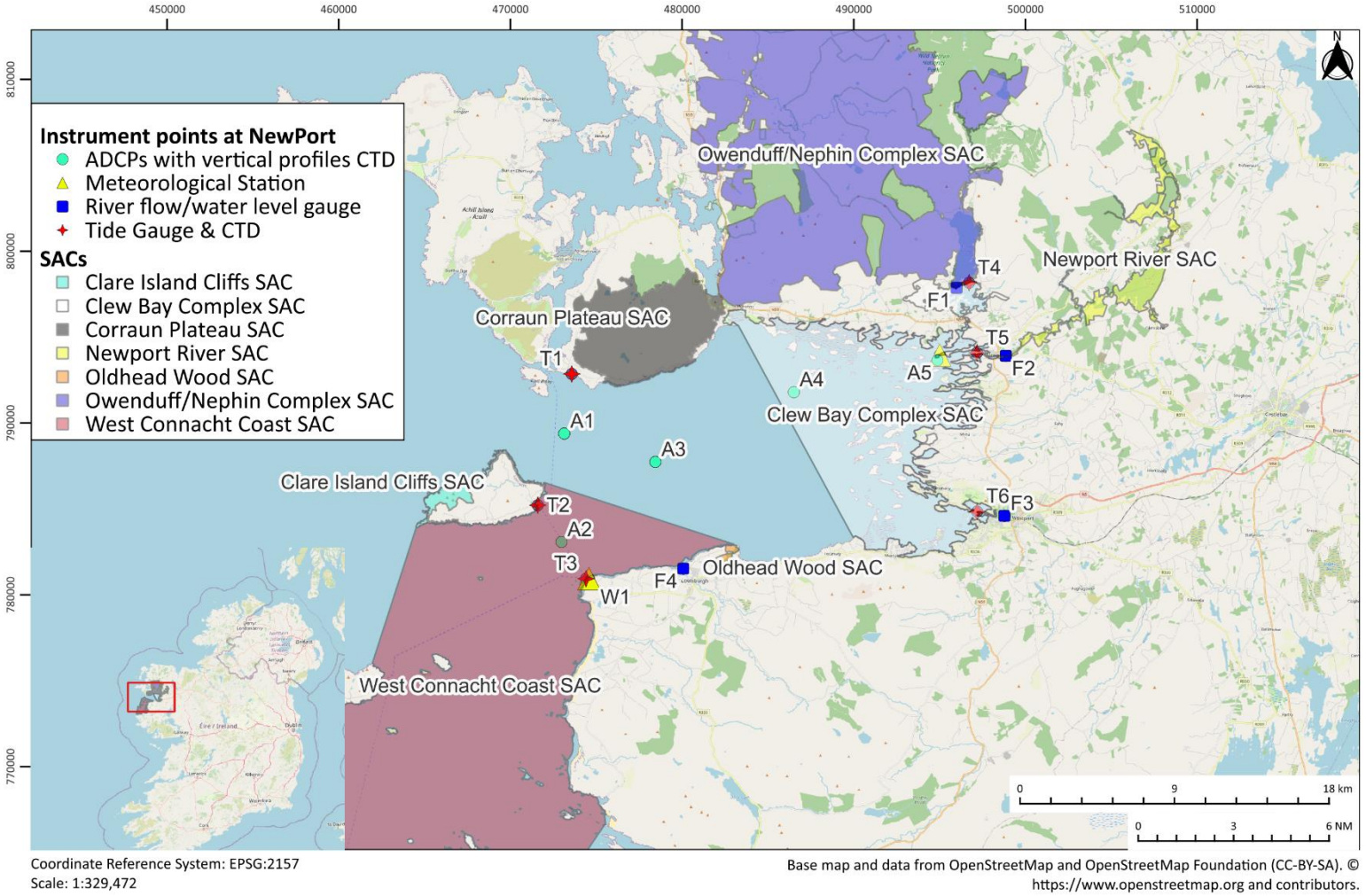

Figure 4-2 SACs within the ZoI of the Project.

4.5.3. Far Ranging Qualifying interests (QIs) Annex II (Marine Mammals)

This section looks specifically at Annex II marine mammals listed as QIs due to their ability to forage over a large range and potentially into the project area. There are two SACs in the immediate vicinity of the Project area within which marine mammal species occur:

- West Connacht Coast SAC (Site code: 002998) – Bottlenose Dolphin (*Tursiops truncatus*) [1349] & Harbour porpoise (*Phocoena phocena*) [1351]
- Clew Bay Complex SAC (Site code: 001482) – Harbour seal (*Phoca vitulina*) [1365]

The following species listed as QIs in SACs in Ireland have been assessed in terms of their potential to occur in the Project area:

- ***Phoca vitulina*** **(Harbour seal):** The furthest foraging trip for harbour seal reported by Sharples *et al.* (2012) was 220 km. A total of 10 SACs in Irish waters designated for harbour seal are located within 220 km of the Project; these SACs are assessed in the Screening assessment.
- ***Halichoerus grypus*** **(Grey seal):** Cronin *et al*. (2011) investigated grey seal movement on Ireland's continental shelf. A total of 529 foraging trips were recorded with the furthest trip measuring 511 km; given this wide range all SACs designated for the species are included in the Screening assessment.

The following cetacean species were also considered:

- ***Phocoena phocena*** **(Harbour porpoise):** The SACs in Irish waters designated for the wide-ranging species are included in the Screening for AA.
- ***Tursiops truncatus*** **(Common Bottlenose Dolphin):** The SACs in Irish waters designated for the species are included in the Screening for AA.

The relevant SACs designated for Annex II marine mammal species are detailed in **Table 4.3**

Table 4.3: SACs designated for marine mammal species found in Irish waters.

SAC (Site code)	Qualifying Interest			
	Harbour seal (*Phoca vitulina*) (1365)	**Grey seal (*Halichoerus grypus*) (1364)**	**Harbour porpoise (*Phocoena phocoena*) (1351)**	**Bottlenose dolphin (*Tursiops truncatus*) (1349)**
Slyne Head Peninsula SAC [002074]				✓
West Connacht Coast SAC [002998]		✓	✓	✓
Slyne Head Islands SAC [000328]		✓		✓
Inishbofin and Inishshark SAC [000278]		✓		
Kilkieran Bay and Islands SAC [002111]	✓			
Clew Bay Complex SAC [001482]	✓			
Duvillaun Islands SAC [000495]		✓		✓
Galway Bay Complex SAC [000268]	✓			
Inishkea Islands SAC [000507]		✓		
Killala Bay/Moy Estuary SAC [000458]	✓			
Lower River Shannon SAC [002165]				✓
Ballysadare Bay SAC [000622]	✓			
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627]	✓			
Blasket Islands SAC [002172]		✓	✓	
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC [000190]		✓		
Donegal Bay (Murvagh) SAC [000133]	✓			

SAC (Site code)	Qualifying Interest			
	Harbour seal (*Phoca vitulina*) (1365)	**Grey seal (*Halichoerus grypus*) (1364)**	**Harbour porpoise (*Phocoena phocoena*) (1351)**	**Bottlenose dolphin (*Tursiops truncatus*) (1349)**
West of Ardara/Maas Road SAC [000197]	✓			
Kenmare River SAC [002158]	✓		✓	
Rutland Island and Sound SA [002283]	✓			
Glengarriff Harbour and Woodland SAC [000090]	✓			
Roaringwater Bay and Islands SAC [000101]		✓	✓	
Horn Head and Rinclevan SAC [000147]		✓		
Slaney River Valley SAC [000781]	✓			
Rockabill to Dalkey Island SAC [003000]			✓	
Lambay Island SAC [000204]	✓	✓	✓	
Saltee Islands SAC [000707]		✓		
St. John's Point SAC [000191]				✓
Inishmore Island SAC [000213]			✓	
Porcupine Bank Canyon SAC [003001]				✓
North-west Porcupine Bank SAC [002330]				✓
South-west Porcupine Bank SAC [002329]				✓
Kilkieran Bay and Islands SAC [002111]			✓	
Belgica Mound Province SAC [002327]			✓	✓
Southern Canyons SAC [002278]				✓

SAC (Site code)	Qualifying Interest			
	Harbour seal (*Phoca vitulina*) (1365)	**Grey seal (*Halichoerus grypus*) (1364)**	**Harbour porpoise (*Phocoena phocoena*) (1351)**	**Bottlenose dolphin (*Tursiops truncatus*) (1349)**
Hook Head SAC [000764]			✓	✓
Carnsore Point SAC [002269]			✓	
Blackwater Bank SAC [002953]			✓	
Bunduff Lough and Machair Trawalua/Mullaghmore SAC [000625]			✓	
Codling Fault Zone SAC [003015]			✓	
Lough Swilly SAC [002287]			✓	
Gweedore Bay and Islands SAC [001141]			✓	

5. Potential Environmental Impacts

5.1. Potential Impact Mechanisms

A detailed description of the Project is provided earlier; given the nature of the proposed activities associated with the Project, the potential impact mechanisms (or sources of impact) are:

Physical disturbance associated with anchorage of current meters and pontoons to the benthos. There is a risk of effects on sensitive benthic subtidal communities if site of deployment and community area overlap.

Physical disturbance associated with weather station installations within Annex I coastal habitats. There is a risk of effects on sand dunes, salt meadows and machairs if sites of installation and habitat areas overlap.

Physical disturbance associated with pontoon installation in the nearshore area of Clew Bay Complex SAC. There is a risk of effects on marine mammal species listed under Annex II of the Habitats Directive if installation sites and foraging areas overlap, posing a collision risk with installation vessel.

Physical disturbance associated with tidal gauge deployment along the coastline overlaps with Clew Bay Complex SAC and West Connacht Coast SAC. There is a risk of effects on Annex I coastal habitats such as sand dune systems and on Annex II marine mammal species if deployment sites and foraging areas overlap, posing a collision risk with installation vessel.

Physical disturbance associated with deployment and operation of hydro-drone, ARCBoat, MBES and dye dispersion. There is a risk of effects on marine mammal species listed under Annex II of the Habitats Directive if the remotely controlled devices and foraging areas overlap, posing a potential collision risk with vessels in the water.

Noise disturbance associated with MBES operation. There is a risk of Annex II marine mammal species interacting with the echosounder causing disturbance.

Noise disturbance associated with current meter operation. There is a risk of species interacting with the meters causing disturbance.

The proposed deployment will temporarily increase the number of vessels in the area during deployment and during collection of the tidal gauges and pontoons. The vessels used will be fully certified and compliant with the aims of the MARPOL (The International Convention for the Prevention of Pollution from Ships) Convention. The MARPOL Convention is a key international treaty designed to minimize pollution from ships and protect the marine environment. It is not

considered likely that the proposed deployment of tidal gauges and pontoons, or the manual collection of water samples will give rise to a pollution event and is **therefore not considered further** in this report.

A drone will be deployed for LiDAR surveys and dye tracing surveys throughout Clew Bay Complex SAC. In the inner reaches of Clew Bay, there is the proposed installation of pontoons. Considering neither of these components of the marine surveys occurs within an SPA, along with the temporary and non-invasive nature of this project, it can be concluded at this stage that there is no risk of effects on bird species listed under Annex I, II and III of the Birds Directive. There will also be no significant impact to important habitat for birds foraging in the area due to the miniscule footprint and temporary nature of the Project. Therefore, in relation to physical disturbance of drones and pontoons on protected bird species, these impacts are **screened out** of further assessment.

Given the depth of the current meters, it can be concluded that even deep diving birds will not occur in high numbers, and if at all, near the deployed equipment, and so potential significant interactions will not occur. Therefore, noise disturbance to protected bird species is **screened out** for further assessment.

5.2. Physical Disturbance to Habitats Directive Annex I Marine Benthic Communities

Flow gauges 1, 3 & 4 are outside of the bounds of any SACs or sensitive habitats. Flow gauge F2 occurs in the Newport River SAC. The flow gauges will be mounted from dry land and removed thereafter. As a result there will be no riverbed disturbance or impact on the habitat of the QIs in the scope of works. Due to the current meters being bed-mounted there is a risk of disturbance to the benthic habitats under the footprint of the deployment locations. Though most current meter deployments occur outside SACs, the deployment of two meters (A4 & A5) occurs within the Clew Bay Complex SAC area (see **Figure 1-1**). The proposed mooring at A4 and A5 coincides with the following marine habitat:

- Large shallow inlets and bays [1160]

This habitat supports a variety of benthic communities and the deployment of the current meter at A4 and A5 coincides with the following subtidal benthic community:

- Sandy mud with polychaetes and bivalve community complex

5.3. Physical Disturbance to Habitats Directive Annex I Coastal Habitats

Weather Stations & Tide Gauges

Due to the weather stations being installed on land near the coastline there is a risk of disturbance to Annex I coastal habitats. The tide gauges present a similar risk as they will be positioned in the water along

the coastline. Weather station W2 and tide gauges T4, T5 and T6 are located within Clew Bay SAC which incorporates three Annex I habitats (see **Figure 1-1**). The proposed weather station and tide gauge are located near the following coastal habitats:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Machairs (* in Ireland) [21A0]

5.4. Physical Disturbance to Habitats Directive Annex II Species and birds

Tide Gauges

Due to the tide gauges being installed in the sea there is a risk of disturbance to Annex II marine mammal species. Tide gauges T2 and T3 are located within West Connacht Coast SAC (see **Figure 1-1**), which is designated for Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351]. There is three tide gauges T4, T5 and T6 located within Clew Bay SAC. There is a risk of effects if the proposed installations overlap with marine mammal foraging areas, posing a collision risk.

Pontoons

Depending on the spatial extent locally of the proposed pontoons they have the potential to pose a collision risk for marine mammals as they must transit the water column to breath at the surface (AECOM Ltd., 2010). The pontoons will be placed throughout Clew Bay Complex SAC which is designated for Harbour Seal (*Phoca vitulina*) [1365]. That said, marine mammals are highly mobile and have the ability to both avoid and evade these devices if they detect the object, perceive it as a threat and take appropriate action at long or short range.

Hydro-drone, deployment vessel, ARCBoat and MBES

Due to the movement of the hydro-drone, instrument deployment vessel, ARCBoat and MBES throughout Clew Bay Complex SAC these remotely operated devices have the potential to pose a collision risk for marine mammals as the equipment traverses the bay area.

Microbial dye tracing

Dye will be released from the baseline discharge locations and will be undertaken during the ebb of spring tides and neap tides on at least three occasions. Rhodamine B and Rhodamine WT are fluorescent dyes commonly used as tracers in hydrological investigations. Rhodamine B and

Rhodamine WT are considered toxic at certain levels and therefore have to be investigated further in this report. Dyes have the potential to negatively impact aquatic life.

5.5. Noise Disturbance to Habitats Directive Annex II Species

Marine mammals rely on sound to navigate, to communicate with one another and to sense and interpret their surroundings. As the MBES and current meters will be in operation throughout Clew Bay there is a risk of noise disturbance to Annex II marine mammal species. If the frequency of anthropogenic noise overlaps with the frequencies used by marine mammals, this may reduce the animal's ability to detect important sounds for navigation, communication and prey detection (Weilgart, 2007). This is termed acoustic masking, which may occur anywhere within an organism's auditory range (Wright *et al*. 2007; Richardson *et al*. 1995). Masking of important vocalisations will result in increasing information ambiguity and, in extreme circumstances, may result in cetaceans being unable to orientate themselves or hunt/evade predation in the marine environment (Wright *et al*. 2007).

Southall *et al*. (2008) have categorised seals and cetaceans into five functional groups based on several laboratory studies, audiometric data and through comparisons of anatomy. The functional groups group cetaceans in relation to their known auditory ability and functional frequencies, whilst all pinniped species were assessed based on their auditory ability in air as well as their auditory ability in water. Otters (*Lutra lutra*) spend 75% of their lives on land. They can be relatively tolerant of disturbance and adjust to circumstances. They are often present in urban areas with considerable human activity nearby. There are no criteria to assess the significance of underwater noise on the Eurasian otter however it is thought they are similar to those of pinnipeds (Ghoul & Reichmuth, 2014) and are assessed as such moving forward. Details of the frequency abilities of cetaceans and whales are included in the table below.

Table 5.1: Functional frequencies of various cetaceans and pinnipeds found in Irish waters (adapted from Southall *et al*. (2007)). Qualifying Interest species of Irish SACs highlighted in bold.

Cetaceans			**Pinnipeds (in water)**	**Pinnipeds (in air)**
Low Frequency (7 Hz-35 kHz)	**Mid-frequency (150 Hz-160 kHz)**	**High Frequency (200 Hz-180 kHz)**	**All species (50 Hz-86 kHz)**	**All species (75 Hz – 30 kHz)**
Baleen whales	Most toothed whales, dolphins	Certain toothed whales, porpoises	All species	All species
Species Recorded in Irish Waters				
Humpback whale Blue whale Fin whale Sei whale Minke whale	Sperm whale Killer whale Long-finned pilot whale Beaked whale species **Dolphin species**	Pygmy sperm whale **Harbour porpoise**	**Grey seal** **Harbour seal**	**Grey seal** **Harbour seal**

6. Screening for Appropriate Assessment

The obligation to undertake AA under the 2011 Birds and Natural Habitats Regulations derives from the Habitats Directive. Regulation 42(1) of the 2011 Regulations requires that:

> *A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which* ***is not directly connected with or necessary to the management of the site as a European Site****, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site*.

The proposed Project is not associated with the 'management' of European sites within the Natura 2000 Network having regard to Article 6 of the Habitats Directive, and as such it is appropriate that the proposed Project is subject to a screening for AA. This screening assessment investigates, in view of best scientific knowledge, whether the proposed Project, individually or in combination with other plans and projects, would be likely to have a significant effect on European sites.

As outlined in **Section 1**, this report, which has been prepared to assist competent authorities address Article 6(3) obligations of the Habitats Directive and associated national regulations, focuses on the potential effects to European sites associated with the proposed Project. A description of the Project is outlined in **Section 1.1**, while **Section 6.1** considers the likelihood of significant effects of the Project on European sites both in isolation and in combination with other projects.

6.1. Characteristics of European Site(s)

6.2. Assessment of Potential Significant Effects to QIs of SACs

Marine Benthic Communities

The deployment of current meters at site A4 and A5 in the inner reaches of Clew Bay overlap with the following marine habitat:

- Large shallow inlets and bays [1160]

This habitat supports the sensitive benthic community:

- Sandy mud with polychaetes and bivalves community complex

Based on the interpolation provided by NPWS, the QI 'Large shallow inlets and bays' extends throughout much of the Clew Bay Complex SAC site and encompasses an area of 10,189 ha. The extent of the area dominated by 'Sandy mud with polychaetes and bivalve community complex' has been identified by NPWS at 5,971 ha. An individual ADCP meter may occupy, at most, an area of *c*. 2m^2

The meters are to be deployed at fixed stations for the duration of the survey (minimum 35 days). The effect on the seabed will be temporary occupation of the seabed though as the area occupied by the meter does not represent a sensitive subtidal benthic community and **no effect is likely to occur** as a result of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** for further assessment.

Coastal Habitat

Weather station W2 and tide gauges T4, T5 and T6 are located within Clew Bay Complex SAC which incorporates three Annex I habitats (see **Figure 1-1**). The proposed weather stations and tide gauges are located near to but do not necessarily overlap with these coastal habitats, the QIs of which are listed in **Table 4.2**. Considering the small spatial extent occupied by the proposed tidal gauges they pose no significant effect to the coastal habitat or QIs of the SACs within which they will be located.

The tidal gauges are to be deployed at fixed stations for the duration of the survey period. The effect to the coastline will be temporary occupation of a minimal area of the coastline, and as the areas occupied by the tidal gauges do not disrupt a sensitive habitat **no effect is likely to occur** as a result of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** of further assessment.

The weather stations will be installed at fixed stations for the duration of the survey period. The effect to the coastal habitat will be temporary occupation, and as the area occupied by the weather station does not disrupt a sensitive community **no effect is likely to occur** as a result of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

Marine Mammals

Tide Gauges

Tide gauges (code: T2 & T3) are located within West Connacht Coast SAC (see **Figure 1-1**). The QIs supported by this SAC is Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351]. Considering the small spatial extent occupied by the proposed tidal gauges they pose no significant effect/no significant collision risk to the QIs.

The tidal gauges are to be deployed at fixed stations for the duration of the survey period. The effect to the habitat will be temporary occupation of a minimal area of the coastline, and as the area occupied by the tidal gauge does not disrupt a sensitive species **no effect is likely to occur** as a result of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** of further assessment.

Pontoons

The likelihood of the pontoons acting as haul-out sites is unlikely as the surface area of the pontoons are expected to be relatively small and seals would require the devices to be no higher than 0.5m above the sea surface in order to be able to mount them. Similarly, the collision risks the pontoons pose is not significant due to their relatively small size.

The pontoons will be installed at fixed stations for the duration of the survey period. The effect to the bay area will be temporary occupation of surface waters in nearshore areas, and as the areas occupied by the pontoons do not disrupt a sensitive community or habitat **no effect is likely to occur** as a result of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

Hydro-drone, deployment vessel, ARCBoat, MBES (Physical disturbance)

The collision risks with the hydro-drone, instrument deployment vessel, ARCBoat and MBES individually pose is not significant due to their relatively small size, slow speed and infrequent deployment throughout the survey period.

The hydro-drone will be deployed on three separate occasions during the survey period. The ARCBoat (**Figure 1-1**) will be deployed on three separate occasions, each lasting *c*. one day during the survey period. The MBES (**Figure 1-1**) will be deployed during the survey period. It is of note that the MBES survey will cover a relatively small nearshore area (see bathymetric extent, **Figure 1-1**). Considering the highly mobile nature of marine mammals and large spatial extent of suitable habitat available, excluding the bathymetric survey extent, an overlap is unlikely. All three pieces of equipment will subsequently be recovered after each sample collection/survey is completed.

The effect to the bay area will be temporary navigation of surface waters, and as the areas occupied by the hydro-drone, ARCBoat and MBES do not disrupt a sensitive community or habitat **no effect is likely to occur** because of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

Aerial Drones

The likelihood of the drones posing a collision risk to birds, listed as SCIs in **Table 4.1** is not significant due to the temporary operation of the drones. A drone will be in operation on three separate occasions to conduct dye tracing surveys, and only during low water on a spring tide to perform LiDAR surveys, during the survey period and will subsequently be retrieved after each sample collection is completed. As the areas occupied by the drones do not disrupt a sensitive community or habitat **no effect is likely to occur** as a result of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

Microbial dye tracing

Dye will be released from the baseline discharge locations and will be undertaken during the ebb of spring tides and neap tides on at least three occasions. Rhodamine B and Rhodamine WT are fluorescent dyes commonly used as tracers in hydrological investigations. These dyes are frequently used due to their strong fluorescence even at low concentrations.

Rhodamine WT will be used in this study because of its low environmental impact. Field, 2005 studied the ecotoxicity of fluorescent dyes, including Rhodamine WT, and found low levels of concern for concentrations under 22mg/L, and Skjolding *et al*., 2021 found no statistically significant effects were observed (p<0.05) at tested concentrations (up to 91, 100 and 200 mg/L for algae, crustaceans and fish embryos, respectively). Earlier work by Parker, 1973 tested the toxicity of Rhodamine WT dye on the larval development of oysters and on juvenile salmon and trout; with concentrations up to 10mg/L over 48 hours for oysters and 375mg/L over 17.5 for fish, no mortalities or abnormalities were observed. The fish remained healthy in dye-free water when last checked a month after the test.

Dye tracing will be carried out with Rhodamine WT below the maximum allowable concentration quality standard set out in Skjolding *et al*., 2021 of >910 µg/L. The effects of the microbial dye tracing are considered to **not be significant** and are therefore **screened out** for further assessment.

MBES (Noise disturbance)

Different models of multi beam echo sounders are used depending on the depth of the site of interest. As previously stated in subsection **4.1** Clew Bay Complex SAC has a depth range of 5-30 m. The "leading manufacturer" of multi beam echo sounders states that a MBES used for a depth range of 0.2-50 m would typically emit sound at a frequency of 500 kHz[4]. This frequency is outside the hearing threshold ranges of those described in

Table 5.1 where the highest functional frequency is 180 kHz in high frequency cetaceans. Therefore, the sound emitted by the MBES will not be heard, if the frequency emitted by the MBES falls into the 500 kHz selection, which is highly likely. The effects of underwater noise emitted by the MBES on marine mammals are considered not to be significant. As the area occupied by the MBES does disrupt a sensitive community or habitat **no effect is likely to occur** as a result of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

[4] kongsberg_application_note_discovering-the-redefined-em-series.pdf (accessed: 12/05/2022)

Current meters (Noise disturbance)

The most common current meters available on the market emit sound at frequencies typically between 300kHz – 1200kHz[5][6][7]. Frequencies within this range are outside the hearing threshold ranges of those described in **Table 5.1** and therefore the sound emitted by the ADCP will not be heard if the frequency emitted by the ADCP falls into this category, which is highly likely. The effects of underwater noise emitted by the ADCPs on marine mammals are considered to **not be significant** and are therefore **screened out** for further assessment.

[5] https://www.nortekgroup.com/products (accessed: 07/05/2024)

[6] https://www.rowetechinc.com/adcp/ (accessed: 07/05/2024)

[7] http://www.teledynemarine.com/adcps/marine-measurements/ (accessed: 07/05/2024)

Table 6.1: Impact Mechanism 1 – Physical disturbance.

Site	Qualifying Interest		Source-Pathway-Receptor Assessment
Corraun Plateau SAC (Site code: 000485)	**Annex I habitat**	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110]	The Project is considered non-invasive and predominantly marine and temporary in nature, with some presence in coastal and freshwater habitats. In relation to terrestrial habitats and species, there is no potential pathway for interaction between the impact mechanism and QI and are therefore excluded at the Screening for AA stage. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs. The QIs and impact mechanism combinations are screened out.
Cross Lough (Killadoon) SAC (Site code: 00484)	**Annex I habitat**	Perennial vegetation of stony banks [1220]	
Lough Cahasy, Lough Baun and Roonah Lough SAC (Site code: 001529)	**Annex I habitat**	Coastal lagoons [1550] Perennial vegetation of stony banks [1220] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	
Oldhead Wood SAC (Site code: 000532)	**Annex I habitat**	European dry heaths [4030] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	
Clare Island Cliffs SAC (Site code: 002243)	**Annex I habitat**	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220]	
Newport River SAC (Site code: 002144)	**Annex II species**	Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029] Salmon (*Salmo salar*) [1106]	The flow gauge F2 occurs in Newport River SAC. The flow gauges will be mounted from dry land and removed thereafter. As a result, there will be no riverbed disturbance or impact on the habitat of the QIs in the scope of works. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs. The QIs and impact mechanism combinations are screened out.

Owenduff/Nephin Complex SAC (Site code: 000534)	**Annex I habitat**	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callicho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] Alpine and Boreal heaths [4060] *Juniperus communis* formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active) [7130] Transition mires and quaking bogs [7140]	The installation of flow gauge (F1) (see **Figure 1-1**) in the mouth of Lough Feeagh, Co. Mayo was assessed in relation to impacts to Annex I habitats and Annex II species. While the flow gauge will be in the proximity of Owenduff/Nephin Complex SAC due to the installation methods discussed in **Section 5.2** not impacting the riverbed or habitat, they are not considered to cause significant disturbance to community or habitat. Furthermore, the presence of the survey equipment will be temporary and will be removed from the area upon the conclusion of the survey period. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. It is possible to exclude the potential for significant effects at the Screening for AA stage. The QIs and impact mechanism combinations are screened out.
	Annex II species	Salmon (*Salmo salar*) [1106] Otter (*Lutra lutra*) [1355] Marsh Saxifrage (*Saxifraga hirculus*) [1528] Slender Green Feather-moss (*Hamatocaulis vernicosus*) [6216]	

Clew Bay Complex SAC (Site code: 001482)	**Annex I Habitat**	Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Embryonic shifting dunes [2110] Marram Dunes (white dunes) [2120] Machairs (* in Ireland) [21A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Coastal lagoons [1150] Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160]	The deployment and installation of tidal gauges (T4, T5 and T6), weather station (W2), hydro-drone and MBES (see **Figure 1-2**), pontoons, ARCBoat and microbial dye were assessed in relation to impacts to Annex I habitats, associated benthic marine communities and Annex II species. While the survey equipment was found to overlap with SACs and associated QIs, the overlap was minimal and is considered not to cause significant disturbance to community or habitat. Furthermore, the presence of the survey equipment will be temporary and will be removed from the area upon the conclusion of the survey period. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. It is possible to exclude the potential for significant effects at the Screening for AA stage. The QIs and impact mechanism combinations are screened out.
	Annex II Species	Geyer's Whorl Snail (*Vertigo geyeri*) [1013]	The Project is predominantly marine and temporary in nature, with some presence in coastal and freshwater habitats. In relation to terrestrial habitats and species, there is no potential pathway for interaction between the impact mechanism and QI and are therefore excluded at the Screening for AA stage. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs. The QIs and impact mechanism combinations are screened out.

West Connacht Coast SAC (Site code: 002998)	**Annex II Species**	Tursiops truncatus (Common Bottlenose Dolphin) [1349] Phocoena phocoena (Harbour Porpoise) [1351]	The potential impacts of physical disturbance and noise disturbance on marine mammals was assessed in section 6.1 and it was determined that there would be no significant effects on these QIs as a result of the project.
Clare Island SPA (Site code: 004136)	**Annex II bird species**	Fulmar (*Fulmarus glacialis*) [A009] Shag (*Phalacrocorax aristotelis*) [A018] Common Gull (*Larus canus*) [A182] Kittiwake (*Rissa tridactyla*) [A188] Guillemot (*Uria aalge*) [A199] Razorbill (*Alca torda*) [A200] Chough (*Pyrrhocorax pyrrhocorax*) [A346]	Due to the nature of the Project, in that the survey equipment will either be underwater or occupying a small spatial extent, and temporary, there is no potential interaction between the impact mechanism and the QIs. It is therefore possible to exclude the potential for significant effect at the Screening for AA stage. The QIs and impact mechanism combinations are screened out.
Cross Lough (Killadoon) SPA (Site code: 004212)	**Annex II bird species**	Sandwich Tern (*Sterna sandvicencis*) [A191]	
Owenduff/Nephin Complex SPA (Site code: 004098	**Annex II bird species**	Merlin (*Falco columbarius*) [A098] Golden Plover (*Pluvialis apricaria*) [A140]	

Table 6.2: Impact Mechanism 2 – Noise.

Site	Qualifying Interest		Source-Pathway-Receptor Assessment
Clew Bay Complex SAC (Site code: 001482)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	Though the MBES and current meters produce a frequency at regular intervals, the sound frequency emitted is beyond the limit of audible functional frequency for relevant cetaceans and pinnipeds. Any noise emission will be inaudible to them, therefore there is no potential pathway for interaction between the impact mechanism and the QIs. The QIs are unable to perceive the Project impact mechanism and therefore it is possible to exclude the potential for significant effects at the Screening for AA stage. The QIs and impact mechanism combinations are screened out.
West Connacht Coast SAC (site code: 002998)	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Inishbofin and Inishshark SAC (Site code: 000278)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364]	
Duvillaun Islands SAC (Site code: 000495)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364] Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Inishkea Islands SAC (Site code: 000507)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364]	
Slyne Head Islands SAC (Site code: 000328)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364] Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Slyne Head Peninsula SAC (Site code: 002074)	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Kilkieran Bay and Islands SAC (Site code: 002111)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Killala Bay/Moy Estuary SAC (Site code: 000458)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Galway Bay Complex SAC (Site code: 000268)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Lower River Shannon SAC (Site code: 002165)	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (Site code: 000627)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Ballysadare Bay SAC (Site code: 000622)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC (Site code: 000190)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364]	
West of Ardara/Maas Road SAC (Site code: 000197)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Rutland Island and Sound SAC (Site code: 002283)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Donegal Bay (Murvagh) SAC (Site code: 000133)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Blasket Islands SAC (Site code: 002172)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364] Harbour porpoise (*Phocoena phocoena*) [1351]	

Horn Head and Rinclevan SAC (Site code: 000147)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364]	
Kenmare River SAC (Site code: 002158)	**Annex II Species**	Harbour seal (*Phoca vitulina*) [1365]	
Roaringwater Bay and Islands SAC (Site code: 000101)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364] Harbour porpoise (*Phocoena phocoena*) [1351]	
Saltee Islands SAC (Site code: 000707)	**Annex II Species**	Grey seal (*Halichoerus grypus*) [1364]	
Rockabill to Dalkey Island SAC (Site code: 003000)	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
St. John's Point SAC [000191]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Inishmore Island SAC [000213]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Porcupine Bank Canyon SAC [003001]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
North-west Porcupine Bank SAC [002330]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
South-west Porcupine Bank SAC [002329]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Kilkieran Bay and Islands SAC [002111]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Belgica Mound Province SAC [002327]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349] Harbour porpoise (*Phocoena phocoena*) [1351]	
Southern Canyons SAC [002278]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349]	
Hook Head SAC [000764]	**Annex II Species**	Bottlenose dolphin (*Tursiops truncatus*) [1349] Harbour porpoise (*Phocoena phocoena*) [1351]	
Carnsore Point SAC [002269]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Blackwater Bank SAC [002953]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Bunduff Lough and Machair Trawalua/Mullaghmore SAC [000625]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Codling Fault Zone SAC [003015]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Lough Swilly SAC [002287]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	
Gweedore Bay and Islands SAC [001141]	**Annex II Species**	Harbour porpoise (*Phocoena phocoena*) [1351]	

6.3. Plans or Projects That Might Act In Combination

As outlined above the obligation to undertake AA under the 2011 Birds and Natural Habitats Regulations derives from the Habitats Directive. Regulation 42(1) of the 2011 Regulations requires that:

> *A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or* ***in combination with other plans or projects*** *is likely to have a significant effect on the European site*.

It is therefore required that the potential impacts of the proposed Project be considered in combination with other relevant plans or projects. Given the nature of the proposed activities associated with the Project, the potential project impact mechanisms (or sources of impact) are:

1. Physical presence of flow gauges in environment
2. Physical presence of weather stations in environment
3. Physical presence of pontoons in environment
4. Physical presence of tidal gauges in environment
5. Physical presence of current meters in environment
6. Physical presence associated with deployment and operation of hydro-drone, ARCBoat and MBES
7. Noise emissions associated with current meter and MBES operations

The assessment of potential in-combination effects considers other plans and projects that may result in cumulative significant effects QIs and SCIs of SACs and SPAs.

To inform the assessment of potential in-combination effects a review of consent applications for projects in the vicinity of the proposed Project included on the following websites was completed in April 2024:

- Maritime Area Regulatory Authority
    - https://www.maritimeregulator.ie/our-work/maritime-usage-licences/applications/

- DHPLG - EIA Portal
    - https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal

- Mayo County Council - Planning System
    - https://www.eplanning.ie/MayoCC/searchtypes
    - https://mayococo.maps.arcgis.com/apps/webappviewer/index.html?id=2b1fc4da0e214d25b5727fecb908ae27

The assessment of potential in-combination effects also considered *negative impacting threats and pressures* and *positive impacting activities/management* affecting the sites as identified in Natura 2000 forms published for the SPA and SAC sites available through the NPWS website (https://www.npws.ie/protected-sites).

Screening assessments of potential cumulative or in-combination effects from current and proposed projects listed on above websites are summarised in **Table 6.3**.

In summary, the assessments presented in **Table 6.3** conclude that there is no potential likelihood for significant effects caused by cumulative or in-combination effects.

It was concluded that there is **no potential likelihood for significant effects from the proposed Project in combination with other plans or projects**.

Table 6.3: Assessment of potential in-combination effects.

Website	Project Details	File Reference	Date Application Received	Assessment of Potential Cumulative or In-combination Effects	Conclusion
DHPLG - EIA Portal	A search of the DHPLG EIA Portal was undertaken to examine projects with potential for in-combination effects.	2021188 2021189 2021191 2023019 2023180	22/9/2021 22/9/2021 23/9/2021 8/2/2023 14/11/2023	Though applications for finfish aquaculture sites occur close to the site, it was determined that there was no potential for in-combination effects to occur with the proposed Project.	No potential significant cumulative or in-combination effects
		2024059	2/4/2024	Construction of a new firewater retention facility; demolition of existing derelict furniture store; new 152no. bay car park, new 119no. bay car park; and ancillary works. An NIS was carried out and determined that this project would have no significant effects with the proposed mitigation in place. This along with the lack of significant effects identified in the current project will result in no potential significant cumulative or in combination effects	No potential significant cumulative or in combination effects
Mayo County Council - Planning System	A search of the Mayo planning databases was undertaken to examine projects with potential for in-combination effects.	-	-	Applications made typically to County Councils and published on the planning database consisted of extensions and renovations to existing houses, and retention of existing developments. These are small-scale terrestrial developments which do not have the potential to result in cumulative effects in combination with the proposed Project.	No potential significant cumulative or in-combination effects

6.4. Screening Outcome

The current assessment investigates the potential for the proposed Project to have significant effects on European Sites within the Natura 2000 network.

The assessment has determined, in light of best available scientific data, that there is no potential for significant effects on the SACs and any SPAs from the proposed Project *i.e.* the likelihood of significant effects on all European sites has been ruled out.

The assessment also determined that there is no potential likelihood for significant effects from the proposed Project in combination with other plans or projects. The findings of the assessment are summarised in **Table 6.4**.

Table 6.4: Screening matrix of the proposed Project.

Screening Matrix	
Brief description of the Project or plan	The objective of the Project is to deploy, install and operate numerous pieces of equipment for marine surveys for Uisce Éireann records in Clew Bay, Newport, Co. Mayo (**Figure 1-1, Figure 1-2, Figure 1-3 & Figure 1-4**). The Project comprises the deployment, installation and operation of the survey equipment throughout the bay area for a minimum period of 35 days with the aim to collect meteorological, tidal, current, river flow, bathymetric, water quality and dye tracing data of the area.
European Site(s)	
Brief description of the European site(s)	The following European sites within the ZoI considered in this screening for Appropriate Assessment are: • Clew Bay Complex SAC • West Connacht Coast SAC • Corraun Plateau SAC • Oldhead Wood SAC • Owenduff/Nephin Complex SAC • Newport River SAC • Clare Island Cliffs SAC • Owenduff/Nephin Complex SPA • Clare Island SPA The QIs of the above SACs and SPAs are listed in **Table 4.1** and **Table 4.2** alongside conservation objectives set for the conservation features.

Assessment Criteria	
Describe the individual elements of the Project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European site.	Given the nature of the proposed activities associated with the Project as detailed in **Section 1.1**, the potential project impact mechanisms (or sources of impact) are: **1.** Physical disturbance (numerous sources) **2.** MBES and current meter noise emission disturbance It is concluded that there is no pathway between the project impact mechanisms and the QIs and SCIs of SACs and SPAs. The assessments are presented in full in **Section 6.2**. The assessment of potential in-combination effects considers other plans and projects, which may result in cumulative significant effects to QIs and SCIs of SACs and SPAs. In summary, the assessments presented **Table 6.3** conclude that there is no potential likelihood for significant effects caused by cumulative or in-combination effects.
Describe any likely direct, indirect or secondary impacts of the Project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of Size and scale, Land-take.	
Distance from the Natura 2000 site or key interests of the site;	A number of the proposed deployment sites (T4, T5, T6, W1, A4 & A5) lie inside of Clew Bay Complex SAC. One site F2 lies within the Newport River SAC and T2 & T3 lie within West Connacht Coast SAC. Owenduff/Nephin Complex SPA and Clare Island SPA are the closest SPAs to the Project area.
Resource requirements (water abstraction *etc.*);	Deployment of the marine survey equipment requires little service maintenance, and the deployment period is relatively short-term (minimum of 35 days). No resources will be required for the Project.
Emissions (disposal to land, water or air);	Noise emissions from operation of current meters and an MBES. Rhodamine WT, microbial dye
Excavation requirements, Transportation requirements;	***Excavation requirements*** No excavation will be required ***Transportation requirements*** All survey equipment, except for the weather stations, will require boating transport for deployment at the sites throughout the bay. A work vehicle will be required to transport the weather stations.
Duration of construction, operation, Decommissioning, Other;	The proposed Project will operate for a minimum of 35 days after which the marine survey equipment will be retrieved wherein all equipment will leave the Project area. It is anticipated that deployment operations will commence in 2024.
Describe any likely changes to the site arising as a result of: Reduction in habitat area; Disturbance to key species; Habitat or species fragmentation; Reduction in species density; Changes in key indicators of conservation value (water quality *etc.*). Climate change	It is concluded that there is no potential likelihood for significant effects caused by the Project in isolation or in combination with other plans and projects regarding the following aspects of SACs and SPAs: • Reduction in habitat area • Disturbance to key species • Habitat or species fragmentation • Reduction in species density • Water quality With regard effect to climate change, the main source of atmospheric emissions from the proposed Project will result from engine exhaust gases from engines associated with the vessel. Given the limited vessel activity proposed, significant effect on climate from atmospheric emissions can be discounted.

Describe any likely impacts on the Natura 2000 site in terms of: Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	It is concluded that there is no potential likelihood for significant effects caused by the Project in isolation or in combination with other plans and projects.
Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss; Fragmentation; Disruption; Disturbance; Change to key elements of the site.	Indicators of significance are loss of SCI and QI species and habitats. Indicators of significance are behavioural changes in SCI and QI species. It is concluded that there is no potential likelihood for significant effects caused by the Project in isolation or in combination with other plans and projects.
Describe from the above those elements of the Project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	It is concluded that there is no potential likelihood for significant effects caused by the Project in isolation or in combination with other plans and projects.

Outcome: The screening matrix above concluded that there is no potential likelihood for significant effects to Natura 2000 sites caused by the Project in isolation or in combination with other plans and projects.

7. Conclusion

The screening for Appropriate Assessment using the Source Pathway Receptor (SPR) model revealed no pathway for potential impacts caused by the Project to act on any of the QIs or SCIs or their conservation objectives assessed within the ZoI.

It has been objectively concluded by AQUAFACT, following an examination, analysis and evaluation of the relevant information, including the nature of the proposed Project, that the proposed Project does not pose a risk of significantly affecting (either directly or indirectly) the conservation features of any European site within the Zone of Influence, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.

8. References

AECOM Ltd. 2010. Strategic Environmental Assessment (SEA) of the Offshore Renewable Energy Development Plan (OREPD) in the Republic of Ireland.

Cronin, M.A., Jessop, M.J. and Del Villar, D. (2011). Tracking grey seals on Irelands' continental shelf Report to National Parks and Wildlife Service, Department of Arts, Heritage and Gaeltacht November 2011 Coastal and Marine Research Centre University College Cork Ireland.

DAHG NPWS. (2012). Marine Natura Impact Statements in Ireland Special Areas of Conservation, A Working Document. https://www.npws.ie/sites/default/files/general/Marine%20Assessment%20Working%20Document.pdf

DEHLG. (2009). Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010). https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

EC. (2018). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice (2018). https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/EN_art_6_guide_jun_2019.pdf

EC. (2001). Managing Natura 2000 Sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC. https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

Field, M. S. (2005). Assessing aquatic ecotoxicological risks associated with fluorescent dyes used for water-tracing studies. *Environmental & Engineering Geoscience*, *11*(4), 295-308.

Ghoul, A., & Reichmuth, C. (2014). Hearing in the sea otter (*Enhydra lutris*): auditory profiles for an amphibious marine carnivore. *Journal of Comparative Physiology A*, *200*, 967-981.

NPWS (2011). Clew Bay Complex SAC (Site code: 001482) Conservation Objectives supporting document – marine habitats and species. Version 1 June 2011.

NPWS. (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.

https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol1_Summary_Article17.pdf

NPWS. (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol2_Habitats_Article17.pdf

NPWS. (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf

OPR (2021). Practice Note PN01 Appropriate Assessment Screening for Development Management. https://www.opr.ie/wp-content/uploads/2021/03/9729-Office-of-the-Planning-Regulator-Appropriate-Assessment-Screening-booklet-15.pdf

Parker, G. G. (1973). Tests of Rhodamine WT dye for toxicity to oysters and fish. *Journal of Research US Geological Survey*, *1*(4), 499.

Richardson, W. J., Greene, C. R., Malme, C. I., and Thomson, D. H. (1995). Marine Mammals and Noise. San Diego, CA: Academic Press, Inc. 576pp.

Sharples, R. J., Moss, S. E., Patterson, T. A. and Hammond, P. S., (2012). Spatial variation in foraging behaviour of a marine top predator (Phoca vitulina) determined by a large-scale satellite tagging program. PLoS one, 7(5).

Skjolding, L. M., Dyhr, K. S., Köppl, C. J., McKnight, U. S., Bauer-Gottwein, P., Mayer, P., Bjerg, L. & Baun, A. (2021). Assessing the aquatic toxicity and environmental safety of tracer compounds Rhodamine B and Rhodamine WT. *Water Research*, *197*, 117109.

Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene., C. R. Jr., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., and Tyack, P. L. (2007). Marine mammal noise exposure criteria: Initial scientific recommendations. Aquatic Mammals 33(4): 411-521.

Weilgart, L. S. (2007). The impacts of anthropogenic ocean noise on cetaceans and implications for management. Canadian Journal of Zoology 85: 1091-1116.

Wright, A. J., Soto, N. A., Baldwin, A. L., Bateson, M., Beale, C. M., Clark, C., Deak, T., Edwards, E. F., Fernández, A., Godinho, A., Hatch, L. T., Kakuschke, A., Lusseau, D., Martineau, D., Romero, L. M., Weilgart, L. S., Wintle, B. A., Notarbartolo-di-Sciara, G., Martín, V. (2007). Anthropogenic Noise as a Stressor in Animals: A Multidisciplinary Perspective. Journal of Comparative Psychology. 20: 250-273.