RECEIVED: 18/10/2024

CHAPTER 11
BIODIVERSITY

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Figures

RECEIVED: 18/10/2024

Table of Tables

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

11 Biodiversity

It is noted that for ease of reference, all changes from the original Biodiversity chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

11.1 Introduction

This chapter of the EIAR identifies, describes, and assesses the likely significant effects of the proposed Operations and Maintenance Facilities (OMF) at Greenore Port, hereafter 'the Proposed Development', on biodiversity (terrestrial, marine, and ornithology). Potential impacts during the demolition, construction, and operational phases are established.

This assessment should be read together with the Appendices contained in Volume III of this EIAR.

The proposed 4.88-hectare development site is distributed over several plots, and for ease of reference, they are described as follows:-

1. 'Terrestrial Port Area' which includes a port commodity warehouse (former Open Hydro building), hardstanding areas, a remnant wall associated with the pre-existing 'engine room', and a communications mast.
2. 'Nearshore Environment' encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
3. 'Residential Site' a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. 'Port Office Entrance' encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

RECEIVED: 18/10/2024

Figure 11.1 Proposed Development Area

This chapter is informed by a suite of supporting surveys and studies appended to this EIAR and presented in Volume III. The following is a list of the Appendices.

- Appendix 11.1 Terrestrial Habitat Survey: Martin B.
- Appendix 11.2 Overwintering Bird Survey 2022-2023: Martin B.
- Appendix 11.3 Overwintering Bird Survey 2023-2024: Martin B.
- Appendix 11.4 Breeding Bird Survey 2023: Martin B.
- Appendix 11.5 Terrestrial Mammal Survey: Martin B.
- Appendix 11.6 Bat Fauna Impact Assessment: Deegan B.
- Appendix 11.7 Seal Survey Carlingford Lough 2023: Martin B.
- Appendix 11.8 Visual Surveys for Marine Mammals at the Proposed Windfarm Site at Oriel: Berrow S. & O'Brien J.
- Appendix 11.9 Static Acoustic Monitoring (SAM) at the Proposed Windfarm Site at Oriel: Berrow S., O'Brien J. & Pommier M.
- Appendix 11.10 Benthic Sampling Data
- Appendix 11.11 Breeding Tern Survey – Green Island

11.2 Expertise & Qualifications

The ornithology & terrestrial ecology section of this chapter has been prepared by Breffni Martin of Regintel. Breffni Martin holds a BSc in Biology awarded by University College Dublin (UCD) in 1983 and has been involved in bird and wildlife conservation in County Louth for more than 20 years.

He has studied Carlingford Lough and Dundalk Bay for the last 15 years completing over 400 hours of focal observations on oystercatchers as part of an appropriate assessment of a cockle fishery in

Dundalk bay (2014-17), as well as over 700 hours observations on birds in Carlingford Lough (2010-11) in a study which informed the designation of the outer part of the Lough. He also completed over 60 boat-based surveys and hundreds of hours of marine mammal observer (MMO) work in the Lough, including for the development of Berth 2 at Greenore Port.

RECEIVED: 18/10/2024

Breffni is a board member of Birdwatch Ireland and director and acting manager of the Louth Nature Trust, an environmental NGO.

He has undertaken over 50 environmental assessments, particularly in relation to coastal and estuarine habitats and has authored many papers in this area. He has undertaken the Irish Wetland Birds Survey on the north Louth shore since 2005, as well as several specialist studies (e.g. on oystercatchers, little terns, seals) and founded and chaired the Louth branch of Birdwatch Ireland and served as a director on the board of Birdwatch Ireland 2017-2021. He also founded the Louth Nature Trust, of which he is also a trustee and manager. Breffni prepared ecological reports to accompany other proposed developments at Greenore Port in the recent past, including the redevelopment of Berth 2 and warehousing for the storage of port commodities.

The marine mammal section was prepared by Dr Simon Berrow, who has been working in the field of marine mammal research for over 25 years. He established the Irish Whale and Dolphin Group in 1991 and remains Chief Executive Officer and Consultancy Manager. Simon is also a Lecturer at the Galway-Mayo Institute of Technology contributing to the Applied Freshwater and Marine Biology Honours Degree and Masters programmes as well as supervising PhD students. He has been carrying out environmental consultancy since 1991 and has managed a number of large projects to completion, including the recently lodged application for the Oriel Offshore Windfarm. He has recently delivered a major three-year project for the Marine Institute under SeaChange and was PI on the ObSERVE-Acoustic project for the Department of Communications, Climate Action and Energy. He has in-depth knowledge of the distribution and ecology of marine mammals in Irish waters and the impacts that affect their distribution.

The benthic section of this chapter of the EIAR has been prepared by Dr Louise Scally of MERC Consultants Ltd. Louise Scally holds an M.Sc. and Ph.D. in ecology from Trinity College Dublin and is a full member of the Chartered institute of Ecology and Environmental Management (CIEEM). She has carried out benthic assessments for a range of marine developments in Ireland and been involved in the preparation of the benthic assessment of EIARs for the following projects:

- Atlantic Marine Energy Test Site (AMETS) 2010: Benthic site investigations and EIAR. Client: ESB.
- Atlantic Marine Energy Test Site (AMETS) 2023: Benthic site investigations and EIAR. Client: Sustainable Energy Authority of Ireland (SEAI).

11.3 Proposed Development

Chapter 2 of this EIAR describes the proposed development in full. The following is a summary of the proposed works.

RECEIVED: 18/10/2024

Three standalone operation and maintenance buildings incorporating office, warehouse and ancillary space (canteen, welfare, plant, cycle parking, etc.) are proposed within the 'terrestrial port' area. Each building has a gross floor area of c.1,670 sq.m and a maximum height of 13.5m.

A new quay wall will be developed at Berth 3 (70m length). This will include a new quay wall face and an upgraded deck. A pontoon will be constructed to accommodate crew transfer vessels (CTVs), for use by the operators to travel out to the offshore windfarms. The CTV's will be accessed via an access ramp connected to the quay wall and deck. Approx 45,000m^3 of material will be dredged to facilitate navigable access at this location, and it will be disposed of on land. If rock is encountered (estimate max of 1,000m^3) it will be reused on site.

Adjacent to the buildings, 76 parking spaces are allocated, with a further 135 spaces proposed in the surface carpark at the 'Residential Site' on Shore Road. The existing carpark associated with the former Open Hydro building (60 spaces) will be used during the construction phase and Phase 1 operations.

Pedestrian and motor vehicle access is via the existing entrance beside the Port's office, which served the previous Open Hydro development. Heavy goods vehicles will access the buildings via the Port's existing heavy goods entrance on Shore Road (R175). Pedestrian access from the Shore Road carpark to the OMF buildings will be provided along a new pedestrian route within the Port's landholding.

To facilitate the development, demolition works are required, including the former Open Hydro building, an ESB substation, a small portion of the Port's office accommodation and the vacant dwelling at the 'residential site' on Shore Road.

Improvement works to the public / private realm in the foreground of the existing Greenore Port office building will comprise of an enhancement to existing road and pathways to facilitate improved pedestrian and vehicular access to the proposed O&M Facilities, a new feature entrance wall, removal of 6 no. port car parking spaces, link to a new pedestrian route from the new Shore Road carpark and hard and soft landscaping. Inside the proposed main entrance to the site, it is proposed to integrate the existing engine shed wall and include this as a feature within the landscape design.

Ancillary development will include the installation of drainage infrastructure, landscaping, lighting, signage, boundary treatments, rooftop solar photovoltaic panels, an ESB substation, a communications mast, a bunded fuel storage tank, waste management areas, etc.

The infrastructure described above will likely be delivered over two phases. However, this could extend to three phases, or the sequence of the works may vary, depending on the delivery of future ORE projects and the associated Offshore Renewable Energy Auctions.

11.4 Methodology

This chapter has been prepared in line with the European Union Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment and Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Regard was had to the following Guidelines.

- Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR). EPA, 2022.
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater Coastal and Marine. CIEEM, 2019.
- Guidance on Marine Baseline Ecological Assessments and Monitoring Activities for Offshore Renewable Energy Projects Part 1 (DCCAE, 2018)
- Guidance on Marine Baseline Ecological Assessments and Monitoring Activities for Offshore Renewable Energy Projects Part 2 (DCCAE, 2018)
- Guidance on Environmental Considerations for Offshore Wind Farm Development (OSPAR, 2008).
- Local Biodiversity Action Plan for County Louth 2021-2026. Louth County Council, 2021.
- National Marine Planning Framework. Prepared by the Department of Housing, Local Government and Heritage gov.ie/housing.
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment', (Department of the Environment, Community and Local Government, March 2013).

RECEIVED: 18/10/2024

11.4.1 Field Surveys

Field surveys were carried out as outlined in the following Table.

Table 11.1 Overview of Field Surveys

Survey Type	Period
Terrestrial habitat survey (inc. invasive species)	June, July, August, September 2023 April and May 2024
Winter bird surveys	October 2022 - March 2023 October 2023 – March 2024
Bat surveys	June and August 2023, May 2024
Summer breeding bird surveys	June and July 2023
Otter, Badger, Amphibian, Reptiles & Invertebrates	June and July 2023
Benthic surveys	August and September 2023
Marine Mammals in Carlingford Lough	June and August 2023
Breeding terns Green Island	May to August 2024

11.4.2 Assessment of Zone of Influence (ZoI)

RECEIVED: 18/10/2024

The zone of influence (ZoI) of a project is the area over which ecological features may be affected by biophysical changes caused by the proposed project. Within the ZoI, those receptors sensitive to change must be identified and considered.

To define a project's ZoI, the potential for project-related effects on sensitive receptors must first be established. For this purpose, a Source-Path-Receptor (SPR) model was applied. The SPR model is a well-established model frequently used to analyse project-related impacts on ecosystems, and we have applied it to the assessment of the proposed project.

Using this approach, all elements of the proposed project were reviewed to assess potential pathways and receptors that might be affected to establish a tailored ZoI. This process involved the following steps:

- The identification of sources of potential impacts and their pathways from the proposed development site to sensitive receptors.
- Consideration of sensitive receptors and their dependent ecosystems.
- Identifying and characterising project related impacts and their likely effects, direct, indirect and cumulative on the identified sensitive receptors.

Once the ZoI was established, the following steps were taken to assess the potential for likely significant effects on sensitive receptors:

1. The scale and scope of the project was examined.
2. A desk review of the available literature describing the habitats and species known to occur at the proposed development site and surrounding area was undertaken.
3. Any project related activities likely to affect migratory or highly mobile species was considered.
4. Any use of the proposed development site by mobile species that make regular movements to, from, or across the site was assessed.
5. An assessment was carried out of the key ecological processes and species activity periods, including seasonal variations in distribution, abundance, and activity.

11.4.3 Biodiversity Surveys

11.4.3.1 Terrestrial Habitat

The terrestrial section of the proposed development area was surveyed during daylight hours in June, July, August, and September 2023 and April and May 2024.

Habitat Survey & Protected Flora

A literature survey was undertaken, reviewing OSI maps, other plans, and any published information regarding the port's development.

The surveys consisted of several walkovers of the onshore proposed development site and adjoining lands during daylight hours. During the walkovers all flora species were recorded along with their abundance and setting. Identifications were confirmed using Webbs Flora (Webb, 1969) where required. The substrate was also assessed and classified using Fossitt's Guide (Fossitt, 1995).

RECEIVED: 18/10/2024

Invasive Species

Searches of the NBDC[1] for invasive species was carried out for any documented records of non-native plants listed in the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015). The proposed development site was surveyed for invasive species concurrent with the habitat surveys.

Terrestrial Mammals

Bat Survey

Two bat assessments (emergent survey and building inspection) were undertaken across the proposed development site, one on the 3rd of August 2023, and the other on the 22nd of May 2024 within the active bat period (March – October).

As outlined in Marnell et al. 2022 'The presence of a large maternity roost can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others. However, most roosts are less obvious. A visit during the summer or autumn has the advantage that bats may be seen or heard. Buildings (which, for this definition, exclude cellars and other underground structures) are rarely used for hibernation alone, so droppings deposited by active bats provide the best clues. Roosts of species which habitually enter roof voids are probably the easiest to detect as the droppings will normally be readily visible. Roosts of crevice-dwelling species may require careful searching and, in some situations, the opening up of otherwise inaccessible areas. If this is not possible, best judgement might have to be used and a precautionary approach adopted. Roosts used by a small number of bats, as opposed to large maternity sites, can be particularly difficult to detect and may require extensive searching backed up by bat detector surveys (including static detectors) or emergence counts.' In relation to the factors influencing survey results the guidelines outlines the following 'During the winter, bats will move around to find sites that present the optimum environmental conditions for their age, sex and bodyweight and some species will only be found in underground sites when the weather is particularly cold. During the summer, bats may be reluctant to leave their roost during heavy rain or when the temperature is unseasonably low, so exit counts should record the conditions under which they were made. Similarly, there may be times when females with young do not emerge at all or emerge only briefly and return while other bats are still emerging thus confusing the count. Within roosts, bats will move around according to the temperature and may or may not be visible on any particular visit. Bats also react to disturbance, so a survey the day after a disturbance event, may give a misleading picture of roost usage.

The survey involved the methodologies outlined in Collins (2016), which included the roost inspection methodologies, i.e., the external methodology outlined in section 5.2.4.1 and the internal survey outlined in section 5.2.4.2 of the guidelines. In addition, the methodologies for presence-absence surveys (Section 7) were carried out for dusk emergent surveys.

[1] https://maps.biodiversityireland.ie/Map

As outlined in Collins (2016) 'The bat active period is generally considered to be between April and October inclusive (although the season is likely to be shorter in northern latitudes). However, because bats wake up during mild conditions, bat activity can also be recorded during winter.

RECEIVED: 18/10/2024

Otter & Badger Surveys

Several otter (*Lutra lutra*) and badger *(Meles meles)* surveys were undertaken in June and July 2023.

The otter survey followed the methodology outlined in the National Otter Survey of Ireland (Reid, 2013), which involved covering all the coastline within 1km of the proposed development site and following all the riparian corridors into the hinterland to the same distance. All evidence of otter presence was recorded including prey remains, spraints, footprints, slides, paths, couches, and footprints. Any evidence of holts was also noted. The overall favourability of the sites was also assessed in terms of disturbance, threats (e.g. from crossing roads, loose dogs) and habitat features.

The badger survey recorded any signs of badger activity, including the presence of setts, foraging evidence, access runs, tracks and prints. The surveys adhered to the guidance as set out in *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Roads Schemes* (NRA 2009) and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA 2006).

A detailed literature survey was also undertaken.

Other Protected Mammals

Concurrent with the habitat survey and otter and badger surveys, the proposed development site and immediately adjacent areas were surveyed for evidence of field signs (prints, hairs, etc) and suitable habitats for other protected terrestrial mammal species including hedgehog, pygmy shrew, pine marten, Irish Stoat, red squirrel, Irish hare and red deer.

Amphibians, Reptiles, and Invertebrates

Based on the existing condition of the site, a largely working port area, and Martin's knowledge of the proposed development site, amphibians, reptiles and terrestrial invertebrates were scoped out from requiring surveying as no significant habitats are present within the development site that would support significant populations.

11.4.3.2 Marine Mammal Assessment

Seal Survey

A preliminary survey (Wilson, 2012) was undertaken by Tara Seal Research over the years 2008 to 2011 assessing abundance of harbour and grey seals, and harbour seal productivity. Prior to the 2008-2011 survey, surveys were undertaken by both NPWS (south of a notional border separating the north and south of the Lough) and NIEA (north of that border). Follow-up surveys on foot of a Car Ferry development were made in 2015 and 2017 (Martin, 2015 - 17). A thermal imaging survey was also carried out in 2018 (Morris, 2018).

A dedicated marine mammal survey was carried out between June 2019 and May 2020 in the site of a planned offshore windfarm, 'Oriel'[2], immediately to the south of the entrance to Carlingford Lough.

---

[2] Oriel application was lodged with An Bord Pleanála on the 24th of May 2024.

Boat-based visual surveys (over 12 days) were carried out over seven months, when sea conditions were suitable, according to a standardised design. The report, *Visual Surveys for Marine Mammals at the Proposed Windfarm Site at Oriel*, prepared by IWDG Consulting, is included as an Appendix.

RECEIVED: 18/10/2024

11.4.3.3 Avifauna Assessment

Wintering Bird Survey

The Irish Wetland Bird Survey (I-WeBS) is the primary method of collecting data for wintering waterbird populations at Irish wetland sites. These data, largely collected by volunteer field surveyors since the winter season of 1994/95, have underpinned the designation of Special Protection Areas (SPAs), and have enabled the production of waterbird population estimates and trends at national and at site level (e.g. Crowe & Holt, 2013; Burke et al., 2019; Lewis et al., 2019). I-WeBS surveys are undertaken primarily on a rising or high tide, when birds are pushed closer to shore or are gathering at roost sites and are therefore easier to count than when widely distributed across exposed tidal flats.

However, I-WeBS surveys are designed to obtain the most accurate peak counts of waterbirds at a site. However, they cannot provide information about waterbird abundance or distribution during the low tide period, when many waterbirds are feeding. This gap in knowledge was addressed somewhat in 2009/10, when the National Parks and Wildlife Service (NPWS) initiated a programme of low tide surveys which took place over the three winter seasons of 2009/10, 2010/11 and 2011/12 at 32 coastal SPAs (The NPWS Waterbird Survey Programme). Due to the cross-border nature of Carlingford Lough SPA, it was not surveyed as part of the NPWS Waterbird Survey Programme. However, comparable counts were undertaken in 2010-11 (by Martin (2011), described in NPWS (2013).

European Designated Sites supporting information was accessed from the NPWS website and information about designated sites was accessed from the Department of Agriculture, Environment and Rural Affairs (DAERA).

Field Surveys were undertaken by Martin from October 2022 to March 2023 and October 2023 – March 2024 in an area of 200 metres around the proposed development site over four hours on high and low tides, covering both spring and neap, so that all tidal states were covered.

The 200-metre boundary is based on Cutts methodology for assessing bird disturbance (Cutts, 2013). The area was divided into two zones, Zone 1 being inside Carlingford Lough SPA and Zone 2 outside of it, see Figure 11-2.

Before the start of the bird survey, the 200-metre area was surveyed by walking over. Subsequently, all birds within this area were counted, and approximate distribution was mapped. Birds using the existing breakwater (part of Zone 2) were separately counted. The total number of species recorded during the surveys was subsequently compared to the Irish Wetland Bird Survey's (IWeBS) most recent maximum counts.

During the 2023 to 24 season, several additional surveys were undertaken, specifically:

- Two-night surveys.
- Targeted visits surveying extreme tidal or weather events.
- A focal behavioural study recording the behaviour of waterbirds using the ZoI (100 observations)

Figure 11.2 Bird Survey Zones

Breeding Bird Survey

A breeding bird survey of terrestrial birds and waterbirds was carried out in June and July 2023 following the *Countryside Bird Survey (CBS): Status and trends of Common and Widespread Breeding Birds 1998-2016* to assess likely breeding behaviour.

The CBS is based on a random approach stratified by region coordinated by Birdwatch Ireland. The field methodology closely follows that of *Risely et al*., 2010. This involved following transects over the development site early in the morning and recording all species and their behaviour, specifically singing, display, gathering nesting material, provisioning of nests and the presence of juveniles.

The survey covered the port area of the subject site as well as likely habitats immediately adjacent to the port. Habitats in the wider environment such as the Greenore Golf Course, Green Island (Island in Carlingford Lough) and the Breakwater were also documented.

In addition, a survey of breeding terns was undertaken in the summer of 2024. This was based on six visits, three of which were from the Greencastle to Greenore car ferry, see Appendix 11.11.

11.4.3.4 Benthic Ecology Sensitivity Assessment

To assess the potential for impacts on benthic habitats and species the MarESA sensitivity assessment was employed. This system involves a systematic process to examine the biology or ecology of a feature, compile the evidence of the effect of a given pressure on the feature (species or habitat) in question, assess the likely sensitivity of the feature to the pressure against standard scales, and to document the evidence used and justify assessments made (Tyler-Walters *et al*, 2018).

Using this system, sensitivity is determined by the capacity of the feature to remain unchanged under the influence of the pressure (its resistance), see Table 11-2, and if changed, the amount of time needed for a full recovery once the activity has stopped (its resilience), Table 11-3.

A feature that is easily damaged has low resistance and if it takes a long time to recover, also has low resilience. If a feature is not sensitive to the pressures associated with an activity, that activity is not incompatible with the conservation of that feature. If, however, there is a high degree of sensitivity of a feature to an activity in an area designated for it, management measures are needed to prevent damage by that activity to that feature. An overall sensitivity assessment matrix Table 11-4 can then be complied.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table 11.2 Resistance assessment scale to a defined intensity of pressure (Tyler-Walters *et al.* 2018)

Resistance	Description
None	Key functional, structural, characterising species severely decline and/or the physiochemical parameters are also affected e.g. removal of habitats causing a change in habitat type. A severe decline/reduction relates to the loss of 75% of the extent, density or abundance of the selected species or habitat component e.g. loss of 75% substratum (Where this can be sensibly applied).
Low	Significant mortality of key and characterising species with some effects on the physical or chemical character of the habitat. Significant decline/reduction relates to the loss of 25-75% of the extent, density, or abundance of the selected species or habitat component e.g. loss of 25-75% of the substratum
Medium	Some mortality of the species without change to habitats. This loss relates to <25% of the species or habitat component
High	No significant effects on the physical or chemical character of the habitat and no effect on population viability of key/characterising species but may affect feeding, respiration and/or reproduction rates

Table 11.3 Resilience assessment scale of a feature (Tyler-Walters *et al.* 2018)

Resilience	Description
Very low	Negligible or prolonged recovery possible; at least 25 years to recover structure and function
Low	Full recovery within 10-25 years
Medium	Full recovery within 2-10 years
High	Full recovery within 2 years

Table 11.4 Overall sensitivity assessment matrix (Tyler-Walters *et al.* 2018)

	Resistance			
Resilience	**None**	**Low**	**Medium**	**High**
Very low	High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Low	High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Medium	Medium sensitivity	Medium sensitivity	Medium sensitivity	Low sensitivity
High	Medium sensitivity	Low sensitivity	Low sensitivity	Not Sensitive

Magnitude assessment method

Definitions used for the magnitude of potential Impacts on benthic (Subtidal and intertidal) ecology are shown in Table 11-5 and the effect of significance matrix used is given in Table 11-6.

RECEIVED: 18/10/2024

Table 11.5 Magnitude assessment matrix

Magnitude	Definition
High	Complete change and/or loss of the baseline biotope with the potential to negatively impact the conservation status of the local ecosystem and with very low chance of recovery
Moderate	Change in the structure and function of the baseline biotope but which would be unlikely to negatively impact the conservation status of the local ecosystem.
Low	Minor or temporary change in the structure and function of the baseline biotope in a localised area
Negligible	No perceptible change to the characterising species of the baseline biotope or to its structure and function

Table 11.6 Effect of significance matrix used for benthic (subtidal and intertidal) ecology

Value/Sensitivity	Magnitude			
	High	Moderate	Low	Negligible
High	Major significant impact	Major significant impact	Moderate significant impact	Insignificant impact
Moderate	Major significant impact	Moderate significant impact	Minor significant impact	Insignificant impact
Low	Moderate significant impact	Minor significant impact	Insignificant impact	Insignificant impact
Negligible	Insignificant impact	Insignificant impact	Insignificant impact	Insignificant impact

Desk Study

To fully understand the receiving environment, relative to project related effects on benthic ecology, the literature consulted included:

- National Parks and Wildlife Service data sources for all European Sites within the ZoI of the proposed project. This included the individual site synopsis for each designated area, conservation objectives and their supporting documents and GIS layers (marine habitats, species and community mapping).
- The Northern Ireland Sublittoral Survey (1986)
- Sublittoral Survey of Northern Ireland (2008)
- Northern Ireland Broadscale Habitat Mapping (2004)
- Available benthic data (NPWS, Marine Institute and INFOMAR)
- Aquaculture licence areas (GIS mapping published by Department of Agriculture, Food and the Marine)
- Northern Ireland Marine Map Viewer (https://www.daera-ni.gov.uk/services/marine-mapviewer)

RECEIVED: 18/10/2024

Subtidal Surveys

Seven (7) Subtidal sediments were collected within the area in August/September 2023 between the breakwater and the existing quay wall (the development footprint). Samples were collected using a $0.1m^2$ Day grab. Following the removal of a sub-sample for particle size distribution and organic content analysis, the remaining sediment was sieved at 1mm mesh size and preserved for macrofaunal identification. Ancillary *in situ* environmental data including station positions, observations and associated imagery were gathered at each sampling location.

Intertidal Surveys

A walkover survey of the intertidal area east and west of the proposed development site at Greenore was undertaken on two separate occasions during August 2023. The second, main survey, was undertaken to coincide with a predicted tidal height of 0.4 meters so the entire shoreline could be covered.

Records were made of the characterising species present and their relative distribution across the site so that the primary biotopes present could be ascertained. Any impacts and activities at the site were also noted and recorded. GIS mapping of the *Zostera noltei* beds present within the area to the west of Greenore point were obtained courtesy of the EPA.

11.4.4 Consultation

Consultation with National Parks and Wildlife Service, 09.01.2024

A consultation meeting with the National Parks and Wildlife Service (NPWS) was held on 9th January 2024 to scope the view of NPWS with regard to the proposed infrastructure being located partially within a European Designated Site (Carlingford Shore SAC (Site code: 002306) and Carlingford Lough SPA (Site code: 004078)) and ensure the project team provides the most robust information from the outset.

NPWS were presented with an overview of the proposed development, including the proposed construction methodologies, details of the methodology being employed by the team of project ecologists and preliminary findings from baseline surveys completed to date. It was established that the existing habitat at Greenore Port is not Annex I habitat and that the proposed development will not result in permanent habitat loss. Generally, the level of information gathered was considered comprehensive to allow for the production of a satisfactory suite of documentation to support the application.

The NPWS representatives advised integrating enhancement features for swifts and guillemots. It was also advised that the ecology team review the construction methodology and include exclusion periods where necessary as a mitigation measure. This advice was given due consideration; the three buildings include swift boxes, and the mitigation section of this report includes exclusion periods.

Consultation with Louth County Council, 10th and 20th May 2024

The first meeting concentrated primarily on the design and engineering aspects of the proposed development. The biodiversity representative highlighted that the Greenore area has a large Swift population and requested that enhancement measures be included in the design. This measure is implemented with each of the three buildings hosting swift boxes. Confirmation was sought that faunal surveys and bat surveys were completed.

RECEIVED: 18/10/2024

It was advised that the landscaping plan should be appropriate to the environment and incorporate native species, together with plants identified in the All-Ireland Pollinator Plan. The proposed landscaping plan was developed in consultation with the project's ecology team and is an appropriate response to the existing environment.

The meeting on 20th May focused on environmental issues, including biodiversity. Representatives from Louth County Council queried whether designated sites in Northern Ireland were considered in the assessments.

The project team outlined that since 1 January 2021, nature conservation areas in the UK (including Northern Ireland) have no longer been part of the Natura 2000 network (Office of the Planning Regulator, 2021), and so they have not been considered in the Supporting Information for Screening for Appropriate Assessment included under separate cover.

It was confirmed by the project ecology team that possible transboundary and RAMSAR conventions were considered as part of the EIAR. The projects and plans examined to inform the cumulative assessment of this EIAR included those deemed relevant in Northern Ireland.

A discussion took place on the extent of rock breaking required. It was outlined that the dredge is predominantly soft, and rock breaking is not anticipated. Berth 3 is not as deep a quay wall as Berth 2, and the vessels will be shallower. If rock is encountered and breaking is required, the volume of approximately 1,000 cubic meters is not comparable to the scale of rock breaking that occurred during the development of Berth 2. The dredge depth proposed is -4m compared with -7.5m for Berth 2.

The dredge plume was discussed. It was outlined that the Marine Mammal Observer (MMO) did not observe a significant dredge plume in the last campaign for Berth 2. The material this time is finer, as evidenced by the particle size analysis, and the proposed marine development area is a scour channel that doesn't allow sediment accumulation. The current at this location provides for fast and wide dispersion to occur. The assessment prepared by RPS, see Chapter 12 of this EIAR, Coastal Processes, confirms the self-scouring nature of the port.

The planning authority queried whether mitigation included restricting the timing of works and, if so, whether this would impact the project's timely implementation. The team confirmed that restrictions would be linked to the pile-driving element of the pontoon and Berth 3 and the rock-breaking element of the dredging. It was confirmed that the construction programme has considered exclusion periods.

The planning authority queried the habits of Brent Geese locally, and the ecology team set out that they are found in the areas of *Zostera beds*, approximately 2 km from the proposed development site, and where there is algae bloom occurring from freshwater inputs as well as algae growing on trestles. It was confirmed that they are not found anywhere close to the port/proposed development area.

11.5 Difficulties Encountered

RECEIVED: 18/10/2024

No difficulties were encountered during the preparation of the biodiversity chapter. All survey dates were within the optimal survey period for each survey, and full site access was achievable on all surveys.

~~Regarding the offshore wind arrays that this development will support, only the Oriel project had been lodged at the time of lodging this application, and at the time of submission, the application was not publicly available on the An Bord Pleanála website. Other applications for offshore wind arrays were not lodged with An Bord Pleanála at the time of writing, and the details were, therefore, not available to the project team.~~

Since lodging the application for permission in May 2024, strategic infrastructure applications for offshore renewable wind energy developments have been submitted. Each project is the subject of its own development consent and EIA process. Within this EIAR they have been considered in section 11.9.8 Cumulative Effects.

The certainty or predictability of this assessment was not affected by any difficulties encountered.

11.6 Baseline Environment

11.6.1 Terrestrial Habitats and Flora

This section should be read together with Appendix 11.1, Terrestrial Habitat Survey.

Terrestrial habitats encountered were classified according to Fossitt (2000) and are illustrated in the following Figure.

RECEIVED: 18/10/2024

Figure 11.3 Existing Habitats - Fossitt (2000)

11.6.1.1CC1 Sea walls, piers and jetties

The development zone encompasses a narrow coastal strip categorised as *Sea walls, piers, and jetties* (CC1). This area spans approximately 150 meters by 5 meters. It features a recently constructed quay wall, several older concrete caissons (each roughly 1 cubic meter in volume), and a pitched sea wall composed of cut limestone cobbles. The sea wall has been reinforced with concrete slabs derived from the dismantling and renovation of the old quay wall. Over time, windblown topsoil and decayed coastal vegetation have accumulated, especially within the crevices of the track and stone bank. The caissons have also been partially filled with clean stone.

Various plant species have been observed in small clusters or as individual specimens within and along the periphery of the caisson area, particularly where decomposing nitrogenous vegetation settles in cracks and crevices. These species include *Plantago maritima, Beta vulgaris, Aster tripolium, Malva sylvestris, Matricaria discoidea, Cochlearia officinalis, Tripleurospermum maritimum, Senecio squalidus, Erysimum sp, and Geranium robertianum,* along with a solitary example of *Reseda luteola*. However, *Crambe maritima, Suaeda maritima*, and *Honkenya peploides* were notably absent.

According to Fossitt, the Groyne/Breakwater at Greenore Port, which marks the northern edge of the development area, is also to be classified CC1. The structure is positioned approximately 100 meters from the berthing face of Greenore Port and was constructed as a rubble mound rock structure, with wooden piles running along its length. The breakwater is used by waterbirds for roosting and loafing, primarily large gulls and cormorants.

11.6.1.2BL3 Buildings and Artificial Surfaces

RECEIVED: 18/10/2024

Buildings and artificial surfaces (BL3) represent a highly modified habitat type characterised by the dominance of artificial materials with negligible ecological value. These recorded areas in the application area consist of concrete hardstanding and man-made structures and are deprived of vegetation.

The terrestrial development area's southwestern section primarily constitutes a functional port area, featuring hardstanding remnants of a wall associated with the pre-existing railway (the engine room wall), a port warehouse (formerly occupied by Open Hydro), a portion of the Greenore Port office, a hardstanding car park, and segments of public/private realm. Consequently, this area falls under Buildings and artificial surfaces (BL3) classification.

Additionally, the existing residential dwelling and driveway are also categorised within this classification due to their predominantly artificial composition.

11.6.1.3 GA2 Amenity Grassland

Amenity grassland (GA2) is a modified grassland habitat that is subject to regular maintenance. The result is a short sward and low biodiversity, which is therefore considered lower local importance. The habitat is present at the residential site within the proposed development site.

11.6.1.4 BC4 Flower beds and borders

Ornamental flower beds, Rowan/Mountain Ash, Cabbage Tree, Sweet Cherry, Whitebeam and Sycamore are present at the existing port office entrance.

11.6.1.5BL1 Stone walls and other stonework

The subject site contains a section of a wall associated with the former Engine Shed of the Greenore railway station. This now free-standing brick and limestone wall can be categorised as Stone walls and other stonework (BL1) according to Fossitt.

11.6.2 Terrestrial Mammals

This section should be read together with Appendix 11.5 Terrestrial Mammal Survey and Appendix 11.6, Bat Fauna Impact Assessment.

11.6.2.1Bats

No bats were noted emerging from structures. Two common pipistrelle bats were observed in 2023 at the residential site and an individual Soprano Pipistrelle was recorded foraging within a large metal storage building to the north of the site outline within the port area in 2024. In 2023 & 2024 no bats were noted transiting through or foraging within the port area inside the proposed site outline. The site is of relatively low importance to the local bat population. The site is currently well-lit from the existing floodlights within the subject site, and from light spill of the adjacent residential area street lighting.

RECEIVED: 18/10/2024

11.6.2.2 Otters & Badgers

Otter spraints were not recorded in the proposed development site or within the wider port landholding.

Otter spraints were recorded along the sea wall of the adjacent golf course, with several clustered around the sluice between the bay and Greenore golf course ponds. Similar numbers were found at Hammils Quay (a slip adjacent to the old railway line) and in other places along the shore. Spraints were also found within the golf course, where the watercourse flows into the golf course under a culvert. Spraints were also noted along the channel leading from the wetlands of Greenore pNHA into the golf course. Several otter tracks and a possible slide were found on an island in one of the ponds on the Greenore Golf Course, indicating a possible couche. No spraints were seen along the east side of the port.

Overall, the intertidal bay between Carlingford and Greenore provides quality otter foraging habitats with an abundance of crabs, crayfish, and fish available. The widespread otter spraints suggest extensive use of the golf course streams and ponds, the shore, and the intertidal area by otters. Wetlands in the hinterland may serve as holt habitats.

Signs of badger were also looked for during the otter survey, but none were seen. Generally, the area around the port and the golf course are unsuitable for badger due to the high-water table.

Figure 11.4 Recorded Otter Spraints

RECEIVED: 18/10/2024

11.6.2.3 Other Fauna

Signs of other fauna, including red fox, badger, and pine martin, were also surveyed but no trace was found. No amphibians or reptiles were noted on site, and smooth newts and viviparous lizards are considered highly unlikely in the area, having regard to the nature of the proposed development area.

11.6.3 Marine Mammals

This section should be read together with Appendix 11.7, 11.8 and 11.9.

Carlingford Lough and adjacent waters are important for marine mammals. Seals, especially harbour (common) seals, occur in good numbers throughout the year and grey seals in much smaller numbers. Harbour porpoises are frequent in the north Irish Sea to the east of Carlingford Lough, and common and bottlenose dolphins also occur occasionally, as do minke whales seasonally.

11.6.3.1 Pinnipeds (seals)

11.6.3.1.1 Harbour (Common) seal *Phoca vitulina*

As part of this project, Martin (2023) carried out land-based counts at haul-out sites around the Lough in June and August 2023. Historical data were also presented, which suggests an apparent decrease in common seal abundance; however, previous counts were based on multiple repeat counts and thus may explain the higher numbers compared to 2023. A total of 119, including 9 pups, were counted in June, and 213, including 7 pups, in August 2023 (Martin 2023).

Harbour seals primarily occupied the inner part of the Lough, “Seal Rock”, Carrigenean, Mill Bay and Green Island. During August/September 2023, they had a pronounced preference for the north part of Green Island. An exception to this was that, on occasions, harbour seals would gather at Carrickbrada in the Greenore count area.

Table 11.7 Estimates of harbour seals in Carlingford Lough from 2008-2023 at haul-out sites (from Martin 2023)

Date	Adult	Pup
July 2008	178	54
Aug/Sept 2008	350	NC
July 2011	187	43
Aug/Sept 2011	376	NC
July 2015	222	29
Aug/Sept 2015	359	NC
July 2017	344	23
Aug/Sept 2017	297	NC
June 2023	110	9
August 2023	206	7

NC – no count

During an aerial survey of common seals carried out during August and September 2012, Duck and Morris (2013) counted 40 on 31 August 2012 in Carlingford Lough making it the single most important site for this species on the east coast of Ireland and 90 in total between Carlingford and north Dublin.

RECEIVED: 18/10/2024

A repeat survey in August 2017 and 2018 recorded very few common seals in Carlingford Lough with most of the 61 counted in the area on the northern side of Dundalk Bay (Morris and Duck 2019). These counts report a 14-31% decline in common seals since 2003.

To the north of the site, two areas designated as ASSI for common seals occur within the ZoI. A baseline of 106 seals occurs in the Murough and 210 within Strangford Lough. Common seals are not as mobile as grey seals, typically foraging within 10km of their haul-out site (Thompson et al. 1998).

11.6.3.2 Grey seal (Halichoerus grypus)

Table 11.8 Grey seal counts (from Martin 2023)

Year	July					Aug/Sept				
2008	nc*	nc	nc	nc	nc	21	34	38	18	15
2009	12	10	16	20	30	nc	nc	nc	nc	nc
2011	8	8	47	39	nc	40	44	32	28	15
2015	23	17	52	40	60	64	48	35	73	57
2017	53	53	17	88	64	74	58	56	39	65
2023	24	nc	nc	nc	nc	40	nc	nc	nc	nc

*nc = no count

Martin (2023) also presented counts of grey seals and estimated 24 were present in July 2023 and 40 in August 2023, but suggested the method used was not applicable to estimates of absolute abundance in Carlingford Lough and should be treated with caution due to the fact that grey seals are far more wide ranging than common seals and a large proportion of the resident population may be in the water during any given survey (grey seals are more reliably assessed at their breeding sites). However, given the relatively small numbers, a comparison with data from previous surveys is presented. Grey seals primarily occupied the outer more exposed parts of the outer Lough at Blockhouse Island and reefs and the Cooley Long Rock.

During an aerial survey of common seals carried out during August and September 2012, Duck and Morris (2013) counted 48 grey seals between Carlingford and Dunany Point and 172 from Lambay Island to Dublin Bay. A repeat survey in August 2017 and 2018 recorded very few grey seals in Carlingford Lough with most of the 83 counted in the area on the northern side of Dundalk Bay (Morris and Duck 2019).

11.6.3.3 Cetaceans

11.6.3.3.1 Irish Whale and Dolphin Group database (2014-2023)

Cetacean records from the area of interest were accessed on 31 January 2023. There were 107 records of cetacean species (and downgrades if species identification could not be determined). These included harbour porpoise (*Phocoena phocoena*), two dolphin species (bottlenose *Tursiops truncatus* and common dolphin *Delphinus delphis*) and three baleen whale species (minke *Balaneoptera acutorostrata*, humpback *Megaptera novaengliae* and bowhead whale (*Balaena mysticetus*).

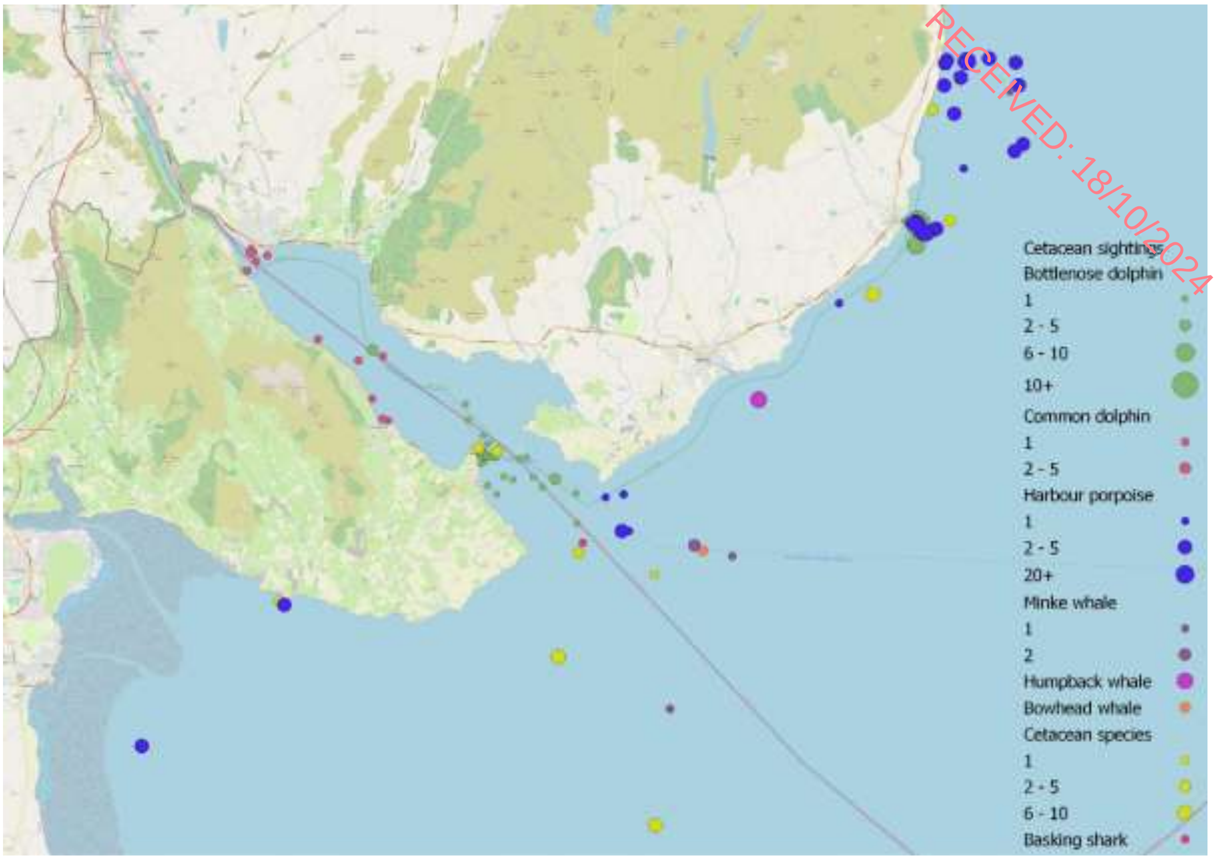
Table 11.9 Cetacean sighting records from the IWDG from 2014 to 2023

RECEIVED: 18/10/2024

	No. of sightings	No. of individuals	Mean Group size
harbour porpoise	31	89	2.9
bottlenose dolphin	50	79	1.6
common dolphin	10	13	1.3
dolphin species	2	12	6.0
dolphin species possibly harbour porpoise	6	23	3.8
minke whale	4	5	1.3
bowhead whale	1	1	1.0
humpback whale	1	1	1.0
cetacean species	2	9	4.5
Total	**107**	**232**	

Of the bottlenose dolphin sightings, 46 were of the solitary individual known as “Fin”, who was observed regularly from July 2020 to November 2022 in the strong tidal current off Greenore. Interestingly, 9 of the 10 common dolphins were also of a single dolphin seen regularly from July 2022 to November 2023 and is still thought to be present. Of the harbour porpoise sightings, all were outside Carlingford Lough in the approaches.

The only record of a bowhead whale in Ireland was reported on 29 May 2016 near the Helly Hunter Rocks at the mouth of Carlingford Lough by Carlingford Lough Pilots Ltd. (Whooley and Berrow 2019). Also, a rare record was of a humpback whale off Kilkeel to the north of the Lough on 6 July 2019. The four records of minke whale were in June, July and October and occurred offshore of Carlingford Lough.



RECEIVED: 18/10/2024

Figure 11.5 Cetacean Sightings in the Area of Interest (2014-2023) Source: IWDG Cetacean Sighting scheme

11.6.3.3.2 Dedicated surveys for offshore windfarm

A dedicated marine mammal survey was carried out between June 2019 and May 2020 at the site of a proposed offshore wind farm immediately to the south of the entrance to Carlingford Lough, see Appendix 11.2. Boat-based visual surveys (12) were carried out over seven months when sea conditions were suitable, according to a standardised design.

A total of 140 on-effort sightings were recorded of at least five marine mammal species (see Table 11-10). Most sightings (67.6%) were of harbour porpoises, which were recorded during every survey. The next most frequently recorded species was grey seal (16.2%) recorded on five of the seven surveys and minke whale (13.2%), recorded on three of the seven surveys. Common seals were recorded on three surveys and accounted for only 2.2% of all sightings (Table 11-10).

Table 11.10 Number of sightings (individuals) of marine mammals during surveys off Oriel from June 2019 to May 2020 (from Berrow and O'Brien 2020)

Date	HP	CD	MW	GS	CS	Others
19-20 June 2019	11(12)	-	-	3(3)	-	
17-18 July 2019	3(3)	-	1(1)	-	1(1)	
1-2 August 2019	15(19)	-	14(14)	4(4)	-	1 basking shark, 1 cetacean sp.
2 October 2019	8(9)	-	3(3)	2(2)	-	
1-2 December 2020	11(15)	1(3)	-	-	1(1)	1 seal sp.
20-21 January 2020	34(70)	-	-	6(6)	1(1)	

19 May 2020	10(21)	-	-	7(7)	-	

HP = Harbour porpoise, CD – Common dolphin, MW = Minke whale, GS = Grey seal, CS = Common seal

RECEIVED: 18/10/2024

Harbour porpoise occurred throughout the survey area with most sightings of single individuals, but larger group sizes were recorded in January and May 2020. Calves were recorded on two occasions, with an adult to calf ratio of 1.4% and juveniles 4.3%. Harbour porpoise calves are born during summer and typically wean over the winter and the presence of calves during spring and juveniles over winter is consistent with this pattern.

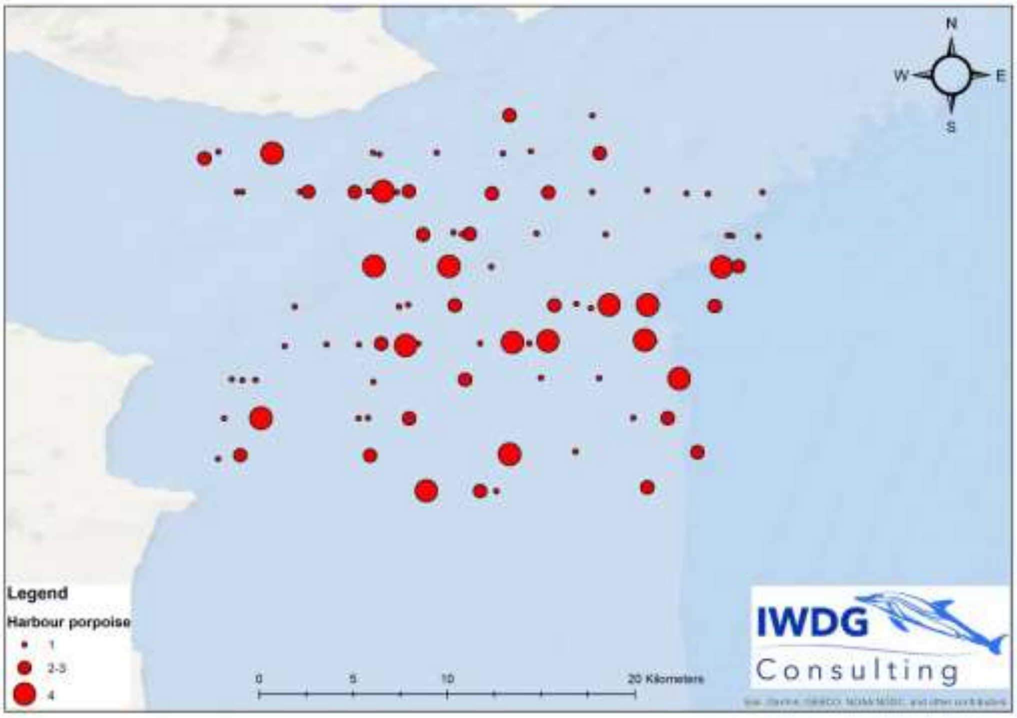


Figure 11.6 Distribution and group size of harbour porpoise sightings off Oriel from June 2019 to May 2020 (from Berrow and O'Brien 2020).

Harbour porpoise density estimates for five of the surveys ranged from 0.14 per sq. km to 0.64 per sq. km and were 0.22 overall. The estimate from January 2020 (0.65 porpoise per sq. km) resulted in an abundance of 205±35, which reflects the peak in abundance, which may be associated with a traditional herring spawning ground within the site (Dickey-Collas et al. 2001).

Individual minke whales were recorded on 18 occasions, 14 of which were in August 2019. They were also recorded on the July and October surveys. They occurred throughout the survey area, tending to be a little offshore.

RECEIVED: 18/10/2024

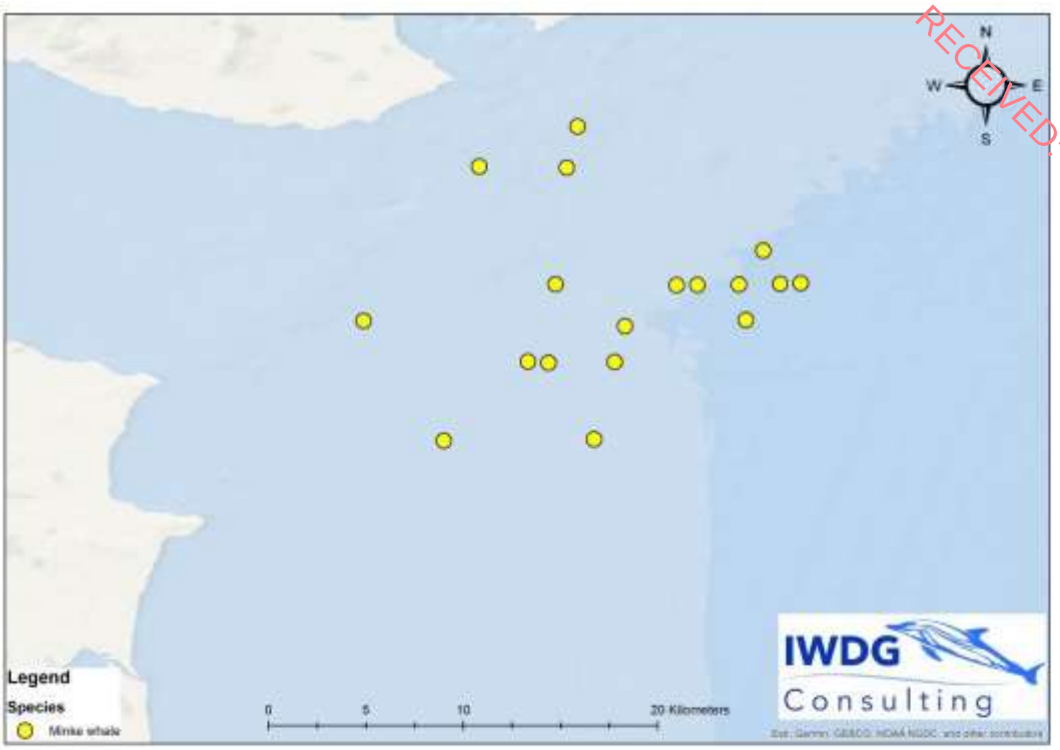


Figure 11.7 Distribution of minke whale sightings off Oriel from June 2019 to May 2020 (from Berrow and O'Brien 2020).

A density estimate was calculated for minke whales in August 2019, providing a density of 0.01±0.02 minke whales per sq.km, which equates to an abundance estimate of 3±0.6 (95% CI 2-5 individuals).

11.6.3.3.3 Grey (Halichoerus grypus) and Common Seal (Phoca vitulina)

Grey seals were the second most frequently recorded species, accounting for 16.2% of sightings and 11.3% of individuals recorded. They were recorded on five of the seven surveys and in all seasons sampled and in consistent numbers per survey. All sightings were of individual animals. Only three sightings of common or harbour seals were recorded, one each in July, December and January, all of single individuals (Table 11-10) and one in November, again of single individuals. Seals were distributed throughout the study area with a tendency to be more inshore. Common seals were recorded in the northern half of the study area.

RECEIVED: 18/10/2024

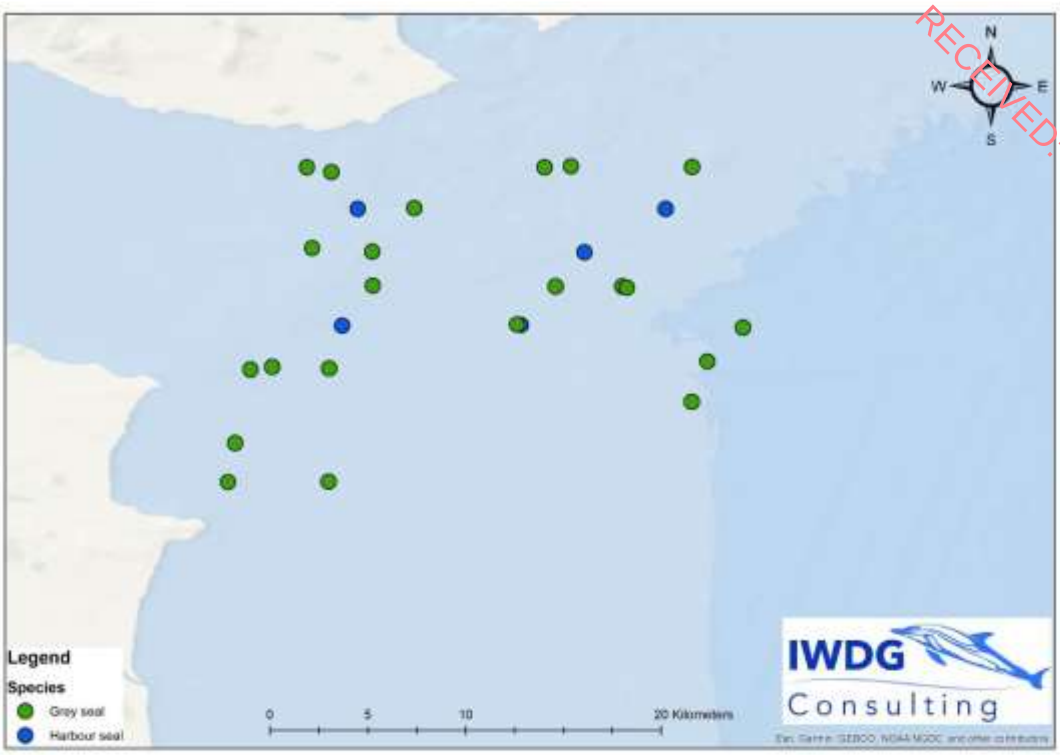


Figure 11.8 Distribution of grey and common (harbour) seal sightings off Oriel from June 2019 to May 2020 (from Berrow and O'Brien 2020).

11.6.3.3.4 Static Acoustic Monitoring at a proposed offshore windfarm

Static Acoustic Monitoring (SAM) was carried out between 2019 and 2020 to complement boat-based visual surveys and describe the long-term presence of harbour porpoise off Co. Louth within the site of a proposed offshore windfarm, Oriel. Between November 2019 and November 2020, a total of 685 days of SAM data were collected across the site. SAM using self-contained click detectors (C-PODs) was conducted at four sites. SAM datasets were then used to explore the temporal presence of harbour porpoises within their detection range. Generalised linear mixed-effect models were used to associate porpoise presence with factors such as season, diel, tidal cycles and phases. Results showed porpoises to be present on average 99% of days monitored. Harbour porpoises were the most frequently detected species with dolphins rarely detected.

Season appeared to influence porpoise presence differently across sites, with winter and summer overall important periods for porpoise presence. The effect of the diel cycle also varied across locations, although night, morning and/or evening phases often yielded more detections than day phases. The tidal cycle and tidal phase only affected the detection rate at some locations, where slack low water coincided with increased detections.

RECEIVED: 18/10/2024

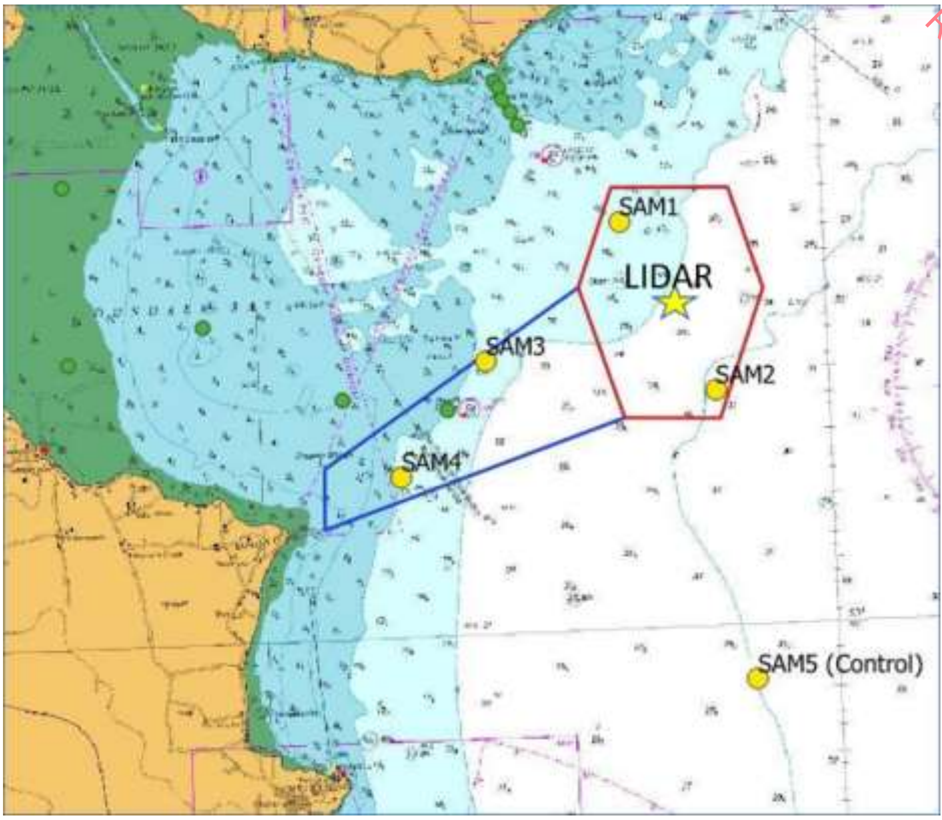


Figure 11.9 Location of all SAM moorings

11.6.3.3.5 Other Endangered, Threatened and Protected Species [3]

Basking sharks *Cetorhinus maximus* were recently provided legal protection in Ireland under the Wildlife Act (2022). Under the Wildlife Act (amended 2022), wilfully disturb basking sharks or destroy their breeding and resting places is now an offence. A ~~single~~ sighting of a single basking shark was recorded on 29 May 2023 in the Hoskyn Channel at the mouth of Carlingford Lough. A second sighting of a single basking shark was also recorded to the south of Carlingford lough on 1 August by Berrow and O'Brien (2020).

11.6.4 Avifauna

11.6.4.1 Over Wintering Birds

This section should be read together with Appendix 11.2 and 11.3. The below represents a summary of those appendices.

An overwintering bird survey was carried out from October 2022 to March 2023 and again from October 2023 to March 2024. The surveys included the intertidal habitat in the relevant count area. In addition, several targeted and behavioural surveys were undertaken during the 2023-2024 period.

[3] The changes in this section have been made for clarification purposes

RECEIVED: 18/10/2024

The total number of species recorded within a 200-metre bird disturbance "zone of influence" around the proposed development site was 25 in the 2022-2023 period and 27 in the 2023-2024 period.

Notably, Brent geese were not seen in the vicinity of the ZoI during the 2023-2024 count season. The main cohort was concentrated in the Zosteria area about 2km distant. During bad weather, they sometimes used the golf course for feeding and shelter. In the latter part of the year, they focused on the two outflows along the Carlingford shore road.

The general port area hosts a highly variable number of waterbirds consisting primarily of two cohorts, regularly occurring birds using the breakwater for roosting, and a more variable cohort consisting primarily of gulls who are attracted to the area when animal feed cargos are being discharged. The latter cohort consists almost exclusively of large gulls such as great black backed gulls and herring gulls, with a smaller number of common and black-headed gulls.

Peaks in numbers on the 6th of January and 13th February 2023 correspond to discharges of animal feed on the quay wall. When animal feed is discharged from ships holds, it is typically lifted by way of a large grab and dumped into a hopper which funnels it into a truck. The truck is then covered but inevitably there is spoil, particularly on windy days. Typically, gulls will compete for this on the quay wall, along the road out of the port, and in the water fronting the quay wall where they often surface feed. They typically avoid the most active parts of the port, particularly when the Liebherr cranes are operating, but particularly herring gulls will aggressively compete for food items right next to human activity.

At other times, when cargos not attractive to birds are being discharged the numbers drop off considerably, particularly gulls, so that on some occasions there are no birds using the breakwater at all, particularly during eastern or northerly winds when it is very exposed. At other times the breakwater is over washed by spring tides.

Recorded species have variable responses to disturbance, be it visual or from noise, with waders and wildfowl being the most susceptible.

Waterbirds frequenting the zone of influence are clearly habituated to the regular activities of the port and are highly tolerant of it. Birds are undisturbed on the breakwater and clearly tolerate even very heavy port activities when there. Given the 100-metre distance from the active port area to the breakwater it can be inferred that a distance of 100 metres is more generally tolerable. Similarly, foraging birds are undisturbed using zone 1 of the ZoI during port operations; zone 2 intertidal is generally not used for foraging but is used by divers and auks at high tide.

Cormorants, Red Shanks, large Gulls and Turnstones have been shown to tolerate disturbance from port activities at distances down to 10m.

The main behaviour observed is loafing and roosting on the breakwater. Foraging is mainly a function of the cargo/spoil stemming from port operations. This area is only available on some spring tides (0.5 metres or less), and these only occur on about 18 days in a given year the area is only available for a few hours on either side of low water, making it available for about 36 hours over a given overwintering period. Taking this as running from September to March, it covers a period of 212 days or 5,088 hours. This means the area is available for less than 1% of the over wintering period.

Furthermore, it was noted that foraging in this area on spring tides does not meet with great success, and birds were observed to prefer other softer areas for foraging.

RECEIVED: 18/10/2024

The targeted visits demonstrated that the breakwater, though an important roosting and loafing area, is not critical. In times of bad weather or extreme tides, other areas are preferred (the golf course, Green Island).

They also demonstrated the very high level of tolerance birds using the breakwater have to the existing port operations. This high degree of habituation means that birds will readily habituate to the activities stemming from the proposed development.

11.6.4.2 Breeding Birds

This section should be read together with Appendix 11.4.

Within the terrestrial port area, a pair of wagtails and a pair of rock pipits are regular along the quay wall and nesting was confirmed in both cases (provisioning of nests). A single pair of jackdaws bred in a cavity in an old wall. No evidence of gulls breeding in the port area was found. A significant reduction in gull numbers was seen during the summer of 2023, mainly sub-adult birds frequenting the port. No evidence of shelduck nesting was seen in the vicinity of the port.

Within the residential plot, a pair of blackbirds, two pairs of collared doves and a pair of woodpigeons were recorded as breeding in the garden area.

There was no sign of breeding birds was found in the office structures, such as house sparrows and starlings, who may nest in the eaves of such structures.

Swifts and house martins were noted flying up and down the main street in Greenore village. Overall, the terrestrial breeding bird population is typical for the existing port related habitat. No rare or especially protected passerines were found.

On the breakwater, black guillemots were confirmed breeding during the summer of 2023, with two pairs using the nesting boxes on the breakwater and a further pair in cavities on the quay wall; the latter are unlikely to be successful due to the presence of rats who may predate eggs and young. In 2024 seven pairs nested with one fledgling confirmed. It was impossible to check breeding due to difficulty accessing the breakwater but it is likely that other birds successfully fledged at a time when there was no observer (when black guillemot chicks fledge, they do not return to the nest).

Green Island, about 1.4 km from the port, has historically supported large populations of breeding terns, however these have failed in recent years for a number of reasons including predation by gulls, rodents and otters, over-washing by high tides, storms, and human activity. A survey undertaken in the summer of 2024 recorded 23 apparently occupied nests, though successful fledging was not observed. See Appendix 11.11 for further details.

11.6.5 Benthic Ecology

RECEIVED: 18/10/2024

This section should be read together with Appendix 11.10.

11.6.5.1 Subtidal benthic ecology within the receiving environment

The benthic habitat of Carlingford Lough is known from extensive surveys carried out during the Northern Ireland Sublittoral Survey (NISS) of 1982-1985 (Erwin *et al*, 1986). The data from this survey is included in the BioMar survey of Ireland database as it covers the entire marine area of Carlingford Lough, including that within Irish jurisdiction. The data from these surveys describes a range of habitats and species recorded during 48 separate dives at various locations throughout the lough. A subset of these sites was resurveyed as part of the Sublittoral Survey of Northern Ireland in 2008 (Goodwin *et al*, 2008). The results of the 2008 survey indicated no significant change since the original NISS baseline survey.

Carlingford Lough Marine Conservation Zone (MCZ) lies north of the navigable channel in the inner part of the lough. MCZs are a term used by the UK to define areas that protect a range of nationally important, rare or threatened habitats and species. The Northern Ireland Department of the Environment carried out additional surveys of this MCZ using dropdown cameras and grab sampling in 2015 (DOE, 2015) which have also confirmed that the original baseline, within the MCZ, has remained largely unaltered.

Table 11-11 provides a summary of the habitats recorded during the NISS and Figure 11-10 shows the locations of all dive sites. This survey did not assign biotopes to the habitats surveyed as they predated the Marine Nature Conservation Review (MNCR) classification of biotopes (Connor *et al*, 2004). However, further work has been undertaken to develop the Northern Ireland Broadscale habitat map (Figure 11-10) has classified the habitats within Carlingford Lough according to the European Nature Information System (EUNIS) classification. This system can be directly correlated to the MNCR scale.

The broadscale mapping indicates that the inner reaches of Carlingford Lough, which includes Carlingford Lough MCZ, is dominated by the biotope SS.SMu.IFiMu.PhiVir: *Philine aperta* and *Virgularia mirabilis* in soft stable infralittoral mud (EUNIS code: A5.343). This area is bisected by a narrow section of the central scour channel characterised by the habitat complex SS.SSa Sublittoral sands and muddy sands (EUNIS code: A5.2). SS.SSa is also found throughout the shallower areas of the lough.

The remainder of the lough is characterised by a mosaic of the following biotopes

- CR.MCR.EcCr Echinoderms and crustose communities (EUNIS code: A4.21)
- SS.SMx.IMx Infralittoral mixed sediment (EUNIS code: A5.43)
- SS.SCS.CCS Circalittoral Coarse sediment (EUNIS code: A5.14)

It is important to note that the NISS records extensive areas of maërl approximately 550 meters northwest of Greenore Point. This area is not classified as maërl in the broadscale mapping. However, based on the available records, it is considered to be present at this location in mosaic with the other biotopes listed above.

RECEIVED: 18/10/2024

Table 11.11 Summary Results of the NISS (1982-1985)

ID	Location	Description	Depth (m)	Easting	Northing
1	S of Killowen Bank, Carlingford Lough.	Firm sand with isolated clumps of large mussels.	28-32	718825.782	814009.04
2	S of Killowen Bank, Carlingford Lough.	Fairly firm plain of fine sand with Mya and occasional clump of *Ascidiella aspersa.*	19-23	718825.783	814109.019
3	S of Killowen Bank, Carlingford Lough.	Sandy mud plain with abundant Ensis sp. and occasional *Arctica islandica*.	12 to 16	718925.761	814009.042
4	S of Killowen Bank, Carlingford Lough.	Sandy mud plain with abundant small *Virgularia* sp. & Burrowing brittle stars.	3 to 7	718925.762	814109.019
5	S of Killowen Bank, Carlingford Lough.	Fairly firm plain of fine sand with small ripples - *Virgularia* very common.	0 to 2	718925.763	814208.998
6	W of Vidal Rock, Carlingford Lough.	Plain of cobbles on gravel.	20-24	724524.555	810309.811
7	E of Green Is, Carlingford Lough.	Lower limit of pure sand 16m then cobbles and sand; much richer in species. Some boulders.	11 to 15	724524.559	810709.726
8	E of Green Is, Carlingford Lough.	Plain of firm fine muddy sand. Sparse algae. Many *Echinocardium*.	2 to 6	724624.539	810809.704
9	E of Green Is, Carlingford Lough.	Areas of boulders on sand plain.	0 to 2	724624.539	810809.704
10	Blockhouse Is, Carlingford Lough.	Boulders and cobbles with hydroids and sponges-strong tidal stream.	11 to 15	725724.302	810009.87
11	Blockhouse Is, Carlingford Lough.	Slope of fairly big boulders with cobble slope at 25m with ridge of boulders beyond this. Rich sponge communities.	20 to 24	725624.323	810009.871
12	N of Greenore Pt, Carlingford Lough.	Sand and cobbles with algal community	1 to 5	722125.071	811809.5
13	S of Carrigaroan, Carlingford Lough.	Sand and cobbles with algal community	0 to 3	721125.29	812909.267
14	SE Killowen Bank, Carlingford Lough.	Area of barren fine rippled sand - smooth firm sand with Ensis sp. Outcrop of bedrock-low lying & sand covered with *Polymastia mammilaris* & *Ciocalypta*.	3 to 7	719825.567	813409.167

RECEIVED: 18/10/2024

15	SE Killowen Bank, Carlingford Lough.	Sand plain of *Echinocardium* with *Ophiura albida* common. Little else. Extensive areas of *Zostera* also poor in other life.	0	719725.59	813709.102
16	W of Killowen Bank, Carlingford Lough.	Sandy mud plain with abundant Ensis sp. and occasional *Arctica islandica*.	8 to 12	718125.933	814508.936
17	W of Killowen Bank, Carlingford Lough.	Sandy mud plain with abundant small *Virgularia* sp. & Burrowing brittle stars.	1 to 5	717825.997	814608.917
18	W of Killowen Bank, Carlingford Lough.	Fairly firm plain of fine sand with Mya and occasional clump of *Ascidiella aspersa.*	11 to 15	718425.866	814109.021
19	NW of Killowen Bank, Carlingford Lough.	Fairly firm plain of fine sand with small ripples - *Virgularia* very common.	0 to 4	717826.001	815008.831
20	SE of Vidal Rock, Carlingford Lough.	Pebble/cobble bottom with hydroids. Dogfish very abundant. Also *Pholis* sp.	20 to 24	725024.45	810209.831
21	S of Vidal Rock, Carlingford Lough.	Plain with cobbles sparsely embedded in sand. Much dead and drift weed. Poor.	6 to 10	724824.489	809909.896
22	S of Vidal Rock, Carlingford Lough.	Pebble. Gravel bed with large plants of *L. saccharina* & *L. hyperborea*. A lot of red crusts and few animals.	0 to 4	724724.508	809709.939
23	S of Vidal Rock, Carlingford Lough.	Site similar to 6m one. Gravel / pebble bed with *Laminaria saccharina* & *L. hyperborea*, red algae & few animals.	0 to 1	724824.486	809609.96
24	N of Greenore Point, Carlingford Lough.	Extensive areas of maërl in muddy gravel and patchy kelp.	0 to 3	722125.069	811609.543
25	W of Buoy No 11a, Carlingford Lough.	Extensive low lying outcrop of bedrock in area of muddy gravel. *Ascidiella aspersa* & *Antedon* very common.	5 to 9	721425.222	812309.395
26	NW Carlingford Lough.	Flat mud plain with abundant *Virgularia* & *Philine* & little else.	0 to 1	715126.579	816308.563
27	NW Carlingford Lough.	Mud plain with *Virgularia* and *Philine*.	0 to 1	716326.317	815208.795
28	Rosstrevor Bay, Carlingford Lough.	Mud plains with *Virgularia* & *Philine* dominating.	0 to 3	716626.262	816108.6
29	Rosstrevor Bay, Carlingford Lough.	Mud plains with Philine. Occasional mucous egg sacs covered with *Stiliger*.	0 to 2	717526.076	816408.532
30	S of Green Island, Carlingford Lough.	Area of soft mud with 6" deep rotting seaweed-area of muddy sand in small mounds. Very poor.	18 to 22	723824.698	809909.899

RECEIVED: 18/10/2024

31	E of Greenore Point, Carlingford Lough.	Pebble & cobble plain with much shell debris. Many dead Ostrea shells. Bivalves & sediment abundant. Abundant *Hydrallmania* & *Alcyonidium*.	11 to 15	722724.935	810709.733
32	S Green Island, Carlingford Lough.	Flat bedrock covered with a layer of muddy silt. Huge patches of *Polymastia mammilaris.*	15-19	723724.723	810309.815
33	S Green Island, Carlingford Lough.	Flat bedrock covered with a layer of muddy silt. Huge patches of *Polymastia mammilaris.*	10 to 14	723724.724	810409.792
34	S Green Island, Carlingford Lough.	Areas of shallow sloping bedrock and flat cobbles with a little sediment.	1 to 5	723824.705	810709.728
35	S Green Island, Carlingford Lough.	Small boulders with dense cover of L. saccharina. Few animals but number of red and brown algae. Very silty.	0	723824.706	810809.706
36	E of Stalka Rock, Carlingford Lough.	Low lying outcrops uneven & fissured with firm sand.	0 to 4	722624.97	812209.412
37	W of Watson Rocks, Carlingford Lough.	Shell gravel plain with abundant shell debris and pebbles. Many infaunal bivalves: no samples. *Ascidiella aspersa* very abundant.	0 to 4	721225.259	811809.503
38	NW Buoy No 11a, Carlingford Lough.	Dunned loose gravel with sand in troughs. Small patches of *Ascidiella aspersa*.	6 to 10	720425.434	812609.335
39	NW Buoy No 11a, Carlingford Lough.	Flat sand with patches of hydroids.	3 to 7	720925.331	812809.29
40	NW Buoy No 11a, Carlingford Lough.	Sand and gravel with *Ascidiella aspersa*.	0 to 2	721225.271	813109.224
41	E of Greenore Point, Carlingford Lough.	Steep slope of small cobbles with pebble / gravel base.	3 to 7	722505.97	810831.85
42	E of Greenore Point, Carlingford Lough.	Steep slope cobbles with quite a few algae on them. Pebble gravel base.	0 to 2	722505.97	810831.85
43	W of Green Island, Carlingford Lough.	Gravel plains with *Ophiothrix* super abundant. Very occasional boulder where *Alcyonium* occasionally got a footing.	3 to 7	723324.811	810809.708
44	SW of Stalka Rock, Carlingford Lough.	Mixed bottom. Some maerl at start amongst bedrock and boulder ridges. Sandy mud patches with Artica.	1 to 5	722025.094	812009.457
45	S of Watson Rocks, Carlingford Lough.	Plain of shelly gravel on mud with occasional cobble. Large outcrop of rock with very steep sides and fissures.	2 to 6	721625.175	811709.523
46	W of Killowen Point, Carlingford Lough.	Mud plain with *Virgularia* and *Philine*.	0 to 2	717526.069	815608.703

47	S of New England Rock, Carlingford Lough.	Boulders and cobbles with hydroids and sponges-strong tidal stream.	19 to 23	725524.344	810009.871
48	N of Green Island, Carlingford Lough.	Pinhead squirt-channel between two rocks-bottom muddy gravel with much drift weed; then sand; then bedrock	3 to 7	724124.647	811209.62

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Figure 11.10 Locations of Dive Stations conducted during the NISS (1982-1985). Source: BioMar database.

RECEIVED: 18/10/2024

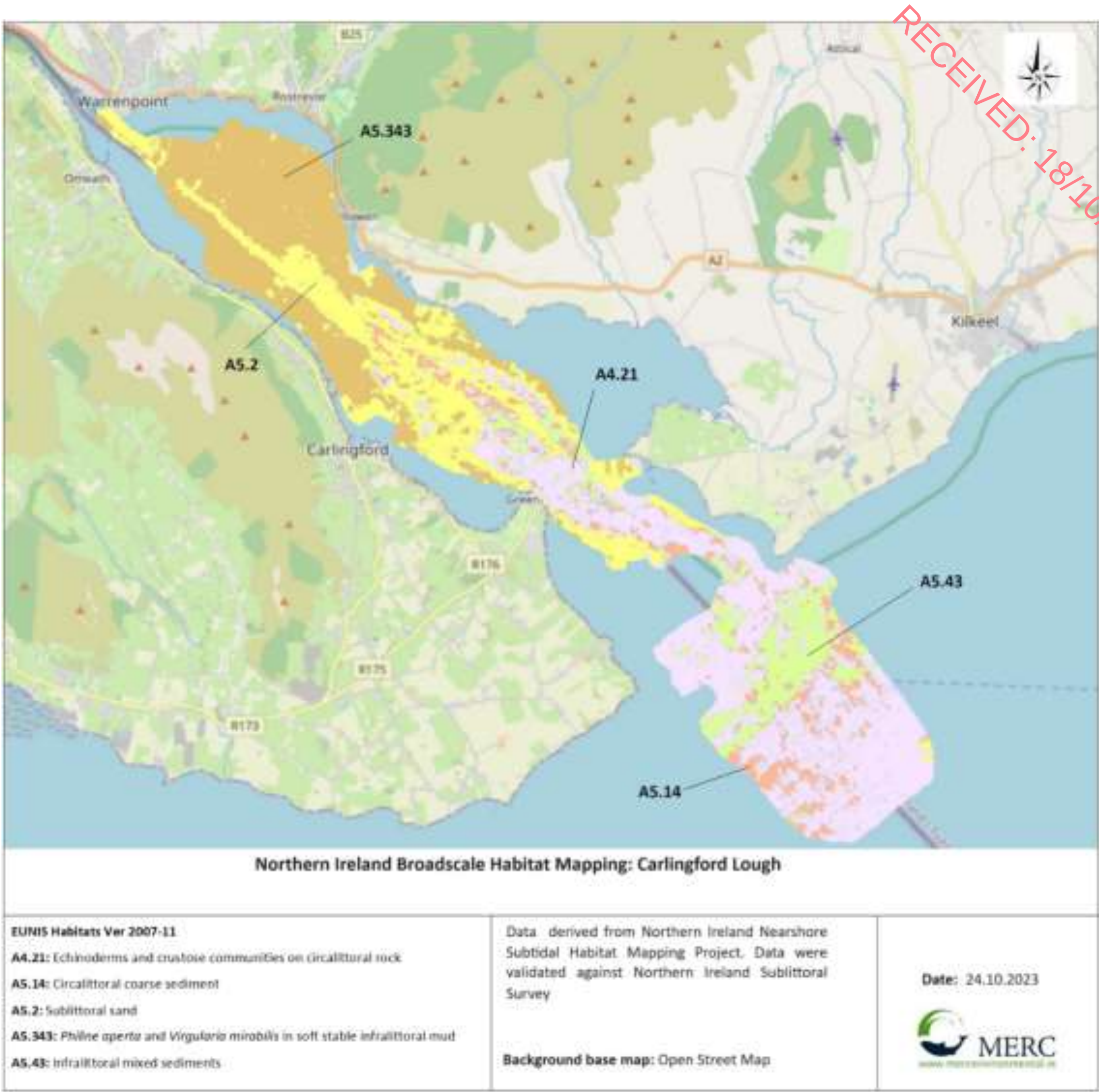


Figure 11.11 Northern Ireland Broadscale Habitat mapping of Carlingford Lough. Subtidal benthic ecology at the proposed development site

The data for the macrofaunal, particle size and organic carbon analysis of grab samples taken within the area of the development site is given in appendix 1 and described below.

A total of seven benthic grab samples were taken throughout the area between the breakwater and the existing quay, Figure 11.12.

A number of attempts to obtain samples failed due to the nature of the seabed. Generally, where failed attempts occurred, the ground was characterised by cobble or rock, also shown in Figure 11.12.

The seabed within the area between the breakwater and the quay is very uneven and appears to be comprised of pockets of deeper accumulations of mud in mosaic with areas of cobble and rock, while coarser sands appear to have accumulated in a pocket towards the southeastern end of the breakwater.

RECEIVED: 18/10/2024

Figure 11.12 Location of all benthic grab stations.

Sediments at stations 1 & 2 were defined as sandy gravel, with high percentages of gravel (>40% of particles over 2mm), coarse sands and a low amount of fine sands and silt/clays. Total organic carbon was correspondingly low. The faunal assemblages at these stations were very diverse, with a high number of taxa (>50 per 0.1m2) and high abundance of animals. The communities partially matched two EUNIS level 5 biotopes- SS.SMx.IMx.VcorAsquAps *Venerupis corrugata*, *Amphipholis squamata* and *Apseudes latreilli* in infralittoral mixed sediment and SS.SMx.IMx.MedCirr *Mediomastus fragilis* and cirratulids in infralittoral mixed sediment. The numerical dominance of the oligochaete *Tubificoides benedii* at station 2 showed the estuarine influence and higher organic carbon content at this station.

Stations 3-7 were less gravelly and contained finer sediments than those sampled at station 1 & 2. Fine, very fine sands and silt/clay comprised the majority of the sediments at these stations. Total organic carbon was, as expected, higher at these stations and a maximum of 8.41% was recorded at station 3. Communities were noticeably less diverse- stations 4 & 6 only contained one animal each and a maximum of 21 taxa was recorded at station 5. With so little data it is difficult to assign biotopes. These communities all have indications of an estuarine influence with the presence of estuarine taxa such as *Tubificoides* spp and *Tharyx robustus*. A lower EUNIS level based on the particle size analysis can be used to attempt to define biotopes for these stations. Stations 3, 4 and 7 could be defined as

SS.SMu.SMuVS Sublittoral mud in variable salinity (estuaries) and stations 5 & 6 as SS.SMx.SMxVS Sublittoral mixed sediment in variable salinity (estuaries)- both EUNIS level 4

RECEIVED: 18/10/2024

No unusual or rare taxa were recorded during this survey.

11.6.5.2 Intertidal habitats

The intertidal habitats described below were recorded during site walkovers carried out on the 16th and 31st of August 2023.

Large expanses of intertidal mudflats and sandflats are present along the northern and southern shores of Carlingford Lough. The majority of the intertidal area along the southern shore is licenced for aquaculture production with active use of these licenced areas. A section of the northern shore, between Greencastle and Killowen, is also in active oyster production.

To the west of the development area, the intertidal area is characterised by a relatively flat sand shore. Above the strandline, coarse sediments characterised by gravel, pebbles and broken shell dominate. Below the strandline, the sediment is characterised by sand with abundant worm casts in mosaic with areas of coarser mixed sediments, boulders and cobble in an undulating pattern. Extensive areas of *Zostera noltei* are present throughout this area Figure 11.12. Patches of Common cord grass (*Spartina angelica*), an Invasive Alien Species (AIS) are present throughout the intertidal area. Areas of intertidal reef dominated by fucoids and *Ascophyllum nodosum* also occur throughout this area.

The main characterising biotopes recorded in the intertidal area are:

- LS.LMp.LSgr.Znol: *Zostera noltei* beds in littoral muddy sand
- LS.LSa.MuSa: Polychaete / bivalve dominated muddy sand shores
- LR.LLR.F.Asc.FS: *Ascophyllum nodosum* on full salinity mid eulittoral rock

Tracks made to access the oyster trestles cross the intertidal flats and frequent littering associated with the aquaculture operation is obvious throughout the area.

Immediately east of Greenore point the intertidal is dominated by a narrow intertidal zone characterised by the biotope LS.LCS.Sh Shingle (pebble) and gravel shores. Further, south along the eastern side of the peninsula, the intertidal area widens out, again forming large sandflat areas dominated by aquaculture (oysters and clams).

RECEIVED: 18/10/2024

Figure 11.13 Intertidal habitats adjacent to Greenore Port.

RECEIVED: 18/10/2024

11.6.6 Designated Sites

The following Figure is extracted from the Carlingford Lough MPA Management Plan (November 2022) and identifies all the designated sites within Carlingford Lough.

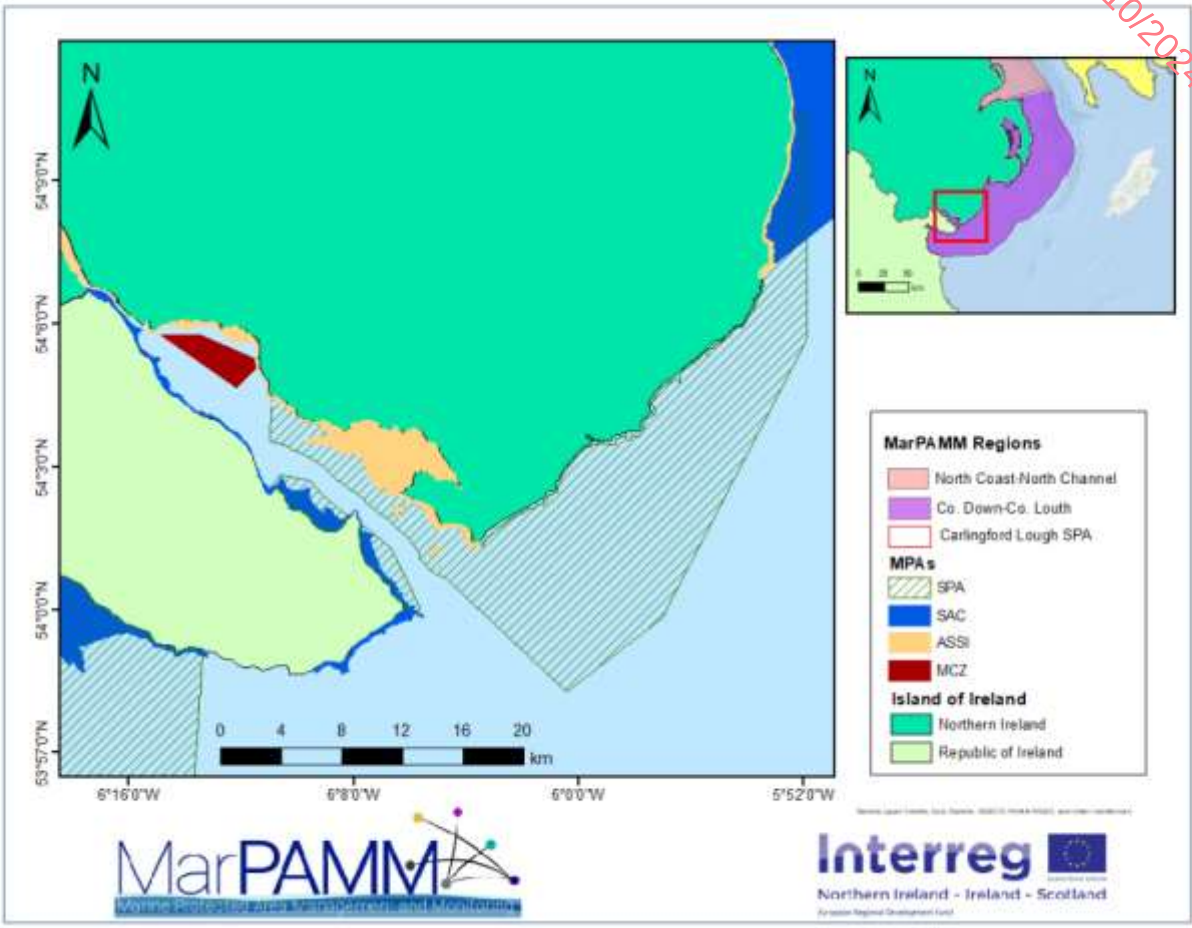


Figure 11.14 Carlingford Lough Designations

11.6.6.1 Relevant European Sites

The proposed development site is partially within Carlingford Shore SAC (Site code: 002306) and Carlingford Lough SPA (Site code: 004078). For reference purposes, and to put the project in the context of other European Sites, SACs and SPAs along the east coast of Ireland, within 50km of the proposed development site are shown in Figure 11-14 and given in Table 11-12. It is acknowledged that the foraging range for waterbirds and marine mammals may cover a far greater range and are discussed in the Supporting Information for Screening for Appropriate Assessment (SISAA) prepared for this project.

RECEIVED: 18/10/2024

Figure 11.15 European sites within a 50Km radius

Site name	Site code	Distance from proposed development site (km)
Carlingford Shore SAC	002306	Partially within development site
Dundalk Bay SAC	000455	13 (hydrologically)
Carlingford Mountain SAC	000453	4 (as the crow flies)
Clogher Head SAC	001459	28 (hydrologically)
Boyne Coast and Estuary SAC	001957	33 (hydrologically)
River Boyne And River Blackwater SAC	002299	41 (hydrologically)
Rockabill to Dalkey Island SAC	003000	48 (hydrologically)
Carlingford Lough SPA	004078	Partially within development site
Dundalk Bay SPA	004026	8 (as the crow flies)
North-West Irish Sea SPA	004236	20 (as the crow flies)
Boyne Estuary SPA	004080	33 (as the crow flies)
River Nanny Estuary and Shore SPA	004158	39 (as the crow flies)
Rockabill SPA	004014	45 (as the crow flies)
Skerries Islands SPA	004122	49 (as the crow flies)

Table 11.12 European sites within a 50km radius

An SISAA and Natura Impact Statement (NIS) have been submitted with the planning application. The NIS concludes as follows,

"This assessment is based on complete, precise and definitive findings in the light of the best scientific knowledge. It objectively concludes that, provided the mitigation measures described in this document are fully implemented, ***no adverse effect will occur on the integrity*** *of any European site."*

11.6.6.2 Natural Heritage Areas

RECEIVED: 18/10/2024

The basic designation for wildlife is the Natural Heritage Area (NHA).

Proposed NHAs (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. These sites are significant for wildlife and habitats.

Prior to statutory designation, pNHAs are subject to limited protection, including recognition of their ecological value by Planning and Licensing Authorities.

Within a 15km radius of the proposed development site, the following pNHAs occur:

- Carlingford Lough pNHA (Site Code 000452)
- Carlingford Mountain pNHA (Site Code 000453)
- Dundalk Bay pNHA (Site Code 000455)

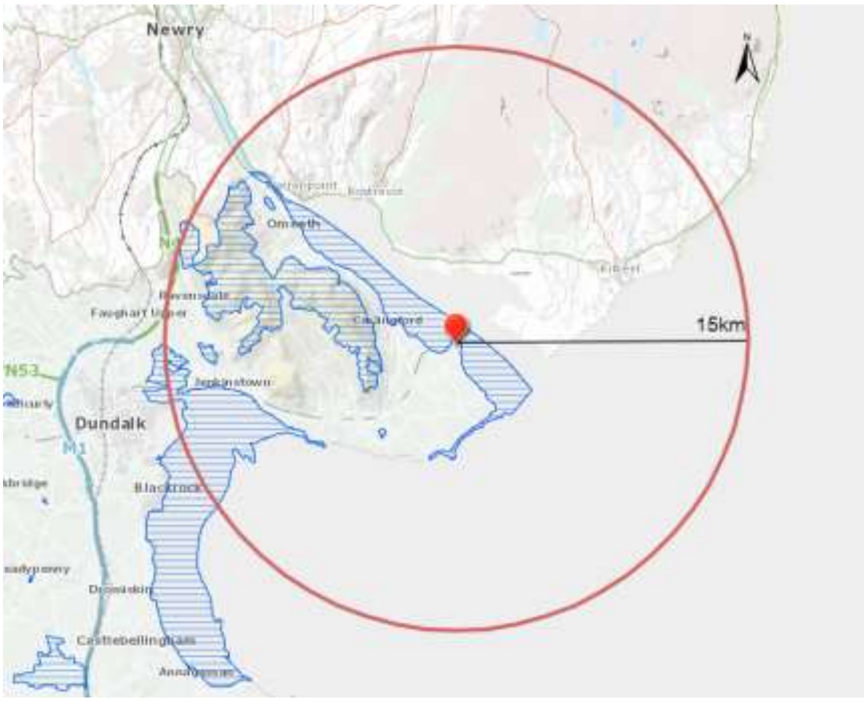


Figure 11.16 Proposed Natural Heritage Areas

11.6.6.3 Other Designated Conservation Areas

Ramsar Sites

Dundalk Bay Ramsar Site (Site code: 834) encompasses 4,768 hectares and lies to the south of the proposed development site. It is coincident with the boundary of Dundalk Bay SPA.

According to the Ramsar Information Sheet for Dundalk Bay,

"The boundary of Dundalk Bay Ramsar site was delineated as the same boundary as the original Special Protection Area in 1994 (but the latter was subsequently enlarged). The Ramsar site occupies the small estuarine inlet at Ballymascanlan and the extensive intertidal habitats of the wider Dundalk Bay. The boundary of the SAC includes all of the Ramsar site but also includes the estuarine waters of Dundalk Harbour and the subtidal waters (dredged channel) connecting Dundalk Harbour to the open waters of the Bay. Both the Ramsar site and the SAC lie within the larger area of Dundalk Bay SPA. The SPA

also includes some additional saltmarsh habitat and an extensive area of open water habitat extending from Riverstown in the North (just east of Giles Quay) to Dunany Point in the South.

RECEIVED: 18/10/2024

The site is of international importance as the extensive intertidal habitats within the site support significant populations of over wintering waterbirds. The site is one of the most important sites for wintering waterbirds in Ireland. The site provides good quality habitat for the feeding and roosting requirements of the various bird species which winter here making it a significant wetland for maintaining the biological diversity of the Atlantic biogeographic region. The site also supports significant stands of Eel grass (Zostera noltii), a species known to be declining internationally, which is important to maintain the biological diversity within the Atlantic biogeographic region. The diversity of interconnected wetland habitats (intertidal mud and sand flats, estuarine waters, intertidal marshes and sand, shingle shores) within the site make it a significant site for the maintenance of regional biodiversity.

WeBS data (from the period 2006/07 to 2015/16) lists internationally important populations of Light-bellied Brent Goose (Branta bernicla hrota), Knot (Calidris canutus), Black-tailed Godwit (Limosa limosa) and Bar-tailed Godwit (Limosa lapponica), The Light-bellied Brent Goose is Vulnerable as several important European populations have declined (Birdwatch Ireland). Knot is Near Threatened on a global scale (IUCN) as subpopulations have experienced population declines; the European population is Least Concern. The Black-tailed Godwit is Vulnerable within Europe and Near Threatened globally; it has undergone rapid declines in Europe and in parts of its global range owing to changes in agricultural practices. The Bar-tailed Godwit's European population is stable but declining globally and is Near threatened. I-WeBS data (same period) also lists nationally important populations of Greylag Goose (Anser anser), Shelduck (Tadorna tadorna), Teal (Anas crecca), Mallard (Anas platyrhynchos), Pintail (Anas acuta), Common Scoter (Melanitta nigra), Little Egret (Egretta garzetta), Oystercatcher (Haematopus ostralegus), Ringed Plover (Charadrius hiaticula), Golden Plover (Pluvialis apricaria), Dunlin (Calidris alpina), Northern Lapwing (Vanellus vanellus), Curlew (Numenius arquata), Redshank (Tringa totanus), Cormorant (Phalacrocorax carbo) and Turnstone (Arenaria interpres). The EU population status for the Pintail is Threatened (EUNIS). Red breasted Merganser has undergone moderately rapid declines in Europe and is Near threatened (IUCN). The Oystercatcher, is undergoing rapid population declines across the European part of its global range and its overall global population trend is decreasing, it listed as Vulnerable in Europe and as Near Threatened globally (IUCN).

RECEIVED: 18/10/2024

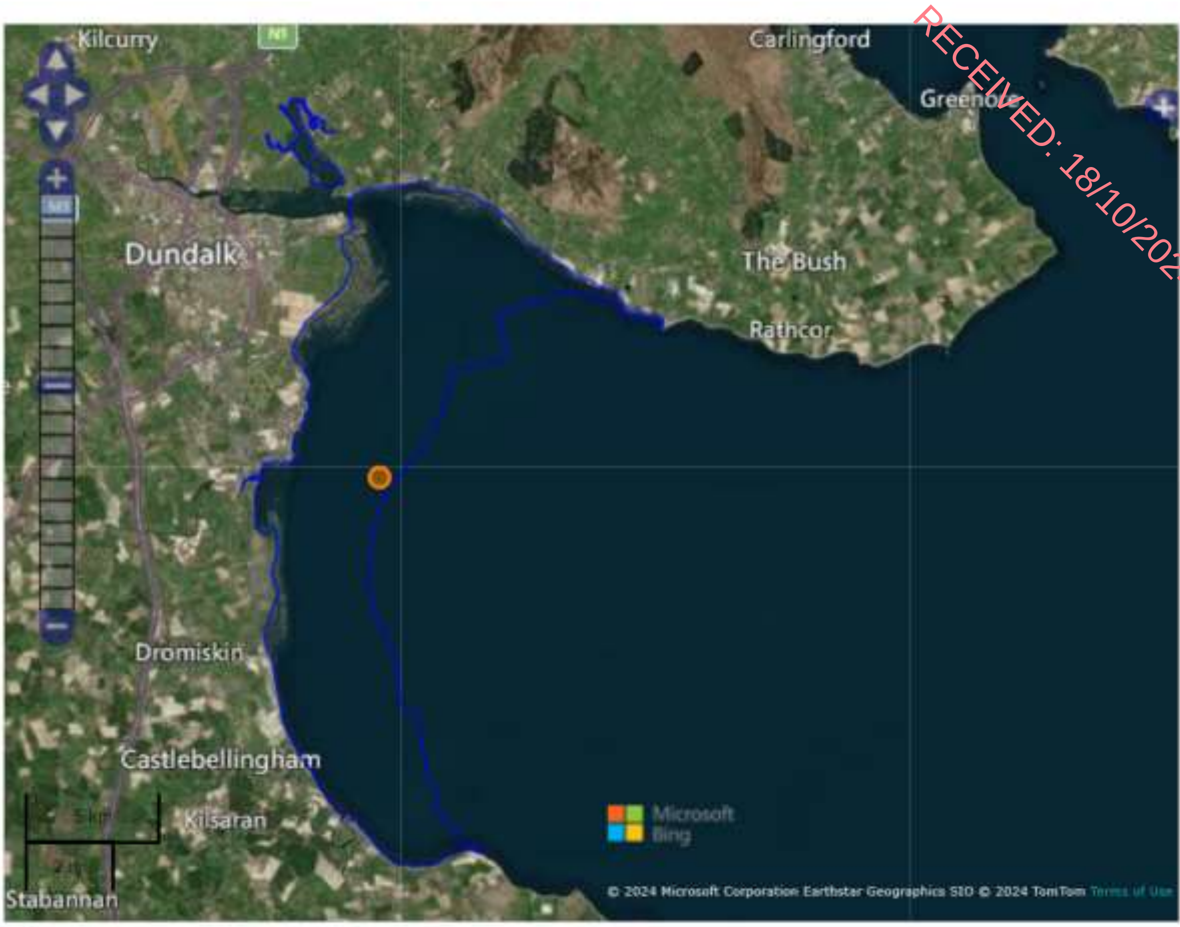


Figure 11.17 Dundalk Bay Ramsar Site

Carlingford Lough Marine Conservation Zone (MCZ)

The OSPAR convention considers Marine Protection Areas (MPAs) as sites for which conservation measures have been created, making use of protective, restorative, and precautionary governance to protect and conserve species, habitats, ecosystems, or ecological processes in the marine environment (OSPAR, 1998). The OSPAR commission provides a mechanism through collaborative governance with EU and non-EU members to protect the marine environment of the North-East Atlantic, encompassing a wide array of marine issues from work on pollution and dumping at sea to the conservation of marine biodiversity (OSPAR, 2016).

Northern Ireland's commitment to the objectives of the OSPAR commission is through marine conservation work undertaken by DAERA within SACs and Marine Conservation Zones (MCZs) (DAERA, 2021). NI has committed to developing and maintaining a network of well managed MPAs through the application of management plans to help steer activity use approaches within the area.

The Carlingford Lough MCZ lies north of the navigable channel in the inner part of the lough and within Northern Ireland.

According to the Dept of Agriculture, Environment and Rural Affairs (DAERA).

> *"The MCZ has been designated as it supports the habitat Philine quadripartita (white lobe shell) and Virgularia mirabilis (sea-pen) in soft stable infralittoral mud. This habitat is only present in*

Carlingford Lough; individual records of P. quadripartita and V. mirabilis occur throughout Northern Ireland. P. quadripartita and V. mirabilis occur in high densities within the MCZ and this habitat is thought to be a temporal variant of other sublittoral cohesive mud and sandy mud communities."

RECEIVED: 18/10/2024

The protected features and conservation objectives are as follows:

Protected Features	Conservation Objectives
Habitats: • Subtidal (sublittoral) mud: ➢ *Philine aperta* and *Virgularia mirabilis* in soft stable infralittoral mud	**Maintain in Favourable Condition**

"Favourable condition", in relation to marine habitats or geological features, means that the habitat's or geological features' extent is stable or increasing and its structures, functions, quality and the composition of its characteristic biological communities (including diversity and abundance) are such that it remains in a healthy condition, which is not deteriorating.

"Favourable condition", in relation to marine species, means that the quality and quantity of the species, habitat, and the composition of its population in terms of number, age, and sex ratio ensures that the population is maintained in numbers that enable it to thrive. For the purposes of determining whether a protected feature is in favourable condition, any temporary deterioration in condition or reduction in numbers shall be disregarded if the habitat or population is sufficiently healthy, thriving and resilient to enable its recovery.

RECEIVED: 18/10/2024

11.6.6.4 Designated Sites in Northern Ireland

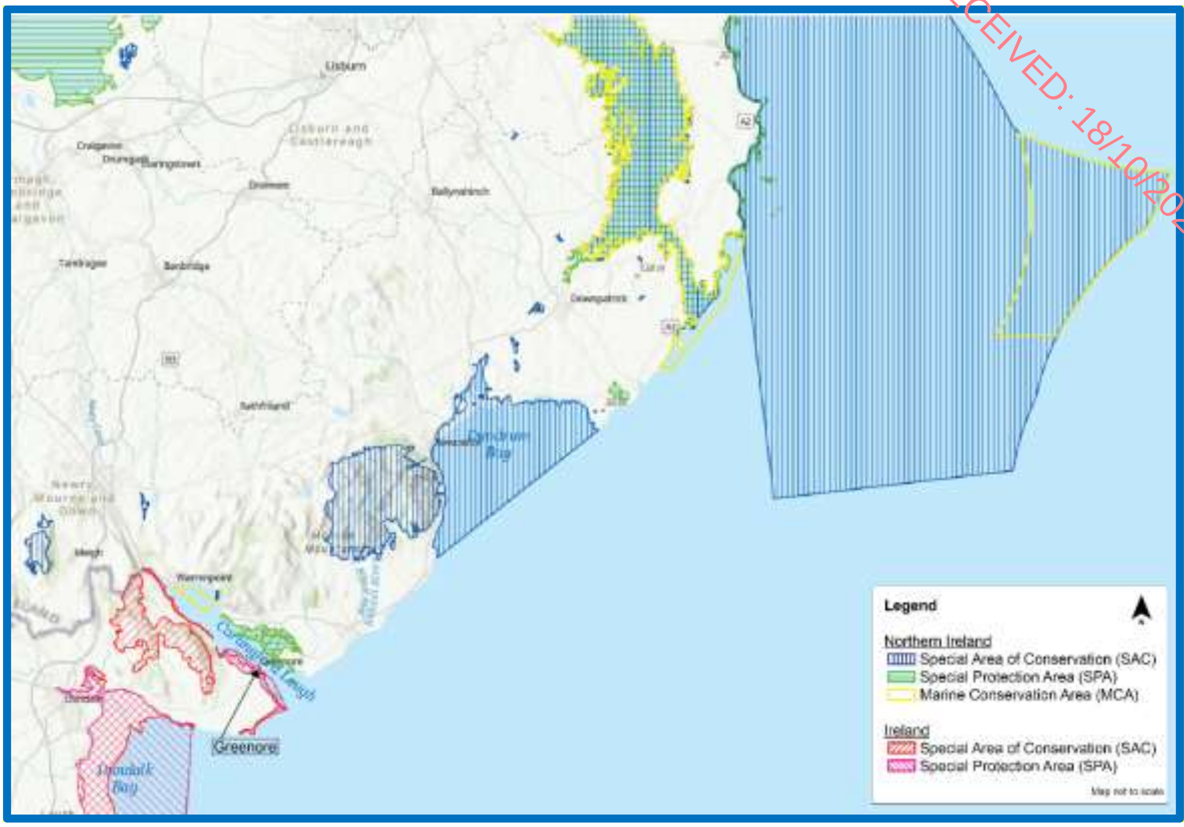


Figure 11.18 Designated Sites in Northern Ireland

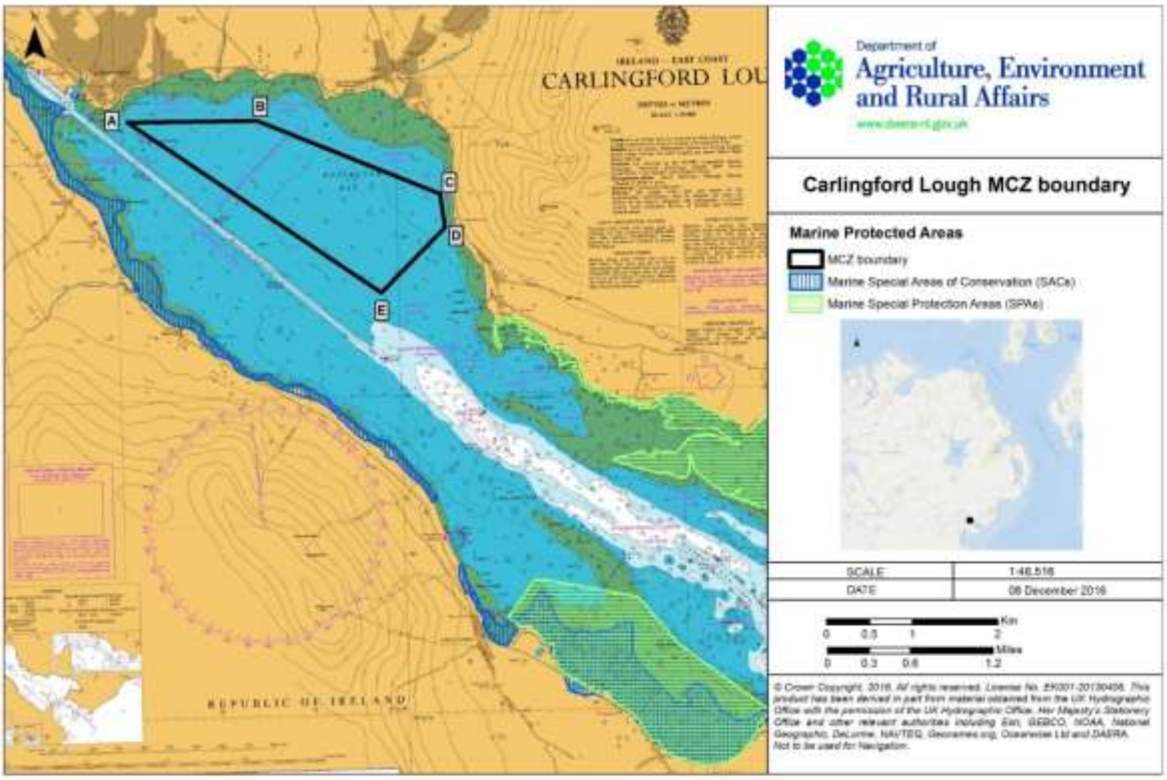


Figure 11.19 Carlingford Lough MCZ

RECEIVED: 18/10/2024

The Carlingford Lough MPA management plan has been designed to be used as a tool that both statutory and local authorities can use to ensure requirements established through the UK Marine Strategy, Marine Strategy Frameworks Directive and OSPAR agreements are fulfilled in future development decisions.

The management plan uses an approach based on an ecosystem management system by Sardá et al., (2017) defined "*As the conservation of the species, habitat or ecosystem structure and functioning to maintain long-term and resilient ecosystem services.*"

The Plan sets out Strategic Guidance, and No. 5 relates to Marine Infrastructure, Ports and Harbours. It states,

"Within Carlingford lough there are two important port assets with Warrenpoint and Greenore, these ports tend to manage their activities in such a way that they contribute positively to the environment status of marine areas. This requirement was derived from the Marine Strategy Framework's Directive and is currently applicable to the RoI to 1 nautical mile for water quality but also includes issues such as litter and noise. Through the UK's withdrawal from the EU, this is covered in NI through the UK Marine Strategy. The purpose of this approach is to achieve good ecological status. This legislation provides the basis for development, managing waste and water pollution.

It continues to state,

"Infrastructure, ports, and harbour developments should operate within appropriate departmental guidance which states that no significant adverse effects, directly or cumulatively on the seabed, designated features, species, wider biodiversity interests or environmental carrying capacity must occur."

Strategic Guidance 6 relates to Dredging and the Plan states,

"Although navigational dredging occurs, there is no overlap between the channel dredging and the MCZ. However, the proximity of Warrenpoint harbour may pose a risk if dredging activity occurs within or adjacent to the MCZ boundary. This risk has the potential to impact the northwest area of the MCZ through "re-suspension and smothering", caused by direct habitat/species destruction through habitat removal or by the disposal of dredged materials (smothering/siltation) onto vulnerable habitat features/species (DAERA, 2016). This risk is currently perceived as low, but the opening of new dredged disposal sites may change this."

Notably, Greenore Port does not engage in capital dredging as it is a self-scouring port; this combined with the distance to the MCZ means that the one-off dredge proposed to facilitate the installation of the proposed Berth 3 and the pontoon means there is no likely impact on the Carlingford Lough MCZ.

11.6.6.4.1 Marine Mammals

In Northern Ireland two ASSI (formerly SACs) for marine mammals (Murrough and North Channel) occur within the 50km ZoI and one (Strangford Lough) just outside. Murrough and Strangford Lough list common seal as a feature of interest and whose conservation objectives include ensuring disturbance does not lead to significant impacts. The feature of interest for North Channel is harbour porpoise whose conservation objectives include minimising disturbance which could lead to behavioural change.

RECEIVED: 18/10/2024

11.6.6.4.2 Avifauna

Carlingford Lough ASSI

Carlingford lough ASSI is designated for Wintering Waterbirds and Breeding terns.

Carlingford Lough ASSI is a wintering site for large numbers of migratory waterbirds. It supports internationally important populations of Light-bellied Brent Goose together with numbers of Great Crested Grebe, Shelduck, Scaup, Red-breasted Merganser, Oystercatcher, Dunlin and Redshank that are significant in an all-Ireland context.

Carlingford Lough supports internationally important numbers of breeding Common, Arctic and Sandwich Terns. These migratory seabirds are present between April and September and feed on fish in inshore waters. Breeding terns are highly susceptible to disturbance and predation and consequently often choose to nest on islands or isolated man-made structures surrounded by water. They are particularly attracted to areas of shingle or broken shells. Environment and Heritage Service would encourage the maintenance or enhancement of habitat or structures used for nesting by terns.

Carlingford Lough Ramsar Site

The Ramsar site designation states: "The site qualifies under Criterion 3c for supporting internationally important breeding populations of sandwich tern. The site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species. It also is known to support a nationally important breeding populations of common, roseate and Arctic terns."

Strangford Lough ASSI

In terms of birds, Strangford Lough ASSI (part 2 – the lower lough) is designated for three species of tern which breed on a number of islands in the area. The principal colonies are on Jackdaw Island, and to a lesser extent on Swan Island and Dunnyneill Island. A small number of Arctic terns have been recorded, while numbers of common tern and sandwich tern are greater.

11.7 The 'Do Nothing' Scenario

There are two extant planning permissions at Greenore Port for the extension and modification of an existing warehouse (LCC Planning Ref 20268/ABP Ref 307862) and the construction of new warehouses (LCC Planning Ref 20543/ABP Ref 310184). As these are valid permissions, the respective developments represent the most likely evolution of the site under the 'Do Nothing' Scenario.

During the processing of the applications, An Bord Pleanála screened both developments for Appropriate Assessment, the conclusions are set out hereunder.

PL15.307862: Extension and modifications to the existing former Open Hydro warehouse.
The Board determined that,

Having regard to the limited scale of the proposed development and its conformity with the established use of the port lands at Greenore, and to the provisions of the Louth County Development Plan 2021-2027 including policy objective EE 27 to facilitate the operation of ports including Greenore, it is considered that, subject to compliance with the conditions set out below, the proposed development would not seriously injure the amenities of property in the vicinity of the site or the natural or built heritage of the area and would be acceptable in terms of the traffic safety and convenience. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Appropriate Assessment Screening

The Board considered that the proposed development would not have the potential to have any significant direct effect on any Natura 2000 site, nor would it be likely to have any significant indirect effect on the Carlingford Shore Special Area of Conservation (Site code: 002306) or Carlingford Lough Special Protection Area (Site code: 004078) through interference with ex situ habitats, disturbance to species within the Natura 2000 site, the release of dust or pollutants to air, downstream impact on water quality, or any other pathway. This conclusion is consistent with the conclusions of the Appropriate Assessment screening report submitted by the applicant. No scientific evidence was submitted by any party in the course of the application or appeal that would support an alternative conclusion as to the likelihood of significant effects on the Natura 2000 sites. There is no potential effect that the proposed development could have on the Natura 2000 sites that could be rendered a likely significant effect by a cumulation of an impact from another plan or project, including the concurrent proposal which is before the Board under An Bord Pleanála reference number ABP-310184-21.

The Board, therefore, concluded, on the basis of the submissions made in connection with the application and appeals which are considered adequate

to allow a screening exercise to be completed, that the proposed development, by virtue of its nature, limited scale and location within the existing area of Greenore Port, would not be likely to have a significant effect on the Carllingford Shore Special Area of Conservation (Site code: 002306) or Carlingford Lough Special Protection Area (Site code: 004078) or any other Natura 2000 site, either by itself or in combination with any other plan or project, and that a Stage 2 Appropriate Assessment (and submission of a Natura impact statement) is not, therefore, required.

PL15.310184: Demolition of existing structures and construction of two new stores and an ESB substation

In making their decision to Grant Permission, the Board concluded that,

RECEIVED: 18/10/2024

Having regard to the limited scale of the proposed development and its conformity with the established use of the port lands at Greenore, and to the provisions of the Louth County Development Plan 2021-2027 including policy objectives EE 26 and EE 27 to facilitate the operation of ports including Greenore, it is considered that, subject to compliance with the conditions set out below, the proposed development would not seriously injure the amenities of property in the vicinity of the site or the natural or built heritage of the area and would be acceptable in terms of the safety and convenience of road users. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

The Inspector's Report includes screening for AA and concludes,

"Having regard to the F.I submitted and the nature and scale of the proposed development and considering that the warehouses are for dry storage cargo goods, within the existing port site, the Planning Authority concluded that no AA issues arise in this case. Therefore, they considered that the proposed development either individually or in combination with other plans or projects would not result in significant effects on the identified designated sites. ABP-310184-21 Inspector's Report Page 65 of 70 7.12.11. It is therefore concluded on the basis on the information submitted in connection with the application and appeals, which is adequate to allow a screening exercise to be completed, that the proposed development, by virtue of its nature, limited scale and location within the existing area of Greenore Port, would not be likely to have a significant effect on the Special Protection Area 004708, the Special Area of Conservation 002306 or any other Natura 2000 site, either in itself or in combination with any other plan or project and so a Stage 2 appropriate assessment and the submission of the Natura Impact Statement is not required."

11.7.1 Short-term (up to Dec 2025)

Each of the extant permissions has a 5-year life-term that expire December 2026 and January 2027 respectively. The programme for modifications and new build is approx. 12 months.

In the absence of development up to 2025, the following is anticipated.

The **'Terrestrial Port Area'** includes a port commodity warehouse (former Open Hydro building), hardstanding areas, a remnant wall associated with the pre-existing 'engine room', and a communications mast. Given the predominantly hardstanding nature of this area and the limited opportunity for flora to establish, no change to the existing baseline is predicted. Fauna would likely remain as described in the baseline.

The **'Nearshore Environment'** encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.

The baseline data indicates the natural benthic environment surrounding Greenore Port, has been largely altered over the years as a result of the construction of the port itself and the development of an intensive aquaculture industry in the surrounding area. It is considered that, even without the proposed development, the benthic baseline would be highly unlikely to change or improve as the current infrastructure and licensed activities will remain active in the short and medium to long term.

Marine mammals in the area, especially seals are accommodated to current levels of activity at the port and so there would be no change anticipated.

RECEIVED: 18/10/2024

The **'Residential Site'** a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road. The garden surrounding the vacant house may change from amenity grassland to recolonising bare ground (ED3) category whereby the area may be invaded by herbaceous plants, typical colonisers are ruderals or weed plants. In urban areas, recolonising bare ground can be important for wildlife and may support a diverse flora. However, the importance would be negligible in this environment where there is an abundance of high-quality habitat in the wider area.

The **'Port Office Entrance'** encompasses a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space that front Euston Street. The biodiversity value of this location would likely remain consistent with the baseline.

11.7.2 Medium Term (Post 2027)

Following the implementation of the extant permission, the following is anticipated to occur within each of the four-character areas.

The **'Terrestrial Port Area'** the existing hardstanding and built environment will be replaced with a similar built environment and it is not anticipated that the redevelopment would result in an appreciable change to the existing flora and fauna baseline.

The **'Nearshore Environment'** implementation of the extant permissions would not change the ecological environment as development is not proposed at this location. Therefore, it is likely that the biodiversity of this area would remain as per the existing baseline. The development of the additional warehousing would not increase the port's throughput, and so there would be no change to disturbance levels above those already in existence and to which marine mammals in the area, especially seals, are habituated. Over time, the breakwater is likely to degrade and, without remediation, partially collapse, negatively impacting the area's roosting and nesting bird population.

The **'Residential Site'** 's biodiversity value is not anticipated to change over and above that described in the short-term scenario as the extant permissions do not relate to this portion of the proposed development site.

The **'Port Office Entrance'**. This location's biodiversity value would likely remain consistent with the baseline as the extant permissions do not relate to this portion of the proposed development site.

11.7.3 Designated European Sites

RECEIVED: 18/10/2024

As set out under Section 11.7, An Bord Pleanála in determining the two extant permissions, concluded that the proposed developments by virtue of their nature, limited scale and location within an existing port area, would not be likely to have a significant effect on the Carlingford Shore SAC or Carlingford Lough SPA or any other Natura 2000 site, either alone or in combination with other plans or projects.

11.8 Potential Significant Effects (Demolition and Construction Phases)

It is noted that a decommissioning phase is not anticipated for the proposed development. The infrastructure is being developed to service offshore wind farms. When those wind farms near the end of their design life (anticipated at least approx. 25 years), they may be 'repowered', i.e. subject to a further grant of planning permission, turbines and associated technology will be replaced (partially or totally) with more powerful and efficient models using the latest technology. The proposed O&M facility will, therefore, continue to be required. In the unlikely event that all relevant offshore wind farms are fully decommissioned, the O&M infrastructure (pontoons and warehouses) can be used as part of the existing port operations, subject to obtaining any necessary further consents. Potential significant effects from decommissioning will, therefore, not occur, and this assessment excludes consideration of decommissioning.

11.8.1 Terrestrial Habitat

The ecological condition of the proposed development area, which will be impacted by the demolition works, is of negligible biodiversity value. Therefore, the proposed demolitions would not have the potential to impact terrestrial habitats.

The terrestrial development area has been subject to significant human modifications over the last 150 years. Therefore, and due to the site's already limited biodiversity value, it is considered highly unlikely that further modifications would impact terrestrial habitats.

Refer to Appendix 11.1.

11.8.2 Terrestrial Mammals

The proposed development site's habitats are of limited value for fauna as evidenced by the baseline surveys.

No signs of otter were identified within the proposed works' footprint. Holts and couches may become established prior to the commencement of construction. Should this occur, then loss of holts and associated injuries to otter therein may occur. As such, the potential for impact is assessed on a precautionary basis.

No signs of badger were identified within the footprint of the proposed works. Setts may become established prior to the commencement of construction. Should this occur, then loss of setts, and associated injuries to badger therein may occur. As such, the potential for impact is assessed on a precautionary basis.

The principal construction impact on terrestrial mammals is the loss of habitat at the Residential Site, which provides limited foraging for common species. These species normally move away from disturbance, and mortality during construction is not expected or will not be substantial.

RECEIVED: 18/10/2024

Refer to Appendix 11.5.

11.8.3 Bats

Having regard to the survey findings, neither the demolition or construction phases are likely to impact bats and therefore there is no likely significant effect. Refer to Appendix 11.6.

11.8.4 Marine Mammals

Following a review of the proposed project and associated scope of work, a range of potential project-related pressures with the potential to act on marine mammals were identified at the demolition, and construction phases of the project, these are detailed in Table 11-13. The ZoI over which the pressures identified above might impact the receiving environment was examined to determine the range over which each impact might exert a pressure. These ranges are also provided in Table 11-13.

The ZoI is not restricted to the immediate proposed development site but includes an extended area in line with the National Parks and Wildlife Service (NPWS) publication *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (2014).

Construction activities will involve underwater noise/vibration disturbance during the construction period. Marine mammals are vulnerable to impacts from increased noise levels, and their sensitivity to different frequencies depends on the species. Seals are the marine mammals most likely to be exposed to construction activities, as cetaceans only rarely occur within Carlingford Lough.

Direct impacts on marine mammals may occur during piling (Berth 3 and Pontoon) and dredging. Potential direct impacts from piling may arise if seals are very close to the quay and pontoon during start-up. Potential direct impacts from dredging may arise if seals are very close to the dredging site during start-up or (and to a lesser extent porpoise or dolphins).

Noise exposure levels during piling and dredging were quantified in Dublin Port during the ABR project. While this is a different area, using larger piles and where attenuation by the bedrock and overlying sediments will be different to that at Greenore, it provides some guidance. Noise measurements took place while H-section piles with a cross-sectional area of 333 cm^2 were being driven to depths of 35m. Peak sound energy occurred at below 1 kHz but there was substantial energy up to 10 kHz, with high frequencies rapidly attenuated (RPS 2016). The hearing range of harbour and grey seals extends over wide frequencies, including the ultrasonic spectrum. The area of best hearing is between 8 and 25 kHz, with acute hearing also at lower frequencies (Terhune and Turnbull 1995), which is above the peak sound energy generated, which was below 1 kHz. Todd *et al*. (2015) reviewed the impacts of dredging on marine mammals and suggested a back-calculated source level of 163 dB re 1 mPa at 1 metre (bandwidth ¼ 20 Hz–100 kHz) for a backhoe dredging operation off the Shetlands of 179 dB re 1 mPa at 1 metre (bandwidth ¼ 3 Hz – 20 kHz). Despite these elevated levels, they are mainly low frequency and below the peak frequency for echolocation and would attenuate quickly.

The study concluded that noise levels attenuated rapidly so that at 500m, they were at background noise levels. Noise levels generated during dredging and disposal operations in Dublin Port (RPS 2016) showed that at ranges of 213m and 268m, noise levels were below the disturbance threshold for seals at 160 dB re 1 µPa (from Southall *et al.* 2021).

RECEIVED: 18/10/2024

Table 11.13 Potential Demolition and Construction Phase Impacts on Marine Mammals

Activity	Potential impact	ZoI
Construction phase		
Dredging	Disturbance	Short-term disturbance of normal activities at dredging site.
	Displacement	Short-term displacement from dredging site.
	Increased foraging opportunities	Possible increase in foraging opportunities at dredging site.
Installation of Berth 3	Permanent threshold shift	Direct impact extending to a max. 1000m from the piling area[4].
	Temporary threshold shift	Direct impact extending to a max. 1000m from the piling area[5].
	Displacement	Direct impact extending to 250m.[6]
	Disturbance	Direct impact extending to 250m[7]
Installation of new pontoon and associated infrastructure	Permanent threshold shift	Direct impact extending 1000m from piling area[8]
	Temporary threshold shift	Direct impact extending to 1000m[9]
	Displacement	Direct impact extending to 250m.[10]
	Disturbance	Direct impact extending to 250m[11]
Landside development of new port facilities	Pollution: Accidental spillage of hydrocarbons or cementitious material (land side)	Area of impact out to 5km.

[4] Mitigation zone established by the NPWS (2014) Guidelines, but in reality, the PTS zone is significantly less (10s of metres - author's professional opinion based on experience)

[5] Mitigation zone established by the NPWS (2014) Guidelines but in reality, the TTS zone is significantly less (<100 metres author's professional opinion based on experience)

[6] Mitigation zone established by the NPWS (2014) Guidelines , but in reality, the TTS zone is significantly less < than 250 metres. The author's professional opinion is based on experience.

[7] Mitigation zone established by the NPWS (2014) Guidelines , but in reality, the TTS zone is significantly less < than 250 metres. The author's professional opinion is based on experience.

[8] Mitigation zone established by the NPWS (2014) Guidelines, but in reality, the PTS zone is significantly less (10s of metres author's professional opinion based on experience.

[9] Mitigation zone established by the NPWS (2014) Guidelines but in reality, TTS zone is significantly less <100 metres author's professional opinion based on experience.

[10] Mitigation zone established by the NPWS (2014) Guidelines but in reality, TTS zone is much, much smaller <250 metres author's professional opinion based on experience.

[11] Mitigation zone established by the NPWS (2014) Guidelines but in reality, TTS zone is much, much smaller <250 metres author's professional opinion based on experience.

11.8.5 Avifauna

RECEIVED: 18/10/2024

The proposed development will take place over two phases as set out in the development description and each is assessed separately below without mitigation Appendix 11.2 Annex 1 details the assessment criteria and Appendix 11.2 Annex 2 for the conservation status of each relevant species.

11.8.5.1Demolition of former 'Open Hydro' Building

The demolition of the building will cause visual and noise/vibration disturbance. It is possible that this may cause some disturbance to birds on the breakwater and in the intertidal area but given the tolerance of roosting birds 100-metre distance from noisy operations in the port area when discharging vessels, this is considered unlikely. Birds roosting in the caisson area (grey heron) would likely move to the breakwater when disturbed and this is reasonably not considered to be a likely significant effect on the SPA.

The demolition works will generate dust, which may be blown over the designated sites, Carlingford Shore SAC and Carlingford Lough SPA, particularly on windy days. The Air Quality assessment prepared for the proposed development and included in the EIAR identifies the risk as follows and proposes mitigation to reduce this to no likely significant residual effect.

Table 11.14 Dust Emission Risk

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling Risk	Low Risk	Medium Risk	High Risk	Low Risk
Human Health Risk	Negligible	Low Risk	Low Risk	Negligible
Ecological Risk	Low Risk	Medium Risk	Medium Risk	Low Risk

Water contaminated with demolition dust could enter the designated sites, for example where it is used for damping dust, or in the case of a significant deluge. This material may enter the SPA where it may be ingested by birds as grit or adventitiously when consuming vegetation (eg Zostera sp) producing a potential knock-on effect. The Water Chapter of the EIAR proposes mitigation in this regard.

11.8.5.2 Construction of New Buildings

Construction activities will similarly involve visual and noise/vibration disturbance during the works. As with the demolition works, this disturbance is considered unlikely to affect birds on the breakwater or foraging in the intertidal area given their tolerance for other similar port activities. However, construction may also generate dust and contaminate water with the potential to enter the designated sites, for example, on windy days, during damping operations, or during rainfall.

11.8.5.3 Dredging Intertidal Area

There are two potential impacts, the first from the dredging activity itself, and the second from the extirpation of an area of intertidal mixed sediment flats. The dredging activity and the permanent extirpation of a section of intertidal foraging area, 3000 sq.m/0.05% oof the whole intertidal area at the sub-site, will make it unavailable to waders, and to a lesser extent, gulls for foraging, given that gulls mainly use it for surface feeding of spoil from the port. In relation to waders the main affected species are redshank, turnstone, curlew, grey heron and little egret. Given that the sub-site is likely well below carrying capacity for these species, and that the breakwater will remain available at the eastern end, the impact is likely to be small displacement and slight deprivation of a small foraging area, which is unlikely to have any long-term effect.

RECEIVED: 18/10/2024

The dredging activity will also lead to significant disturbance close to the breakwater and will create a plume of silt in the water which may increase turbidity, affecting the ability of divers and auks to fish. The plume may produce a knock-on effect on birds by settling on intertidal vegetation such as Zostera sp beds on an incoming tide. However, given the character of the substrate, generally coarse with fines being absent this is unlikely to be significant, see Benthic Section of the Biodiversity Chapter for full details. The level of turbidity is likely to be low given the coarseness of the substrate and the lack of silt in the substrate.

11.8.5.4 Piling for New Pontoons

The piling driving element of the piling works involves the production of noise, which has a startle effect, though some bird species may become quickly habituated if the noise is regular (e.g., gulls). This can be effectively mitigated through monitoring and a slow start-up to habituate the birds.

11.8.5.5 Construction of New Quay Platform and Floating Pontoons

Construction of the quay platform and pontoons may result in temporary displacement of waders, and this is unlikely to have any significant effect on waterbird condition or productivity.

Table 11.15 Summary of Potential Significant Effects from the Demolition & Construction Phases

Activity	Quality	Significance	Duration	AA Screening Test
Demolition of former open-hydro building	Negative	Slight	Temporary	Likely Significant Effect
Construction of O&M Buildings	Negative	Slight	Medium term	Likely Significant Effect
Dredging and piling intertidal area	Negative	Moderate	Temporary	Likely Significant Effect
Quay wall and pontoon construction	Negative	Not significant	Long-term	No Likely Significant Effect

Table 11.16 Summary of Potential Significant Effects from the Demolition & Construction Phases on Various Receptors

RECEIVED: 18/10/2024

Receptor	Value/abundance	Potential Impact Construction	Potential Impact Operation
Carlingford Lough SPA intertidal area	International	Complete conversion of 3000m sq / 0.05% of sub-site intertidal to subtidal	Nil
Light-bellied Brent Goose	12	Small displacement* if present	Nil
Shelduck	2	Nil	Nil
Wigeon	10	Nil	Nil
Teal	8	Nil	Nil
Great Crested Grebe	2	Nil	Nil
Great Northern Diver	2	Nil	Nil
Red-throated Diver	1	Nil	Nil
Cormorant	89	Small displacement	Nil
Shag	4	Nil	Nil
Little Egret	3	Neutral	Nil
Grey Heron	5	Neutral	Nil
Oystercatcher	17	Small displacement	Small displacement
Grey Plover	1	Nil	Nil
Dunlin	15	Small displacement	Nil
Black-tailed Godwit	3	Nil	Nil
Curlew	5	Small displacement	Small displacement
Redshank	12	Small displacement	Small displacement
Turnstone	10	Small displacement	Small displacement
Black-headed Gull	166	Small displacement	Nil
Common Gull	27	Small displacement	Nil
Lesser Black backed Gull	13	Small displacement	Nil
Herring Gull	1291	Nil	Nil
Great Black-backed Gull	67	Nil	Nil
Guillemot	2	Neutral	Nil
Razorbill	2	Neutral	Nil
Breeding sandwich terns Green Island	26	Nil	Nil

*Small displacement means displacement between 10-100m

11.8.6 Benthic Environment

RECEIVED: 18/10/2024

Following a review of the proposed project and associated scope of work, a range of potential project-related pressures with the potential to act on benthic habitats were identified at the construction phases of the project. These are detailed in the following Table. To determine the ZoI over which the pressures identified above might impact the receiving environment, the range over which each impact might exert a pressure was examined, and these ranges are also provided in Table 11-15.

Notably, the review did not identify evidence that the demolition elements of the project would potentially impact the benthic habitats within the proposed project's ZoI.

Table 11.17 Potential construction stage project-related pressures on the benthic environment

Activity	Potential impact	ZoI
Construction phase		
Dredging	Smothering of benthic species	Direct impact within the development footprint extending out to 250 meters distance to allow for dispersion.
	Damage to benthic species	Direct impact within the development footprint.
	Introduction of Invasive Alien Species	It is not possible to predict an exact area for the spread of IAS following any introduction.
Installation of Berth 3	Damage to benthic species	Direct impact within the development footprint.
	Smothering of benthic species	Direct impact extending to 250m from the development footprint.
	Habitat loss (area of new quay extension)	Direct area of new quay wall. Calculated to be 198.9 Square meters of benthic habitat.
Installation of new pontoon and associated infrastructure	Smothering of benthic species	Direct impact extending to 250m
	Habitat loss (Footprint of piles)	Direct area of piles. Calculated to be <1 square meter
	Introduction of Invasive Alien Species	It is not possible to predict an exact area for the spread of IAS following any introduction.
Land side development of new port facilities	Pollution: Accidental spillage of hydrocarbons or cementitious material (land side)	Area of impact out to 5km.

In order to assess the potential for impact of each of the aforementioned pressures on the benthic habitats within the ZoI of the proposed project, the Marine Evidence based Sensitivity Assessment (MarESA), Tyler-Walters *et al.* (2018), was applied. A description of this methodology is provided in section 11.4 and the results of the sensitivity assessment are set out below.

Table 11.18 Overall sensitivity assessment matrix (Tyler-Walters et al. 2018)

RECEIVED: 18/10/2024

	Resistance	Resilience	Sensitivity
Smothering			
SS.SMu.IFiMu.PhiVir	High	High	Not sensitive
SS.SCS.CCS	High	High	Not sensitive
SS.SMx.IMx	High	High	Not sensitive
CR.MCR.EcCr	High	High	Not sensitive
SS.SMx.IMx.VcorAsquAps	N/A	N/A	N/A
SS.SMx.IMx.MedCirr	High	High	Not sensitive
SS.SMu.SMuVS	High	High	Not sensitive
SS.SMx.SMxVS	High	High	Not sensitive
LS.LMp.LSgr.Znol	None	Very low	High
LS.LSa.MuSa	High	High	Not sensitive
LS.LCS.Sh	High	High	Not sensitive
LR.LLR.F.Asc.FS	Low	Low	High
Pollution (Hydrocarbons)			
SS.SMu.IFiMu.PhiVir	N/A	N/A	N/A
SS.SCS.CCS	Low	High	Low
SS.SMx.IMx	Low	High	Low
CR.MCR.EcCr	Low	High	Low
SS.SMx.IMx.VcorAsquAps	N/A	N/A	N/A
SS.SMx.IMx.MedCirr	Low	High	Low
SS.SMu.SMuVS	Low	High	Low
SS.SMx.SMxVS	Low	High	Low
LS.LMp.LSgr.Znol	Low	Medium	Medium
LS.LSa.MuSa	Low	High	Low
LS.LCS.Sh	Low	High	Low
LR.LLR.F.Asc.FS	N/A	N/A	N/A
Pollution (cementitious)			
SS.SMu.IFiMu.PhiVir	N/A	N/A	N/A
SS.SCS.CCS	Low	High	Low
SS.SMx.IMx	Low	High	Low
CR.MCR.EcCr	Low	High	Low
SS.SMx.IMx.VcorAsquAps	N/A	N/A	N/A
SS.SMx.IMx.MedCirr	Low	High	Low
SS.SMu.SMuVS	Low	High	Low
SS.SMx.SMxVS	Low	High	Low
LS.LMp.LSgr.Znol	None	Very low	High
LS.LSa.MuSa	Low	High	Low
LS.LCS.Sh	Low	High	Low
LR.LLR.F.Asc.FS	N/A	N/A	N/A
Pollution (Waste/ Sewage)			

	Resistance	Resilience	Sensitivity
SS.SMu.IFiMu.PhiVir	NR	NR	Not sensitive
SS.SCS.CCS	Low	High	Low
SS.SMx.IMx	Low	High	Low
CR.MCR.EcCr	Low	High	Low
SS.SMx.IMx.VcorAsquAps	High	High	Not sensitive
SS.SMx.IMx.MedCirr	NEv	NR	NEv
SS.SMu.SMuVS	Low	High	Low
SS.SMx.SMxVS	Low	High	Low
LS.LMp.LSgr.Znol	Medium	Medium	Medium
LS.LSa.MuSa	Low	High	Low
LS.LCS.Sh	Low	High	Low
LR.LLR.F.Asc.FS	NR	NR	Not sensitive
Abrasion/Damage			
SS.SMu.IFiMu.PhiVir	Medium	Medium	Medium
SS.SCS.CCS	Low	High	Low
SS.SMx.IMx	Low	High	Low
CR.MCR.EcCr	Low	High	Low
SS.SMx.IMx.VcorAsquAps	Medium	High	Low
SS.SMx.IMx.MedCirr	Medium	High	Low
SS.SMu.SMuVS	Low	High	Low
SS.SMx.SMxVS	Low	High	Low
LS.LMp.LSgr.Znol	Low	Medium	Medium
LS.LSa.MuSa	Low	High	Low
LS.LCS.Sh	Low	High	Low
LR.LLR.F.Asc.FS	Low	Low	High
Introduction of IAS			
SS.SMu.IFiMu.PhiVir	Medium	Very Low	Medium
SS.SCS.CCS	Medium	Very Low	Medium
SS.SMx.IMx	Medium	Very Low	Medium
CR.MCR.EcCr	Low	Very Low	High
SS.SMx.IMx.VcorAsquAps	Low	Very Low	High
SS.SMx.IMx.MedCirr	Low	Very Low	High
SS.SMu.SMuVS	Low	Very Low	High
SS.SMx.SMxVS	Low	Very Low	High
LS.LMp.LSgr.Znol	Low	Low	High
LS.LSa.MuSa	Medium	Very Low	Medium
LS.LCS.Sh	Medium	Very Low	Medium
LR.LLR.F.Asc.FS	Low	Low	High
Shading			
SS.SMu.IFiMu.PhiVir	High	High	Not sensitive
SS.SCS.CCS	NR	NR	NR
SS.SMx.IMx	NR	NR	NR

RECEIVED: 18/10/2024

	Resistance	Resilience	Sensitivity
CR.MCR.EcCr	NR	NR	NR
SS.SMx.IMx.VcorAsquAps	NR	NR	NR
SS.SMx.IMx.MedCirr	NR	NR	NR
SS.SMu.SMuVS	NR	NR	NR
SS.SMx.SMxVS	NR	NR	NR
LS.LMp.LSgr.Znol	Low	Medium	Medium
LS.LSa.MuSa	NR	NR	NR
LS.LCS.Sh	NR	NR	NR
LR.LLR.F.Asc.FS	NEv	NR	NEv
Habitat Loss			
SS.SMu.IFiMu.PhiVir	None	Low	High
SS.SCS.CCS	None	Low	High
SS.SMx.IMx	None	Low	High
CR.MCR.EcCr	None	Low	High
SS.SMx.IMx.VcorAsquAps	None	Very low	High
SS.SMx.IMx.MedCirr	None	Low	High
SS.SMu.SMuVS	None	Low	High
SS.SMx.SMxVS	None	Low	High
LS.LMp.LSgr.Znol	None	Very low	High
LS.LSa.MuSa	None	Very low	High
LS.LCS.Sh	None	Low	High
LR.LLR.F.Asc.FS	None	Very low	High

NR: Not relevant, NEv: No Evidence
Biotopes codes in bold: Assessment derived from Marlin sensitivity assessments.
All other Biotope complexes: based on expert judgement with regard to range of characterising species present.

RECEIVED: 18/10/2024

11.8.6.1 Smothering of benthic biotopes and habitats

Sediment mobilisation in subtidal and intertidal benthic habitats has the potential to lead to effects on a range of benthic habitats and species. The extent to which sediments will mobilise is dependent on the nature of the sediment (coarse sediments settle out rapidly following disturbance), the exposure of the site (sediments in exposed sites will frequently be subject to natural disturbance due to wave action), the tidal regime of the area (tide swept sediments are generally devoid of "fines"). The impact of sediment mobilisation on benthic habitats and their constituent species is dependent on the sensitivity of those species to burial and smothering resulting from sediment mobilisation and transport. The species found in exposed sediments are generally robust specialists capable of withstanding disturbance and smothering. The impacts of physical disturbance on the species associated with exposed coarse sediments are generally low and greatest in areas of low natural disturbance where the species present are less well adapted to withstand physical stress.

The sediment habitat within the proposed dredge and construction area is comprised of relatively coarse materials and previous dredge campaigns in this area did not result in a significant sediment plume, due to the nature of the material and the strong tide between the breakwater and the quay wall.

Furthermore, local circulation around the port area on an ebb tide is easterly and southerly on a spring tide. It is therefore anticipated that any sediment mobilised will be rapidly dispersed in the local area.

RECEIVED: 18/10/2024

The biotopes SS.SMx.IMx, CR.MCR.EcCr and LS.LMp.LSgr.Znol are all assessed as sensitive to smothering pressures. However, the extent of the ZoI is considered to be too small and localised to impact these biotopes. Therefore, no significant impacts associated with either the dredging or quay wall and pontoon construction phases on any sensitive habitats within the ZoI is anticipated.

11.8.6.2 Pollution (Hydrocarbons)

Inshore working vessels (not covered by international regulation) and equipment associated with the construction phase of the project have the potential to lead to localised impacts on marine and coastal species resulting from accidental spillage of hydrocarbons.

However, due to the size of these vessels their use of hydrocarbons is relatively low. The extent of dispersal of hydrocarbons in marine waters is governed by several factors including spreading, drifting, evaporation, dissolution, photolysis, biodegradation and formation of both oil-in-water and water-in-oil emulsions.

Diesel and petrol are light, refined petroleum products with a relatively narrow boiling range, meaning that, when spilled on water, most of the oil will evaporate or naturally disperse within a few days or less. Wave or swell action may lead to some of the oil dispersing into the water column. Oil dispersed in the water column can adhere to fine-grained suspended sediments which then settle out and get deposited on the seafloor. This process is more likely to occur in estuaries and near river mouths where fine-grained sediment is present. It is less likely to occur in open marine settings such as Carlingford Lough. Diesel oil is readily and completely degraded by naturally occurring microbes, under time frames of one to two months. In terms of toxicity to water-column organisms, diesel is considered to be one of the most acutely toxic oil types. Fish, invertebrates and seaweed that come in direct contact with a diesel spill may be killed. The area of impact of accidental fuel spills will be depended on the volume spilled and weather, dispersion conditions. The volume of such fuel likely to be carried by the small vessels using the area during the construction phase of the project is likely to be quite low. For this reason, the ZoI, relative to potential pollution events, is considered to extend out from the source to a distance of 5km. This is a highly conservative approach and takes account of the tidal dynamics within Carlingford Lough and the adjacent open waters of the Irish Sea.

It is considered that, without mitigation, there is a potential for impact on the sensitive biotopes within the ZoI, listed as having high or medium sensitivity, in Table 11-16 during the construction phase of the project.

11.8.6.3 Abrasion and Disturbance

The physical zone of impact is confined to the development footprint adjacent to the existing quay wall, the proposed new pontoon, and the dredge area during construction. Within this area, the sublittoral biotopes present are:

- SS.SMu.SMuVS Sublittoral mud in variable salinity
- SS.SMx.SMxVS Sublittoral mixed sediment in variable salinity

These two biotopes are common in areas with low salinity around the Irish coast. The benthic analysis did not indicate the presence of any rare or unusual species within this area.

RECEIVED: 18/10/2024

The intertidal habitat in this area is characteristic of LR.LLR.F.Asc.FS in mosaic with LS.LSa.MuSa. These two biotopes are very common in both Carlingford Lough and around the Irish coast. The LR.LLR.F.Asc.FS biotope in this area is partially formed on boulder debris resulting from defence works along the embankment adjacent to the existing quay.

While these biotopes will be impacted during the construction phase of the project, it is considered that they will re-establish within the short term (<5 years[12]) following dredging. Therefore, no significant impact on these two biotopes is anticipated.

11.8.6.4 Habitat Loss

The installation of the quay wall (Berth 3) will lead to the loss of 198.9 square meters of benthic habitat. This area of habitat is comprised largely of LS.LSa.MuSa with pockets of LR.LLR.F.Asc.FS which has formed on the aforementioned boulder debris. As such, no Annex I habitats are represented within this area of loss. Similarly, the minimal loss of habitat attributed to the insertion of two piles associated with the pontoon within the SAC area in an area represented by SS.SMx.SMxVS Sublittoral mixed sediment in variable salinity which does not in itself constitute an Annex I habitat. These biotopes have likely formed in this area as a result of the original port development itself. Therefore, no significant impact on these three biotopes is anticipated.

The installation of the extension to the quay wall will result in the loss of 153.7 sq. m (0.015 hectares), or 0.00252%, of the Wetlands and Waterbird habitat within Carlingford Lough SPA.

The dredge area where the habitat will change from intertidal to sub-tidal represents 3,000 sq. m. This area will be lost as intertidal foraging over mixed substrate and become a subtidal habitat. The importance of the intertidal foraging area is minor due to its hard character, and limited availability.

11.8.6.5 Introduction and Spread of Invasive Alien Species (IAS)

While the known occurrence of marine IAS in Carlingford Lough is likely as a result of increased anthropogenic activity (leisure craft and aquaculture) over the years, the proposed development is unlikely to contribute further introductions of IAS as most commercial shipping is governed by MARPOL regulations.

Small vessels and plant working in intertidal areas can potentially lead to the introduction of marine IAS if not correctly antifouled and/or cleaned before entering an area. While the risk of IAS introduction is considered very low it may contribute to the spread of IAS in the northeast of Ireland and other SACs in this area if not adequately mitigated for during the construction phase.

[12] Short-term as defined by Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)

11.8.7 Designated European Sites

RECEIVED: 18/10/2024

The SISAA, determined that there was potential for the project, alone and in combination with other projects and plans, to have adverse effects on the integrity of the following European sites:

- Carlingford Shore SAC
- Carlingford Lough SPA
- Rockabill to Dalkey Island SAC

Table 11.19 European Designated Sites: Likely significant effect of the proposed development

Carlingford Shore SAC	Potential for Likely Significant Effects (LSE)	
Annual vegetation of drift lines	Potential for LSE	An impact to this habitat within Carlingford Shore SAC has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels, jack-up barges and associated plant which may be required to operate in the proposed project area adjacent to this habitat.
Perennial vegetation of stoney banks	Potential for LSE	An impact to this habitat within Carlingford Shore SAC has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels, jack-up barges and associated plant which will be required to operate in the proposed project area adjacent to this habitat.
Carlingford Lough SPA		
Brent Goose (*Branta bernicla hrota*)	Potential for LSE	An impact to the habitat (Zostera noltei beds) which is the primary food source for this species has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels, jack-up barges and associated plant which may be required to operate in the proposed project area adjacent to this habitat. Based on the distribution of Brent geese around the lough, it is unlikely that they will be temporarily displaced due to noise and visual disturbance impacts. However, applying the precautionary approach an impact could occur from the startle effect caused by the pile-driving element of the marine piling works.
Wetlands and waterbirds	Potential for LSE	An impact to the habitat (*Zostera noltei beds*) which is the primary food source for this species has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels, jack-up barges and associated plant which may be required to operate in the proposed project area adjacent to this habitat. Similarly, accidental spillage of hydrocarbons and cementitious material also has the potential to impact the benthic habitats and their associated invertebrate community upon which other wildfowl associated with this SPA feed. The installation of the extension to the quay wall will lead to the loss of 153.7 Square meters (0.015 hectares) or 0.00252% of the Wetland and Waterbirds habitat within Carlingford Lough SPA.

RECEIVED: 18/10/2024

Carlingford Shore SAC	Potential for Likely Significant Effects (LSE)	
		It is unlikely that waterbirds will be displaced due to noise and visual disturbance impacts. However, applying the precautionary approach an impact could occur from the startle effect caused by the pile-driving element of the marine piling works. The accidental spillage of hydrocarbons from small vessels, jack-up barges and plant operating in the area may have the potential to lead to temporary impacts on benthic sediments in the event of any accidental spillage or leakage of hydrocarbons or cementitious material. It is considered that this may have the potential to result in negative impacts on benthic habitats associated with the wetland habitat for waterbirds within Carlingford Lough SPA.
Rockabill to Dalkey		
Harbour porpoise (*Phocoena Phocoena*)	Potential for LSE	Harbour porpoise (*Phocoena phocoena*) which occur regularly and are associated with a European site (Rockabill to Dalkey Island SAC). Increased disturbance may occur, especially during the operation phase, and collision risk to a much lesser extent. Any impact on the feeding resource for these species (i.e. from the accidental spillage of hydrocarbons or run-off of cementitious material) has the potential to impact this species. Underwater noise, on start-up of plant and machinery working in subtidal areas, has the potential to impact Harbour porpoise with the potential to lead to effects at this European sites. Increased traffic associated with this development could lead to increased disturbance and even displacement in the wider offshore area on routes to and from Greenore which has the potential to impact Harbour porpoise associated with other European sites. While the risk is considered to be extremely low, the potential for negative effects, without mitigation, is considered possible.

Wintering waterbirds and seabirds (*ex-situ* effects) – Possibility of Potential Effect

RECEIVED: 18/10/2024

<u>The Breakwater</u>

Although outside of Carlingford Lough SPA, Greenore port breakwater is a regular high tide roost used by small numbers of waders and divers, particularly cormorants, and larger numbers of gulls.

While no loss of the breakwater will occur because of the proposed development, disturbance related to the construction works on waterbirds is considered likely to trigger a small temporary displacement for the gull species and possibly a more permanent displacement for a small number of waders. However, they may become habituated to the new arrangement as they are to the current activities associated with a busy shipping port.

A small risk of displacement of these species is associated with noise due to marine piling, specifically pile driving.

The operation of the facility is highly unlikely to impact the conservation objectives of European sites for which they form an SCI. Therefore, while a short-term displacement may impact the COs of European sites, no long-term impact is considered likely.

<u>Greenore Golf Course</u>

Up to 280 black-headed gulls and smaller numbers of herring gulls use the golf course. When the ground is wet, a small number of oystercatchers also use the golf course foraging for earthworms. A population of 65 mallards seems to be permanent residents of the golf course, rarely venturing onto the SPA intertidal area. It was also observed that during bad weather events, birds often use the golf course for roosting (golfers typically also being absent at these times,

Therefore, no significant impact on waterbirds utilising the golf course is considered likely. For this reason, likely significant effects on SPAs designated for waterbirds within the development site's foraging range are not considered likely.

<u>Other SPAs</u>

A cohort of Brent geese are known to commute between Dundalk Bay SPA (roosting) and Carlingford Lough (feeding). However, other than a possible small displacement when drifting on the water awaiting tidal changes, they are unlikely to be impacted by the development. Specialist waders such as curlews, black-tailed godwits and oystercatchers may also move between the two SPAs. However, they are unlikely to be impacted, except for a possible small displacement.

Redshank and turnstones are more likely to be site faithful. Gulls, in particular herring gulls (O'Hanlon, 2022), are likely to range very widely in the winter months in search of feeding opportunities and these may involve visits from Dundalk Bay SPA and the North-West Irish Sea SPA and further afield. Equally, gulls frequenting these SPAs may, in turn, visit Carlingford Lough SPA, particularly when there are animal feed feeding opportunities at the port. The proposed development will result in a small temporary displacement of gulls and is unlikely to impact the conservation objectives of these distant SPAs. A small number of turnstones and redshanks use the breakwater for roosting when weather conditions are suitable (they avoid it in strong north or easterly winds). These species tend to be more site faithful, particularly turnstones, and so are unlikely to visit other SPAs.

Rockabill SPA, lies approximately 50km from the development site and is designated for Purple Sandpiper (*Calidris maritima*), Roseate Tern (*Sterna dougallii*), Common Tern (*Sterna hirundo*), and Arctic Tern (*Sterna paradisaea*). The latter three tern species breed on the island. However, studies into their foraging pattern have shown that they do not venture as far as Carlingford Lough. According to the NPWS site synopsis "*Surveys of the foraging behaviour of the Roseate Tern population on Rockabill have recorded up to 73% of Roseate Terns foraging within 3.5 km of the islands. The seas surrounding the islands, to a distance of 3.5 km, are therefore included within the SPA to protect the foraging resource of this internationally important Roseate Tern population.*"

RECEIVED 18/10/2024

Other SPAs designated for breeding seabirds, Irelands Eye Spa and Lambay Island SPA are even further away, well beyond the foraging range of any breeding seabird. Irelands Eye QI include (Cormorant (*Phalacrocorax carbo*), Herring Gull (*Larus argentatus*), Kittiwake (*Rissa tridactyla*), Guillemot (*Uria aalge*), Razorbill (*Alca torda*) while Lambay Island SPA QIs are Fulmar (*Fulmarus glacialis*), Cormorant (*Phalacrocorax carbo*), Shag (*Phalacrocorax aristotelis*), Greylag Goose (*Anser anser*), Lesser Black-backed Gull (*Larus fuscus*), Herring Gull (*Larus argentatus*), Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge*), Razorbill (*Alca torda*) and Puffin (*Fratercula arctica*).

Boyne Estuary SPA lies approximately 30 km from the development site, QIs for this site are overwintering Shelduck (*Tadorna tadorna*), Oystercatcher (*Haematopus ostralegus*), Golden Plover (*Pluvialis apricaria*), Grey Plover (*Pluvialis squatarola*), Lapwing (*Vanellus vanellus*), Knot (*Calidris canutus*) , Sanderling (*Calidris alba*), Black-tailed Godwit (*Limosa limosa*), Redshank (*Tringa totanus*), and Turnstone (*Arenaria interpres*). In an overwintering context these species are all likely to be site faithful and unlikely to visit the ZoI of the development site, or indeed Carlingford Lough at all. It is also designated for breeding Little Tern (*Sterna albifrons*), where a colony of up to 100 pairs regularly breeds during the summer. This species is notable for its short foraging range, typically less than 2km, and so are unlikely to visit the development site; indeed, little terns have never been recorded in Carlingford Lough.

RECEIVED: 18/10/2024

11.9 Potential Significant Effects (Operational Phase)

11.9.1 Terrestrial Habitat

As described under section 11.8.1 above for the demolition and construction phase, the terrestrial development area has been subject to significant human modifications over the last 150 years. Therefore, and due to the site's already limited biodiversity value, it is considered highly unlikely that further modifications would impact terrestrial habitats.

The landscape design integrates habitat enhancement measures through the selection of native planting and species listed in the All-Ireland Pollinator Plan. The effect of these measures is likely moderately positive, at the local level with a permanent duration.

11.9.2 Terrestrial Mammals

As described under section 11.6, the proposed development site's habitats are of very limited value for fauna, having regard to the largely built nature of the existing environment. The proposed operational phase will have no perceptible impact on terrestrial mammals.

11.9.3 Bats

The Bat Report states,

"The potential for collision risk and impact on flight paths in relation to bats is considered is considered low due to the low level of bat activity on site and the buildings would be deemed to be clearly visible to bats. The site is currently well-lit from the existing floodlights within the subject site, and from light spill of the adjacent residential area street lighting. There are no predicted significant negative impacts on bat species from the proposed development."

11.9.4 Marine Mammals

Following a review of the proposed project and associated scope of work, a range of potential project-related pressures with the potential to act on marine mammals were identified at the operational phase of the project, these are detailed in Table 11-18. The ZoI over which the pressures identified above might impact the receiving environment was examined to determine the range over which each impact might exert a pressure.

The ZoI is not restricted to the immediate proposed development site but includes an extended area in line with the National Parks and Wildlife Service (NPWS) publication *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (2014).

Table 11.20 Potential Operational Phase Impacts on Marine Mammals

RECEIVED: 18/10/2024

Activity	Potential impact	ZoI
Operational phase		
Presence of a new pontoon	Displacement	Long-term displacement of normal activities along access route by vessels using pontoon.
	Disturbance	Medium-term displacement of normal activities along access route by vessels using pontoon.
	Pollution (waste, sewage and accidental spillage of hydrocarbons from visiting vessels)	Area of impact out to 5km.
Day-to-day use of port and associated facilities	Pollution (waste, sewage and accidental spillage of hydrocarbons)	Medium-term displacement of normal activities along access route by vessels using pontoon. Area of impact out to 5km.

Both seals and cetaceans are likely to be exposed to potential disturbance during the operational phase. Seals are more likely to be exposed within Carlingford Lough, while cetaceans are more likely to be exposed in the approaches to and at the mouth of the Lough.

Low-frequency continuous sound such as that generated by shipping has been reported as the dominant source of anthropogenic sound in a broad-band range from 5 to 300 Hz. Characteristics of shipping noise, including frequency and source level, are roughly related to vessel size and speed (Richardson *et al*. 2013). Smaller vessels such as a CTV produce higher frequencies of noise, typically up to 10 kHz (which attenuate at shorter distances) but at a lower source level (for example, see Sims et al. 2012).

The hearing range of harbour and grey seals extends over wide frequencies, including the ultrasonic spectrum. The area of best hearing is between 8 and 25 kHz, with acute hearing also at lower frequencies (Terhune and Turnbull 1995), which overlaps in part with the peak sound energy generated up to 10 kHz.

The waters surrounding haul-out sites are critical habitats for feeding and/or for navigation to more offshore foraging areas. This may lead to chronic exposure to man-made noise, however, in areas with repeated exposure to human activity, marine mammals may become habituated with a decline in avoidance responses and thus become less sensitive to noise and disturbance (Richardson *et al.* 2013).

The fast nature of CTV also presents a collision risk to marine mammals at the surface. CTV routes to ORE sites will tend to be fixed, reducing the effect of disturbance and collision risk as marine mammals learn to avoid the area after repeated use. Clearly, it is important that these routes do not pass through (or close to) important habitats.

11.9.5 Avifauna

Only the control rooms will operate 24/7. The deployment of technicians and equipment on the pontoons, the entry-exit from the port area and the berthing of Crew Transfer Vessels (CTVs) will take place over an approx. 18-hour period, running from 6 am to 9 pm.

The potential impacts on avifauna during the operational stage of the proposed development are (i) disturbance arising from increased human activity, noise, and lighting caused by the movement between the OMFs and the pontoons and (ii) the movement of CTVs as they travel out from the port to the offshore wind arrays.

RECEIVED: 18/10/2024

Based on a demonstrated tolerance distance of between 10 and 100 metres and the observed habituation of birds using the breakwater for roosting, no long-term significant effect on these birds is considered likely.

A reduction in the number of divers and auks using the port area for fishing may result, though anecdotally, floating pontoons may attract fish, which may have the effect of offsetting the displacement effect when the pontoons are not in use. Similarly, grey herons and little egrets may also use the pontoons as a platform for fishing.

The coming and going of small vessels from the port to maintain and service windfarms is unlikely to have any impact on foraging terns who may be breeding on Green Island due to the fact that the vessels will follow established routes and operate at low speeds.

It is unlikely that the operational stage will have a significant adverse effect on the local avifauna population.

11.9.6 Benthic Environment

Following a review of the proposed project and associated scope of work, a range of potential project-related pressures with the potential to act on benthic habitats were identified at the operational phase of the project. These are detailed in the following Table. To determine the ZoI over which the pressures identified above might impact the receiving environment, the range over which each impact might exert a pressure was examined, and these ranges are also provided in Table 11-19.

Table 11.21 Potential operational stage project-related pressures on the benthic environment

Activity	Potential impact	ZoI
Operational phase		
Presence of new pontoon	Shading effect of new pontoon	Direct area below pontoon extending to 25m buffer.
	Introduction of Invasive Alien Species from visiting vessels	It is not possible to predict an exact area for the spread of IAS following any introduction.
	Pollution (waste, sewage and accidental spillage of hydrocarbons from visiting vessels)	Area of impact out to 5km.
Day-to-day use of port and associated facilities	Pollution (waste, sewage and accidental spillage of hydrocarbons)	Area of impact out to 5km.

11.9.6.1 Pollution (Hydrocarbons)

RECEIVED: 18/10/2024

Vessels accessing and moored on the proposed new pontoon (not covered by international regulation) and equipment have the potential to lead to localised impacts on marine and coastal species resulting from the accidental spillage of hydrocarbons.

The area of impact of accidental fuel spills will depend on the volume spilled and weather and dispersion conditions. The volume of such fuel likely to be carried by the small vessels using the area during the operational phases of the project is likely to be quite low. For this reason, the ZoI, relative to potential pollution events, is considered to extend out from the source to a distance of 5km. This is a considered a highly conservative approach and takes account of the tidal dynamics within Carlingford Lough and the adjacent open waters of the Irish Sea.

It is considered that, without mitigation, there is a potential for impact on the sensitive biotopes within the ZoI, listed as having high or medium sensitivity, in Table 11-16 during the operational phase of the project.

11.9.6.2 Introduction of IAS

Vessels (not governed by MARPOL regulations) visiting the pontoon area can lead to the introduction of IAS. While the risk of IAS introduction is considered very low, it may contribute to the spread of IAS in the northeast of Ireland if not adequately mitigated.

11.9.6.3 Shading/fouling

The area directly under the proposed new pontoon and access gangway will be subject to shading effects. The sublittoral biotopes present in this area are not sensitive to shading. Therefore, no shading impact is foreseen.

Fouling of the wetted surface of structures e.g. by mussels frequently leads to an alternation of the benthic habitat directly below and radiating out for a number of meters from the structure due to the establishment of mussels and their associated pseudofeces. However, the tide across this area is likely to prevent the formation of significant residues of pseudofeces. Furthermore, the biotopes at this location would not be sensitive to the effects of pseudofeces deposition.

11.9.7 Designated European Sites

There is a direct spatial overlap between the proposed project and Carlingford Shore SAC and Carlingford Lough SPA. There is a small potential for increased disturbance to Harbour porpoise from the Rockabill to Dalkey Island SAC from increased boat traffic accessing the proposed project site.

An impact to the habitat within Carlingford Shore SAC has been identified from the potential for accidental spillage of hydrocarbons associated with CTVs which will be required to operate in the proposed project area adjacent to this habitat.

11.9.7.1 Coastal Habitats

RECEIVED: 18/10/2024

Perennial vegetation of stony banks

An impact to this habitat within Carlingford Shore SAC has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels i.e. CTVs.

Annual vegetation of drift lines

An impact to this habitat within Carlingford Shore SAC has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels i.e. CTVs

11.9.7.2 Avifauna

Brent Goose and other water birds

An impact to the habitat (*Zostera noltei* beds) which is the primary food source for this species **has** been identified from the potential for accidental spillage of hydrocarbons associated with small vessels i.e. CTVs.

Based on the distribution of Brent geese around the lough, it is unlikely that they will be temporarily displaced due to noise and visual disturbance impacts. However, applying the precautionary principle, a Likely Significant Effect is assigned.

Wetlands for Waterbirds

As above for Brent Geese, an impact to the habitat (*Zostera noltei* beds) which is the primary food source for this species has been identified from the potential for accidental spillage of hydrocarbons associated with small vessels i.e. CTVs.

Similarly, accidental hydrocarbon spillage has the potential to impact the benthic habitats and the associated invertebrate community upon which other wildfowl feed.

Similar to the Brent Geese displacement due to noise and visual disturbance impacts is considered unlikely. However, applying the precautionary principle, a Likely Significant Effect is assigned.

11.9.7.3 Benthic habitats

The accidental spillage of hydrocarbons from small vessels i.e. CTVs operating in the area may have the potential to lead to temporary impacts on benthic sediments in the event of any accidental spillage or leakage of hydrocarbons. It is considered that this may have the potential to result in negative impacts on benthic habitats associated with the wetland habitat for waterbirds within Carlingford Lough SPA.

11.9.7.4 Wintering waterbirds and seabirds (*ex-situ effects*)

The Breakwater

Disturbance related to the operational phase on waterbirds is considered likely to trigger a small temporary displacement for the gull species and possibly a more permanent displacement for a small number of waders. However, it is likely that they would become habituated to the new arrangement as they are to the current activities associated with a busy shipping port.

RECEIVED: 18/10/2024

11.9.7.5 Marine Mammals associated with SACs (ex-situ effects)

Harbour porpoise (*Phocoena phocoena*) which occur regularly and are associated with a European site (Rockabill to Dalkey Island SAC). Increased disturbance may occur especially during the operation phase, and to a much lesser extent, collision risk. Any impact on the feeding resource for these species (i.e. from the accidental spillage of hydrocarbons from CTVs) has the potential to impact this species associated with other European sites. Harbour porpoise associated with the North Channel ASSI may be similarly exposed to increased disturbance.

Increased traffic associated with this development could lead to increased disturbance and even displacement in the wider offshore area on routes to and from Greenore which has the potential to impact Harbour porpoise associated with other European sites. While the risk is considered to be extremely low, the potential for negative effects, without mitigation, is considered possible.

11.9.8 Cumulative Effects

The cumulative assessment takes account of the impacts associated with the proposed development together with other projects and plans.

This section has also been updated to reflect planning applications for offshore wind farms submitted with An Bord Pleanála in the period since the original EIAR was produced and submitted to Louth County Council on 28th May 2024.

A fundamental requirement of assessing cumulative/in-combination effects is to identify those projects, plans or activities with which the proposed development may interact and create a cumulative impact. These interactions can arise during the construction, operation, and decommissioning phases.

A decommissioning phase is not anticipated for the proposed development. The infrastructure is being developed to service offshore wind farms. When those wind farms near the end of their design life (anticipated at least approx. 25 years), they may be 'repowered' i.e. subject to a further grant of planning permission turbines and associated technology will be replaced (partially or totally) with more powerful and efficient models using the latest technology. The proposed O&M facility will, therefore, continue to be required.

In the unlikely event that full decommissioning of all relevant offshore wind farms occurs, the O&M infrastructure (pontoon and warehouses) will be capable of being utilised as part of the existing port operations, subject to obtaining any necessary further consents.

To inform this part of the report a 'long list' of projects, plans and activities was compiled, and it is presented in Appendix 1.1 (Volume III) and includes,

- Planning permissions – Last 5 years
- Planning applications
- Projects holding a Maritime Area Consent (MAC)

- Foreshore Licenses
- Aquaculture Licences in Carlingford Lough
- Wastewater discharge Licences

We are not aware of any other proposed projects at this time for which applications have not yet been submitted.

RECEIVED: 18/10/2024

Table 11.22 Potential for Cumulative Impacts

Potential impact	Identified projects with potential for cumulative impact	Assessment of potential for cumulative impact
Carlingford Shore SAC		
Annual vegetation of drift lines [1210]		
Projects with a hydrological connection to the Carlingford Shore SAC that, during their individual construction phase(s), may generate an accidental spillage of hydrocarbons that would reach the SAC during high spring tides or high swell.	No projects identified.	No potential for impact
Perennial vegetation of stony banks [1220]		
Projects with a hydrological connection to the Carlingford Shore SAC that, during their individual construction phase(s), may generate an accidental spillage of hydrocarbons that would reach the SAC during high spring tides or high swell.	No projects identified	No potential for impact
Carlingford Lough SPA		
Light-bellied Brent Goose (Branta bernicla hrota) [A046]		
Projects, plans or activities that would directly impact the identified foraging areas for brent geese and waterbirds. In particular, any planned oyster beds, and any plans or projects associated with the golf course.	Existing and additional aquaculture operations in the vicinity of the port have the potential to displace brent geese and waterbirds from their preferred foraging habitat. Carlingford Oyster Company LCC2360352. Existing aquaculture operations within Carlingford Lough.	Potential for cumulative impact, without mitigation during the construction phase of the proposed development.
Projects, plans or activities that would lead to displacement of birds roosting area	None identified	No potential for cumulative impacts.
Noise and vibration from piling, rock-breaking, blasting and other intensive construction activities cause disturbance	Temporary displacement	No potential for cumulative impacts.

Occupation of the site will generate foul sewage for disposal at Dundalk Wastewater Treatment Plant	In relation to residential developments granted permission in the last 5 years, the review demonstrates that the permissions predominantly relate to extensions or modifications to existing dwellings, with three permissions relating to new dwellings. None of the applications included an Appropriate Assessment Screening or a Natura Impact Statement. The granting of permission demonstrates that the planning authority was satisfied that for each development, they would not, alone or in combination with other plans or projects, adversely affect the integrity of any European sites. Therefore, any potential for cumulative impact with the proposed development is considered to be unlikely or insignificant.	No potential for cumulative impacts.
	A permission under appeal relates to Carlingford Oyster Company Limited retention and completion of a partially constructed single story extension at a production building. The report on file references inter alia: A submission from the Loughs Agency may be relevant to the drainage with regard to surface water mitigation measures.	Potential for cumulative impact, without mitigation during the construction phase of the proposed development.
Wetland and Waterbirds [A999]		
Projects, plans or activities that would directly impact the wetlands and waterbirds habitat within the SPA and/or contribute to habitat loss.	Carlingford Oyster Company) LCC2360352. Operational phase impacts of the existing aquaculture operations within Carlingford Lough resulting from the accidental spillage of hydrocarbons associated with vehicles accessing the oyster trestles.	Potential for cumulative impact, without mitigation during the construction phase of the proposed development.
***Ex situ* sites**		
Rockabill to Dalkey Island SAC		
Reefs [1170]		
Accidental spillage of hydrocarbons	Hydrological link to distant and weak for any potential for impact	No potential for cumulative impacts.
Phocoena phocoena (Harbour Porpoise) [1351]		

RECEIVED: 18/10/2024

Vessels transiting the approaches to Carlingford Lough, utilising the new CTV berths will increase noise levels in this area	The Oriel and North Irish Sea Offshore Windfarms, which have been awarded a MAC will also contribute to increased noise levels in the area	Potential to act cumulatively with the proposed project but can't be fully assessed as the design of the OWF has not been finalised as full planning permission has not been granted.
Disturbance due to construction noise	Four potential future ORE projects have been identified. Oriel Windfarm Limited (MAC-001) Bray offshore Ltd, Kish Offshore wind Ltd (Dublin array: MAC-003 & 004. North Irish Sea Array windfarm: MAC-005 Codling Wind Park Ltd: MAC-006	Site investigation licences have been applied for and granted to these projects. Such applications have been subject to AA, including the consideration of the potential for impacts with mitigation excluded. The applications for planning permission (and associated EIAR and/or Natura Impact Statement) for these projects are due to be submitted in 2024. Should any of these proposed ORE projects secure development permission, the proposed works associated with those projects could potentially overlap with time period of the construction and/or operational phase of the proposed development, and that in-combination impacts may be possible.
North Channel ASSI, Murrough ASSI, Strangford Lough ASSI are no longer part of the network of European sites. However, with due regard to the precautionary principle, they have been included in this assessment.		
North Channel ASSI		
Phocoena phocoena (Harbour Porpoise) [1351]		
Vessels transiting the approaches to Carlingford Lough, utilising the new CTV berths will increase noise levels in this area	The Oriel and North Irish Sea Offshore Windfarms, which have been awarded a MAC will also contribute to increased noise levels in the area.	Potential to act cumulatively with the proposed project but can't be fully assessed as the design of the OWF has not been finalised as full planning permission has not been granted.
Disturbance due to construction noise	Four potential future ORE projects have been identified. Oriel Windfarm Limited (MAC-001) Bray offshore Ltd, Kish Offshore wind Ltd (Dublin array: MAC-003 & 004. North Irish Sea Array windfarm: MAC-005	Site investigation licences have been applied for and granted to these projects. Such applications have been subject to AA, including the consideration of the potential for impacts with mitigation excluded.

RECEIVED: 18/10/2024

	Codling Wind Park Ltd: MAC-006	The applications for planning permission (and associated EIAR and/or Natura Impact Statement) for these projects are due to be submitted in 2024. Should any of these proposed ORE projects secure development permission, the proposed works associated with those projects could potentially overlap with time period of the construction and/or operational phase of the proposed development, and therefore in-combination impacts may be possible.
Murrough ASSI		
Common seal (Phoca vitulina) [1365]		
Seals entering the immediate Activities in Carlingford lough could experience disturbance	Temporary displacement	No potential for cumulative impacts.
Strangford Lough ASSI		
Common seal (Phoca vitulina) [1365]		
Seals entering the immediate Activities in Carlingford lough could experience disturbance	Temporary displacement	No potential for cumulative impacts.

RECEIVED: 18/10/2024

11.9.9 Summary

RECEIVED 18/10/2024

The following Table summarises the identified likely significant effects during the demolition and construction phases of the proposed development before mitigation measures are applied. The description of effects follows the terminology established in the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

Table 11.23 Summary of Demolition and Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Type
Pollution (Hydrocarbons)	Negative	Moderate significant impact	5km	Low	Direct
Abrasion and Disturbance	Neutral	Insignificant impact	Direct area of dredging and quay wall/pontoon installation	Low	Direct
Habitat loss	Neutral	Insignificant impact	Direct area of dredging and quay wall/pontoon installation	High	Direct
Introduction of IAS	Negative	Moderate significant impact	Carlingford Lough	Medium	Indirect
Displacement of Seals	Negative	Moderate significant impact	>500m	High	Direct
Displacement of Birds	Negative	Moderate significant impact	>100m	High	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

RECEIVED: 18/10/2024

Table 11-1. Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Type
Pollution (Hydrocarbons)	Negative	Moderate significant impact	5km	Low	Direct
Introduction of IAS	Negative	Moderate significant impact	Carlingford Lough	Medium	Indirect
Shading/fouling	Neutral	Insignificant impact	25m	N/A	Direct
Displacement of marine mammals	Negative	Moderate significant impact	>1000m	High	Direct
Displacement of Birds	Negative	Moderate significant impact	>100m	High	Direct

11.10 Mitigation Measures

11.10.1 Incorporated Design Mitigation

The design integrates enhancement measures for swifts in the form of 10 swift boxes per OMF building, for a total of 30 boxes.

The landscape design is carefully considered to ensure that all species are capable of thriving within this coastal setting. Native species are included together with pollinators as advised by the All-Ireland Pollinator Plan.

11.10.2 Demolition & Construction Phase Mitigation

Mitigation Measure No. 1

Where feasible, the timing of the clearing of the vegetation within the 'Residential Site' will avoid the bird breeding season (March-August inclusive). Where the construction programme does not allow this seasonal restriction to be observed, a pre-clearance check of that area f the proposed development site for nests will be carried out by a suitably qualified ecologist in advance of commencing the clearance. Where it can be confirmed that no nesting birds are present, the clearance will commence. Where breeding birds are confirmed to be present, the clearance must not commence until it can be confirmed that the chicks have fledged.

Mitigation Measure No. 2

Prior to any works commencing the Construction Environment Management Plan (CEMP) will be reviewed and updated by the Contractor. It will, *inter alia*, include all of the mitigation measures detailed in this section. The CEMP will be reviewed by a qualified ecologist to ensure it meets the requirements of this chapter and the Natura Impact Statement.

RECEIVED: 18/10/2024

In addition, the CEMP will detail the relevant person with overall responsibility for the implementation for the CEMP.

The CEMP will include details of the following:

- Details of all chemical/fuel storage areas (including location and bunding to contain run-off of spillages and leakages).
- Details of how and where hazardous wastes such as oils, diesel and other hydrocarbon or other chemical waste are to be stored and disposed of in a suitable manner.
- Details of emergency plan to deal with the containment of chemical spillage, cement spillage.
- Truck wheel wash details (including measures to avoid and treat runoff).
- Site run-off management, including details of appropriate containment measures to be put in place at the quayside to prevent contamination of the lough.
- A Waste Management Plan (WMP) which clearly sets out the Contractor's proposals regarding the treatment, storage and disposal of waste.

Mitigation Measure No. 3

Care will be taken at all times to avoid contamination of the environment with cementitious material. A protocol for the management of cement will be prepared. Specifically, this should detail measures to:

- Assess where any wastewater associated with the use of cement will run and the most appropriate way to dispose of it.
- Ensure that an appropriate area of the site, at least 50m from the marine area, is designated for concrete ~~delivery~~ washout.[13] Further, ensure this area is away from stormwater drains or that drains and gutters in the vicinity have been blocked off.
- Use spill mats to contain any spills.
- Use sandbags or diversion booms to direct any run-off to an appropriate safe location away from marine areas.
- Set up a designated Washdown Area away from marine areas or with potential to run-off to it.
- Ensure proper management in the event of an accidental spill.

Mitigation Measure No. 4

The assessment of impacts indicated that the accidental spillage of hydrocarbons had the potential to lead to a localised significant impact on the receiving environment. Therefore, the following mitigation will be implemented during the construction phase to avoid the possibility of accidental spillage of any hydrocarbons associated with the use of plant, machinery or inshore vessels (if used).

The proper use and storage of oils and fuels as set out below will be implemented by the appointed contractor.

- A designated area within the site compound will be established for the storage of plant, machinery and materials during the construction phase of the project. The site compound will

[13] The changes have been made to ensure consistency throughout the application

RECEIVED: 18/10/2024

be suitably located with due regard for the receiving environment and in particular the sensitive receiving waters.

- All plant and machinery will be refuelled at a dedicated refuelling area within the site compound with appropriate spill controls in place.
- All plant and machinery will be regularly checked for leaks.
- Any hydrocarbons used on the project site will be contained within a bunded container or area.
- A hydrocarbon oil boom to be available at all times onsite in the event of it needing to be deployed.
- If required, generators to be on a hydrocarbon mat at all times.
- A spill kit to deal with any accidental spillage of hydrocarbons will be available at the project site.
- The roles and responsibilities of construction and associated staff regarding the protection of the receiving environment will be clearly set out and documented.

Mitigation Measure No. 5

The assessment of impacts indicated the potential for the introduction of IAS associated with plant and small vessels working in the intertidal and subtidal areas. Therefore, the following mitigation will be implemented by the developer:

Boats, barges and marine equipment working in the intertidal and nearshore area will be free of fouling by the use of appropriate application of antifouling paints and/or washdowns for smaller boats and plant. All visible hitchhikers will be removed from any tracked plant and equipment entering the intertidal area.

Mitigation Measure No. 6

Where feasible, ~~the~~ any[14] pile driving element of the marine piling works will not take place between the 20th of May and the 30th of June. Where the construction programme does not allow this seasonal restriction to be observed, a pre-construction check of the breakwater for nesting black guillemot will be carried out by a suitably qualified ecologist in advance of commencing the pile driving works. Where it can be confirmed that no nesting birds are present, the pile driving will commence. Where birds are confirmed to be present, the pile driving works must not commence until it can be confirmed that the chicks have fledged, and the site has been abandoned.

Mitigation Measure No. 7

Where feasible, any rock-breaking element of the capital dredge will not take place between the 20th of May and the 30th of June. Where the construction programme does not allow this seasonal restriction to be observed, a pre-construction check of the breakwater for nesting black guillemot will be carried out by a suitably qualified ecologist in advance of commencing the rock-breaking works.

[14] The changes have been made to ensure consistency throughout the application

RECEIVED: 18/10/2024

Where it can be confirmed that no nesting birds are present, the rock breaking will commence. Where birds are confirmed to be present, the rock-breaking works must not commence until it can be confirmed that the chicks have fledged, and the site has been abandoned.

Mitigation Measure No. 8

To mitigate any startle effect from the pile-driving element of the marine piling works on overwintering birds, a suitably qualified observer will monitor that aspect of the works, and piling driving will start later than the general construction operation commencement on each day to ensure a slow start-up to habituate the birds.

Mitigation Measure No. 9

NPWS (2014) provides guidance to manage the risk to marine mammals from man-made sound sources in Irish waters. This document provides guidance and mitigation measures to address key potential sources of anthropogenic sound that may impact negatively on marine mammals in Irish waters. The mitigation methods should follow the guidance prescribed by the NPWS to avoid PTS. The guidance set out in NPWS (2014).

Mitigation Measure No. 10

A suitably qualified, and experienced Marine Mammal Observer during piling and dredging to implement NPWS (2014) Guidelines (and any amendments).

Mitigation Measure No. 11

A pre-demolition bat survey of structures proposed for demolition for bats will be carried out by a suitably qualified ecologist.

The mitigation measures for dust are contained in Chapter 14 of this EIAR and water in Chapter 10.

Mitigation Measure No. 12

If marine pile driving or rock dredging activity is simultaneous with similar activities associated with the proposed ORE projects indicated in Table 11.22, depending on the distance and the rate of sound attenuation, we will ensure sound exposure is not above internationally approved noise exposure levels for marine mammals, following consultation with the NPWS.

11.10.3 Operational Phase Mitigation

Mitigation Measure No. 13

The assessment of impacts indicated that the accidental spillage of hydrocarbons from smaller vessels using the pontoon had the potential to lead to a localised impact on the receiving environment. Therefore, the following mitigation will be implemented during the operational phase of the project to avoid the possibility of accidental spillage of any hydrocarbons:

- Refuelling of vessels via decanting from containers will not be permitted at the pontoon or within the port area.
- Bilges and/or ballast water (if relevant) will not be emptied at the pontoon.

- Detergent will not be used to clear up small spills of hydrocarbons. Oil absorbent cloths will be used instead.
- Greenore Port will maintain a kit of oil absorbent cloths and small booms to deal with accidental spillages.
- Oil absorbent collars will be fitted around the fuel nozzle to catch any drips or overflow.
- Clear signage indicting refuelling protocols will be displayed at the pontoon.

RECEIVED: 18/10/2024

Mitigation Measure No. 14

The assessment of impacts indicated the potential for the introduction of IAS through small boats using the marina. Therefore, the following mitigation will be implemented by the developer:

- Recreational vessels will not be permitted to use the pontoon.
- Ballast water (if relevant) will not be discharged within the port area.
- Regular inspections of the hulls of visiting vessels for obvious IAS will be carried out by the operators.
- Clear signage indicating biosecurity protocols will be displayed at the pontoon.
- Staff will be trained in the identification of obvious IAS.
- Fouled vessels should not be allowed to enter the pontoon area.
- Any IAS recorded will be reported to the National Biodiversity Data Centre.

Mitigation Measure No. 15

Outside of Carlingford Lough, disturbance to marine mammals during operation may occur as vessel traffic will increase. The new quay wall and pontoons will provide berths for up to 11 CTV which will access the North Irish Sea from Greenore. These vessels will be required to use existing channels on the approach to and from the port. Each vessel pilot and captain is responsible to act accordingly and slow speeds to match environmental conditions and restrict any risk of wake. Once clear of the Lough vessels will reach operational speed, which could cause disturbance and a collision risk to marine mammals. In accordance with Maritime Notice 15 of 2005, a speed limit of 7knots is to be adhered to when encountering areas of mammal populations. These routes have not yet been established and disturbance and displacement will need to be considered by each ORE project through the environmental assessment undertaken for those projects.

Mitigation Measure No. 16

Post-construction (Phase 1 and Phase 2) survey of seals in June and September to ensure haul out sites still being used by common and grey seals.

11.11 Residual Impact Assessment

RECEIVED: 18/10/2024

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

Table 11.24 Demolition and Construction Phase Residual Effects

Likely Significant Effect	Significance Pre Mitigation	Mitigation Proposed	Significance Post Mitigation
Pollution (Hydrocarbons)	Moderate significant impact	Yes	No Significant Effect will arise.
Abrasion and Disturbance	Insignificant impact	Yes	No Significant Effect will arise.
Habitat loss	Insignificant impact	No	No Significant Effect will arise.
Introduction of IAS	Moderate significant impact	Yes	No Significant Effect will arise.
Displacement of Seals	Moderate significant impact	Yes	No Significant Effect will arise.
Displacement of Birds	Moderate significant impact	Yes	No Significant Effect will arise.

Table 11.25 Operational Phase Residual Effects

Likely Significant Effect	Significance	Mitigation proposed	Significance Post Mitigation
Pollution (Hydrocarbons)	Moderate significant impact	Yes	No Significant Effect will arise.
Introduction of IAS	Moderate significant impact	Yes	No Significant Effect will arise.
Shading/fouling	Insignificant impact	No	No Significant Effect will arise.
Displacement of marine mammals	Moderate significant impact	Yes	No Significant Effect will arise.
Displacement of Birds	Moderate significant impact	Yes	No Significant Effect will arise.

11.11.1 Cumulative Residual Effects

Neither the development proposed, nor any other projects or plans will give rise to any significant impacts on biodiversity and there are no predicted cumulative impacts in relation to biodiversity, for example in terms of habitat loss or disturbance to protected species, as a result of the Proposed Development in combination with existing / proposed plans or projects. Therefore, no significant effect will arise.

11.12 Risk of Major Accidents or Disasters

RECEIVED: 18/10/2024

Considering the sensitivity of Carlingford Lough, the landscape design at the interface of the terrestrial and nearshore area has been developed in consultation with the project ecologist to ensure that the species selected are appropriate and will not pose a threat to lough.

11.13 Worst Case Scenario

The worst-case scenario would be that the mitigation measures proposed were not implemented, and the effect would be as per the summary set out in Section 11.9.9.

11.14 Interactions

There are interactions between this Biodiversity Chapter and those of Landscape & Visual (Chapter 5), Land and Soils (Chapter 9), and Water and Hydrology (Chapter 10).

In terms of Land and Soils, there is overlap with the biodiversity chapter in that the potential impact of the construction works, through excavation, construction etc., have the potential to adversely affect the receiving environment; both geological and ecological. The mitigation measures in both chapters overlap somewhat as they deal with protecting the receiving environment from the construction works e.g., protecting waterbodies from pollution and sedimentation.

Likewise, with Hydrology, the mitigation measures proposed in these chapters address the potential for the Construction Phase to impact receiving waterbodies and ecology in the vicinity of the Site.

In terms of Landscape and Visual, the proposed landscaping of the Site interacts with its biodiversity and ecology; through the changes that will occur to the existing habitats and flora at the Site. The landscaping proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect the ecology of the Site. The Site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.

A series of mitigation measures have been prepared to minimise dust emissions and they are set out in Chapter 14, Air Quality. It is concluded that provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality effects during the construction phase including demolition are direct, short-term, negative, and not significant. Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see Table 14.1). Therefore, the predicted residual, dust-related, human health effect of the construction phase of the proposed development is direct, short-term, negative, and not significant.

11.15 Monitoring

RECEIVED: 18/10/2024

The project will be monitored by a suitably qualified ecologist. The ecologist will be familiar with the ecological significance of the site, the practical constrains of the site and all of the proposed mitigation outlined in this document and any associated relevant conditions that may be a condition of consent. The project ecologist will liaise closely with the on-site project supervisor during both the pre-construction and construction phase of the project.

- The project ecologist will have the authority to halt works that may appear to be leading to any previously unforeseen impact and will ensure that all mitigation specified is carried out.
- The role of the ecologist will include informing site staff, as well as supervisors on the sensitivity of the environment where works are proposed. The project ecologists' role will include weekly site walkovers of the planned areas of work in advance of any operations. The ecologist will liaise with the site supervisor on a weekly basis to discuss potential areas of sensitivity, including the presence of Invasive Alien Species, and advice on any further actions that may be required to avoid potential impacts. The site supervisor will advise all staff working on the site of the relevant sensitivities at weekly tool box meetings in advance of any work taking place. Compliance with such advice will be overseen by the site ecologist.
- An Invasive Species Management Plan (ISMP) for the proposed new pontoon will be prepared. The ISMP will include an annual monitoring schedule by a marine ecologist experienced in the identification of IAS, including cryptic IAS. The monitoring schedule will include inspections of the wetted surfaces of the pontoon and quay walls. All IAS recorded will be identified to species level and records provided to the National Biodiversity Data Centre. An inspection log recording the surveys undertaken and any IAS recorded will be maintained by the developer/occupier of the O&M units.
- A record of all antifouling procedures implemented will be kept for the duration of the project.

11.16 Conclusion

This assessment demonstrates that if the identified mitigation measures are implemented during the demolition, construction and operational stages, the identified significant effects can be appropriately mitigated and reduced to a level whereby no significant effect will arise.

11.17 References and Sources

Berrow, Simon and O'Brien, Joanne (2020) Visual Surveys for Marine Mammals at the Proposed Windfarm Site at Oriel. Final Report to Oriel Windfarm Limited. Irish Whale and Dolphin Group. 23 pp.

Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. Bat Conservation Trust, London.

Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O., & Reker, J.B. 2004. The Marine Habitat Classification for Britain and Ireland. Version 04.05. JNCC, Peterborough, ISBN 1 861 07561 8.

Department of Environment (2015) Carlingford Lough pMCZ support Spyball camera survey.

Duck, C. and Morris, C. (2013) An aerial survey of harbour seals in Ireland: Part 2: Galway Bay to Carlingford Lough. August-September 2012. Unpublished report to the National Parks & Wildlife Service, Department of Arts, Heritage & the Gaeltacht, Dublin.

Erwin, D.G., Picton, B.E., Connor, D.W., Howson, C.M., Gilleece, P. and Bogues, M.J. 1986. The Northern Ireland Sublittoral Survey. Ulster Museum.

Fossitt, J.A. (2000). A Guide to Habitats in Ireland. Heritage Council of Ireland series, ISSN 1393-6808

Goodwin, C., Picton, B., Breen, J., Edwards, H. and Nunn, J. 2011. Sublittoral Survey Northern Ireland (2006 – 2008). Northern Ireland Environment Agency Research and Development Series No 11/01.

Marnell F, Kelleher C., Mullen E. (2022), *'Bat mitigation guidelines for Ireland – v2'*, [National Parks and Wildlife Service. Department of Housing, Local Government and Heritage, 2022-03, Irish wildlife manuals, No.134.

McKeown, M. (2014) *Measurements of Pile driving Noise*. Alexandra Basin Dublin Port. Technical Report for RPS, August 2014.

Mitchell, A.J. and Service, M. 2004. Northern Ireland Nearshore Subtidal Habitat Mapping Project: Report to DARD & EHS.

Morris, C.D. and Duck, C.D. (2019) Aerial thermal-imaging survey of seals in Ireland, 2017 to 2018. Irish Wildlife Manuals, No. 111 National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

O'Brien, J., Pommier. M. and Berrow, S. (2020) Static Acoustic Monitoring (SAM) at the Proposed Windfarm Site at Oriel. Final Report to Oriel Windfarm Limited. Irish Whale and Dolphin Group. 23 pp

Richardson, W. J., Greene Jr, C. R., Malme, C. I., & Thomson, D. H. (2013). *Marine mammals and noise*. Academic press.

Risely, K., Baillie, S.R., Eaton, M.A., Joys, A.C., Musgrove, A.J., Noble, D.G., Renwick, A.R. & Wright, L.J. (2010). The breeding bird survey 2009. BTO Research Report 559. British Trust for Ornithology, Thetford.

RECEIVED: 18/10/2024

RPS (2016) *Underwater Acoustic Emissions, Dublin Port Report on July 2016 Dredging and Dumping Operations*. Alexandra Basin Dublin Port. Technical Report for RPS, September 2016. 18 pp.

Sims, P.Q., Hung, S.K. and Würsig, B. (2012) High-Speed Vessel Noises in West Hong Kong Waters and Their Contributions Relative to Indo-Pacific Humpback Dolphins (*Sousa chinensis*)", *Journal of Marine Sciences*. https://doi.org/10.1155/2012/169103.

Southall, B.L., Nowacek, D.P., Bowles, A.E., Senigaglia, V., Bejder, L. and Tyack P.L. (2021) Marine Mammal Noise Exposure Criteria: Assessing the Severity of Marine Mammal Behavioral Responses to Human Noise. **DOI:** https://doi.org/10.1578/AM.47.5.2021.421, 421-464.

Thompson, P.M., Mackay, A., Tollit, D.J. Enderby, S. and Hammond, P.S. (1998) The influence of body size and sex on the characteristics of harbour seal foraging trips *Canadian Journal of Zoology*, 76:1044-1053, https://doi.org/10.1139/z98-035

Todd, V.L.G., Todd, I.B., Gardiner, J.C., Morrin, E.C.N., MacPherson, N.A., DiMarzio, N.A., and Thomsen, F. (2015) A review of impacts of marine dredging activities on marine mammals. ICES Journal of Marine Science 72(2), 328-340.

Turnbull, S.D., and Terhune, J.M. (1995) The effect of signal onset/offset envelope on underwater detection thresholds of a harbor seal (*Phoca vitulina*).*The Journal of the Acoustical Society of America* 98.1 78-80.

Whooley, P. and Berrow, S. (2019) Bowhead whale (*Balaena mysticetes* Linneaus), a cetacean species new to Irish waters. Irish Naturalists Journal. 36(2), 169-171.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

CHAPTER 12
COASTAL PROCESSES

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Figures

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Tables

12 Coastal Processes

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

12.1 Introduction

This chapter assesses the potential impact of the proposed O&M Facility on coastal processes around the Greenore Port area and includes information about the tidal regime, inshore wave climate and sediment dispersion to enable the competent authority to assess the potential impacts on coastal processes.

The assessment presented in this chapter is based on the project description detailed in Chapter 2.

12.2 Expertise & Qualifications

The author, Penny Haywood, is a Project Scientist within RPS and holds a BSc (Hons) in Marine Science, an MSc in Applied Marine Geoscience and an MSc in Civil Engineering and has 10 years of experience working in the field of offshore and coastal hydrodynamics.

The reviewer, Kristopher Calder, is a Technical Director within RPS and holds a BSc (Hons) in Marine Biology and an MSc (Distinction) in Physical Oceanography and has over ten years of experience in the field of coastal processes and numerical modelling. Kristopher is a Chartered Scientist (CSci) and Water and Environment Manager (CWEM) and a full member of the Chartered Institute of Water and Environmental Management (CIWEM) an Associate Member of the Institute of Civil Engineers (AMICE).

12.3 Proposed Development

A full description of the proposed development is set out in Chapter 2 of this EIAR. The following is a summary of the proposed works.

A full description of the proposed development is provided in **Chapter 2** of this EIAR. The following is a summary of the proposed works:

Greenore Port Unlimited Company intend to apply for a 10-year permission for development at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare) and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. In general, it will comprise of terrestrial (landside) and nearshore works, with three standalone buildings incorporating office, warehouse and ancillary space landside and a pontoon to accommodate Crew Transfer Vessels (CTVs) marine side. To facilitate the proposed development, dredging within the nearshore and the demolition of existing port buildings and a vacant residential property is required.

The Operations and Maintenance Facilities (OMF) will provide twenty-four-seven, year-round support, to three individual offshore renewable energy (ORE) projects that will be owned and operated by entities separate from the applicant. These ORE projects will consist of offshore windfarms on the East Coast of Ireland.

RECEIVED: 18/10/2024

Three standalone operation and maintenance buildings incorporating office, warehouse and ancillary space (canteen, welfare, plant, cycle parking etc.) are proposed within the 'terrestrial port' area. Each building has a gross floor area of c.1,670 sq.m and a maximum height of 13.5m.

A new quay wall will be developed at Berth 3 (70m length). This will include a new quay wall face and upgraded deck. A pontoon will be constructed to accommodate crew transfer vessels (CTVs), for use by the operators to travel out to the offshore windfarms. The CTV's will be accessed via an access ramp connected to the quay wall and deck. Approx 45,000m^3 of material will be dredged to facilitate navigable access at this location, and it will be disposed of on land. Where rock is encountered (estimate max of 1,000m^3), it will be reused on site.

Adjacent to the buildings, space is allocated for 76 car parking spaces, with a further 135 spaces proposed in the surface carpark at the 'Residential Site' on Shore Road. The existing carpark associated with the former Open Hydro building (60 spaces) will be used during the construction phase and Phase 1 of the development.

Pedestrian and motor vehicle access is via the existing entrance beside the Port's office, which served the previous Open Hydro development. Heavy goods vehicles will access the buildings via the Port's existing heavy goods entrance on Shore Road (R175). Pedestrian access from the surface carpark to the OMF buildings will be provided along a new pedestrian route within the Port's landholding.

To facilitate the development, demolition works are required, including the former Open Hydro building, an ESB substation, a small portion of the Port's office accommodation and the vacant dwelling at the 'residential site' on Shore Road.

Improvement works to the public / private realm in the foreground of the existing Greenore Port office building will comprise of an enhancement to existing road and pathways to facilitate improved pedestrian and vehicular access to the proposed O&M Facilities, a new feature entrance wall, removal of 6 no. port car parking spaces, link to new pedestrian route from the new Shore Road carpark and hard and soft landscaping. These works are located within the Greenore Architectural Conservation Area (ACA). The aim is to redesign the space to improve the character of the ACA at this point; provide a more user friendly space with pedestrian priority; and improve the existing access arrangements to the site. Inside the proposed main entrance to the site, it is proposed to integrate the existing engine room wall and include this as a feature within the landscape design.

Ancillary development will include the installation of drainage infrastructure, landscaping, lighting, signage, boundary treatments, rooftop solar photovoltaic panels, an ESB substation, a communications mast, a bunded fuel storage tank and waste management areas etc.

The infrastructure described above will likely be delivered over two phases. However, this could extend to three phases, or the sequence of the works may vary,, depending on the delivery of future ORE projects and the associated Offshore Renewable Energy Auctions.

The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

RECEIVED: 18/10/2024

1. **'Terrestrial Port Area'**, (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing 'engine room', and a communications mast.
2. **'Nearshore Environment'** (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
3. **'Residential Site'** (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. **'Port Office Entrance'** (c. 0.18ha) encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

The following is a general location plan of the plots identified above.

Figure 12.1 Development Areas

12.3.1 Aspects Relevant to this Assessment

The aspects of the development that considered relevant and therefore considered as part of this chapter are the existing site conditions in context of the tide, wave and sediment transport regimes and the impact of dredging works during the construction period. These aspects will be considered in addition to the potential operational phase impacts of the proposed development on these key coastal processes.

This section should be read in conjunction with the design drawings and reports which accompany this planning application.

12.4 Assessment Methodology

The assessment of the impacts of the proposed development in context of coastal processes was undertaken as per the numerical modelling methodology described in section 12.4.5.

RECEIVED: 18/10/2024

12.4.1 Relevant Legislation & Guidance

Specific to the assessment of Coastal Processes, the following guidance documents and codes were considered:

- Advice to Inform Development of Guidance on Marine, Coastal and Estuarine Marine Processes Numerical Modelling Assessments (Pye, et al., 2017).
- Guidance on Best Practice for Marine and Coastal Marine Processes Baseline Survey and Monitoring Requirements to inform EIA of Major Development Projects (Brooks, et al., 2018).
- EN 1991-1-4 (2005) (English): Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions [Authority: The European Union Per Regulation 305/2011, Directive 98/34/EC, Directive 2004/18/EC.
- CP 3:Chapter V-2:1972. Code of basic data for the design of buildings. Loading - Wind loads.

12.4.2 Study Area

As detailed in Section 12.4.7, the study area considered for this assessment included all of Carlingford Lough, extending from Newry in the north west to *c.*3km beyond Ballagan Point in the south east at the entrance to the Lough. This extent study area was determined based on two factors. Firstly the large extent was required to ensure the hydraulics was sufficiently represented in all numerical simulations. Secondly, it was necessary, to ensure the model sufficiently covered the extent of two tidal excursions (i.e., the distance that a suspended particle could potential be transported).

This was determined by releasing neutrally buoyant particles within the vicinity of Greenore Port. The excursion (i.e., distance travelled) of these particles was examined over the course of a spring tide cycle and used to ensure the study area encompassed this extent.

12.4.3 Site Surveys/Investigations

Data from the following site surveys and/or investigations were used to inform the assessment presented in this chapter:

- Greenore Port Geotechnical Interpretive Report as supplied by Gavin & Doherty Geosolutions (2024).
- Bathymetry data/drawing no. MG230307 as supplied by Six West Ltd (2023).
- Topography data/drawing no. MG230104_Rev1_Overview as supplied by Six West Ltd (2023).
- Groyne survey as supplied by Six West Ltd (2023).

12.4.4 Consultation

As part of the design process, the applicant engaged and consulted extensively with a range of relevant statutory and non-statutory stakeholders, including Louth County Council, local pilots for the lough and the existing port operational team. A vessel simulation modelling exercise was undertaken to ensure the configuration of the maritime development and proposed vessels did not negatively interact with existing operations. In addition, the applicant consulted with owners of nearby oyster farming operations regarding the potential impact of the proposed development on these operations.

RECEIVED: 18/10/2024

Whilst the findings presented in this chapter directly address potential issues regarding the impact of dredging operations on water quality, stakeholders confirmed that the previous development of Berth 2, including dredging works, had no adverse impact in context of coastal processes.

12.4.5 Modelling Methodology

RPS used the MIKE 21 hydrodynamic numerical modelling software package by Danish Hydraulic Institute (DHI)(described in the following section) to address potential coastal processes issues. This was achieved by developing a range of two-dimensional numerical models to represent:

- The pre-project scenario.
- The post-project scenario with the proposed development in place.

These models were used in conjunction with hydrographic survey data to assess the construction and operational impacts of the Greenore O&M Facilities Project in the context of the following coastal processes:

- The tidal regime;
- The inshore wave climate;
- The dispersion and settlement of sediment plumes generated during dredging operations; and
- Sediment dynamics and the morphological response of the seabed around Greenore Port.

The impact of the proposed development on these coastal processes has been quantified using difference plots throughout this chapter, i.e. post-project minus pre-project conditions. As such, the extent and magnitude of potential impacts as a result of the proposed development can be identified and compared against baseline conditions.

To conclude the assessment, mitigation measures are proposed to reduce impacts, where appropriate. This enables a "with mitigation" assessment to be made of any residual impact as a result of the construction and operational phases of the proposed development and/or in combination with other projects in the vicinity.

12.4.6 Coastal Process Modelling Software

A suite of coastal process models, based on the MIKE software developed by DHI was used to assess the potential impact of the O&M facilities on the coastal processes at Greenore Port within Carlingford Lough. The MIKE system is a state-of-the-art, industry standard modelling application, based on a flexible mesh approach. This software was developed for applications within oceanographic, coastal and estuarine environments.

A brief synopsis of the MIKE system and modules used for this assessment is outlined below:

- **MIKE 21 Flow Model FM system** - Using these flexible mesh modelling systems, it is possible to simulate the mutual interaction between currents, waves, and sediment transport by dynamically coupling the relevant modules in both two and three dimensions. Hence, a full feedback of the bed level changes on the waves and flow calculation can be included.

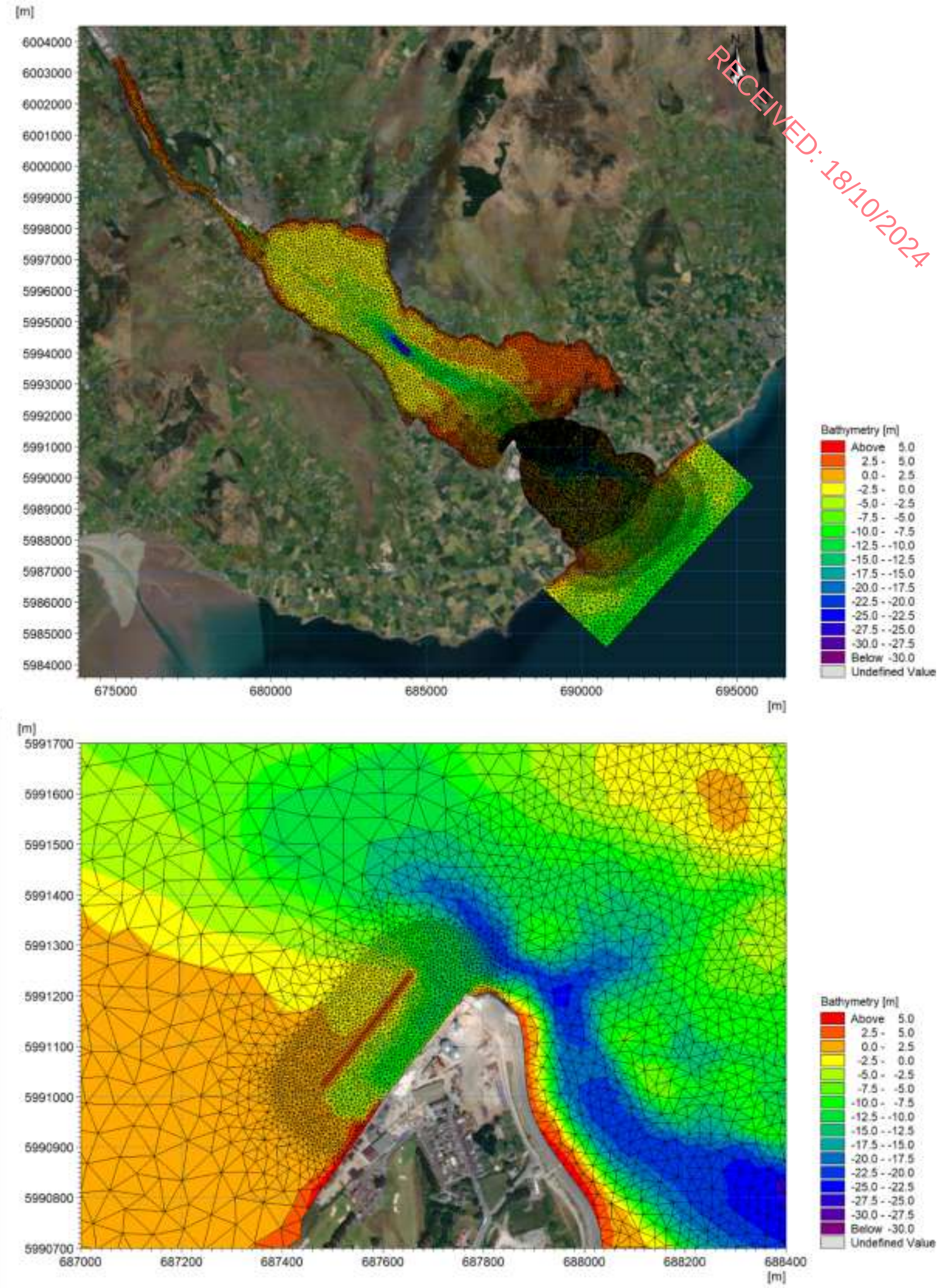
- **The Hydrodynamic module** –This module is capable of simulating water level variations and flows in response to a variety of forcing functions in lakes, estuaries, and coastal regions. The HD Module is the basic computational component of the MIKE 21 and MIKE 3 Flow Model systems providing the hydrodynamic basis for the Mud Transport and Spectral Wave modules The Hydrodynamic module solves the two -dimensional incompressible Reynolds averaged Navier- Stokes equations subject to the assumptions of Boussinesq and of hydrostatic pressure.

  Thus, the module consists of continuity, momentum, temperature, salinity, and density equations. When being used in three dimensions, the free surface is taken into account using a sigma coordinate transformation approach whereby the vertical layer is divided equally into a discrete number of layers.
- **The Spectral Wave (SW) module** – This module simulates the growth, decay and transformation of wind-generated waves and swell in offshore and coastal areas and accounts for key physical phenomena including wave growth by wave action, dissipation, refraction, shoaling and wave-current interaction.
- **The Mud Transport module** - The Mud Transport module simulates the erosion, transport, settling and deposition of cohesive and fin-grain non-cohesive material in marine, brackish and freshwater areas. The module can be used to assess the impact of dredging operations, dispersion of material, siltation, and contaminated sediment studies.

12.4.7 Coastal Process Models and Data Sources

The models used to assess the impact of the proposed development on coastal processes were created using flexible mesh technology to provide detailed information on the coastal processes around Greenore Port and Carlingford Lough. The model mesh sizes varied from *c.* 15,000m^2 (equivalent to *c.*122m x 122m squares) at the boundary to *c.* 50m^2 (equivalent to 7m x 7m squares) within the vicinity of Berth 3 as shown in Figure 12.2. The bathymetry of the pre and post-project scenario models are illustrated in Figure 12.3.

RECEIVED: 18/10/2024



RECEIVED: 18/10/2024

Figure 12.2 Extent of bathymetry and mesh structure of the Greenore and Carlingford Lough model.

RECEIVED: 18/10/2024

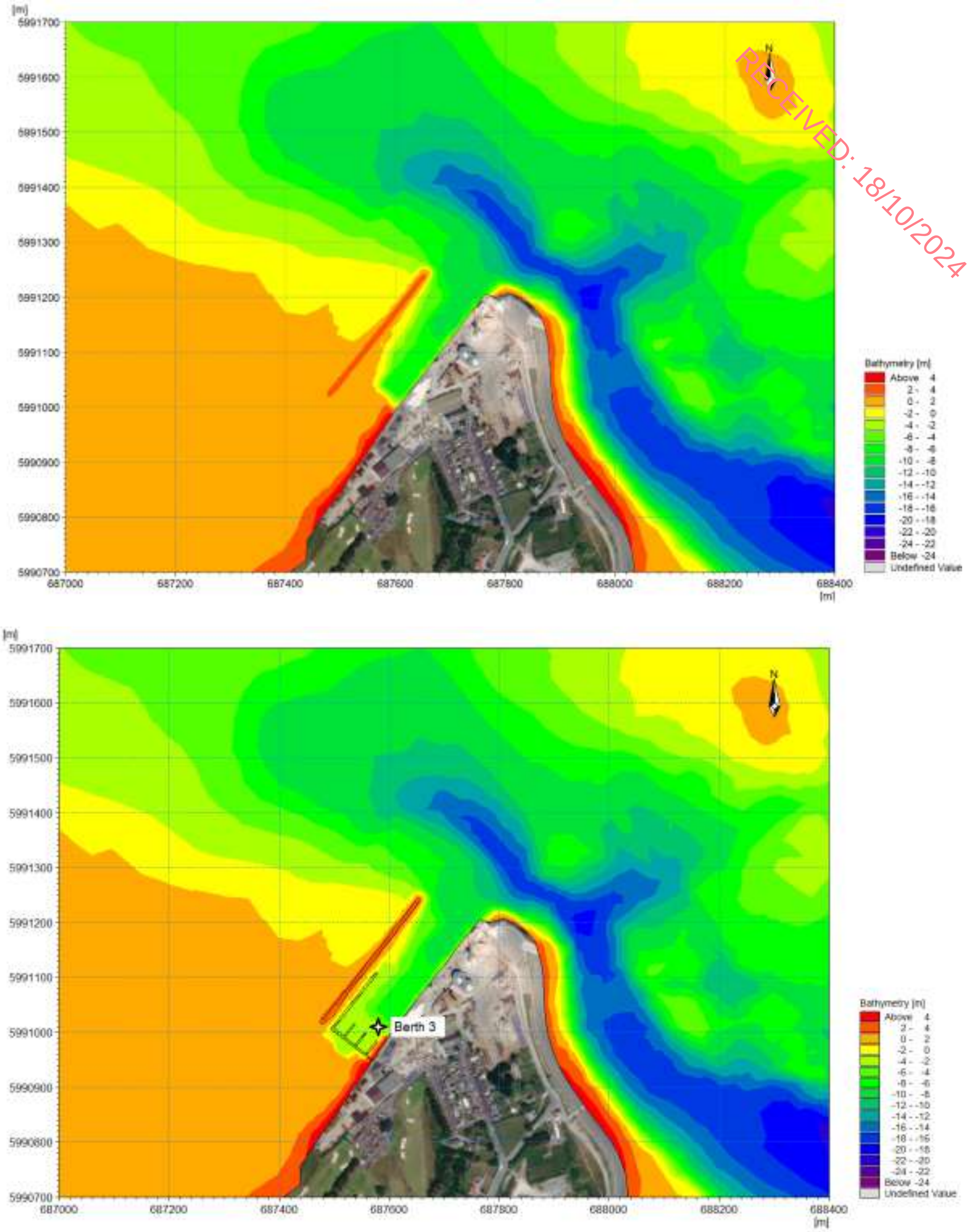


Figure 12.3 Bathymetry at Greenore Port in the pre-project (upper) and post-project (lower) models with the location of Berth 3 illustrated.

12.4.7.1 Data Sources

12.4.7.1.1 Wind data

RECEIVED: 18/10/2024

The berths at Greenore Port are exposed to storm waves generated over the waters of Carlingford Lough, mainly from the area of the Lough upstream of the port. As such, the wave climate is primarily governed by winds acting over the various local fetches. The wind speeds for wave generation are affected by the local topography with higher wind speeds along the axis of the lough due to the nature of the mountains on either side of Carlingford Lough. Waves generated in the Irish Sea can enter the Lough and at times also reach the approaches of Greenore Port but these waves are highly modified by the complex bathymetry around the mouth of the Lough.

Wind data from BS EN 1991-1-4:2005:A1:2010, which gives extreme overland wind speed throughout GB and parts of Ireland has been used for this study with the wind speeds increased by 17% to account for the increase in wind speed over the water adjoining the shoreline.

In the case of the winds blowing along the axis of the Lough, the wind speed for wave generation was based on the full overwater wind speed due to the local increase in wind velocity resulting topographical effects. For wind from these directions the winds peed can be some 30% above the equivalent overland speed as identified in BS CP3 part V. Similarly, full overwater wind speeds were used for the generation of waves in the Irish Sea which can enter the Lough during storms from the 90°N to 165°N sector.

The mean hourly wind speed for the various storm directions was then adjusted using the directional coefficient given in BS EN 1991-1-4:2005:A1:2010. Finally, the wind speeds were adjusted for the length of time required to fully develop the waves over the fetches. The resulting wind speed by direction is given in Table 12.1 for the local fetches and in Table 12.2 for the fetches across the Irish Sea.

Table 12.1 Storm wind speed (m/s) by return period for various local fetch directions

Storm Direction °N	Wind Speed m/s	Wind Speed m/s	Wind Speed m/s	Wind Speed m/s
	1 in 1 yr	1 in 10 yr	1 in 50 yr	1 in 100 yr
270	22.36	26.73	29.72	31.22
285	21.55	25.75	28.63	30.07
300	22.83	27.28	30.33	31.86
315	21.43	25.69	28.61	30.08
330	21.42	25.59	28.46	29.89
345	20.69	24.72	27.49	28.87
0	19.70	23.54	26.17	27.49
15	17.90	21.39	23.78	24.98
30	17.67	21.11	23.48	24.66
45	17.21	20.56	22.86	24.01
60	16.84	20.12	22.38	23.50
75	16.64	19.89	22.12	23.23
90	16.35	19.54	21.73	22.82

Table 12.2 Storm wind speed (m/s) by return period and directions for Irish Sea fetches

Storm Direction °N	Wind Speed m/s	Wind Speed m/s	Wind Speed m/s	Wind Speed m/s
	1 in 1 yr	1 in 10 yr	1 in 50 yr	1 in 100 yr
90	15.07	18.08	20.15	21.18
105	15.34	18.40	20.51	21.56
120	16.05	19.25	21.45	22.56
135	16.72	20.06	22.35	23.50
150	17.08	20.49	22.84	24.01
165	17.38	20.85	23.24	24.43

RECEIVED: 18/10/2024

12.4.7.1.2 Water levels

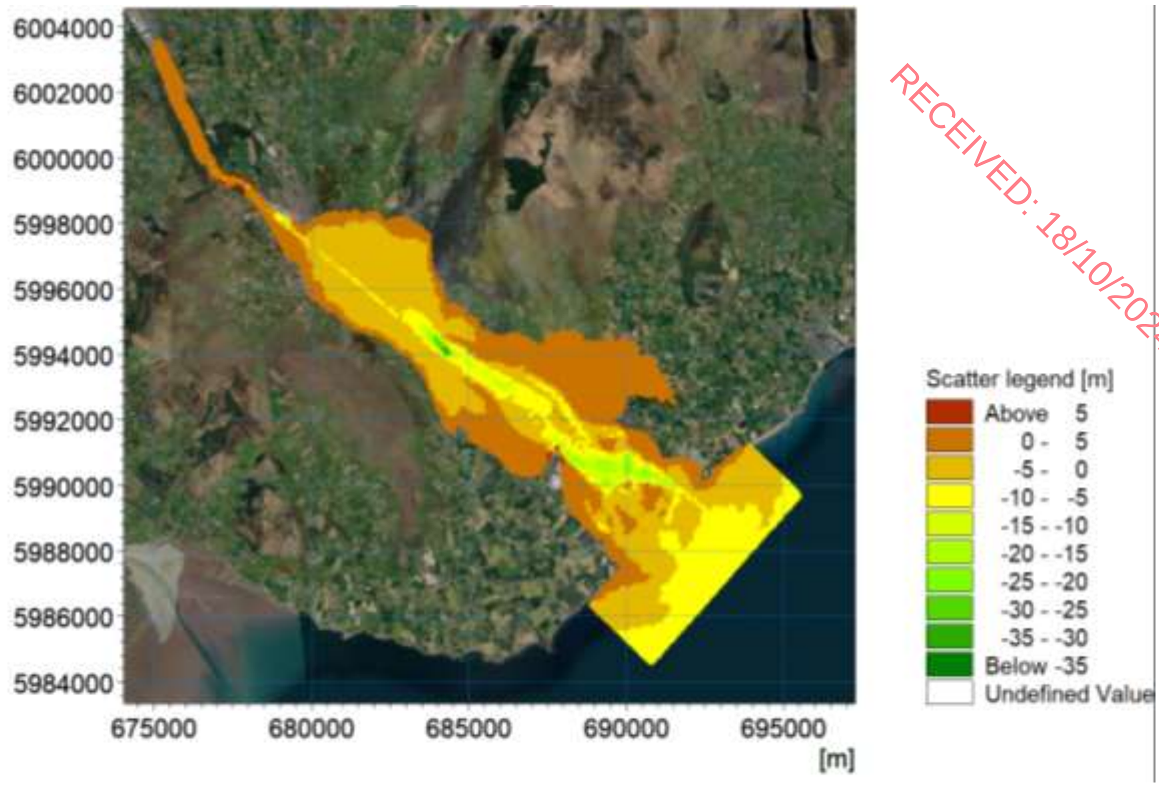
The Environmental Agency in NI (NIEA) together with DEFRA/EA and SEPA has issued predicted extreme water levels at a 2-kilometre spacing around the coast of the UK. These figures have been derived from a sophisticated skew surge analysis of long-term tidal gauge records (Environment Agency, 2018). The extreme water levels for various return period events based on the estuary point off Greencastle, have been converted to OD Malin and CD Greenore and are shown in Table 12.3.

Table 12.3 Extreme water levels at the study area (Environment Agency, 2018)

Storm return period (years)	Extreme Water levels	
	m OD Malin	m CD
1 in 1	2.82	5.89
1 in 2	2.92	5.99
1 in 5	3.06	6.13
1 in 10	3.14	6.21
1 in 20	3.24	6.31
1 in 25	3.26	6.33
1 in 50	3.35	6.42
1in 75	3.40	6.47
1 in 100	3.44	6.51
1 in 200	3.58	6.65
1 in 500	3.85	6.92
1 in 1000	3.97	7.04

12.4.7.1.3 Bathymetry Data

The bathymetry data used to construct all numerical models consisted of a combination of detailed surveys of Carlingford Lough undertaken for previous projects and specific surveys undertaken by 6-West around Greenore Port for this project. The data points around Greenore Port and Carlingford Lough used in the models are shown in Figure 12.44.



RECEIVED: 18/10/2024

Figure 12.4 Bathymetry data around Greenore and Carlingford Lough used to develop the numerical models.

12.4.7.2 Boundary Conditions

The hydrodynamic models used for this assessment were driven by a surface elevation boundary which was derived from the Admiralty tide tables based on the tidal constituents provided for Greenore Point. An example of this boundary condition is illustrated in Figure 12.5.

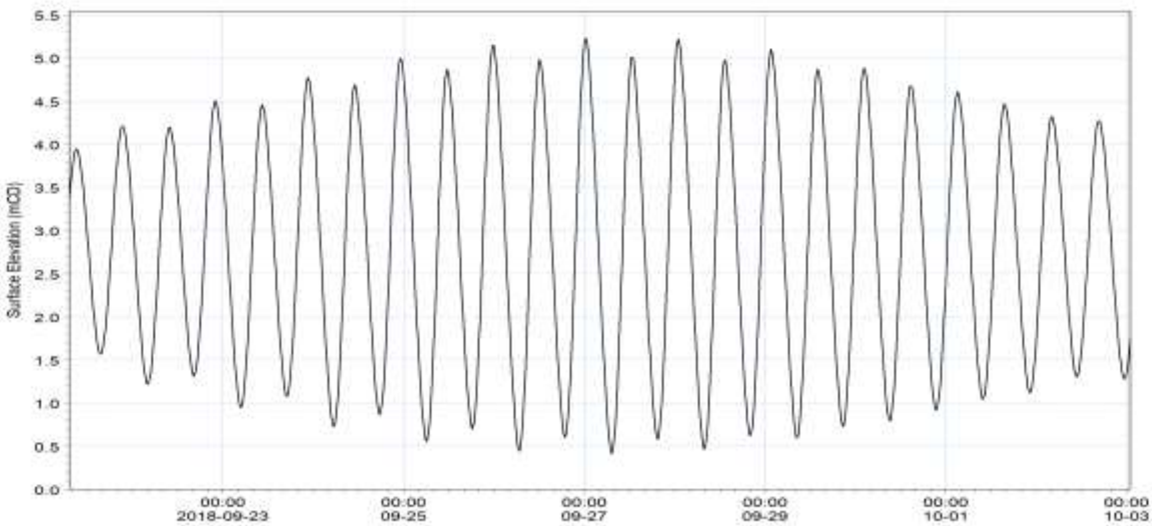


Figure 12.5 Typical surface elevation boundary used to inform the Greenore hydrodynamic model.

Boundary conditions for the spectral model of Carlingford Lough were taken from specific simulations of the RPS Irish Sea wave model for the appropriate storm conditions. An example of the significant wave heights in part of the Irish Sea Model during a 1 in 50 year storm from 105°N is shown in Figure 12.6.

RECEIVED: 18/10/2024

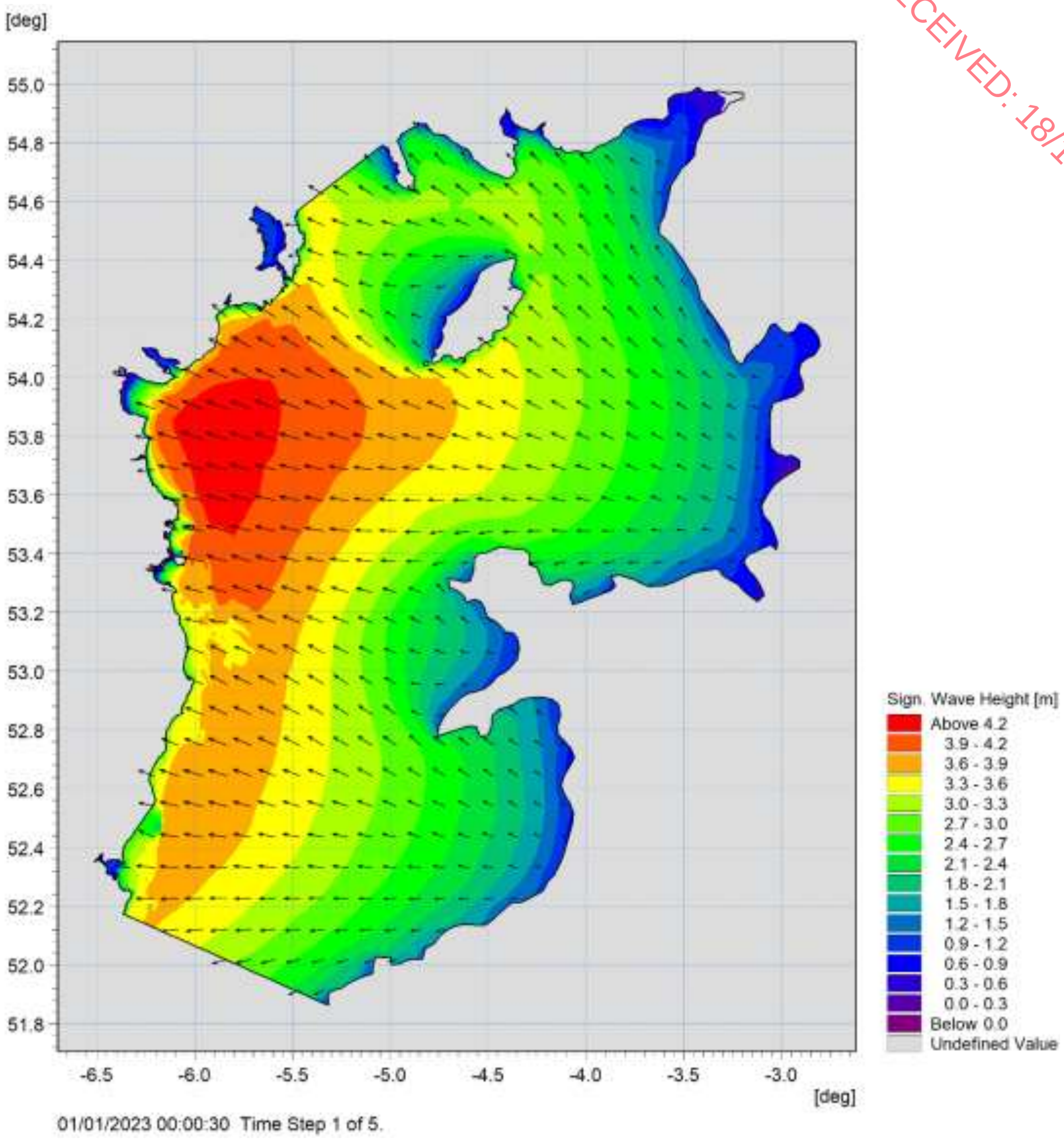


Figure 12.6 Significant wave heights and mean wave directions in the Irish Sea – 1 in 50 year return period storm from 105°N at MHWS.

12.5 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIAR chapter

12.6 Baseline Environment

RECEIVED: 18/10/2024

In this section of the environmental appraisal, the following coastal processes were considered based on the existing scenario:

- **Tidal regime:** Current speeds and direction.
- **Wave patterns:** Significant wave heights and directions.
- **Littoral Currents:** Wave and tidal-driven current speeds affecting sedimentation.

This assessment was undertaken based on the output of bespoke hydraulic modelling of coastal processes within the study area.

12.6.1 Tidal Regime - Baseline Scenario

The MIKE 21 Hydrodynamic module described in Section 12.4.6 was used to derive baseline tidal regime information for Greenore Port.

Figure 12.7 and Figure 12.8 illustrate spring tide flows into and out of Carlingford Lough during mid-flood and mid-ebb respectively. It will be seen from these figures that current velocities tend to be greatest between Greenore Point and Greencastle Point whereby tidal velocities can regularly exceed 1.0m/s owing to the nature of constricted flows in this region. Current velocities subsequently decrease further within the Lough as the tidal regime becomes less constricted.

Figure 12.9 to Figure 12.12 provide a more detailed illustration of current speeds and directions around Greenore Port during typical spring mid-flood, high tide, mid-ebb and low tide conditions. It will be seen from these Figures that current velocities within the Port area do not typically exceed 0.5m/s during most tidal phases owing to the sheltering effect of Greenore Point except during mid-ebb conditions during which current velocities can exceed 1.0m/s.

These results indicate that the baseline tidal regime is sufficient to create natural flushing conditions within the Port which in turn would generally reduce sedimentation and thus the need for extensive maintenance dredging. These findings are in line with observations and records of the harbour master.

It will be seen from Figure 12.13 which illustrates current velocities during typical mid-ebb neap tides that current velocities throughout the Port are not generally less than 0.3m/s. These velocities would be sufficient to keep fine silt material in suspension thus indicating that the Port would be unlikely to silt even during neap conditions.

Typical surface elevations, current speed and direction at the location of the proposed Berth 3 are shown in Figure 12.14 12.14. The location from which this data was extracted is illustrated in Figure 12.3.

RECEIVED: 18/10/2024

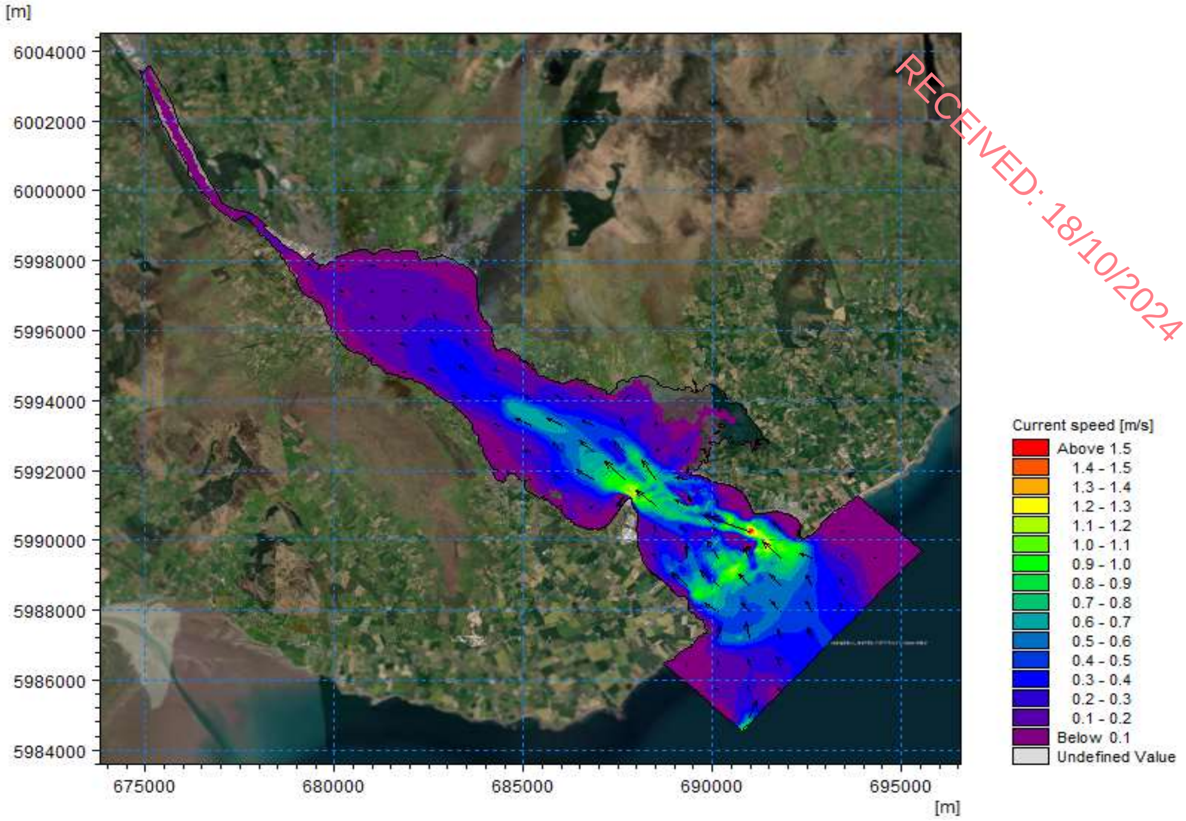


Figure 12.7 Typical current velocities and directions in Carlingford Lough during spring mid-flood conditions – Baseline scenario.

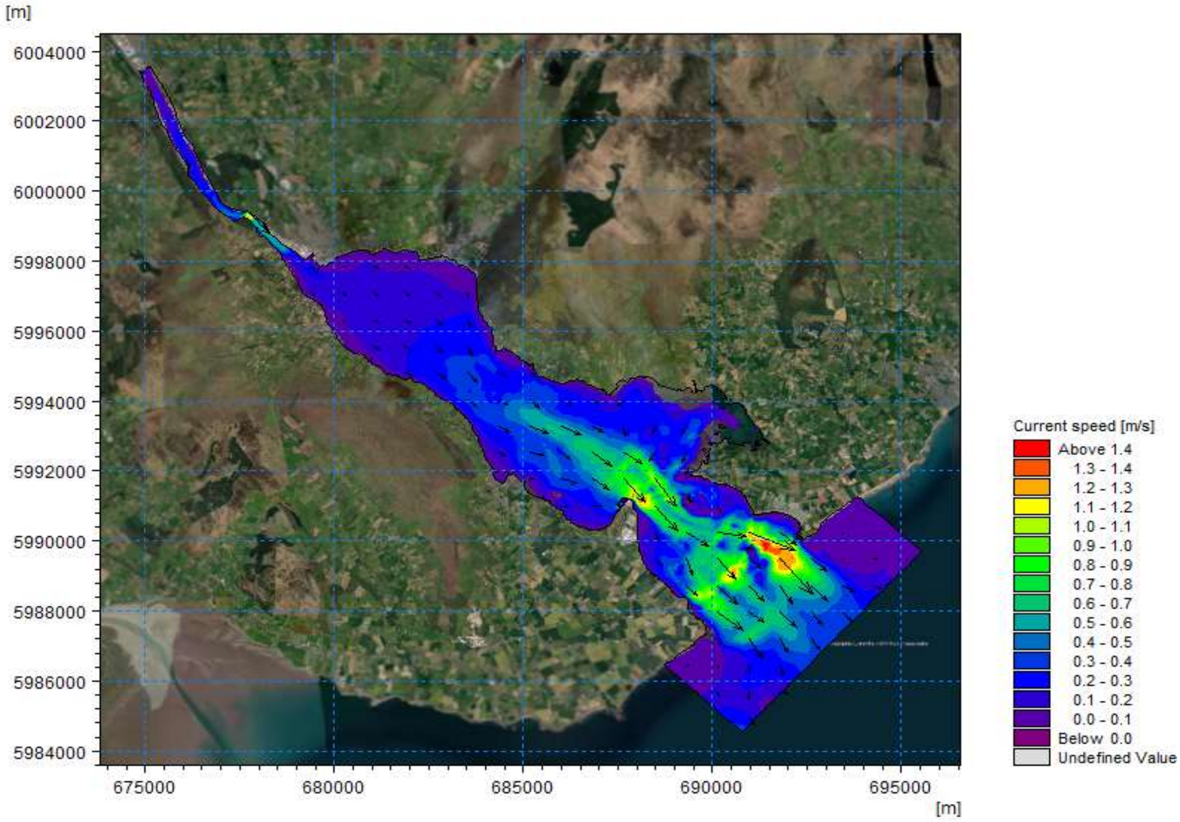


Figure 12.8 Typical current velocities and directions in Carlingford Lough during spring mid-ebb conditions – Baseline scenario.

RECEIVED: 18/10/2024

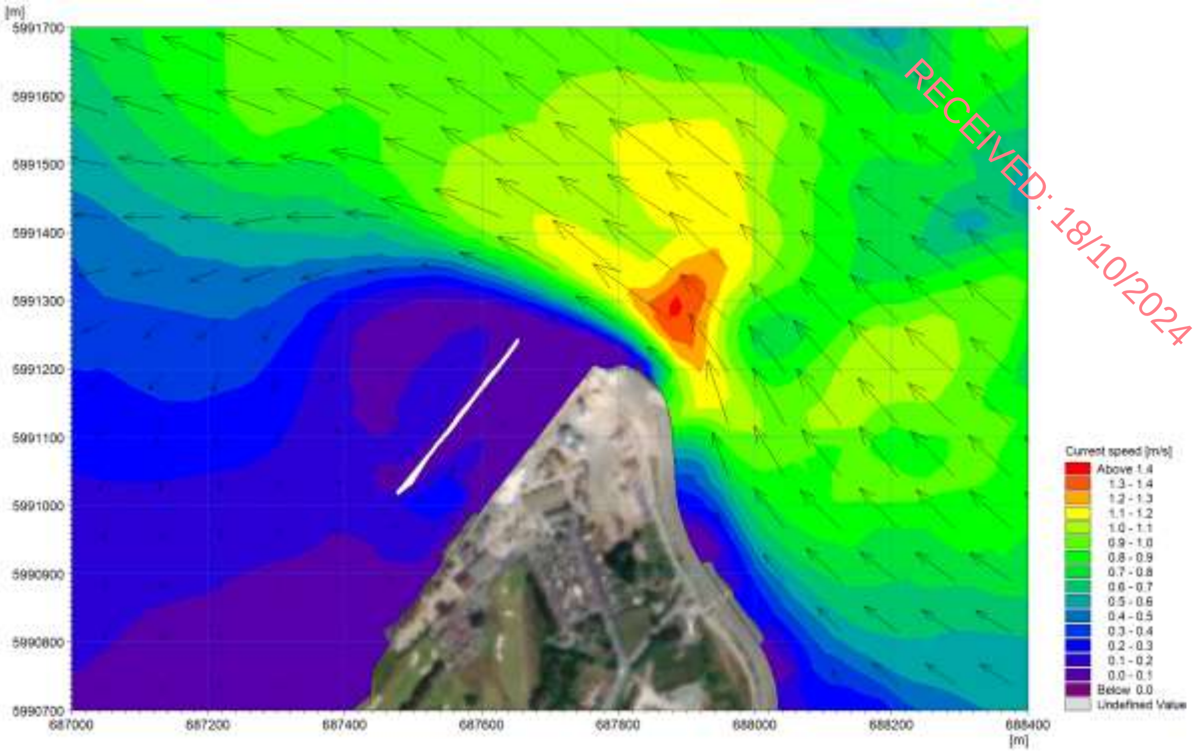


Figure 12.9 Typical current velocities and directions at Greenore Port during spring mid-flood conditions – Baseline scenario.

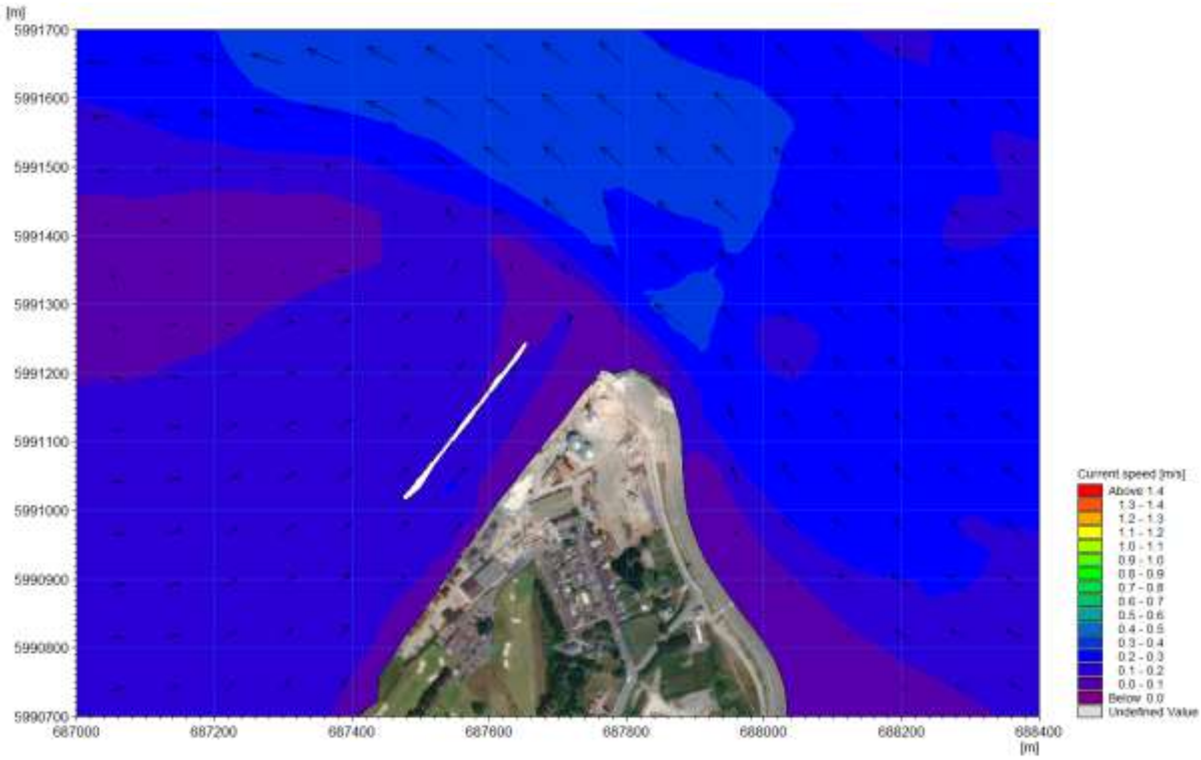


Figure 12.10 Typical current velocities and directions at Greenore Port during spring high tide conditions – Baseline scenario.

RECEIVED: 18/10/2024

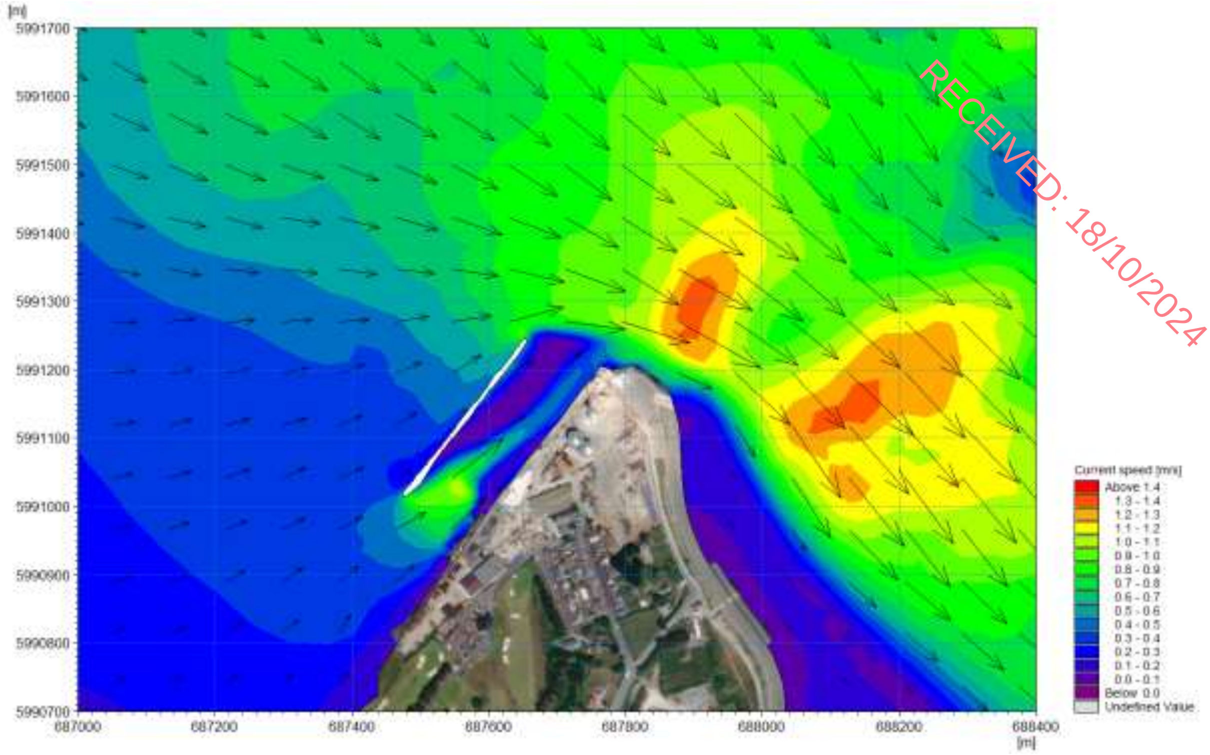


Figure 12.11 Typical current velocities and directions at Greenore Port during spring mid-ebb tide conditions – Baseline scenario.

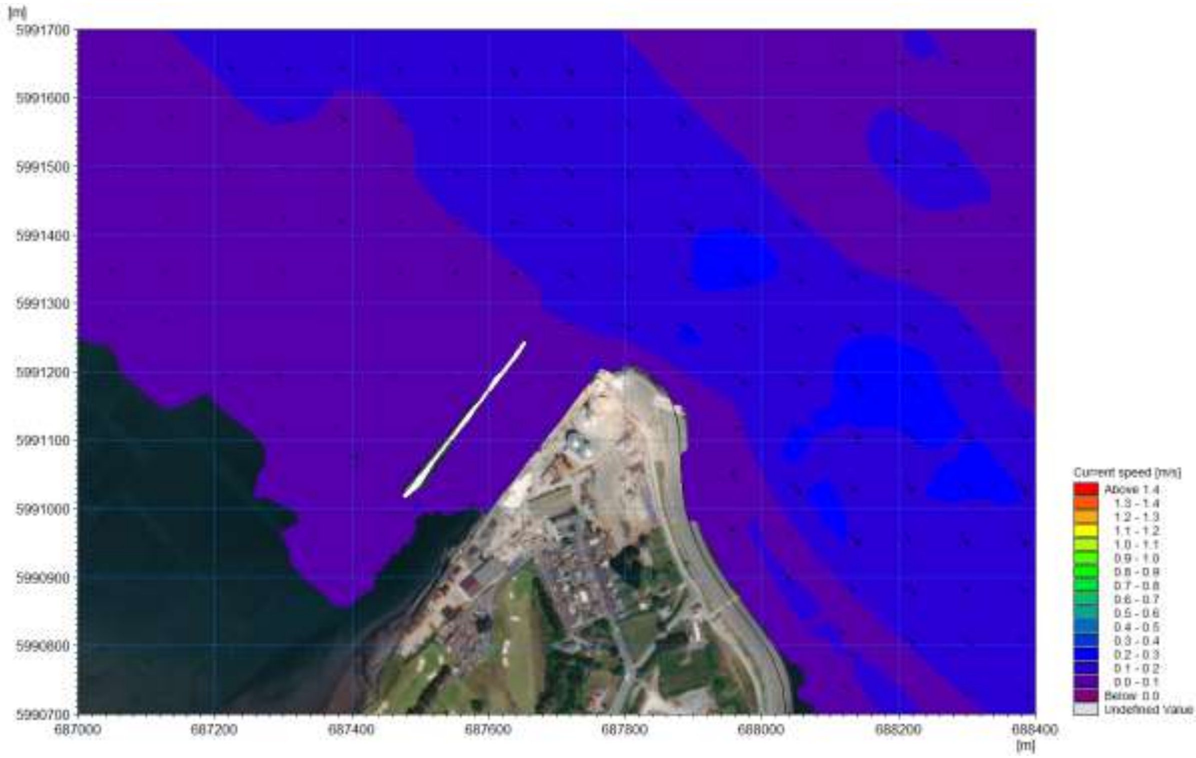


Figure 12.12 Typical current velocities and directions at Greenore Port during spring low tide conditions – Baseline scenario.

RECEIVED: 18/10/2024

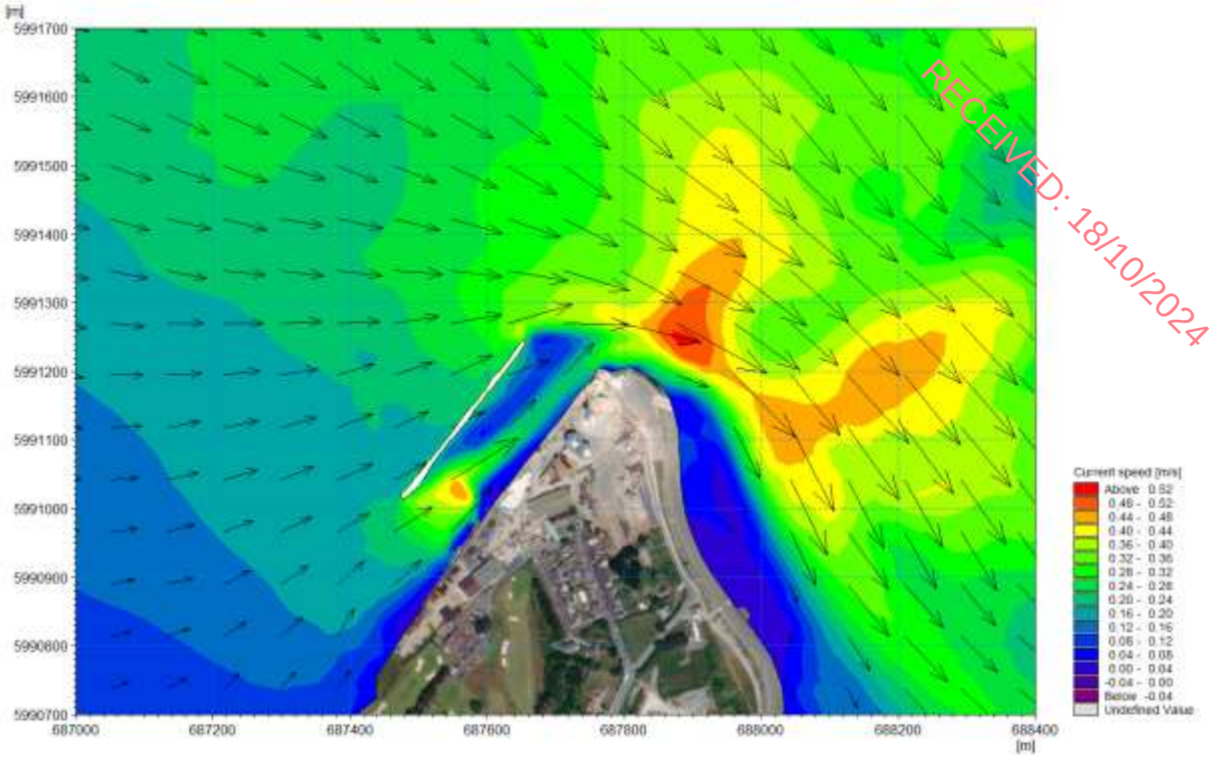


Figure 12.13 Typical current velocities and direction at Greenore Port during neap-ebb tidal conditions – Baseline scenario.

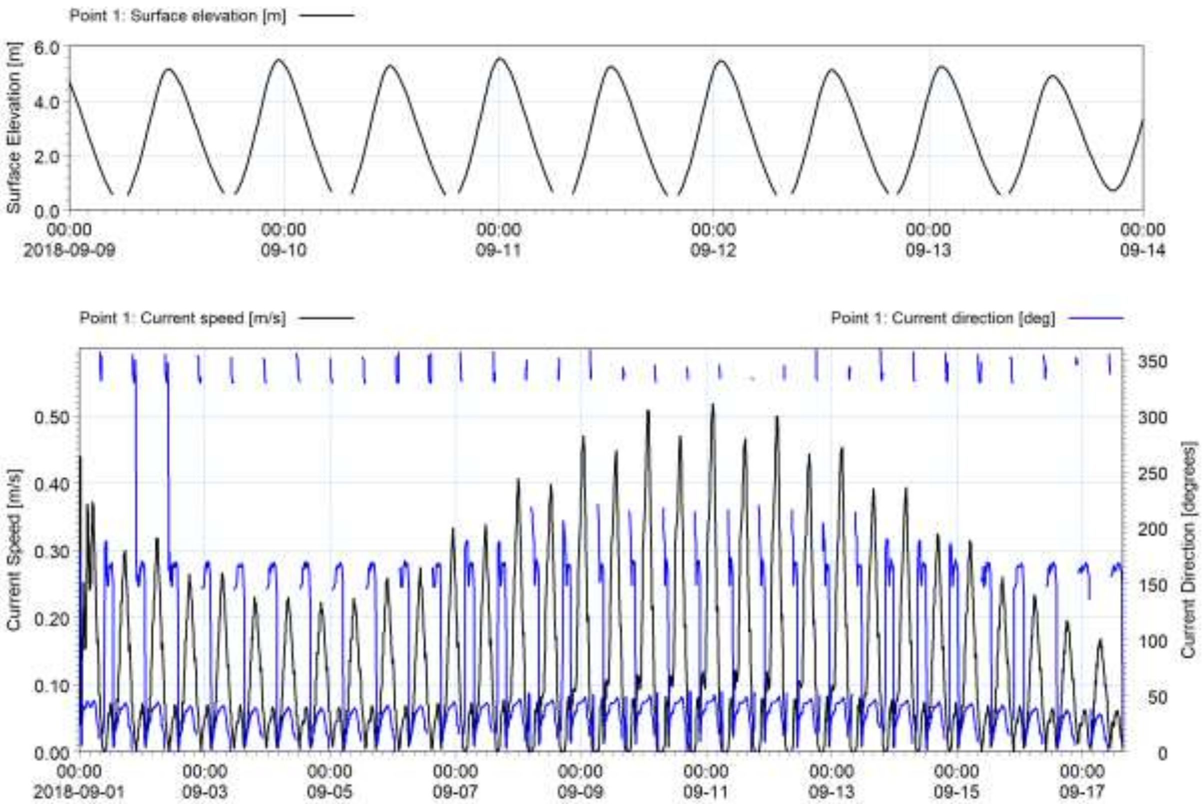


Figure 12.14 Surface elevations (upper), current velocities and directions (lower) during a typical spring tidal regime within the vicinity of Berth 3 at Greenore Port.

12.6.2 Wave Climate - Baseline Scenario

The Spectral Wave (SW) module described in Section 12.4.6 was first used to simulate the generation and transformation of a series of storms with a return period of 1 in 50 years with wind directions at 15°N intervals from 90°N through to 165°N directions across the Irish Sea. As described in Section 12.4.7.2, these simulations provided boundary conditions for the Carlingford Lough model for storms running in from the Irish Sea. In addition to providing boundary condition data, the purpose of this assessment was to determine if waves propagating from the Irish Sea would contribute significantly to the wave climate at Greenore Port.

RECEIVED: 18/10/2024

As illustrated in Figure 12.15 to Figure 12.17, this assessment of 1 in 50-year return period storm conditions during periods of Highest Astronomical Tide (HAT) found that storm waves from the Irish Sea are greatly attenuated by the complex bathymetry at the entrance to the Lough. Consequently, the size of the waves at Greenore Port will be very much smaller than those generated by storm winds over local fetches in Carlingford Lough itself. Furthermore, the wave period of the waves reaching the Port during these offshore storm events will be short as the longer period fraction of the wave spectra are refracted into the shorelines before reaching the Port.

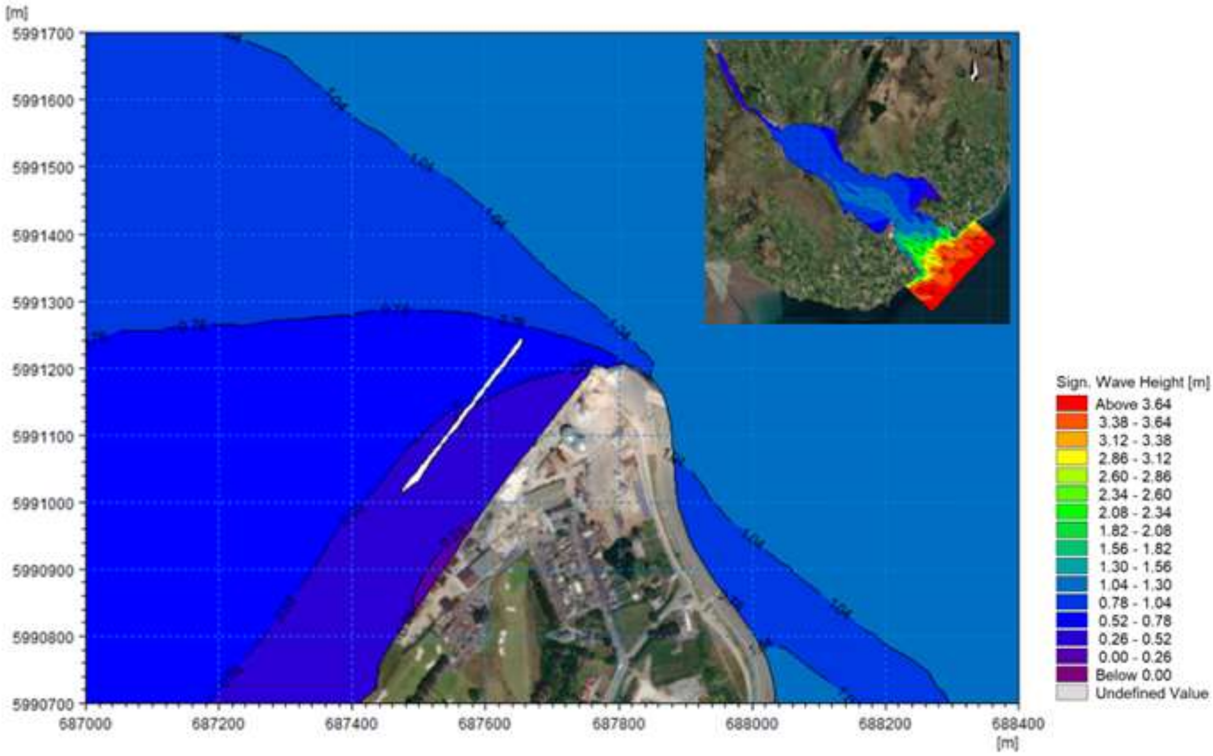
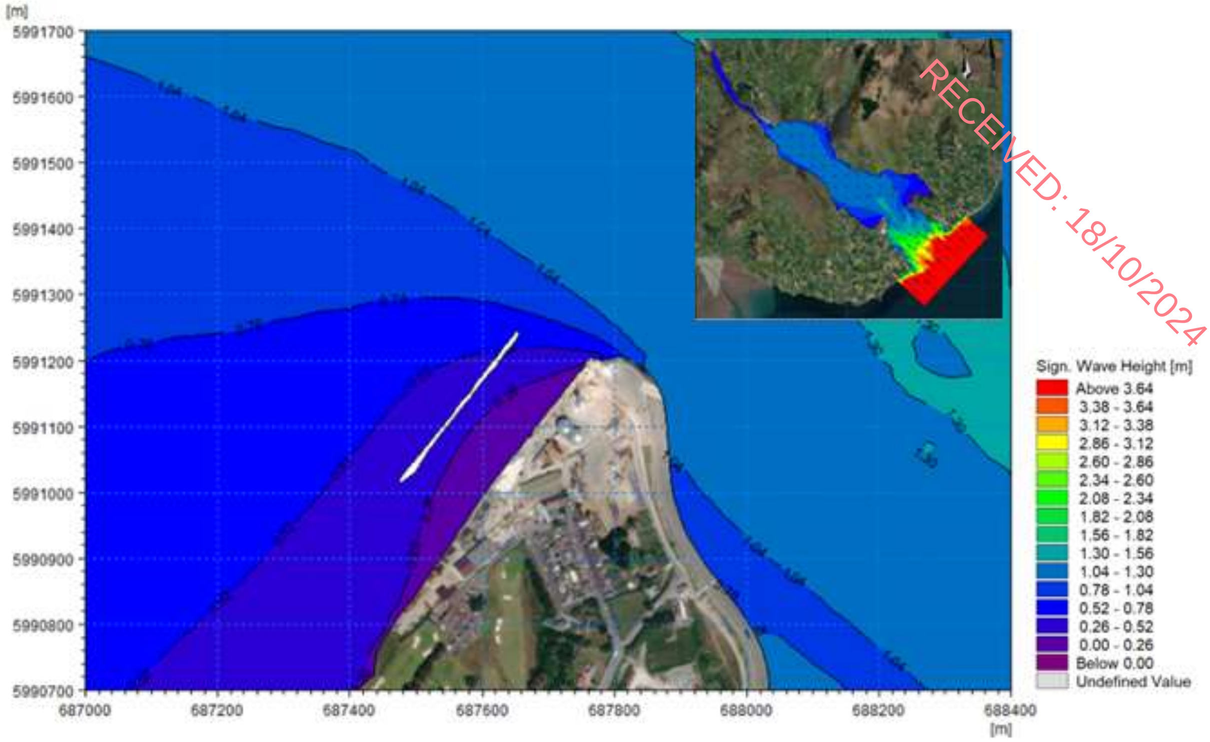


Figure 12.15 Significant wave heights at Greenore Port during 1 in 50 year storm in the Irish Sea from 105°N at HAT – Baseline scenario.



RECEIVED: 18/10/2024

Figure 12.16 Significant wave heights at Greenore Port during 1 in 50 year storm in the Irish Sea from 135°N at HAT – Baseline scenario.

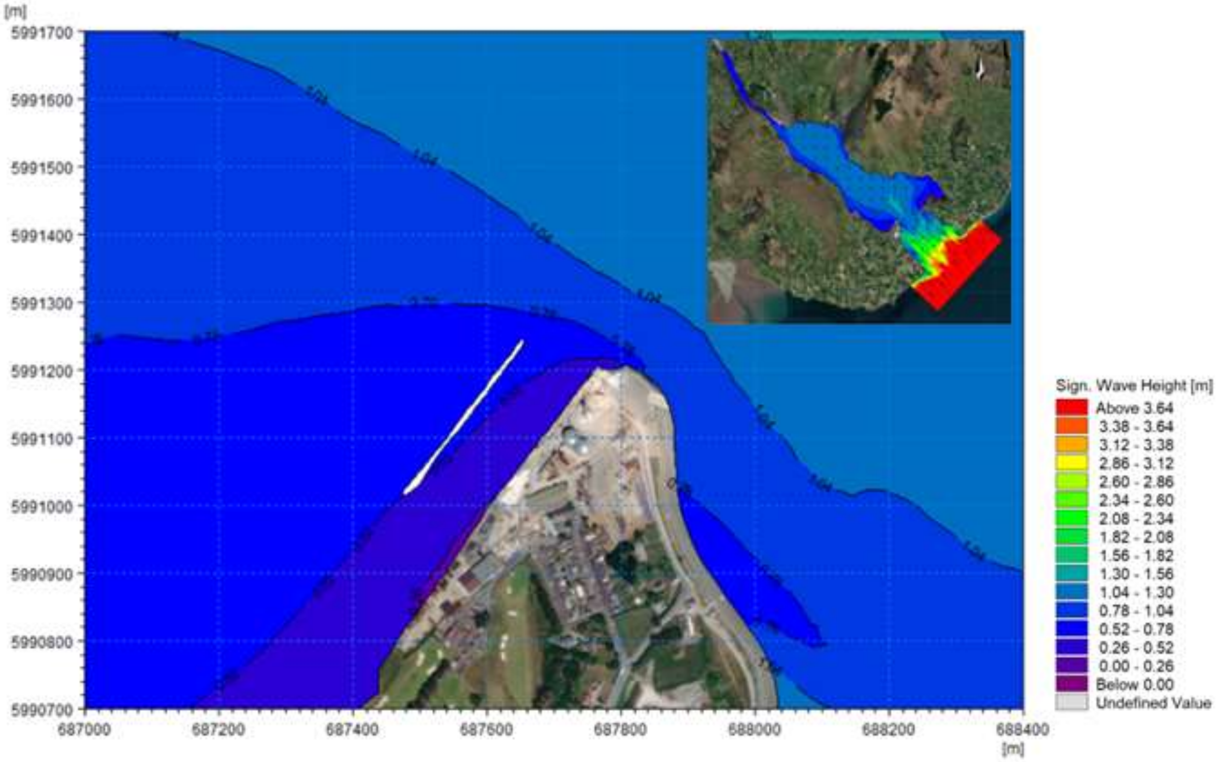


Figure 12.17 Significant wave heights around the Greenore Point berths during 1 in 50 year storm in the Irish Sea from 165°N at HAT – Baseline scenario.

Initial simulations demonstrated that the wave climate at Greenore is most affected by storms generated over the local fetches of Carlingford Lough itself. Thus, simulations were undertaken for 1 in 1, 10, 50, and 100 year return period events for every 15°N sector from between 270°N through north to 90°N. All simulations were again undertaken at Highest Astronomical Tide as wave penetration over the old breakwater is greatest during periods of high tidal levels.

RECEIVED: 18/10/2024

This assessment found that storms from 300ºN produced the largest waves at Greenore Port. Outputs from the 1 in 50 year return period storm event simulation with waves from 270°N, 300°N and 15°N are presented in Figure 12.18 to Figure 12.20. This assessment found that it was storms from 300°N that produced the most arduous conditions at Greenore Port, with significant wave heights of 1.34m and corresponding wave peak wave periods of 4.13s being observed within the vicinity of the Port.

A summary of the inshore wave conditions at Greenore Port within the vicinity of Berth 3 for a range of storm directions during 1 in 50 return period conditions at periods of HAT is presented in Table 12.4. The location from which this data was extracted is illustrated in Figure 12.3.

Table 12.4 Wave parameters at Berth 3 for a range of storm directions approaching Greenore Port, during 1 in 50 year conditions at HAT.

Storm Direction °N	Significant Wave Height (m)	Maximum Wave Height (m)	Peak Wave Period (s)	Wave Period, T01 (s)	Mean Wave Direction °N
270	1.12	2.25	3.79	3.012	311
285	1.18	2.36	3.97	3.16	321
300	1.34	2.59	4.13	3.37	329
315	1.29	2.52	4.09	3.34	332
330	1.27	2.48	4.03	3.28	335
345	1.18	2.32	3.73	3.16	341
360	1.07	2.14	3.57	3.03	351
15	0.90	1.83	3.25	2.83	2
30	0.80	1.63	3.20	2.68	15
45	0.71	1.46	3.18	2.57	212
60	0.62	1.28	3.15	2.47	26
75	0.53	1.09	3.09	2.36	30
90	0.48	0.99	3.08	2.30	32
105	0.35	0.73	3.01	2.15	33
120	0.21	0.43	3.15	2.37	32
135	0.14	0.29	7.13	2.27	18
150	0.25	0.52	1.81	1.36	219
165	0.38	0.79	2.07	1.45	220

RECEIVED: 18/10/2024

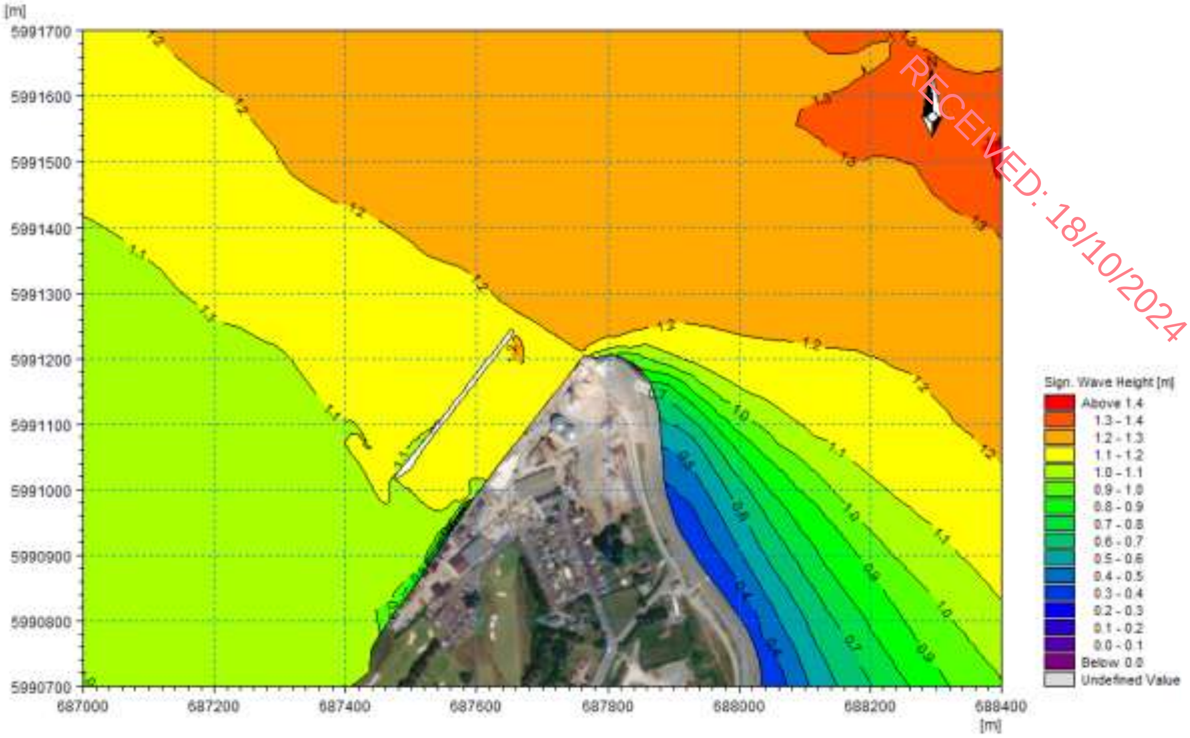


Figure 12.18 Significant wave height and mean wave directions around Greenore during a 1 in 50 year return period storm from 270°N at HAT water level – Baseline scenario.

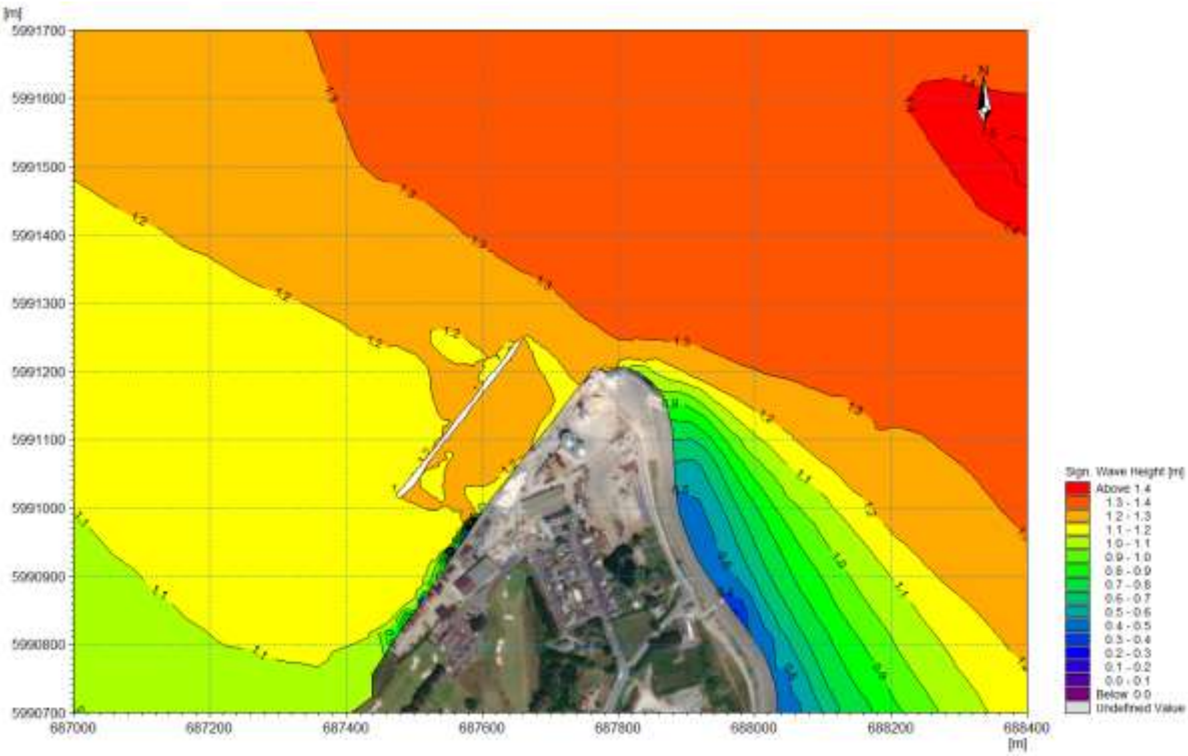
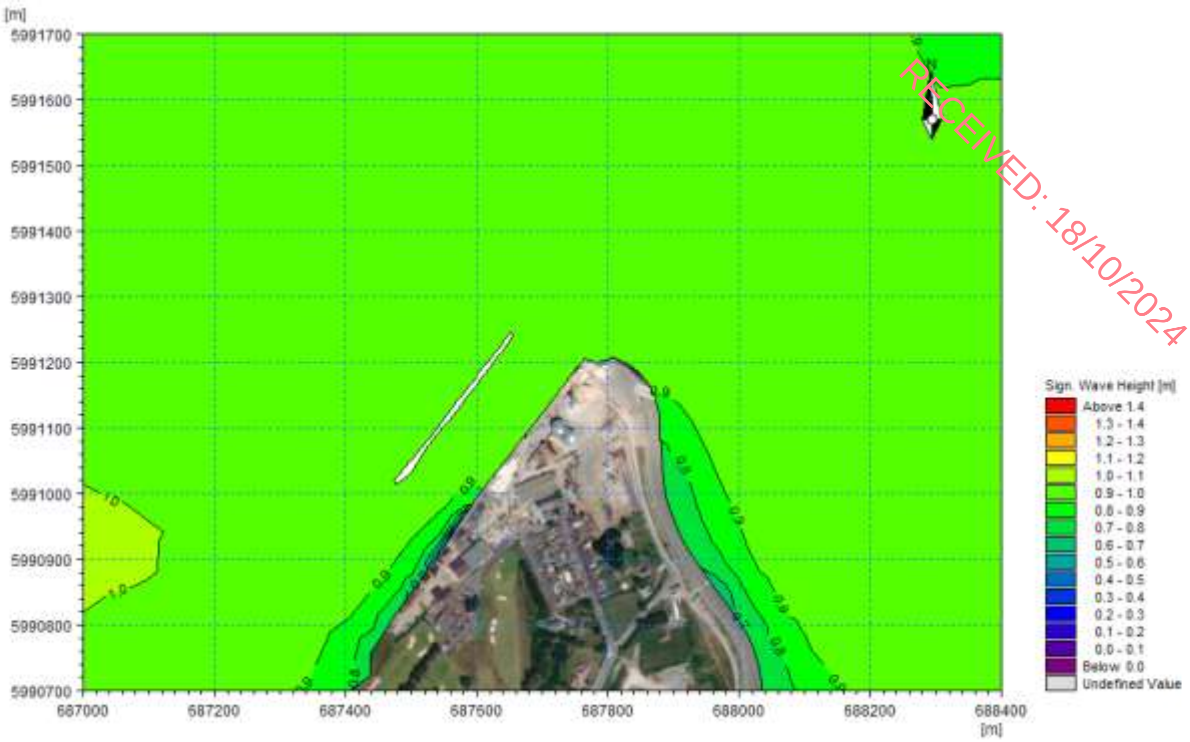


Figure 12.19 Significant wave height and mean wave directions around Greenore during a 1 in 50 year return period storm from 300°N at HAT water level – Baseline scenario.



RECEIVED: 18/10/2024

Figure 12.20 Significant wave height and mean wave directions around Greenore during a 1 in 50 year return period storm from 15°N at HAT water level – Baseline scenario.

12.6.3 Littoral Currents - Baseline Scenario

Littoral currents are the result of the combined action of tides, wind and waves on the current regime and are primarily responsible for the suspended and bed-load transport of sediment material within a coastal environment. As such, littoral currents can be used as a proxy to infer the potential direction and rate of sediment transport.

To assess baseline littoral currents, a coupled hydrodynamic and spectral wave model which also included a variable wind field was used to simulate and quantify littoral currents during a typical 1 in 1 year return period storm event from 300°N.

The output from this assessment is presented in Figure 12.21 to Figure 12.24 for typical spring mid-flood, high water, mid-ebb and low water conditions respectively. It was found that the inclusion of wind and wave conditions enhanced current velocities throughout the study area, particularly during mid-flood conditions whereby velocities around Greenore Point increased from *c.* 1.1m/s to more than 1.4m/s.

Current velocities were also increased by a similar magnitude during mid-ebb conditions within the vicinity of Greenore Port. This can be attributed to a marginally greater volume of water having to flow back out of Carlingford Lough which would in turn increase velocities and the natural tidal flushing capacity of the Port.

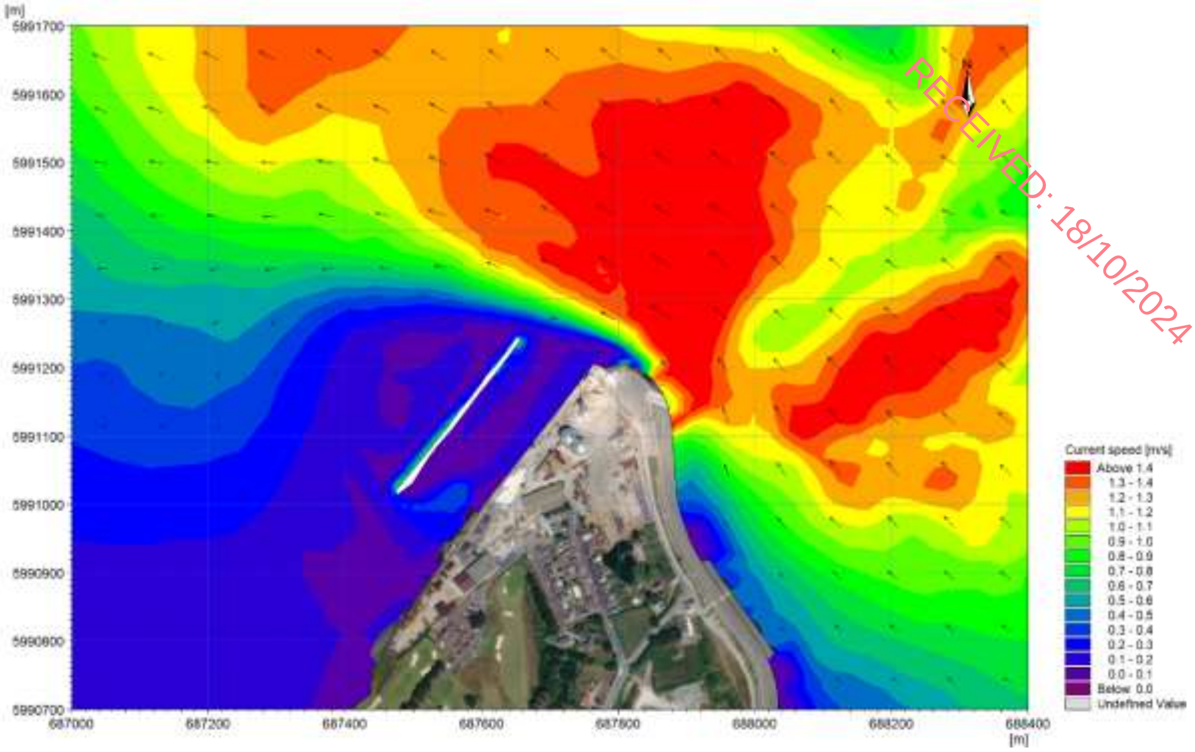


Figure 12.21 Littoral current velocities and direction during a mid-flood, 1 in 1 year storm conditions from 300°N - Baseline scenario.

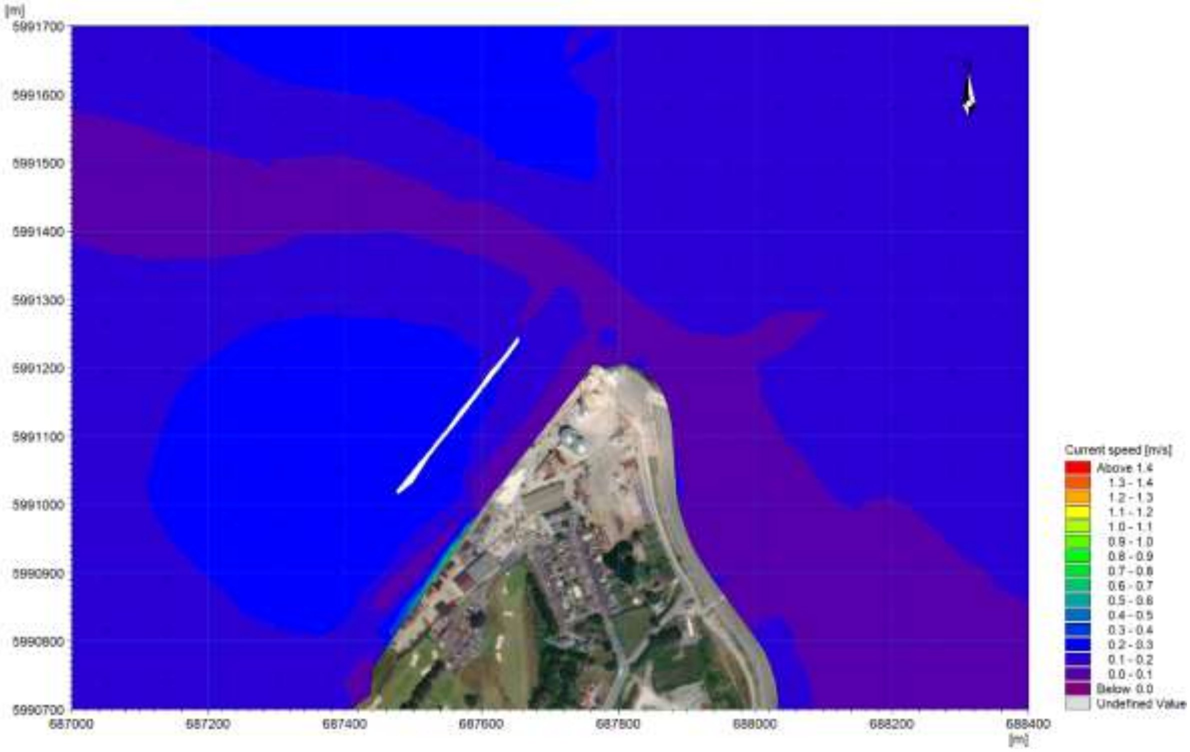
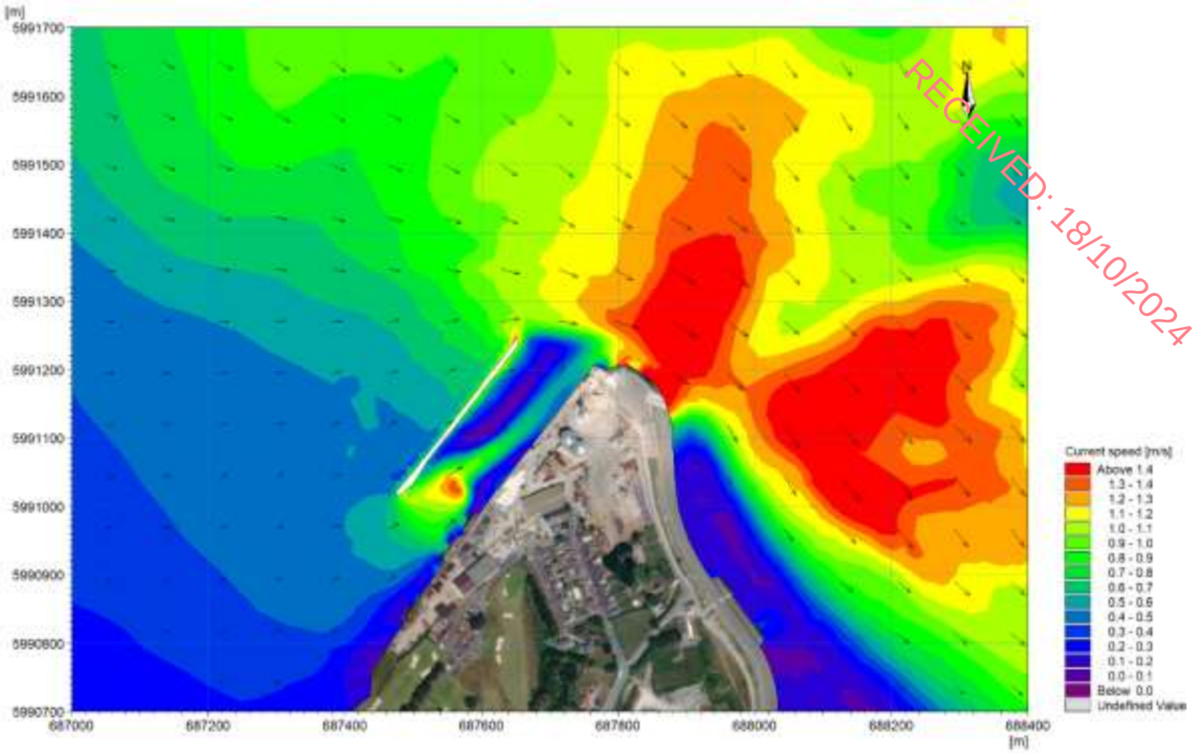


Figure 12.22 Littoral current velocities and direction during high tide, 1 in 1 year storm conditions from 300°N - Baseline scenario.

RECEIVED: 18/10/2024



RECEIVED: 18/10/2024

Figure 12.23 Littoral current velocities and direction during a mid-ebb tide, 1 in 1 year storm conditions from 300°N - Baseline scenario.

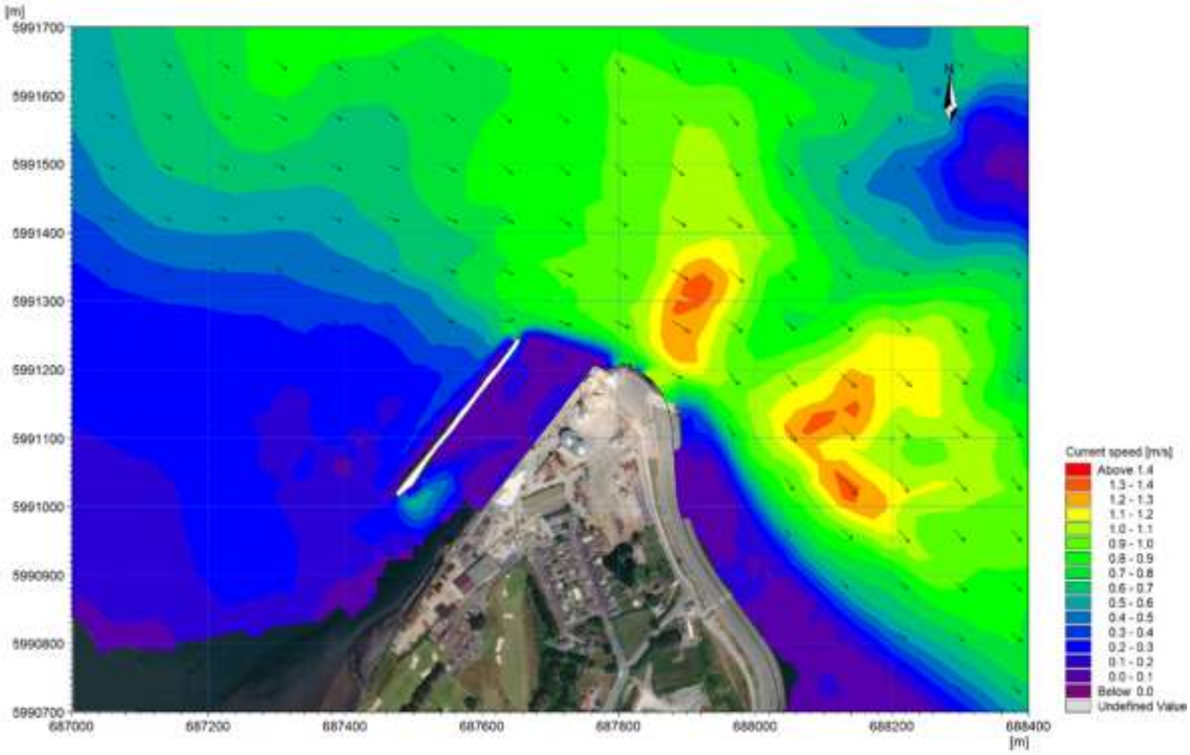


Figure 12.24 Littoral current velocities and direction during low tide, 1 in 1 year storm conditions from 300°N - Baseline scenario.

12.7 The 'Do Nothing' Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no dredging works or alteration to the existing maritime development. As such, there would be a neutral effect on the existing coastal processes, i.e., the tide, wave and sediment transport regime.

RECEIVED: 18/10/2024

12.8 Potential Significant Effects

An analysis of the potential impacts of the proposed development on the existing coastal processes during the demolition, construction and operational phases are outlined below. Due to the inter-relationship between water & hydrology the following impacts discussed will be considered applicable to Chapter 10 of the EIA Report.

Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 12.9.

12.8.1 Demolition Phase

No demolition works are proposed as part of the maritime development.

12.8.2 Construction Phase

The major marine elements of the proposed development are outlined in Chapter 2. In the context of coastal processes, the element of the O&M facilities that has the potential to result in construction phase impacts is the dredging works within the vicinity of Berth 3. Approximately 45,000 cubic meters of material will be dredged in this area to facilitate navigable access with material being disposed of on land.

Temporary impacts on water quality have the potential to occur during the construction phase of the works, i.e. the dredging operations. Mobilised suspended sediment release through backhoe dredging is the principal potential source of environmental impact.

The potential impacts from the increase in background suspended sedimentation concentrations and deposition levels as a result of the capital dredging operation of the construction phase are assessed in the following sections.

The proposed piling works required to fix the proposed pontoon berths are not expected to result in an increase of suspended sediments given that all piles will be driven as opposed to augured.

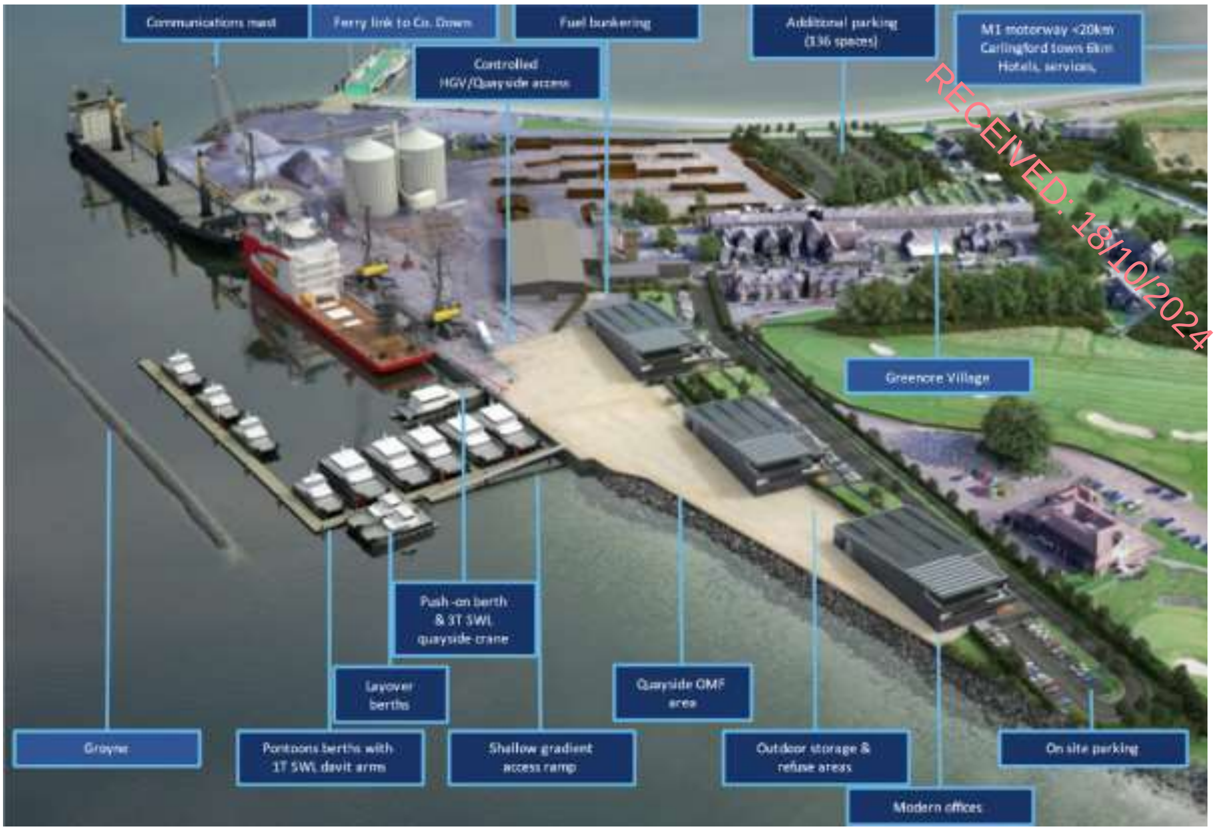


Figure 12.25 Visualisation of the proposed development.

RECEIVED: 18/10/2024

12.8.2.1 Potential impacts as a result of dredging

As described in Chapter 2, the proposed development will include dredging activities in the nearshore area to achieve a seabed level of -4m relative to chart datum as illustrated in Figure 12.26 12.26. The dredging operations will result in the removal of *c.* 45,000m^3 of marine sediment.

RECEIVED: 18/10/2024

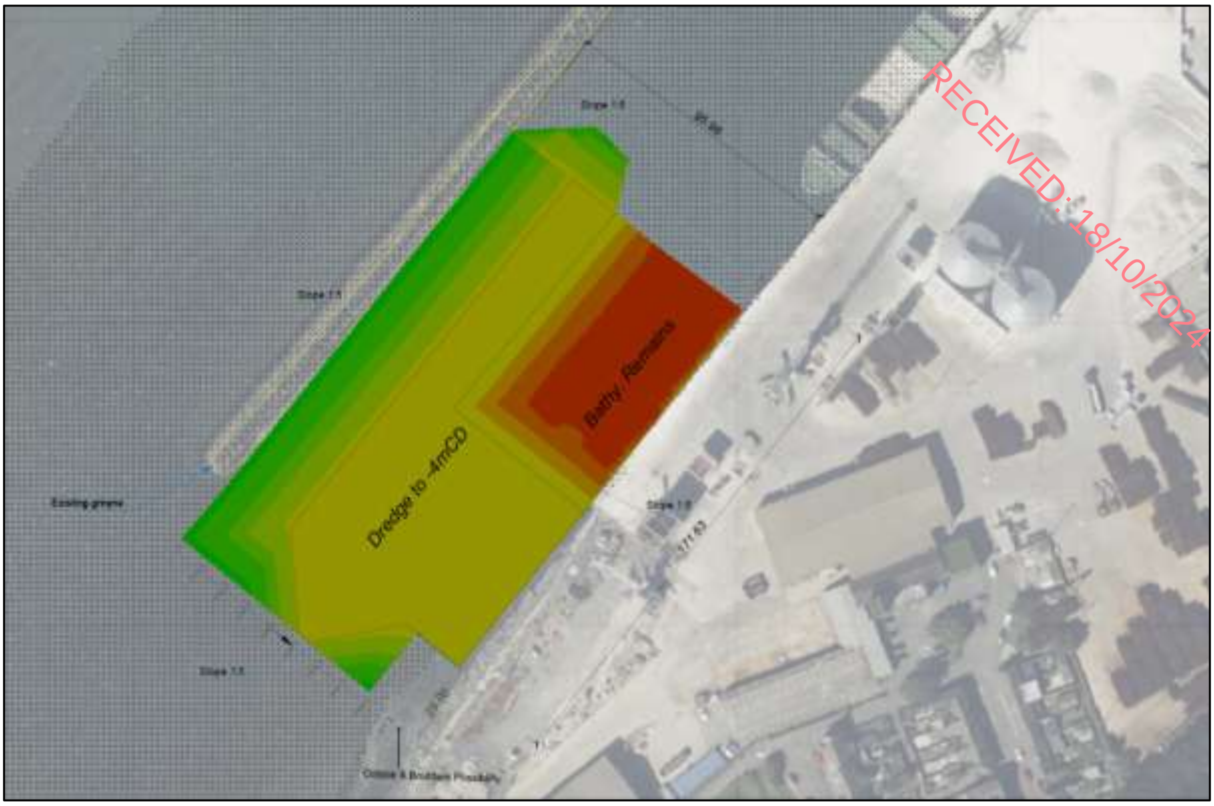


Figure 12.26 Dredge plan drawing extract (Drawing Number: D5111 McCarthy Browne).

Notwithstanding the application of mitigation measures, the process of dredging unavoidably causes disturbance of sediment on the seabed and dispersal of some material in the water column. This chapter considers the effect of same on the tidal regime, inshore wave climate and sediment dispersion within the Study Area. The potential impacts arising from the dredging activity have therefore been assessed as described in the following sections of the report.

A project-specific geotechnical report (Gavin & Doherty Geosolutions, 2024) summarised the geology of the area to be dredged and is shown in Table 12.5 below.

Table 12.5 Summarised geology (Gavin & Doherty Geosolutions, 2024).

Top of Stratum (mCD)	Thickness (m)	Description
-1	3.2	Sandy Silty **CLAY**
-4.2	2.8	Silty fine to medium **SAND** containing cobbles and boulders
-4.4	0.6	Silty fine to medium **SAND** containing a little gravel with occasional cobbles and boulders.
-5.1	0.9	Silty **CLAY** containing occasional shells

The only particle size analysis data available for this area was from a site investigation report by Glover Site Investigations Ltd. in 1998. Of the 17 samples sieved three had no fines content, twelve had a fines content between 1% - 7%, and two samples had a fines content between 20% - 25% (Glover Site Investigations Ltd., 1998). The low prevalence of fine material across this area is consistent with observations from previous dredge campaigns which reported only minimal dredge plumes being produced as a result of dredging works.

To assess the potential for sediment plumes as a result of the dredging activities under the proposed development, a coupled hydrodynamic and mud transport model was run for a dredging campaign which lasted for 50 days, thus covering a full range of spring and neap tidal flow conditions. The dredge material in the dispersion model was characterised using two distinct sediment fractions, one to represent fine sand material and another to represent silt material. In line with industry-standard practice, sediment material was introduced as a source term based on an overspill rate of 3% of the fine sediment content from the backhoe dredger. The dredge simulation parameters are summarised in Table 12.6.

RECEIVED: 18/10/2024

Table 12.6 Dredge simulation input parameters.

Parameter	Value
Dredge Quantity	45,000 m^3
Dredge rate	80m^3/hr
Fines Content	20% **is considered very conservative given presence of fines is expected to be considerably less.*
Overspill	3%
Active Dredging	12.21 hrs per day
Length of simulation	50 days
Sediment Fraction 1 – Fine Sand	0.125mm
Sediment Fraction 2 – Silt	0.0310mm

The dredge path along which the sediment material was introduced as a source term is illustrated in Figure 12.27.

The dispersion of material during the dredging operations is illustrated by a series of plume envelope diagrams that show total suspended sediment concentrations (SSCs) in the water column. Figure 12.28 12.28 to Figure 12.31 illustrates the total SSCs during typical spring mid-flood, high water, mid-ebb and low water conditions.

Figure 12.28 demonstrates that during periods of mid-flood conditions there is very little dispersion of the resultant plume envelope. This can be attributed to the asymmetry between peak current velocities and tidal phases, in that atypically at Greenore, currents are near slack during mid-flood conditions but then peak near high water conditions.

During periods of high water, SSC plumes can be seen to extend north-east for up to *c.* 250m before sediment settles back to the seabed or is fully dispersed to below background levels. As demonstrated byFigure 12.29, the total SSC of these plumes is typically less than 4.0mg/L. Similar dispersion characteristics are observed during mid-ebb tidal conditions as illustrated in Figure 12.30.

Resultant sediment plumes during typical low water conditions are illustrated in Figure 12.31. Owing to near slack conditions during this period, the dispersion of sediment is extremely limited and confined exclusively within the limits of Greenore Port.

RECEIVED: 18/10/2024

Figure 12.27 Dredge path used in the model for suspended sediments.

Figure 12.28 Suspended sediment concentration plume during typical mid-flood conditions.

RECEIVED: 18/10/2024

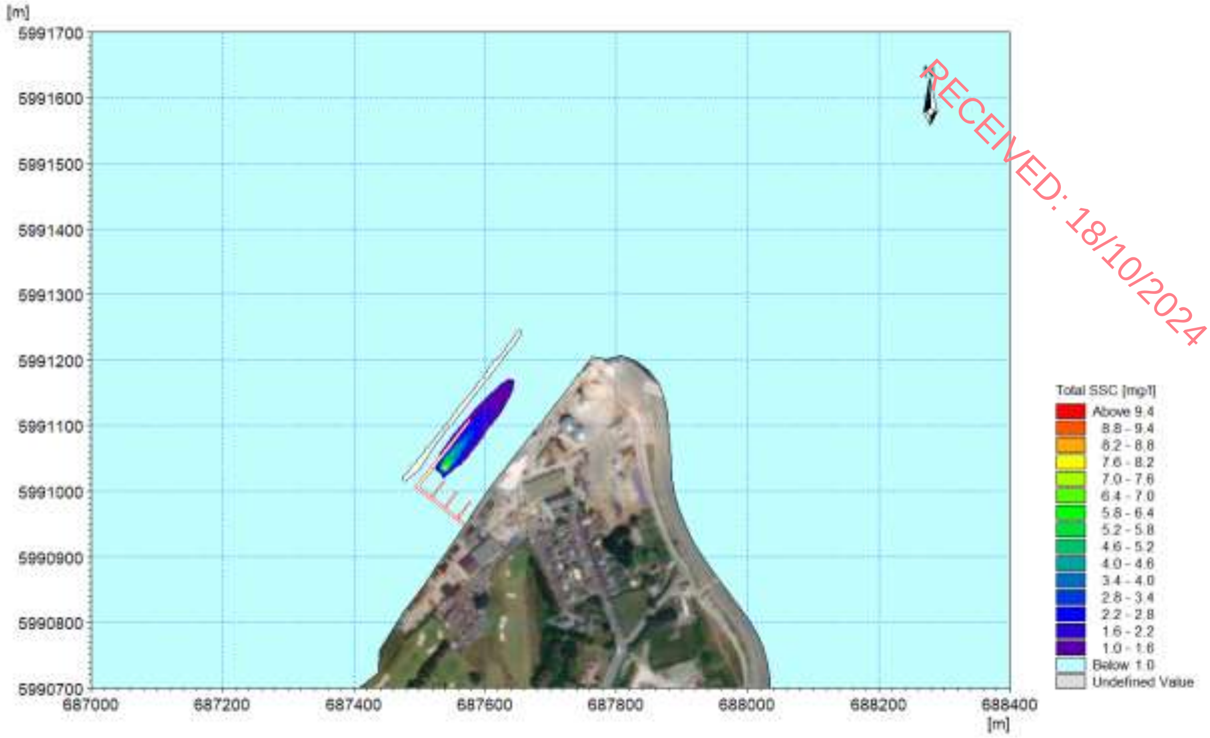


Figure 12.29 Suspended sediment concentration plume during typical high tide conditions.

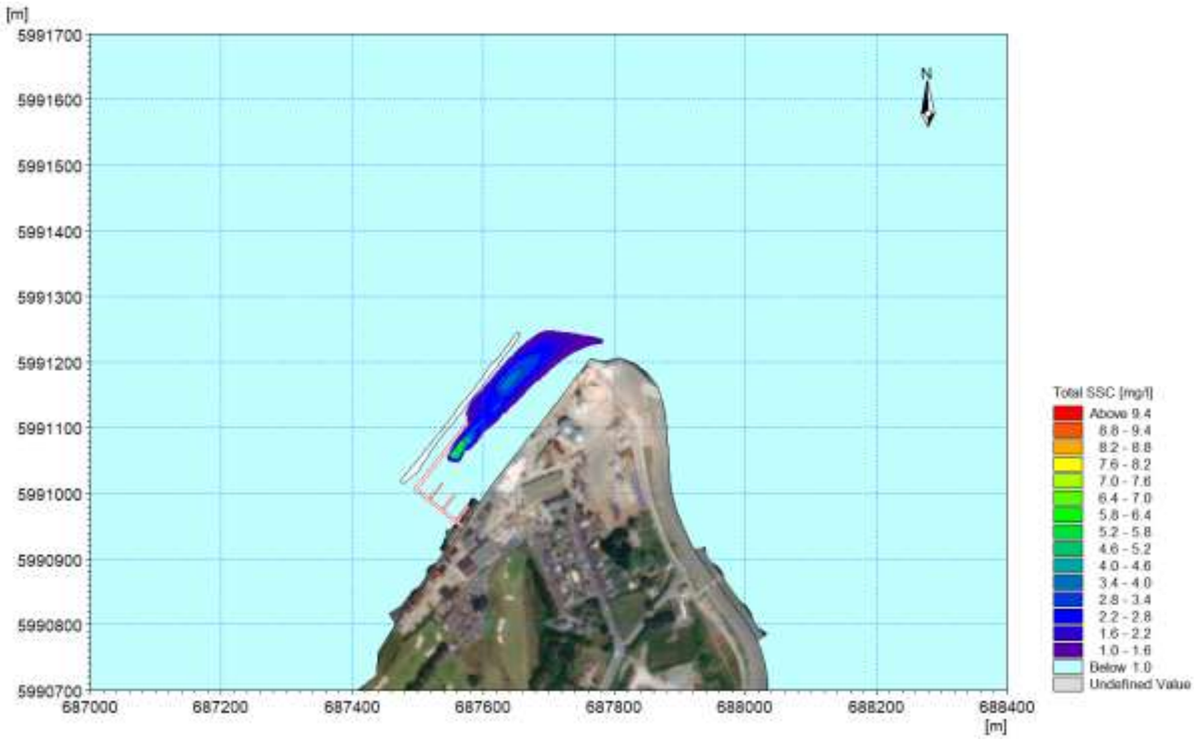
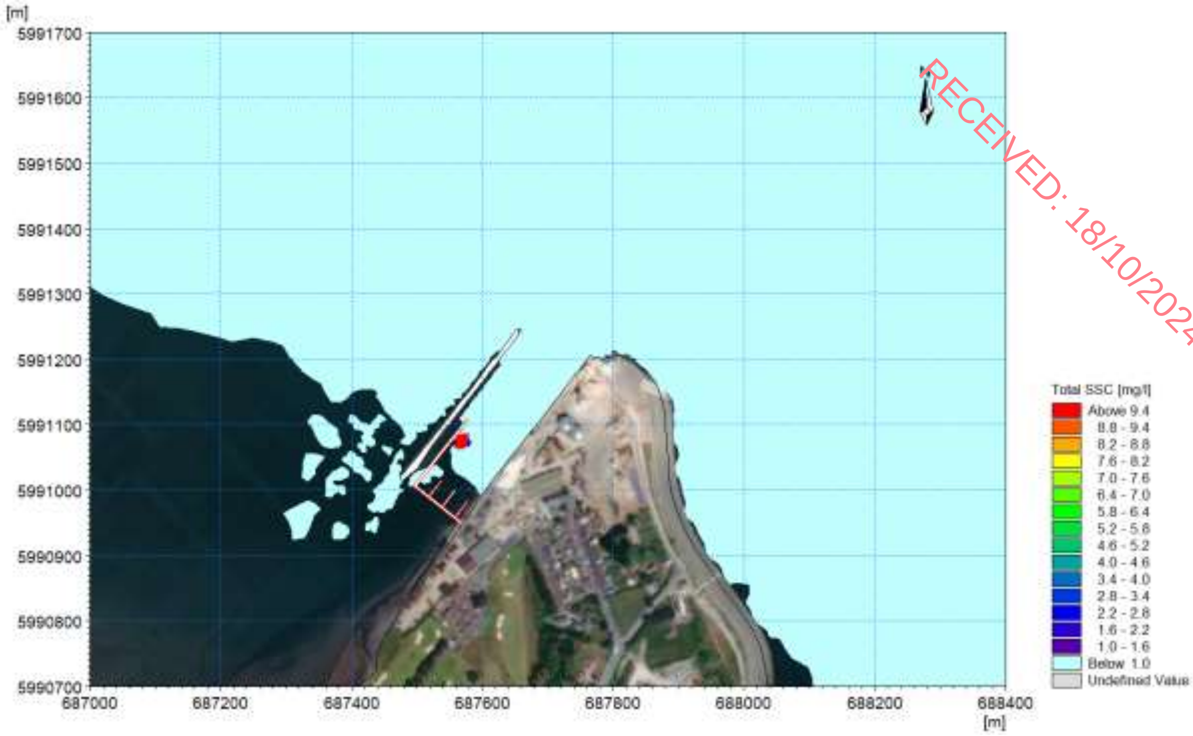


Figure 12.30 Suspended sediment concentration plume during typical mid-ebb conditions.



RECEIVED: 18/10/2024

Figure 12.31 Suspended sediment concentration plume during typical low tide conditions.

Figure 12.32 illustrates the average total SSC within the vicinity of Greenore over the course of the dredging activity. It will be seen from this figure that the average SSC is generally less than 1.0mg/L and the plume is mostly confined to within the Greenore Port area. Beyond the Port area, the SSC of plumes is generally less than 0.5mg/L. Importantly, there is no detectable increase in sediment concentrations within the vicinity of the nearby aquaculture sites within Carlingford Lough.

Figure 12.33 demonstrates that the total deposition of sediment material upon completion of the dredging works is less than 5cm. It should be noted that in reality, dredging would proceed until the specified design depth is reached and any material deposited within the dredge area will be removed by the dredger until the specification is met.

RECEIVED: 18/10/2024

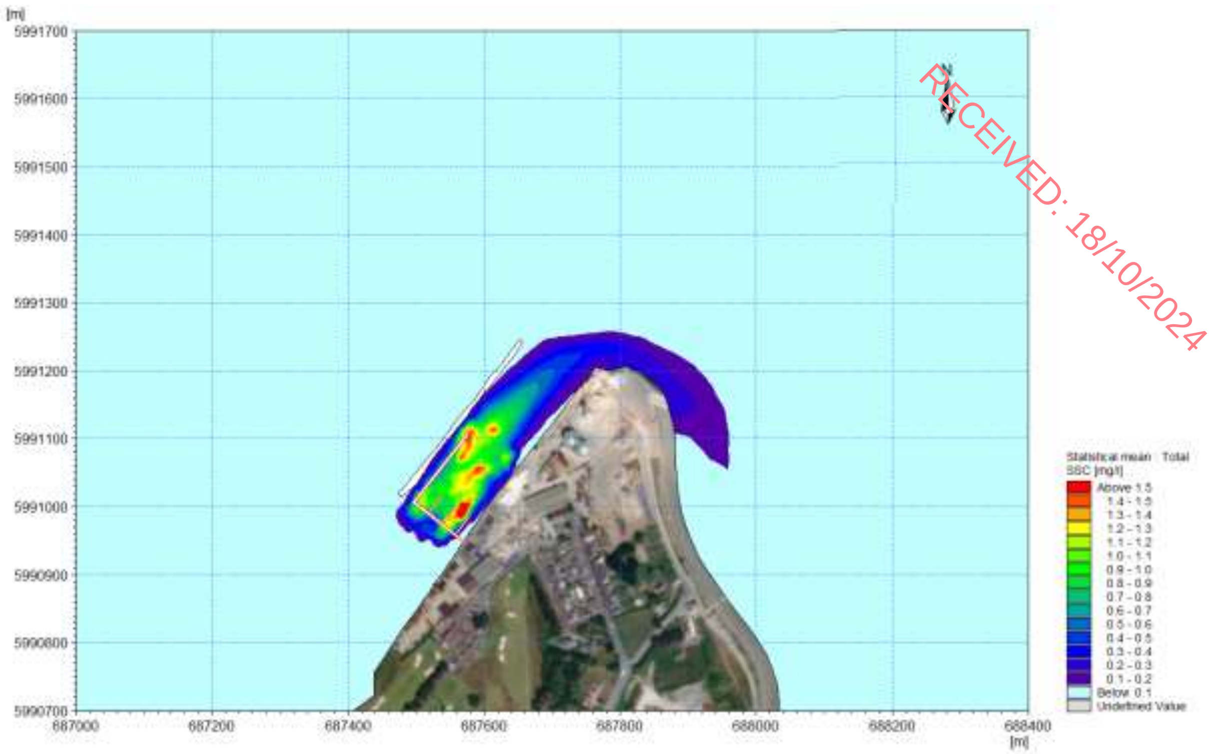


Figure 12.32 Average suspended sediment concentrations during dredge works.

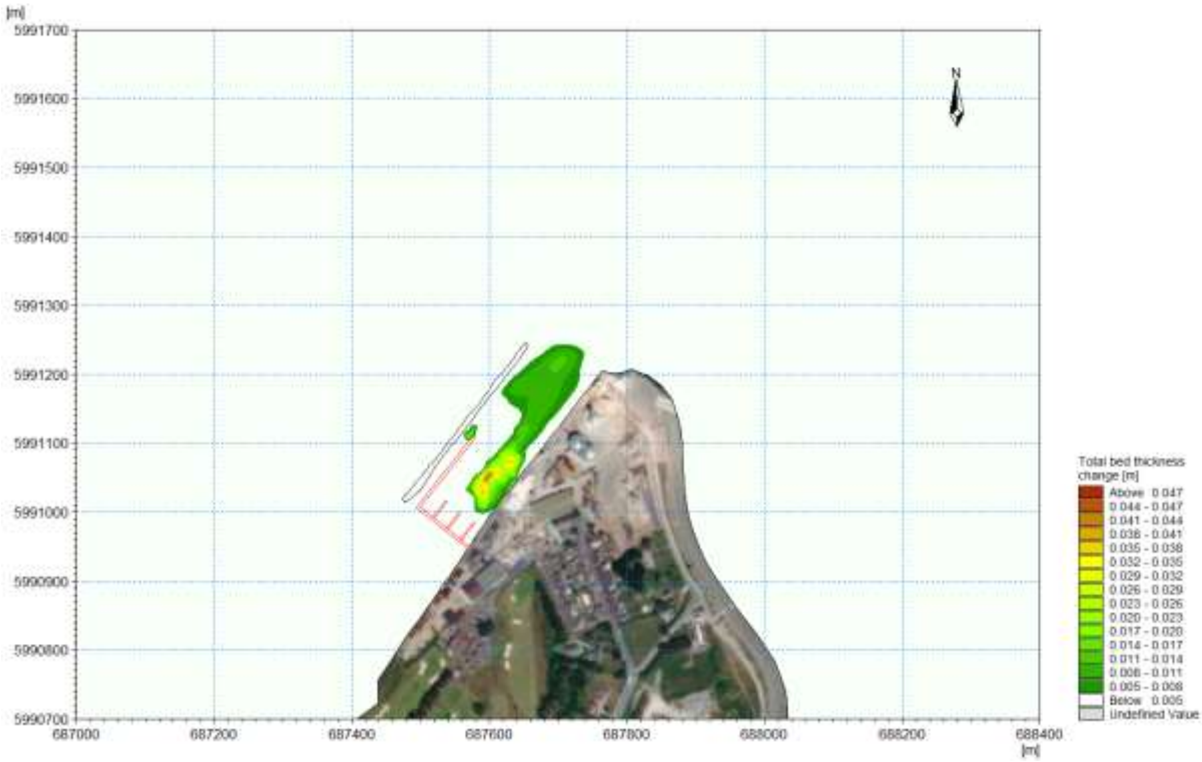


Figure 12.33 Total deposition of sediment material upon completion of the dredge works.

12.8.3 Operational Phase

RECEIVED: 18/10/2024

Port development consisting of the construction of structures and/or changes in the configuration of the seabed bathymetry through capital dredging works has the potential to impact coastal processes. In particular, the proposed depth alterations to the seabed and associated restoration of the existing breakwater to -4.0m Chart Datum (CD) crest level has the potential to impact the following coastal processes during the operational phase of the project:

- Tidal current patterns within Greenore Port and Carlingford Lough.
- Sedimentation and erosion patterns within Greenore Port and Carlingford Lough.
- The inshore wave climate within Greenore Port and the surrounding area.
- Prevailing water levels and the existing flood risk in Greenore Port and Carlingford Lough.

The operational phase impacts in the context of these coastal processes are assessed in the followings Sections.

12.8.3.1 Potential changes to the existing tidal regime

The potential for changes with the proposed development in place was assessed to consider operational phase impacts. The MIKE 21 Hydrodynamic module described in Section 12.4.6 was used in conjunction with the post-development scenario 2D model to simulate the tidal regime at Greenore Point following the construction of the scheme.

Figure 12.34 to Figure 12.37 12.37 illustrate tidal current velocities and directions following the construction of the proposed development at typical spring mid-flood, high water, mid-ebb and low tide conditions.

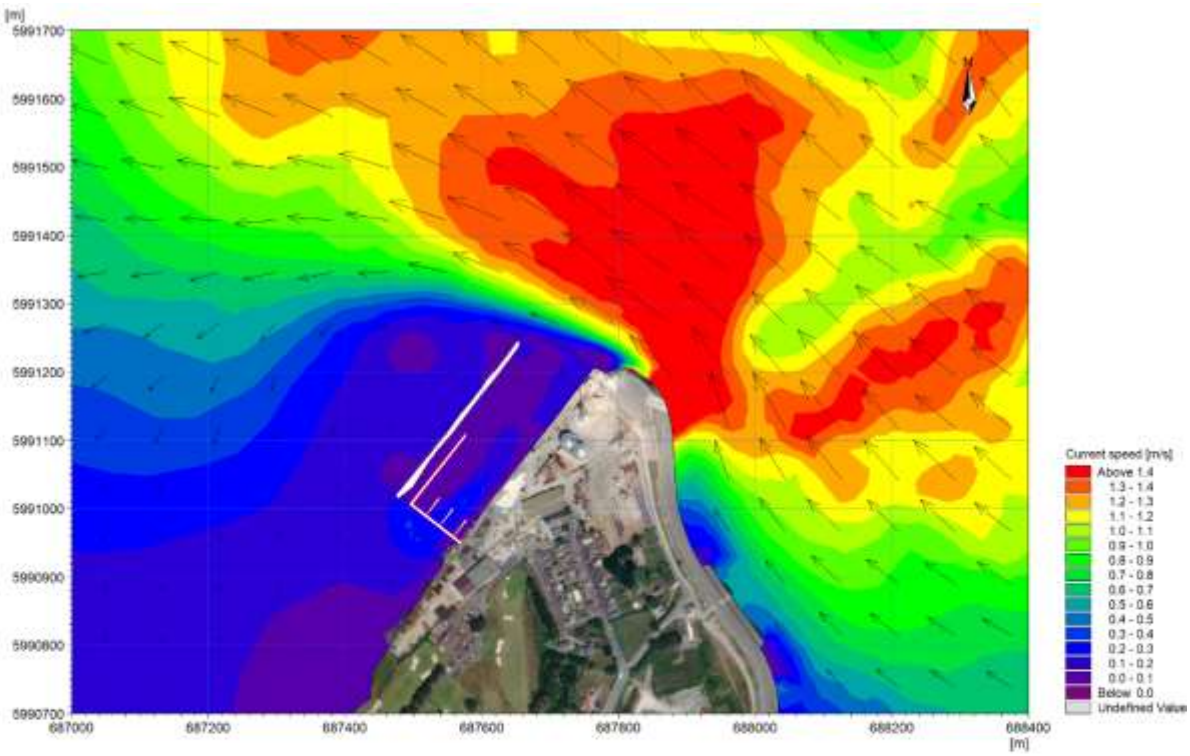


Figure 12.34 Typical current velocities and directions at Greenore Port during spring mid-flood conditions – Proposed scenario.

RECEIVED: 18/10/2024

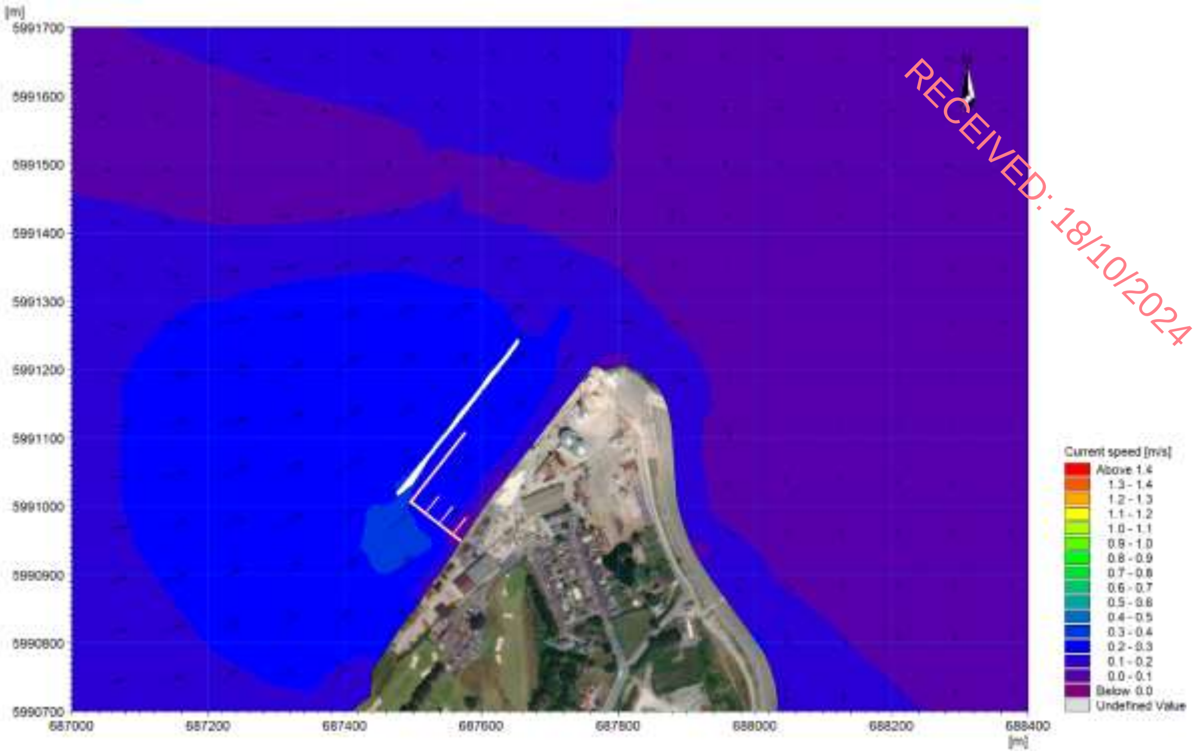


Figure 12.35 Typical current velocities and directions at Greenore Port during spring high tide conditions – Proposed scenario.

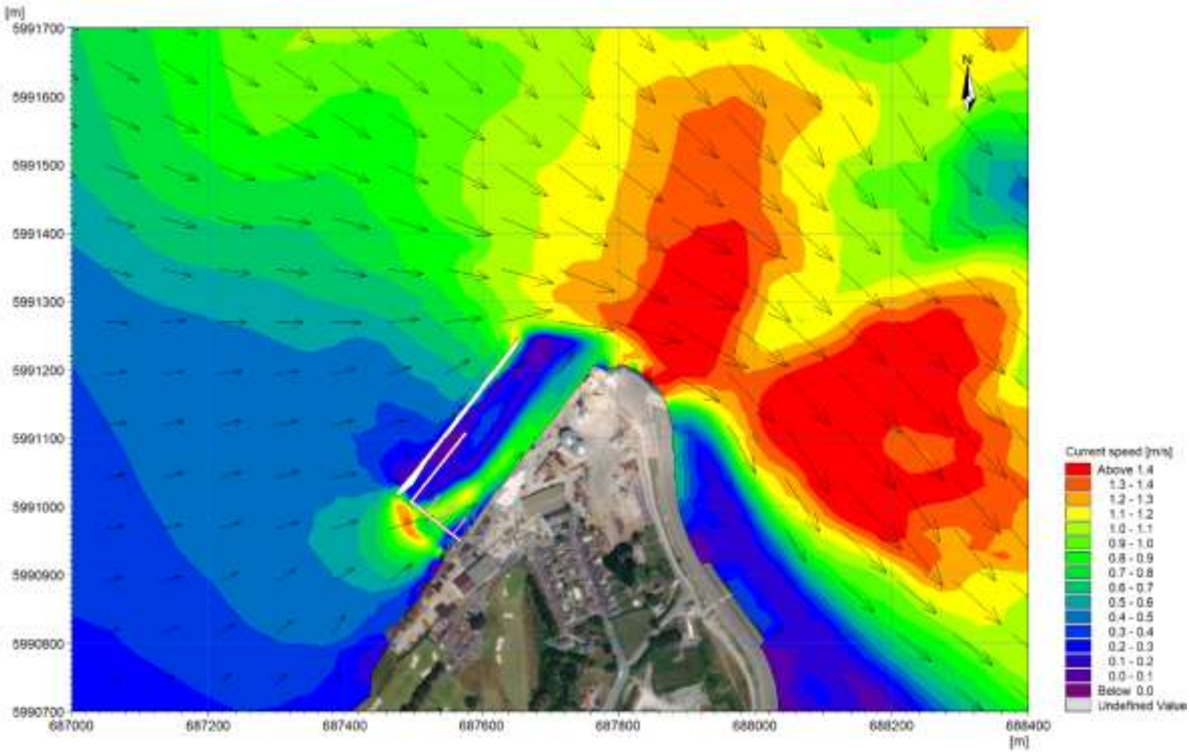
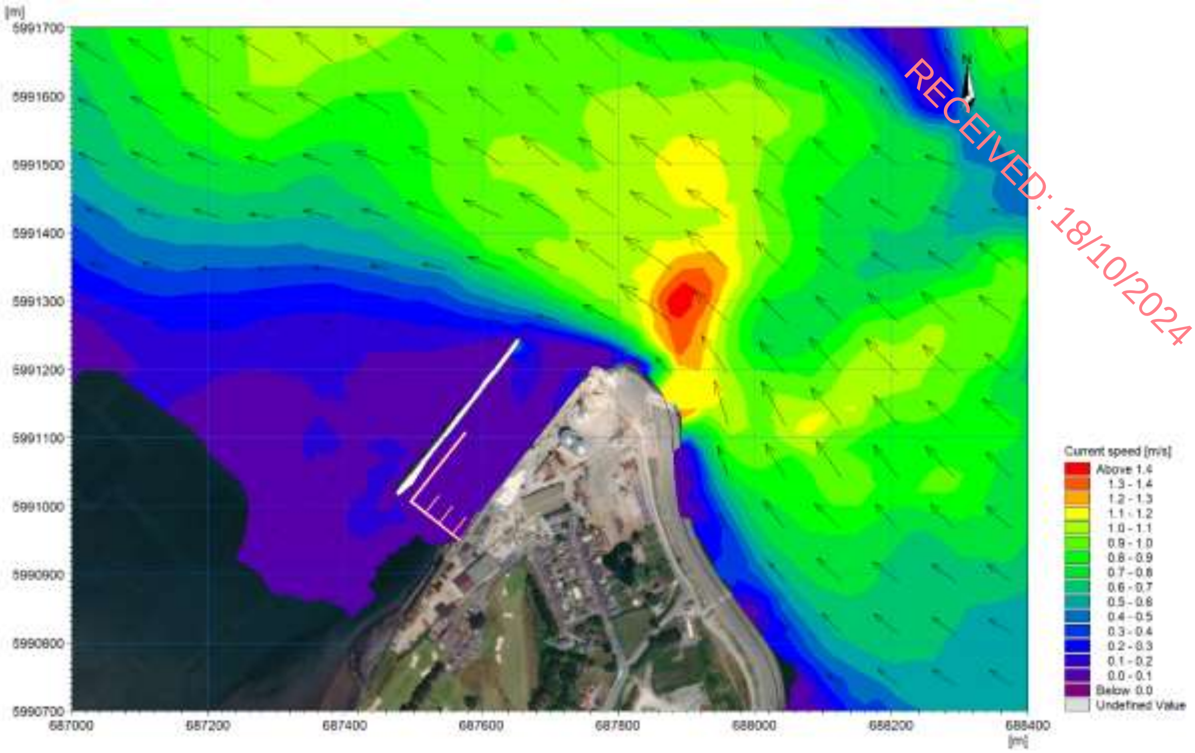


Figure 12.36 Typical current velocities and directions at Greenore Port during spring mid-ebb conditions – Proposed scenario.



RECEIVED: 18/10/2024

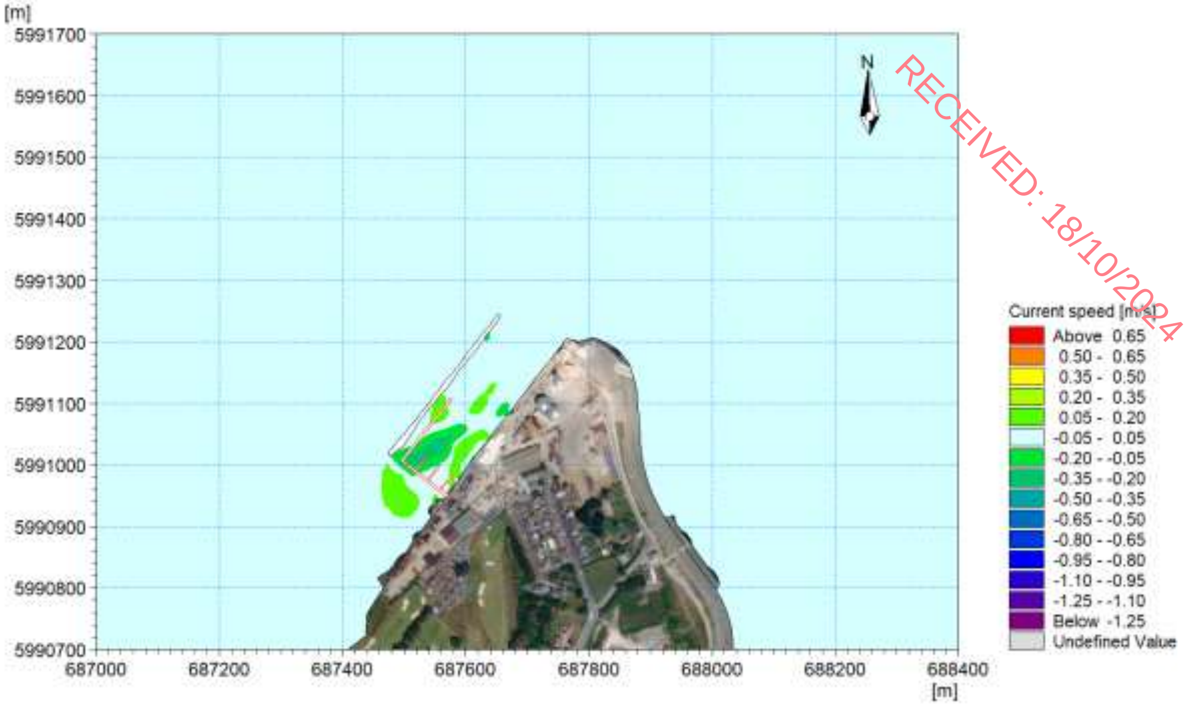
Figure 12.37 Typical current velocities and directions at Greenore Port during spring low tide conditions – Proposed scenario.

The difference in modelled current velocities for the pre and post development simulations have been computed for the same typical spring mid-flood, high tide, mid-ebb and low tide conditions and are presented in Figure 12.37 and Figure 12.41 respectively. It should be noted that spring tides are periods of greatest current velocities and that any changes in the tidal regime would therefore be greatest during these periods.

These figures show that the maximum predicted change to the mid-flood or ebb current speeds *within* the confines of Greenore Port is generally less than ±0.65m/s. During periods of high or low tide, changes *within* the confines of Greenore Port do not generally exceed ±0.35m/s. These highly localised changes can be attributed to the dredged seabed levels which result in local changes to the hydrodynamic regime.

Importantly, it will be seen from Figure 12.37 and Figure 12.41 12.41 that changes to the current velocities *beyond* the confines of Greenore do not typically exceed ±0.35m/s and are limited to within a *c.* 200m vicinity of Greenore Port. The greatest changes to the tidal regime are experienced during the mid-ebb phase of the tidal regime as illustrated in Figure 12.39. This would be expected as the tidal regime tends to flow parallel to the coastline during these periods and therefore "experiences" changes to the seabed to a greater extent relative to mid-flood phases the Port is sheltered by Greenore Point.

Based on this assessment, the tidal regime is predicted to remain substantially unchanged following the construction of the proposed development and no notable changes to the tidal regime were detected beyond the immediate vicinity of Greenore Port (i.e., beyond +200m).



RECEIVED: 18/10/2024

Figure 12.38 Difference in tidal current velocities plot during mid-flood as a result of the dredge campaign.

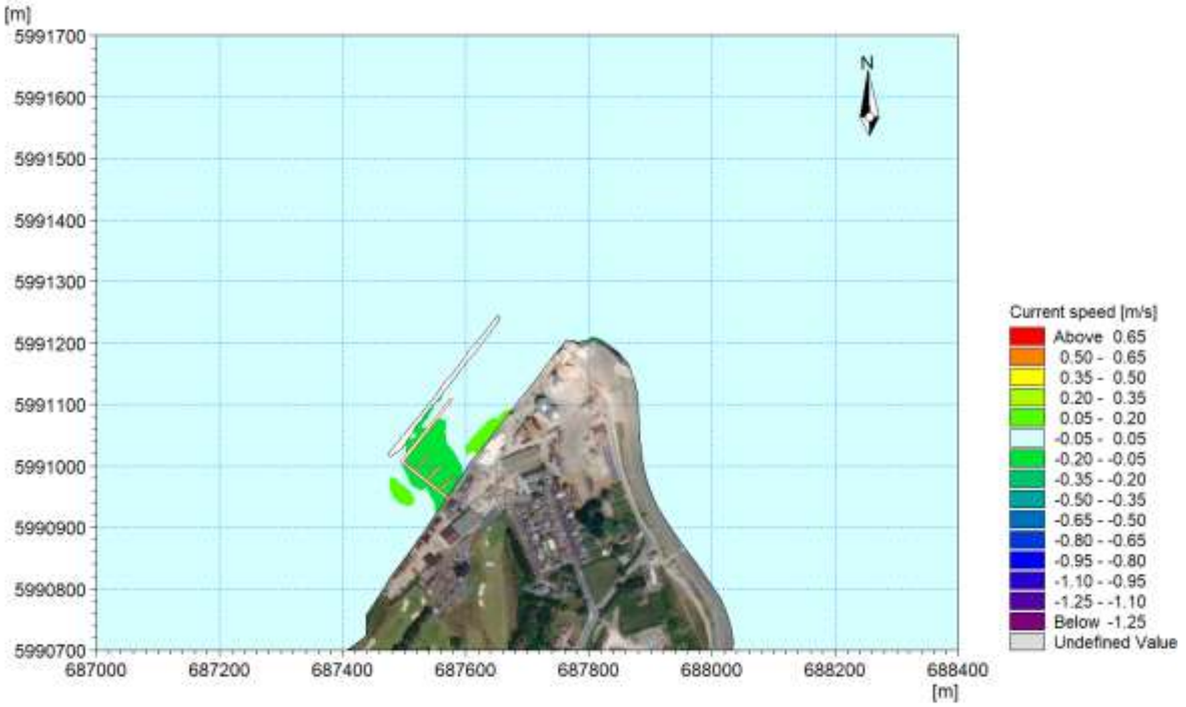
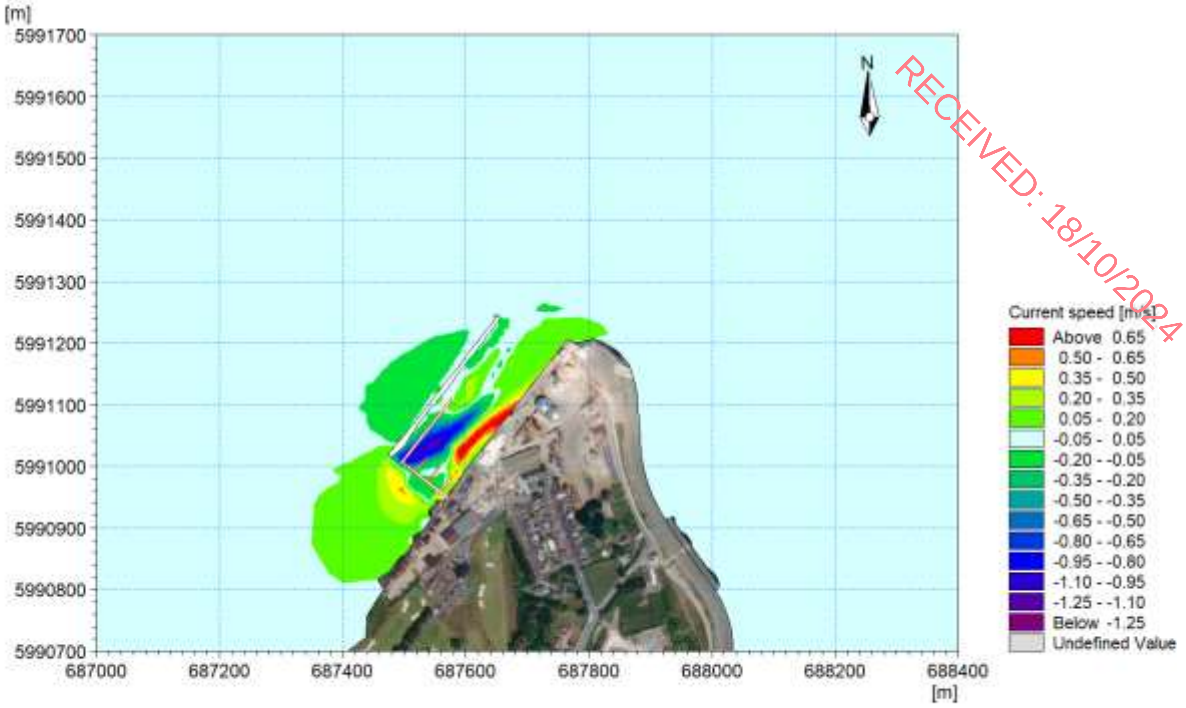


Figure 12.39 Difference in tidal current velocities plot during high tide as a result of the dredge campaign.



RECEIVED: 18/10/2024

Figure 12.40 Difference in tidal current velocities plot during mid-ebb as a result of the dredge campaign.

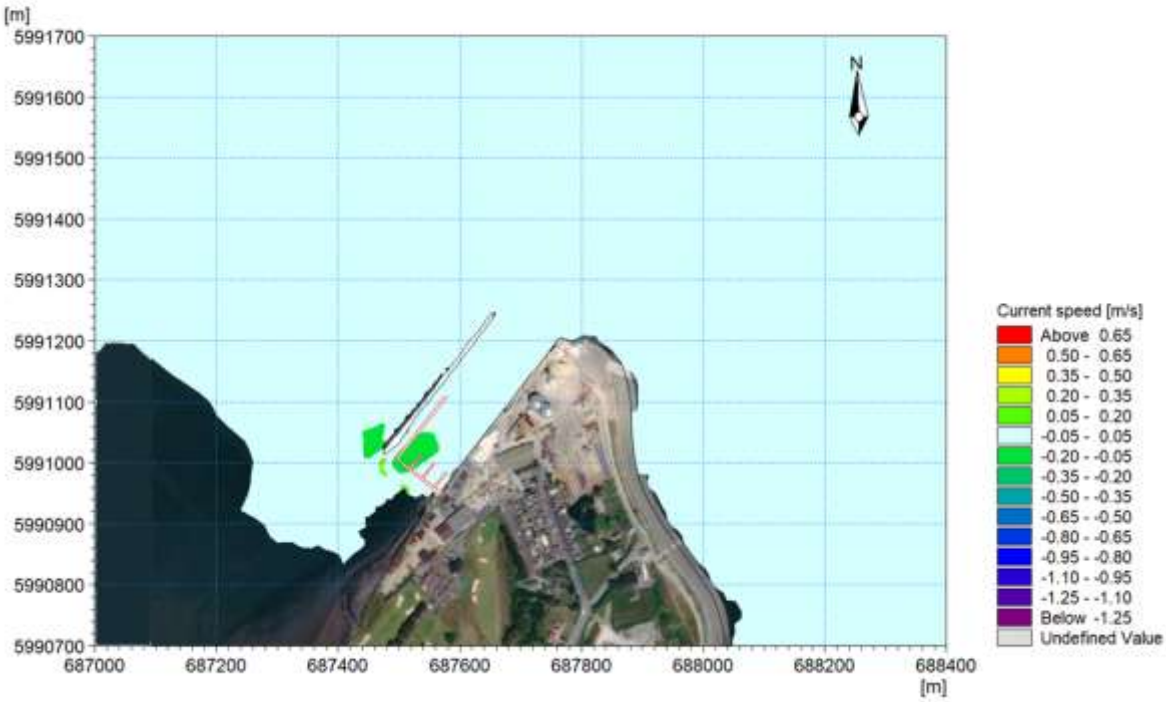


Figure 12.41 Difference in tidal current velocities plot during low tide as a result of the dredge campaign.

12.8.3.2 Potential changes to the wave climate

Operational phase impacts also considered included potential alteration to wave climate and its associated possible impact on the coastline with respect to erosional pressure. The MIKE 21 Spectral Wave module described in Section 12.4.6 was used in conjunction with the post-development scenario 2D model to re-run the most arduous inshore 1 in 50-year return period storm event which occurred during winds from 300°N.

The simulated inshore wave climate within the study area for this particular event post-project development is illustrated in Figure 12.42.

A wave height difference plot for this event is presented in Figure 12.43. This effectively illustrates the differences between Figure 12.19 and Figure 12.42. It will be seen that the proposed development results in a decrease of significant wave heights within the confines of Greenore Port by up to *c.* 0.25m. This would be expected should the proposed development require some restoration of crest levels along the existing breakwater to *c*.4.0m Chart Datum (CD).

Whilst there is a very localised increase in significant wave heights of *c.* 0.25m along a short section of the coastline *within* Greenore Port. This localised change will not increase erosional pressures given that this section of the coastline is comprised of hard infrastructure complete with coastal defences as illustrated in Figure 12.25(labelled "Quayside *OMF area*"). This change is considered permanent, neutral and imperceptible.

Whilst there was a very localised increase in significant wave heights of c. 0.25m along a very localised section of the coastline within Greenore Port, this change was considered negligible. This localised change is not expected to increase erosional pressures given that this section of the coastline is comprised of hard infrastructure complete with coastal defences.

In summary, changes to the wave climate following the construction of the proposed development are not considered significant and will not impact operations within the Port or erosional pressures on adjacent coastlines beyond the vicinity of Greenore Port.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

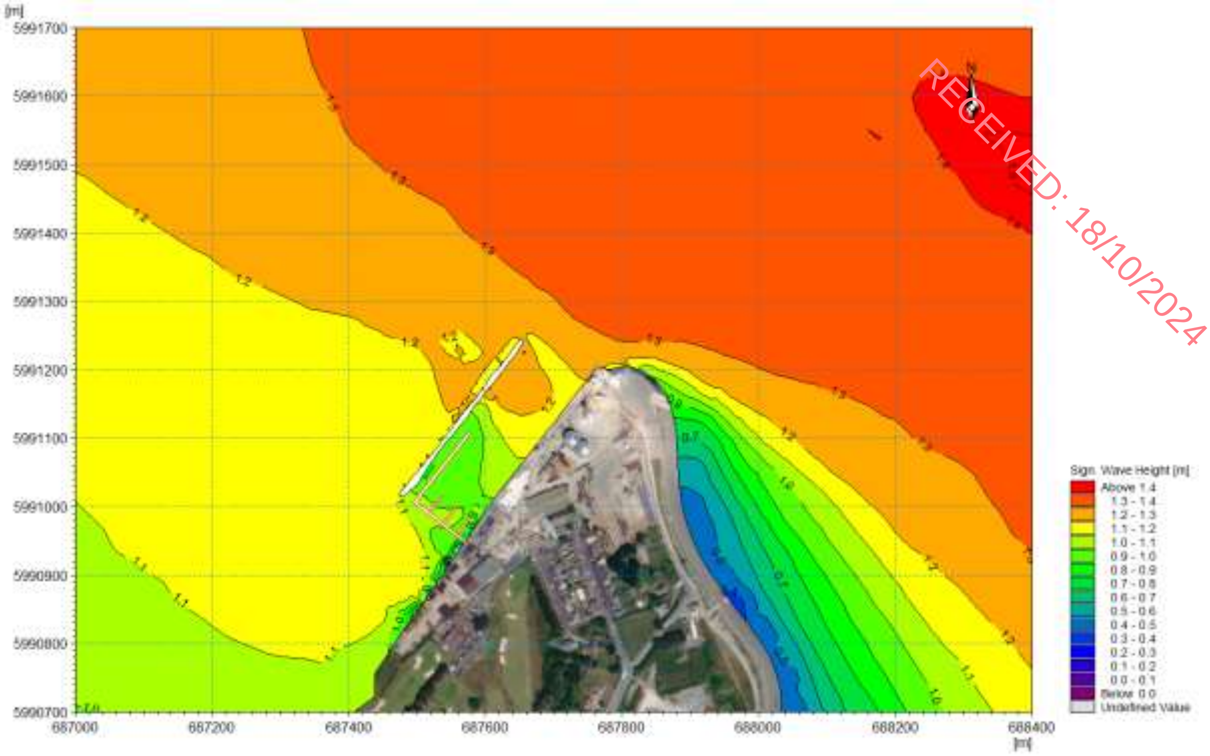


Figure 12.42 Significant wave height and mean wave directions around Greenore during a 1 in 50 year return period storm from 300°N at HAT water level – Proposed scenario.

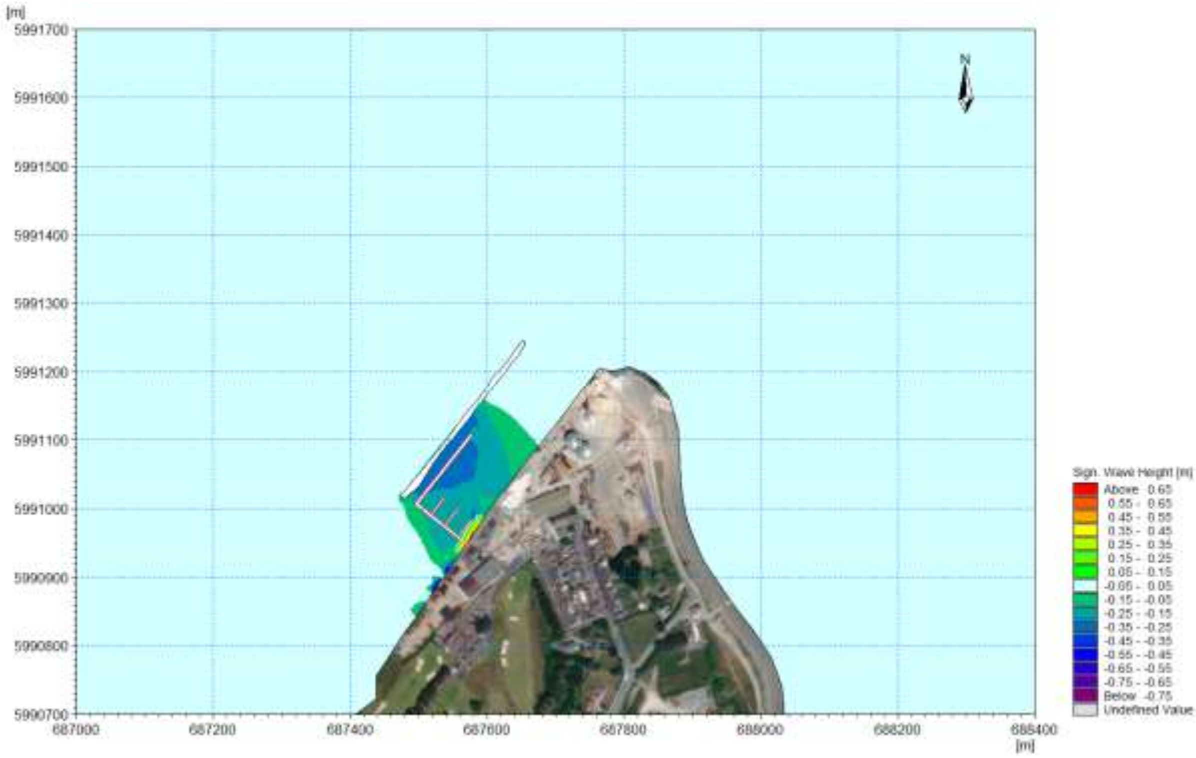


Figure 12.43 Difference in significant wave heights as a result of the proposed development during a 1 in 50 year return period storm from 300ºN at HAT.

12.8.3.3 Potential changes to the existing littoral current regime

RECEIVED: 18/10/2024

Figure 12.44 to Figure 12.47 12.47 illustrate the littoral tidal current velocities and directions at Greenore following the construction of the proposed development during typical spring mid-flood, high water, mid-ebb and low water tidal conditions respectively.

The differences in littoral current velocities as a result of the proposed development during the same tidal phases are illustrated in Figure 12.48 12.48 to Figure 12.51. As would be expected, these differences are relatively analogous to those described in Section 12.8.3.1 in that:

- That the maximum predicted change to the mid-flood or ebb current speeds *within* the confines of Greenore Port is generally less than ±0.65m/s.
- During periods of high or low tide, changes *within* the confines of Greenore Port do not generally exceed ±0.35m/s.
- These highly localised changes can be attributed to the repaired breakwater and dredged seabed levels.
- Changes to the current velocities *beyond* the confines of Greenore do not typically exceed ±0.35m/s and are limited to within a *c.* 200m vicinity of Greenore Port.
- The greatest changes to the tidal regime are experienced during the mid-ebb phase of the tidal regime.

Based on this assessment, the littoral current regime is predicted to remain substantially unchanged following the construction of the proposed development and no notable changes to the littoral current regime were detected beyond the immediate vicinity of Greenore Port (i.e., beyond +200m).

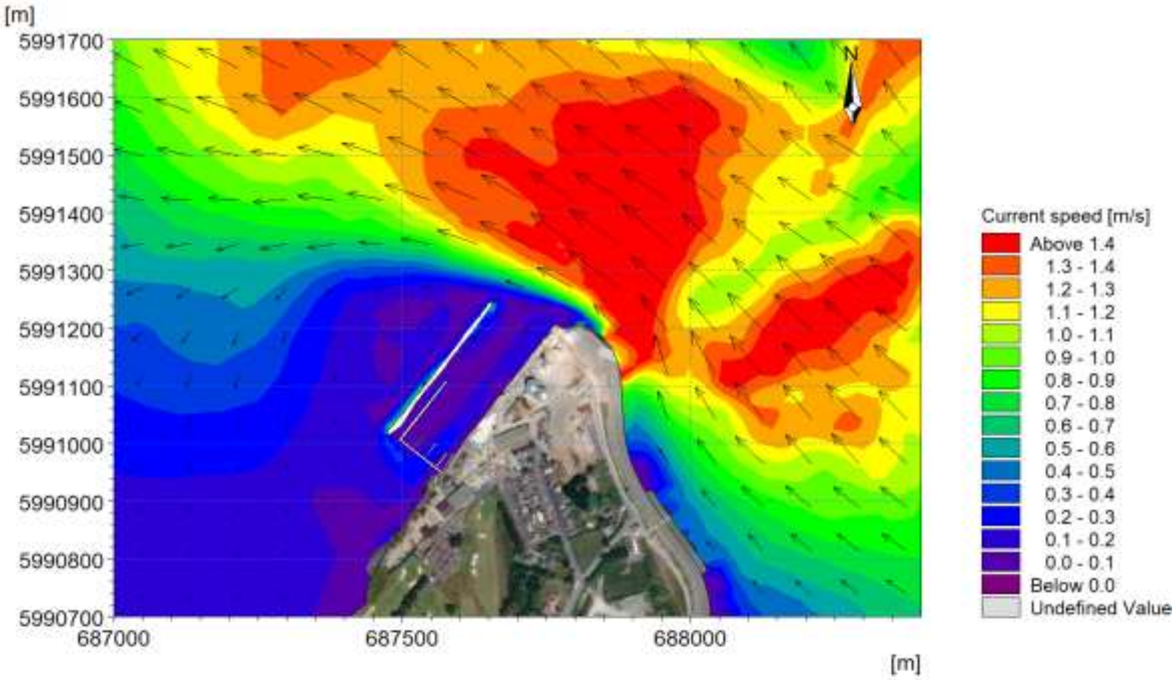


Figure 12.44 Typical littoral current velocities and direction at Greenore Port during spring mid-flood tidal conditions – Proposed scenario.

RECEIVED: 18/10/2024

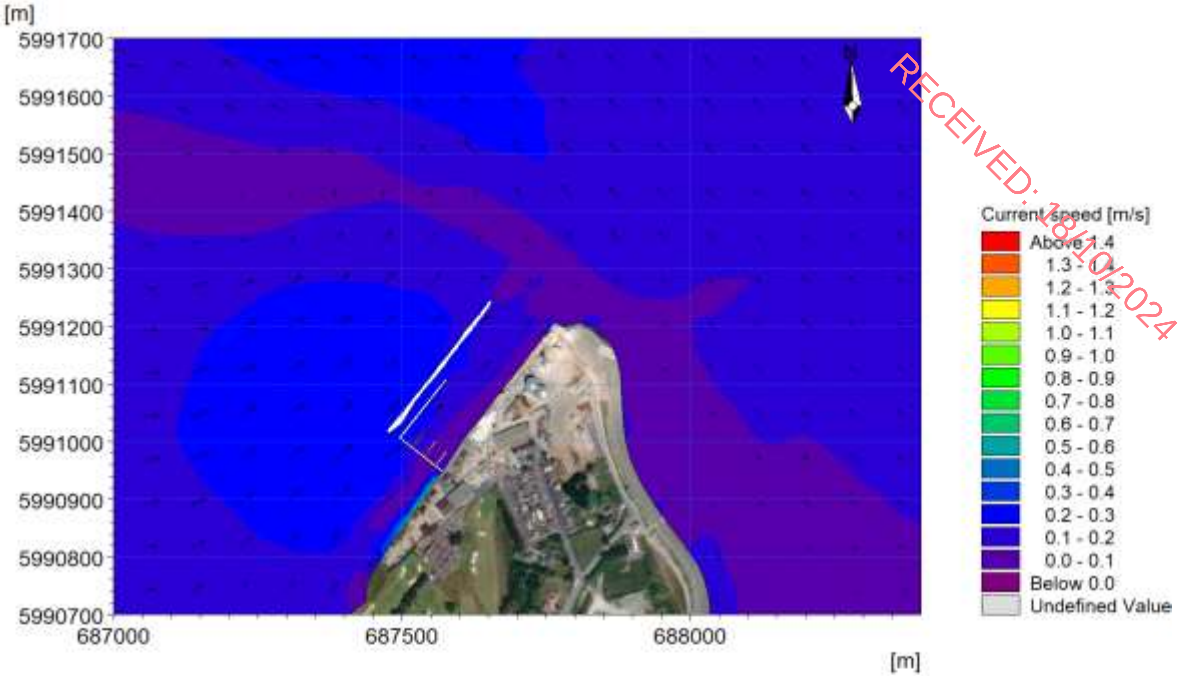


Figure 12.45 Typical littoral current velocities and direction at Greenore Port during spring high tidal conditions – Proposed scenario.

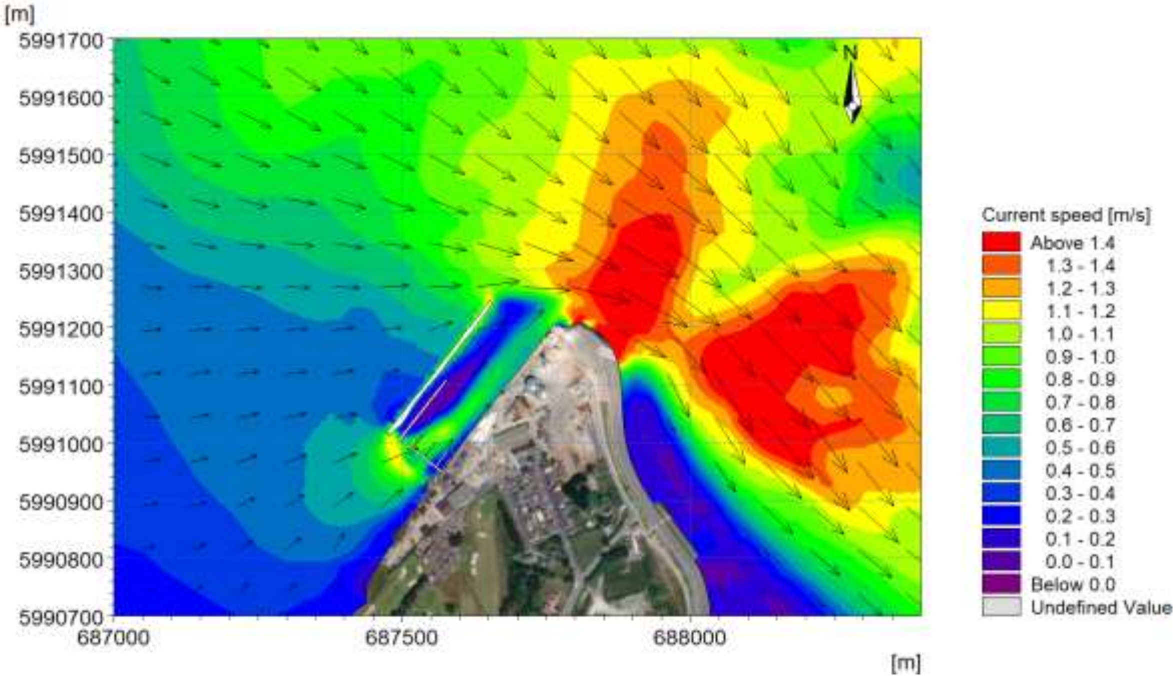


Figure 12.46 Typical littoral current velocities and direction at Greenore Port during spring mid-ebb tidal conditions – Proposed scenario.

RECEIVED: 18/10/2024

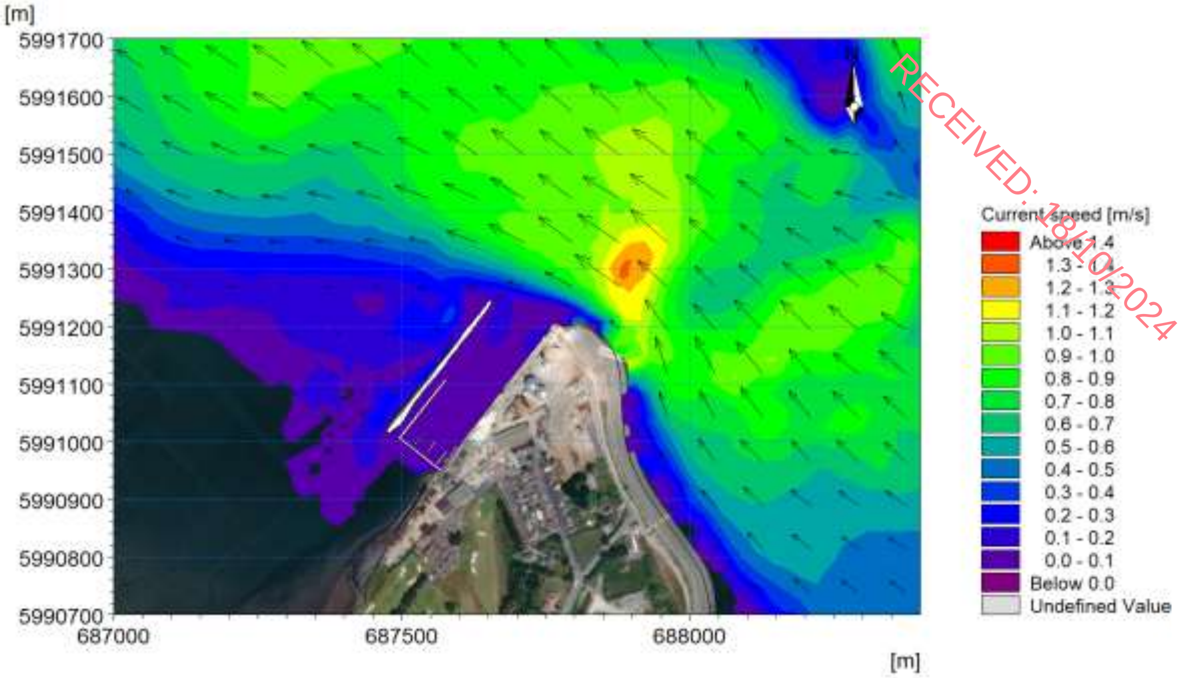


Figure 12.47 Typical littoral current velocities and direction at Greenore Port during spring low tidal conditions – Proposed scenario.

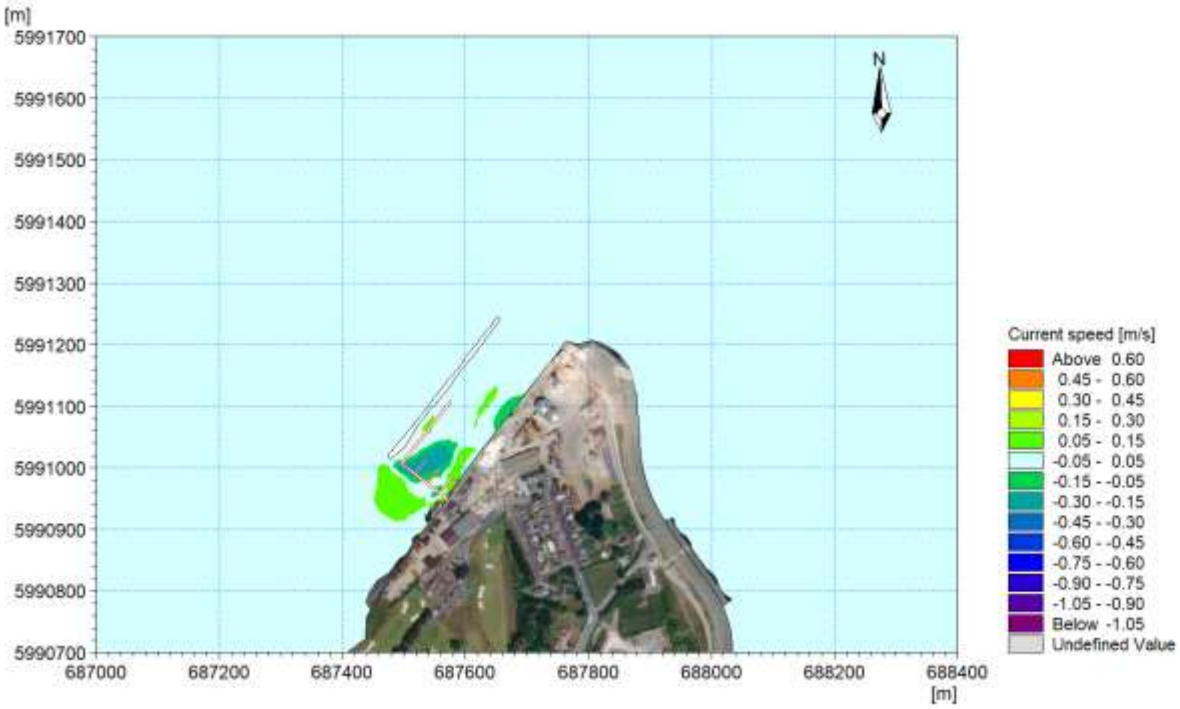


Figure 12.48 Difference in littoral current speeds during mid-flood as a result of the proposed development.

RECEIVED: 18/10/2024

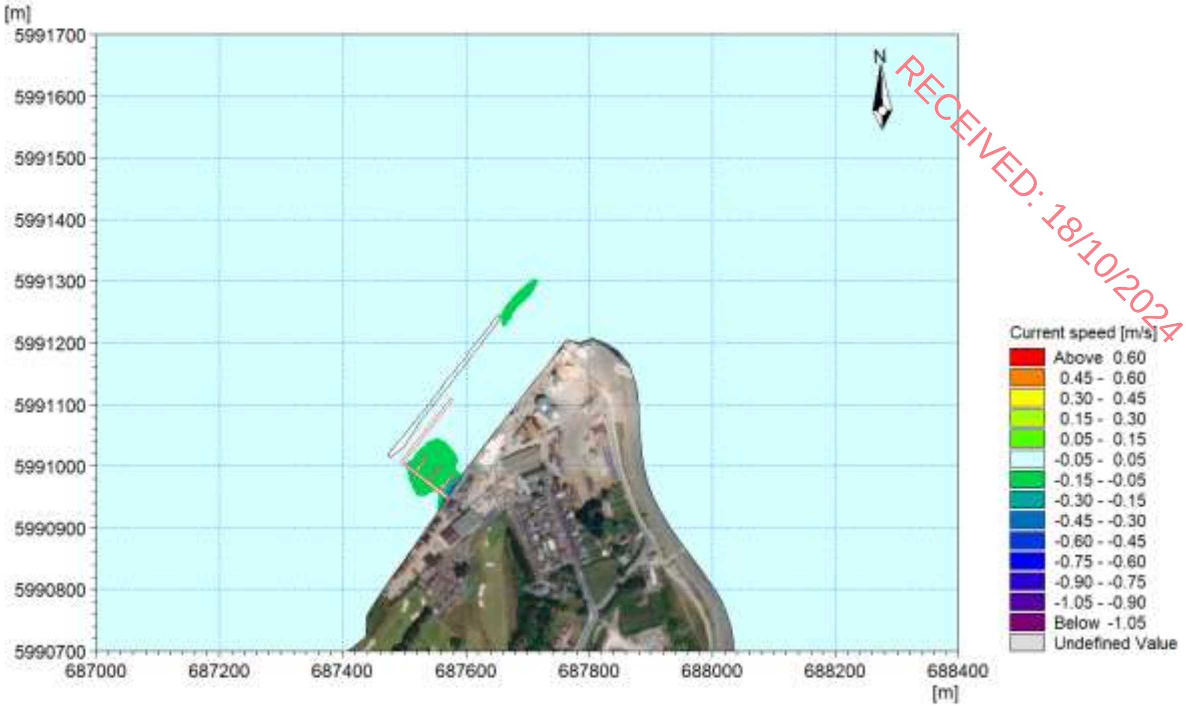


Figure 12.49 Difference in littoral current speeds during high water as a result of the proposed development.

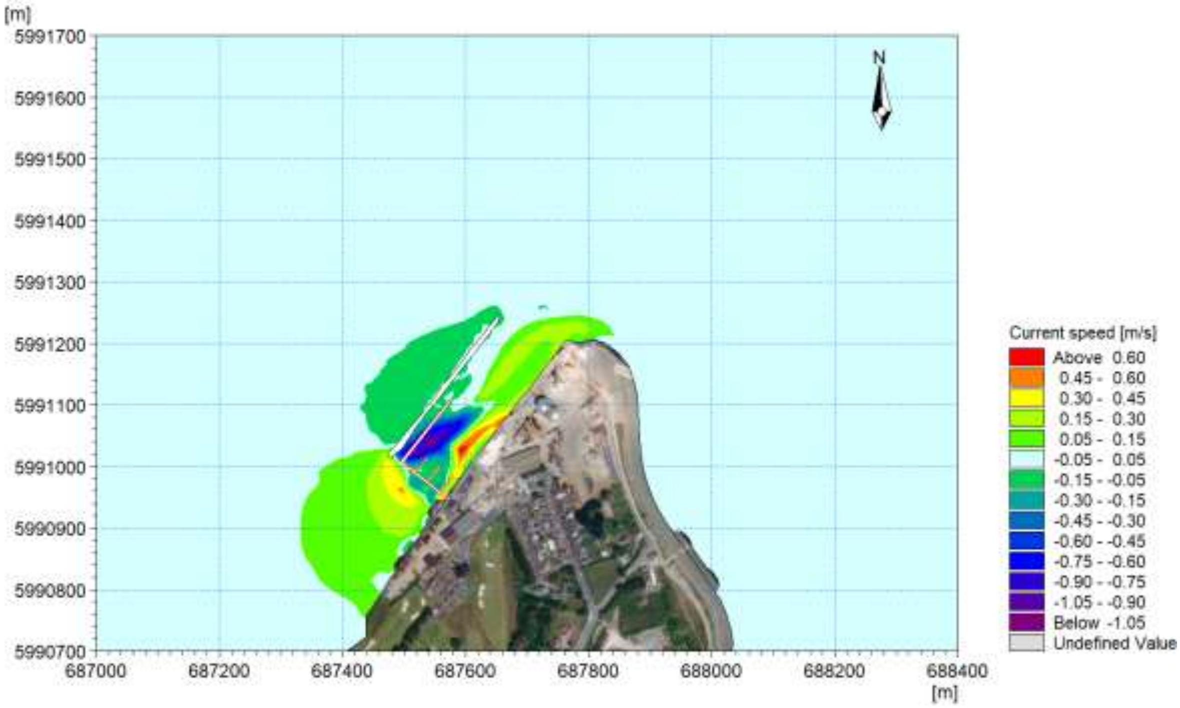
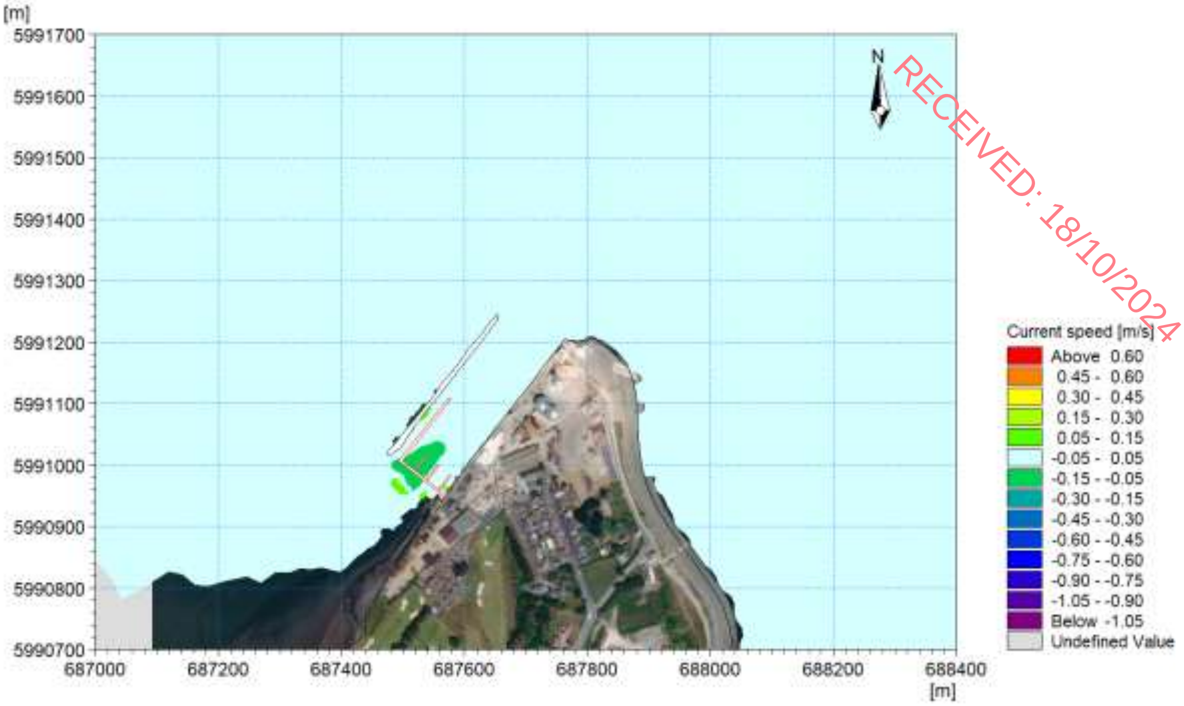


Figure 12.50 Difference in littoral current speeds during mid-ebb as a result of the proposed development.



RECEIVED: 18/10/2024

Figure 12.51 Difference in littoral current speeds during low water as a result of the proposed development.

12.8.3.4 Potential changes to the existing sediment transport

Sediment on the seabed is transported when it is exposed to large enough forces, or shear stresses, by the water movements. These movements can be caused by the current or by the wave orbital velocities or a combination of both. The relevant parameters that govern sediment transport within a coastal environment are therefore based on the following coastal processes:

1. Wave conditions at the site and the possible variations over a site.
2. Current conditions as well as the variations of current over an area.
3. Water-level conditions, i.e., tide, storm surge and wave set-up.
4. Bathymetry variations in an area.
5. The sediment characteristics over an area.
6. The sources and sinks of sediment, such as rivers or tidal inlets.

It has been demonstrated above that the proposed development will have no significant impact on these processes and it can be concluded therefore that the proposed O&M Facilities development will not result in a significant impact on the sediment transport regime at Greenore or the wider Carlingford Lough area.

12.8.4 Cumulative Effects

Potential cumulative impacts may arise from the proposed development at Greenore Port when combined with other existing and/or approved projects. In accordance with the European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017) and EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022), existing and/or approved projects with the potential for cumulative impacts have been identified as described in Chapter 1.

A review of these projects was undertaken and concluded that there are no developments within the surrounding area that may interact with the proposed development in terms of coastal processes owing to the very localised impact on tides, waves and sediment transport (including sediment dispersion).

RECEIVED: 18/10/2024

Aside from cumulative impacts with approved projects, it is recognised that there are sixteen licensed aquaculture sites within a 1.5km zone of influence from the proposed development. As demonstrated by Sections 12.8, the proposed development is not expected to result in a significant impact on coastal processes within the vicinity of any of these licensed aquaculture sites. The potential for impact on these sites is further discussed in the Biodiversity (Chapter no. 11).

12.8.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 12.7 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increase in suspended sediments	Negative	Not Significant	Local	Unlikely	Short-term	Direct
Deposition of suspended sediments	Negative	Not Significant	Local	Unlikely	Short-term	Direct

Table below summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 12.8 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Change to tidal regime	Negative	Not Significant	Local	Unlikely	Long-term	Direct
Change to wave climate	Negative	Not Significant	Local	Unlikely	Long-term	Direct
Change to littoral current	Negative	Not Significant	Local	Unlikely	Long-term	Direct
Change to sediment transport regime	Negative	Not Significant	Local	Unlikely	Long-term	Direct

12.9 Mitigation

RECEIVED: 18/10/2024

12.9.1 Incorporated Design Mitigation

There were no design mitigations arising from the assessment of coastal processes.

12.9.2 Demolition Phase Mitigation

No demolition works are proposed as part of the maritime development.

12.9.3 Construction Phase Mitigation

Whilst the potential impact to existing coastal processes as a result of proposed construction phase activities is considered not significant, in-line with best practice the following mitigation measures will still apply to the proposed dredging campaign:

- A documented Accident Prevention Procedure will be put in place before commencement.
- A documented Emergency Response Procedure will be put in place before commencement.

The above mitigation measures will ensure the likelihood of construction phase works that could result in a potential risk to receiving water environment remains unlikely.

12.9.4 Operational Phase Mitigation

Given the insignificant impact on existing coastal processes, no mitigation measures are considered necessary during the operational phase of the proposed development.

12.10 Residual Impact Assessment

The implementation of the mitigation measures outlined in Section 12.9 will ensure that the potential risk to coastal processes will be negligible thus reducing the significance of environmental impact to imperceptible.

12.10.1 Demolition Phase

No demolition works are proposed as part of the maritime development.

12.10.2 Construction and Operational Phases

In circumstances where the mitigation measures are fully implemented during the construction and operational phases as outlined in Section 12.9 the impact of the O&M facility on the coastal processes at Greenore will consist of a small-scale, temporary increase in suspended sediment concentrations during dredge operations.

The proposed O&M facility is therefore not expected to have a significant effect on coastal processes or result in a perceptible increase in erosional pressures on adjacent coastlines beyond the vicinity of Greenore Port.

12.10.3 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

RECEIVED: 18/10/2024

Given the insignificant impact on existing coastal processes, no mitigation measures are considered necessary during the operational phase of the proposed development.

Table 12.9 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increase in suspended sediments	Negative	Not Significant	Local	Unlikely	Short-term	Direct
Deposition of suspended sediments	Negative	Not Significant	Local	Unlikely	Short-term	Direct

12.10.4 Cumulative Residual Effects

There are no developments within the surrounding area that may interact with the proposed development in terms of coastal processes owing to the very localised impact on tides, waves and sediment transport (including sediment dispersion).

Aside from cumulative impacts with approved projects, it is recognised that there are sixteen licensed aquaculture sites within a 1.5km zone of influence from the proposed development. As demonstrated by Section 12.8, the proposed development is not expected to result in a significant impact on coastal processes within the vicinity of any of these licensed aquaculture sites. The potential for impact on these sites is further discussed in the Biodiversity (Chapter no. 11).

The additional projects included in the updated List of Cumulative Projects appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea were considered and no additional cumulative effects arising from these projects were identified.

12.11 Risk of Major Accidents or Disasters

There is no Risk of Major Accidents or Disasters related to coastal processes and the proposed development.

12.12 Worst Case Scenario

In a worst-case scenario, if the mitigation measures described in section 12.9 are not applied, the impact to coastal processes as a result of an increase in suspended sediments and the resultant deposition of suspended sediments is not considered significant.

Nevertheless, the proposed construction phase mitigation measures are in line with best practice and will ensure the likelihood of potential impacts to the receiving environment remains unlikely.

RECEIVED: 18/10/2024

12.13 Interactions

Given the close vicinity of multiple licensed aquaculture sites within 1.5km of the proposed development, dredging operations have the potential to interact with aquaculture sites. This potential impact is described and assessed in Chapter 11 (Biodiversity).

12.14 Monitoring

Given the lack of potential impacts to coastal processes as a result of the proposed development, no monitoring measures have been proposed.

12.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures. No Operational Phase mitigation or monitoring measures are proposed in context of Coastal Processes.

Table 122-12.10 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Accidents relating to dredging works	The contractor will be required to produce suitable Accident Prevent Procedures for dredging works	The contractor will review and main records relating to accidents and incidents.
Emergencies relating to dredging works	The contractor will be required to produce suitable Emergency Response Procedures for dredging works	

12.16 Conclusion

The assessment of coastal processes was based on an extensive numerical modelling programme using RPS' in-house suite of MIKE coastal process modelling software developed by the Danish Hydraulic Institute (DHI). Baseline models were calibrated and verified against a range of project specific hydrographic data and subsequently used to assess the construction and operational impacts of the proposed development.

The assessment concluded that:

- Dredging operations required for the proposed development will not result in any significant impact on either water quality in terms of suspended sediments, or the nearby environmentally designated areas in terms of sediment deposition with mitigation measures in place.
- The tidal regime is predicted to remain substantially unchanged as a result of the proposed development. The risk of impact to the existing tidal regime is therefore determined to be neutral and no mitigation is required.
- The assessment of potential changes to the inshore wave climate found that the proposed wave climate generally reduced owing to the possible restoration of the existing breakwater structure to -4.0m CD and the predominant wave conditions at the site. Whilst there was a very localised increase in significant wave heights of c. 0.25m along a very localised section of

the coastline within Greenore Port, this change was considered negligible. This localised change is not expected to increase erosional pressures given that this section of the coastline is comprised of hard infrastructure complete with coastal defences.

- Given that there are no significant changes to key coastal processes that govern sediment transport, i.e., tides, waves and littoral current, it can be concluded that the proposed development will result in no discernible change to the existing sediment transport regime at Greenore or the wider Carlingford Lough area.

RECEIVED: 18/10/2024

The proposed development is not expected to act in combination with other nearby developments to result in any significant impacts to baseline coastal process conditions.

In circumstances where the mitigation measures are fully implemented during the construction and phases (i.e., restrictions to dredging operations), the impact of the proposed development on the coastal processes at Greenore will consist of small-scale, low magnitude changes in the tidal regime and wave climate. On the basis that the appropriate mitigation measures are fully implemented during the construction phase, the impact of the proposed development on coastal processes will be imperceptible.

12.17 References and Sources

1. Brooks, et al., (2018). Guidance on Best Practice for Marine and Coastal Marine Processes Baseline Survey and Monitoring Requirements to inform EIA of Major Development Projects. Natural Resources Wales.
2. CP 3:Chapter V-2:1972. Code of basic data for the design of buildings. Loading - Wind loads.
3. EN 1991-1-4 (2005) (English): Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions [Authority: The European Union Per Regulation 305/2011, Directive 98/34/EC, Directive 2004/18/EC.
4. Environment Agency. (2018). Coastal Design Sea Levels - Coastal Flood Boundary Extreme Sea Levels.
5. Gavin & Doherty Geosolutions (2024). Greenore Port Geotechnical Interpretive Report.
6. Pye, et al., (2017). Advice to Inform Development of Guidance on Marine, Coastal and Estuarine Marine Processes Numerical Modelling Assessments Natural Resources Wales.
7. Six West Ltd (2023). Groyne survey.
8. Six West Ltd (2023).Bathymetry data/drawing no. MG230307.
9. Six West Ltd (2023).Topography data/drawing no. MG230104_Rev1_Overview.

RECEIVED: 18/10/2024

CHAPTER 13

NOISE & VIBRATION

VOLUME II

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

Table of Figures

Table of Tables

RECEIVED: 18/10/2024

13 Noise & Vibration

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

13.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on noise and vibration.

It should be read in conjunction with project description (Chapter 2) and the Material Assets: Traffic and Transport chapter (Chapter 6).

13.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Alistair Maclaurin of AWN Consulting Ltd.

Alistair Maclaurin (Senior Acoustic Consultant) holds a BSc in Creative Music and Sound Technology and a Diploma in Acoustics and Noise Control. He is a member of the Institute of Acoustics. Alistair has worked in the field of acoustics since 2012. He has been the lead noise consultant across various sites on major infrastructure projects such as Crossrail and Thames Tideway Tunnel, specialising in construction noise assessment and control. Additionally, he has undertaken various other environmental noise assessments for infrastructure developments and planning reports across the UK and Ireland.

13.3 Proposed Development

A full description of the proposed development is set out in Chapter 2 of this EIAR. The following is a summary of the proposed works.

A full description of the proposed development is provided in **Chapter 2** of this EIAR. The following is a summary of the proposed works:

Greenore Port Unlimited Company intend to apply for a 10-year permission for development at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. In general, it will comprise of terrestrial (landside) and nearshore works, with three standalone buildings incorporating office, warehouse and ancillary space landside and a pontoon to accommodate Crew Transfer Vessels (CTVs) marine side. To facilitate the proposed development, dredging within the nearshore and the demolition of existing port buildings and a vacant residential property is required.

The Operations and Maintenance Facilities (OMF) will provide twenty-four-seven, year-round support, to three individual offshore renewable energy (ORE) projects that will be owned and operated by entities separate from the applicant. These ORE projects will consist of offshore windfarms on the East Coast of Ireland.

RECEIVED: 18/10/2024

Three standalone operation and maintenance buildings incorporating office, warehouse and ancillary space (canteen, welfare, plant, cycle parking etc.) are proposed within the 'terrestrial port' area. Each building has a gross floor area of c.1,670 sq.m and a maximum height of 13.5m.

A new quay wall will be developed at Berth 3 (70m length). This will include a new quay wall face and upgraded deck. A pontoon will be constructed to accommodate crew transfer vessels (CTVs), for use by the operators to travel out to the offshore windfarms. The CTV's will be accessed via an access ramp connected to the quay wall and deck. Approx 45,000m^3 of material will be dredged to facilitate navigable access at this location, and it will be disposed of on land. Where rock is encountered (estimate max of 1,000m^3), it will be reused on site.

Adjacent to the buildings, space is allocated for 76 car parking spaces, with a further 135 spaces proposed in the surface carpark at the 'Residential Site' on Shore Road. The existing carpark associated with the former Open Hydro building (60 spaces) will be used during the construction phase and Phase 1 of the development.

Pedestrian and motor vehicle access is via the existing entrance beside the Port's office, which served the previous Open Hydro development. Heavy goods vehicles will access the buildings via the Port's existing heavy goods entrance on Shore Road (R175). Pedestrian access from the surface carpark to the OMF buildings will be provided along a new pedestrian route within the Port's landholding.

To facilitate the development, demolition works are required, including the former Open Hydro building, an ESB substation, a small portion of the Port's office accommodation and the vacant dwelling at the 'residential site' on Shore Road.

Improvement works to the public / private realm in the foreground of the existing Greenore Port office building will comprise of an enhancement to existing road and pathways to facilitate improved pedestrian and vehicular access to the proposed O&M Facilities, a new feature entrance wall, removal of 6 no. port car parking spaces, link to new pedestrian route from the new Shore Road carpark and hard and soft landscaping. These works are located within the Greenore Architectural Conservation Area (ACA). The aim is to redesign the space to improve the character of the ACA at this point; provide a more user friendly space with pedestrian priority; and improve the existing access arrangements to the site. Inside the proposed main entrance to the site, it is proposed to integrate the existing engine room wall and include this as a feature within the landscape design.

Ancillary development will include the installation of drainage infrastructure, landscaping, lighting, signage, boundary treatments, rooftop solar photovoltaic panels, an ESB substation, a communications mast, a bunded fuel storage tank and waste management areas etc.

The infrastructure described above will likely be delivered over two phases. However, this could extend to three phases, or the sequence of the works may vary,, depending on the delivery of future ORE projects and the associated Offshore Renewable Energy Auctions.

The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

1. **'Terrestrial Port Area'**, (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing 'engine room', and a communications mast.
2. **'Nearshore Environment'** (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
3. **'Residential Site'** (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. **'Port Office Entrance'** (c. 0.18ha) encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

RECEIVED: 18/10/2024

The following is a general location plan of the plots identified above.

Figure 13.1 Development Areas

13.3.1 Aspects Relevant to this Assessment

When considering a development of this nature, the potential noise and vibration impact on the surroundings and on the development itself must be considered for each of two distinct stages:

- demolition & construction phase, and;
- operational phase.

During the Demolition and construction stage, the main focus in relation to noise and vibration impacts will be from demolition, piling, dredging and other more typical construction activities. These activities have the potential to emit the highest levels of noise or vibration at receptor locations. The construction phase impacts will be temporary to short-term in duration.

The primary potential sources of noise and vibration during the operational phase of the proposed development are as a result of road traffic related noise increases; static and mobile plant noise as part of the warehouse units and port; and the additional marine vessel movements that will occur at the development. All operational sources are assessed as long-term.

Note that whilst the Proposed Development will be constructed over two distinct phases, given that the construction phases are not scheduled to overlap there will be no increases of construction impacts due to a combination of the phases.

RECEIVED: 18/10/2024

13.4 Methodology

This chapter has been prepared having regard to the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- BS 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228–1) (British Standard Institute, 2014a);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (hereafter referred to as BS 5228 – 2) (British Standard Institute, 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (hereafter referred to as BS 7385–2). (British Standard Institute, 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472–1) (British Standard Institute, 2008);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS 4142) (British Standard Institute, 2019);
- BS 8233: Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS8233) (British Standard Institute, 2014)Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UK Highways Agency (UKHA), 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (hereafter referred to as ISO 9613 – 2) (International Organization for Standardization, 1996);
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (International Organization for Standardization, 2016);

- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (hereafter referred to as ISO 1996 – 2) (International Organization for Standardization, 2017), and;
- The UK Department of Transport Calculation of Road Traffic Noise (hereafter referred to as the CRTN) (UK Department of Transport 1988)
- Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (EPA 2014) (hereafter referred to as NG4);
- Guidelines for Environmental Noise Impact Assessment IEMA) (2014)

RECEIVED: 18/10/2024

The assessment will be undertaken using the following methodology:

- A review of the local area to identify the closest sensitive locations have been undertaken;
- Baseline noise monitoring has been undertaken in the vicinity of the proposed development site in order to characterise the existing noise environment;
- A review of the most applicable standards and guidelines has been reviewed in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations relating to construction phase activities have been undertaken at the nearest sensitive locations to the development site;
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the proposed development, and;
- A schedule of mitigation measures has been incorporated where required, to reduce, where necessary, the identified potential outward impacts relating to noise and vibration from the proposed development.

13.4.1 Relevant Legislation & Guidance

13.4.1.1 Construction Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. It is industry standard that British Standard Institute guidance is relied upon.

British Standard BS 5228 – 1: 2009+A1:2014

For residential properties, reference is made to BS 5228-1:2009+A1:2014 'ABC' method is referenced here for the purposes of setting appropriate construction noise thresholds for the development. This is the most widely accepted standard for this purpose in Ireland.

The ABC approach designates a residential noise-sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities, depending on context.

Table 13.1 Example Threshold Of Significant Effect at Dwellings

RECEIVED: 18/10/2024

Assessment category and threshold value period (L_{Aeq})	Threshold value in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

D) 19:00–23:00 weekdays, 13:00–23:00 Saturdays and 07:00–23:00 Sundays

Commercial Receptors

BS 5228-1:2009+A1 gives several examples of acceptable limits for construction or demolition noise, the most simplistic being based upon the exceedance of fixed noise limits. For example paragraph E.2 states:

> *"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."*

Paragraph E.2 goes on to state:

> *"Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:*
>
> *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;*
>
> *75 decibels (dBA) in urban areas near main roads in heavy industrial areas".*

For non-residential locations it is considered appropriate to adopt the 75dB(A) criterion during the day.

Proposed Threshold Noise Levels

Figure 13.2 provides an overview of the closest receptor groups surrounding the proposed site that will experience the greatest impact from the construction works.

Taking into account the baseline noise environment monitored around the development site (see Section 13.6), and using the criteria discussed above, the following Construction Noise Threshold (CNT) levels are proposed for the nearby receptors to this development in Table 13.2.

Table 13.2 Construction Noise Thresholds for NSLs

RECEIVED: 18/10/2024

Noise Sensitive Location	Description	Category	CNT, Daytime. dB $L_{Aeq,12hr}$
R1	Greenore Golf Club (commercial)	Commercial	75
R2	Residential properties located off Anglesey Terrace and Euston St, including 3 properties at the northern end of Anglesey Terrace and Euston Street adjoining the southern boundary of the terrestrial port area and port office area of the site; and properties on Euston Terrace backing onto the Residential site.	Category A	65
R3	Residential properties located off the R175 and Euston St. These properties are located approximately 120m to the south of the development and 50m west of the 'residential site' / future carpark on Shore Road.	Category A	65
R4	Residential properties located off Euston St and Shore Rd located adjacent to the 'residential site' / future carpark and approximately 60m south east from the primary area of the development.	Category A	65
R5	Greenore Coast Guard Station (commercial)	Commercial	75

There are receptors further from the development site, however, the work areas will typically be 300m or greater from these areas and, hence, these receptors can be scoped out of the assessment as the attenuation due to distance will be sufficient to reduce the impacts at these locations to not significant.

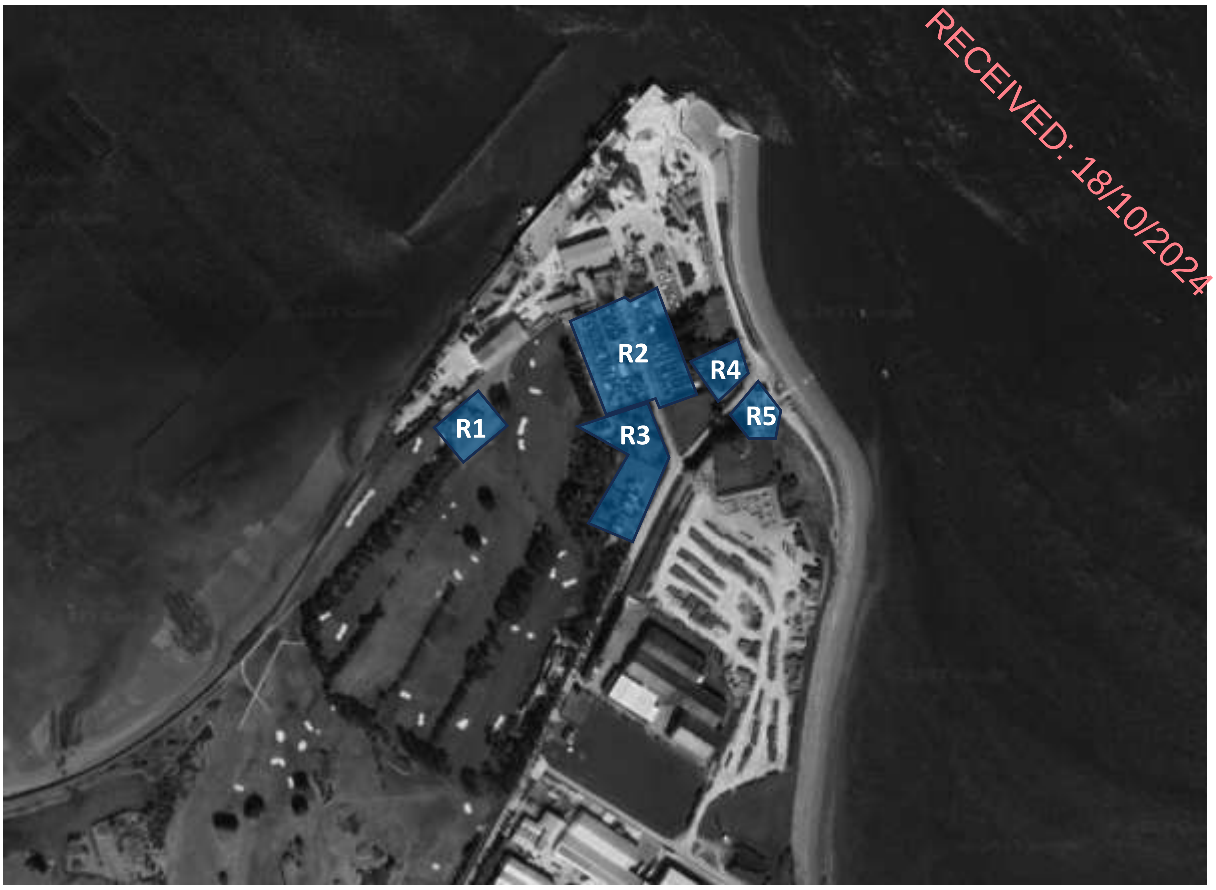


Figure 13.2 Identified Receptor Locations

Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 13.3 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of *DMRB: Noise and Vibration*.

Table 13.3 Likely Impact due to Construction Noise

Construction Noise Level	Guidelines for Noise Impact Assessment Significance (DMRB)	EPA Mapped Effects	Determination
Below or equal to baseline noise level	Negligible	Below or equal to baseline noise level	Depending on CNT, duration & baseline noise level
Above baseline noise level and below or equal to CNT	Minor	Above baseline noise level and below or equal to CNT	
Above CNT and below or equal to CNT +5dB Note 2	Moderate	Above CNT and below or equal to CNT +5 dB	
Above CNT +5 and below or equal to CNT +15dB	Major	Above CNT +5 to +15 dB	
Above +15dB		Above CNT +15 dB	

RECEIVED: 18/10/2024

Note 1: CNLs at the upper end of this range will result in higher potential impacts, therefore this range is categorised as slight to moderate, acknowledging that values approaching the CNT are greater than slight. In accordance with DMRB, noise levels below the CNT are deemed 'Not Significant'.

Note 2: The DMRB does not distinguish beyond a 'Major' impact. For the purposes of distinguishing between a Very Significant and Profound Impact, CNLs exceeding the CNT by +20dB are categorised as Profound.

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and determine the likely impacts during the construction stages.

Construction Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: *DMRB Noise and Vibration* 2020 and the *EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB document. Table 13.4 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2020).

Table 13.4 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

13.4.1.2 Construction Vibration

Building Damage

BS 7385 - 2 (BSI 1993) gives guidance regarding acceptable vibration in order to avoid damage to buildings. BS 5228 – 2 (BSI 2014b) reproduces these same guidance values.

These standards differentiate between transient and continuous vibration. Surface construction activities are transient because they occur for a limited period of time at a given location. Both documents recommend that, for soundly constructed residential property and similar light framed structures that are generally in good repair, a threshold for minor or cosmetic damage (i.e. non-structural damage) should be taken as a PPV (in frequency range of predominant pulse) of 15mm/s at 4 Hertz (Hz) increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5mm/s PPV the risk of damage tends to zero. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in BS 5228 – 2 (BSI 2014b) Table B.2 might need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. Historically important buildings that are difficult to repair might require special consideration on a case-by-case basis, but buildings of historical importance should not be assumed to be more sensitive unless they are structurally unsound.

RECEIVED: 18/10/2024

If a building is in an unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other groundborne disturbance. The vibration limit range for protected and historical buildings are equal to or up to 50% of those for light framed buildings, depending on their structural integrity. Where no structural defects are noted, the same limit to those for light framed buildings apply. For other structures and buildings that are determined to be potentially vulnerable to vibration due to significant structural defects, further stringent criteria have been applied for transient vibration. It is assumed that known buildings and structures of this kind, will be subject to condition surveys well in advance of the works, and any defects identified repaired. The results of conditions surveys will determine whether a building or structure is classed as "vulnerable". Table 13.5 sets out the limits as they apply to vibration frequencies at 4Hz where the most conservative limits are required. At higher frequencies, the relevant limit values for transient vibration within Table B.2 and Figure B.1 of BS5228-2 (BSI 2014b) will apply, with similar reductions applied for continuous vibration and those for protected structures. For line 2 of Figure B.1. at frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) should not be exceeded. Taking the above into consideration the vibration criteria for building response is set out in Table 13.5. Table 13.5 Transient vibration guidance values for avoidance of cosmetic building damage.

Table 13.5 Building Damage Criteira for Construction Vibration

Vibration Limits for Buildings (PPV) at the closest part of building to the source of vibration, at a frequency of 4Hz		
Building Type	Transient Vibration	Continuous Vibration
Reinforced or framed structures. Industrial and heavy commercial buildings	50mm/s	25mm/s
Unreinforced or light framed structures. Residential or light commercial-type buildings	15mm/s	7.5mm/s
Protected and Historic Buildings *Note 1	6mm/s – 15mm/s	3mm/s – 7mm/s
Identified Potentially Vulnerable Structures and Buildings with Low Vibration Threshold	3mm/s	

Note 1: The relevant threshold value to be determined on a case-by-case basis. Where sufficient structural information is unavailable at the time of assessment, the lower values within the range will be used, depending on the specific vibration frequency.

Human Response Criteria

Humans are sensitive to vibration stimuli, and perception of vibration at high magnitudes may cause concern to building occupants. BS 5228 – 2 notes that vibration typically becomes perceptible at around 0.15 mm/s to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. During surface construction works associated with breaking of ground, piling, and excavation, depending on the methodologies involved have the potential to be perceptible to building occupants and have the potential to cause significant effects.

Higher levels of vibration are however typically tolerated for single events or events of temporary duration, particularly during construction projects and when the origin of vibration is known. For example, piling can typically be tolerated at vibration levels up to 2.5 mm/s during the daytime and the evening if those affected are aware of the time-frame and origin of the vibration, and if they have been informed about the limit values relating to the structural integrity of neighbouring properties. Table 13.6 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS 5228 – 2 and reference to the Association of Noise Consultants (ANC) Measurement and Assessment of Groundborne Noise and Vibration (ANC, 2020).

RECEIVED: 18/10/2024

Table 13.6 Human Response to Vibration Significance Ratings

Criteria	Impact Magnitude	Significance Rating
≥10 mm/s PPV	Very High	Very Significant
≥1 mm/s PPV	High	Moderate to Significant
≥0.3 mm/s PPV	Medium	Slight to Moderate
≥0.14 mm/s PPV	Low	Not significant to Slight
Less than 0.14 mm/s PPV	Very Low	Imperceptible to Not significant

Notes from BS5228-2

A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472 (BS1 2008), and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

13.4.1.3 Operational Phase – Additional Traffic on Public Roads

In order to consider the potential noise impact associated with the proposed development introducing additional traffic onto the existing road networks, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 13.7 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2020).

Table 13.7 Likely Impact Associated with Change in Traffic Noise Level

RECEIVED: 18/10/2024

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0.0 – 2.9	Barely Perceptible	Negligible	Imperceptible, Not significant Note 1
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Significant
10+	Doubling of loudness and above	Major	Very significant

Note 1: Change in noise levels at the upper end of this range will approach perceptibility, therefore this range is categorised as Imperceptible to Not significant.

13.4.1.4 Operational Phase – Industrial Noise (Mechanical Plant and Services)

EPA – NG4

The EPA Noise Guidance 4 document is typically used to provide operational noise emission limits (ELVs) at EPA licensed sites across Ireland. The document has been used to provide guidance on noise level emissions for the proposed development in the context of similar operating facilities. An assessment of noise under the EPA NG4 guidance requires a noise survey of baseline conditions and then derives appropriate criteria for noise due to the operation of the site. The criteria apply at the façades of the noise-sensitive locations.

The first part of selecting the noise criteria is to carry out a 'quiet area' screening on the location of the site. To be considered a 'quiet area', the following three criteria are tested:

- The site must be located **at least 3km from an urban area with a population of more than 1,000 people**: in this instance the site is located less than 3 km from Carlingford which has a population of over 1,000.
- The site must be **at least 3 km away from any local industry**: the proposed devopment is located adjoining an existing active port and there are a number of other industries existing within 3km therefore this criterion is not met.
- The site must be **at least 5km away from any National Primary Route**: the N1 road is approximately 15 km west of the site.

In this instance, two of the above criteria are not met and therefore the site is not considered to be in a 'quiet area'.

Having confirmed that the site is not in a 'quiet area', the next part of the derivation of Noise criteria according to NG4 is to test whether the site meets the criteria for an 'area of low background noise'.

For a noise-sensitive location in the vicinity of the site to be considered an 'area of low background noise', the noise levels measured at that location during the environmental noise survey need to satisfy <u>all three</u> the following criteria:

- Arithmetic Average of L_{A90} During Daytime Period ≤40 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Evening Period ≤35 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Night-time Period ≤30 dB L_{A90}.

RECEIVED: 18/10/2024

Depending on whether each location is considered an 'area of low background noise', Table 13.8 below outlines the noise emission limit criteria detailed in the NG4 document. The noise levels measured during the baseline noise surveys are presented in Section 13.6 of this chapter. It's noted that in every 24 hour period at least one of the criteria for areas of low background noise is exceeded, hence, this area is not considered to be of low background noise.

Table 13.8 NG4 Approach for Determining Appropriate Noise Criteria

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night Noise Criterion, dB L_{Aeq} (23:00 to 07:00hrs)
Areas of Low Background Noise	45 dB	40 dB	35 dB
All Other Areas	55 dB	50 dB	45 dB

As the Proposed Development would operate continuously (i.e. on a '24/7' basis), the night-time noise criterion is critical to the assessment. As these nearest noise-sensitive locations are not identified as areas of low background noise as per the NG4 guidance, a 45 dB $L_{Aeq,T}$ night time criterion applies.

Assessment of Significance

The 'Guidelines for Environmental Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the proposed development.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 13.9 below is based on an example scale within the IEMA guidelines. The corresponding significance of effect from in the EPA's EIA Report Guidelines (2022) is also presented.

Table 13.9 Noise Effect Scale

RECEIVED: 18/10/2024

Noise Level Change dB(A)	Subjective Response	Impact Guidelines for Noise Impact Assessment Significance (IEMA)	Effect Guidelines on the Information to be contained in EIARs (EPA)
0	No change	None	Imperceptible
0.1 – 2.9	Barely perceptible	Minor	Not Significant
3.0 – 4.9	Noticeable	Moderate	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Profound

It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels and have been used to assess the impact of operational noise.

BS 8233:2014: Guidance on sound insulation and noise reduction for buildings

To determine the potential operational noise impact at the closest residential dwellings, guidance has been drawn from BS 8233:2014. It is appropriate to derive external assessment criteria based on the internal criteria noted in the Table 13.10. This is done by factoring in the degree of noise reduction afforded by a partially open window. This is nominally deemed to be 15 dB as defined within the BS8233 guidance.

Table 13.10 Indoor ambient noise levels for dwellings from BS 8233:2014

Activity	Location	Day 07:00 to 23:00hrs dB $L_{Aeq,16hour}$	Night 23:00 to 07:00hrs dB $L_{Aeq,8hour}$
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

Based on the guidance outlined the BS 8233 standard, the following external noise levels would be considered reasonable in order to achieve suitable internal noise levels within the nearest residential properties:

- Daytime (07:00 to 23:00 hrs) 50 dB $L_{Aeq,16hour}$
- Night (23:00 to 07:00 hrs) 45 dB $L_{Aeq,8hour}$

RECEIVED: 18/10/2024

13.5 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

13.6 Baseline Environment

13.6.1 Baseline Survey

Baseline noise monitoring has been undertaken across the development site on from 23rd to 30th August 2023 to determine the range of noise levels at varying locations across the development site and to establish the existing noise climate the nearest existing noise sensitive locations.

The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

13.6.1.1 Measurement Parameters

The noise survey results are presented in terms of the following parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

13.6.1.2 Survey Equipment

The surveys were undertaken using a RION NL-52 sound level meter with the serial number 164427. The equipment was check calibrated before and after the survey period.

13.6.1.3 Weather Conditions

Weather conditions were calm and dry during the survey and did not adversely affect noise measurements.

13.6.1.4 Measurement Locations

Attended noise monitoring was undertaken at three locations around the development site. The locations are described below and illustrated in Figure 13.3.

UT1 Noise monitoring was undertaken along the southern boundary of the development site to characterise the noise levels incident on the closest receptors to the proposed development.

AT1 Attended noise monitoring was undertaken proximate to the Greenore Golf Club to characterise noise levels in that vicinity.

AT2 Attended noise monitoring was undertaken at the rear of properties on Euston St to characterise the noise environment in the local vicinity to the receptor.

AT3 Attended noise monitoring was undertaken along Euston St to characterise the noise levels along the east coastline of the development location and nearest receptors.

RECEIVED: 18/10/2024

Figure 13.3 Baseline Noise Survey Locations

13.6.1.5 Measurement Results

The results of the noise monitoring completed at the various locations are presented in the following sections. In general, it was noted that the noise environment consisted of operational noise from the port (e.g. ferry/boat movements, vehicular movements on site with associated reverse alarms etc.), local road traffic noise, occasional noise from the golf course and typical environmental noise from the slight breeze that was present.

Table 13.11 Noise Survey Results at Location AT1

RECEIVED: 18/10/2024

Date	Time	Measured Noise Levels, dB		
		$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
30/08/2023	11:23	53	77	47
	12:34	53	71	46
	13:41	49	77	42

Table 13.12 Noise Survey Results at Location AT2

Date	Time	Measured Noise Levels, dB		
		$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
30/08/2023	11:47	51	73	42
	12:56	47	68	42
	14:07	50	70	43

Table 13.13 Noise Survey Results at Location AT3

Date	Time	Measured Noise Levels, dB		
		$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
30/08/2023	12:10	59	77	44
	13:18	59	79	43
	14:30	62	83	48

Table 13.14 Noise Survey Results at Location UT1

Date	Period	Measured Noise Levels, dB		
		$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
23/08/2023	Day (07:00 – 19:00)	51	85	46
	Eve (19:00 – 23:00)	47	76	38
	Night (23:00 – 07:00)	42	82	32
24/08/2023	Day (07:00 – 19:00)	59	92	48
	Eve (19:00 – 23:00)	46	83	38
	Night (23:00 – 07:00)	39	85	32
25/08/2023	Day (07:00 – 19:00)	53	83	45
	Eve (19:00 – 23:00)	49	76	41
	Night (23:00 – 07:00)	49	96	42
26/08/2023	Day (07:00 – 19:00)	50	79	42
	Eve (19:00 – 23:00)	56	79	49
	Night (23:00 – 07:00)	52	100	38

RECEIVED: 18/10/2024

Date	Period	Measured Noise Levels, dB		
		$L_{Aeq,T}$	L_{Amax}	$L_{A90,T}$
27/08/2023	Day (07:00 – 19:00)	50	78	38
	Eve (19:00 – 23:00)	56	77	49
	Night (23:00 – 07:00)	46	95	32
28/08/2023	Day (07:00 – 19:00)	50	78	41
	Eve (19:00 – 23:00)	44	81	33
	Night (23:00 – 07:00)	34	79	26
29/08/2023	Day (07:00 – 19:00)	61	92	47
	Eve (19:00 – 23:00)	48	116	42
	Night (23:00 – 07:00)	42	89	35
30/08/2023	Day (07:00 – 19:00)	52	116	44

It is noted that noise levels during the night period at UT1 varied significantly depending on the operations taking place at the port. Continuous equivalent noise levels ranged between 34 and 52 dB $L_{Aeq,8hr}$ and background noise levels ranged from 26 to 42 dB $L_{A90,8hr}$.

13.7 The 'Do Nothing' Scenario

In the Do Nothing scenario it is expected that the noise environment will remain as per the baseline which will include the operational port noise in it's existing state (this includes 24/7 operation of the facilities with ship movements to and from the port). It's noted that there are two permitted developments that planned for implementation in the absence of the proposed development.

- Extension and modification of existing Warehouse, LCC Planning Ref 20268, ABP Ref 307862; and
- New Warehouse, LCC Planning Ref Planning ref 20543, ABP Ref 310184.

13.8 Potential Significant Effects

13.8.1 Construction and Demolition Phase

13.8.1.1 Noise

In terms of the potential noise and vibration impacts indicative ranges of noise levels associated with construction may be calculated in accordance with the methodology set out in BS 5228-1:2009+A1:2014. This standard sets out sound power / sound pressure levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels.

It is proposed that the development will be constructed in 2 key phases. It's noted that the phases will not be undertaken simultaneously. Various activities will take place for each phase, they are outlined below:

Phase 1:

- Dredging
- Quay wall
- Pontoon
- Building A
- Demolition of "Barbara's House"
- Communications Mast
- Ancillary site and development works and landscaping

RECEIVED: 18/10/2024

Phase 2:

- Pontoon (part)
- Demolition Open Hydro
- Building B and C
- Substation
- Fuel Storage
- Access control/fencing
- Port Entrance upgrades
    - Demolition of 'Sea Farer's Room' (part of port office building)
    - Construction
- Surface Carpark and pedestrian access
- Demolition of ESB Substation/Switch room
- Ancillary site and development works and landscaping

The key stages and activities with potential to result in noise impacts are discussed below.

Demolition – Phase 1 & 2

During the demolition stage it is expected that breaking and crushing will be required in order to remove existing structures from the port. For this specific activity a total construction noise level of 92 dB L_{Aeq} at 10m has been used as referenced from BS 5228-1:2009 Table C.1:1. This noise level will inform calculations of demolition noise at receptor locations.

Piling for Proposed Buildings – Phase 1 & 2

The proposed methodology for piling indicates that there is the potential for driven piles depending on ground conditions. For this activity a construction noise level of 91 dB L_{Aeq} at 10m has been used as referenced from BS 5228-1:2009 Table D.4:29. This noise level will inform calculations of demolition noise at receptor locations.

Quay Wall / Pontoon Piling– Phase 1 & 2

The proposed methodology for piling for the quay wall indicates that piling will be undertaken. For this activity a construction noise level of 88 dB L_{Aeq} at 10m has been used as referenced from BS 5228-1:2009 Table C.3:8. This noise level will inform calculations of quay wall piling at noise at receptor locations.

Construction of Proposed Buildings, Quay Wall and Pontoon & Gangway Installation – Phase 1 & 2

For construction work areas with lower noise levels such as those associated with superstructure works including site compounds (for storage, offices and material handling, generators etc.), smaller items of mobile plant (excavators, cranes, dozers), landscaping and concreting works with lower noise emissions, a total construction noise level of 80 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would include, for example two items of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area.

RECEIVED: 18/10/2024

Port Entrance Upgrades – Phase 2

The port entrance upgrades will use typical items of plant such as excavators, rollers and dumpers. For this area a total construction noise level of 80 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would include, for example two items of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area.

Dredging – Phase 1

For dredging works a backhoe long reach excavator will be utilised, working from pontoons. Reference is made to BS5228 Table C.4:63 where a suitable noise level for an excavator is given as 77 dB at 10m.

Construction Compounds – Phase 1 & 2

The construction compounds will be utilised as delivery and storage spaces for construction vehicles and materials. They will be designed in such a way that noise and vibration impacts are minimised at nearby receptors, mainly by way of installation of barriers between receptors and compound, but also, where practicable, by locating internal routes and working areas far as possible from the most sensitive receptors. Mitigation measures will be implemented so that the criteria defined Section 13.4.1.1 are achieved. Measures that can be implemented are discussed in Section 13.9.1.

Indicative Construction Noise Levels

Indicative noise calculations have been undertaken which assume that plant items are operating for 66% of the time. It must be stated that for most of the time, plant and equipment will be a greater distance from the nearest NSLs than those used within the calculations and the “on-time” of plant and equipment will be less than those assumed over a normal working day (i.e. the use of piling rigs or breakers for demolition will be in use for shorter periods than those assumed over a normal working day) and consequently will have lower noise levels. The assessment presented is therefore representative of a best estimate conservative scenario representing construction activities. Table 13.15 presents the calculated noise levels at receptor locations.

Table 13.15 Predicted Construction Noise Levels

RECEIVED: 18/10/2024

Receptor	CNT	Predicted Construction Noise Level, dB $L_{Aeq,T}$					
		Demolition (Phase 1 & 2)	Piling for Buildings (Phase 1 & 2)	Quay Wall / Pontoon Piling (Phase 1 & 2)	Construction of Proposed Buildings, Quay Wall and Pontoon & Gangway Installation (Phase 1 & 2)	Port Entrance Upgrades (Phase 2)	Dredging (Phase 1)
R1	75	**87**	**81**	67	72	52	56
R2	65	**84**	**77**	65	**66**	**75**	54
R3	65	**73**	**69**	61	54	55	50
R4	65	**79**	64	57	52	54	46
R5	75	63	62	55	50	51	44

Reference to Table 13.15 indicates that construction noise levels have the potential to exceed the adopted CNT of 65 dB $L_{Aeq, 12hr}$ at R1 to R4 during demolition works and during the piling works for the buildings. During the construction of the proposed buildings and the port entrance upgrades there is a predicted exceedance of the CNT at R2. Drediging works are proposed to occur during the night periods and exceed the thresholds at receptors R1 – R3. These receptors are likely to experience a *negative*, *significant*, and *temporary* effect. The resultant impacts at the remaining receptors for the remainder of the phases are *negative* and range from *not significant* to *moderate*, and *temporary*. Consequently, mitigation measures will be required to reduce noise levels from these activities.

13.8.1.2 Construction Traffic

A *Traffic and Transport Assessment* relating to the proposed development has been prepared by TrafficWise for the proposed development and is included under separate cover. Information from this report and Chapter 6 Material Assets: Traffic and Transport has been used to determine the predicted change in noise levels in the vicinity of the local roads to the development during the construction stage.

In terms of potential noise impact, traffic volumes would need to increase by 25% or greater along the designated network to result in a negligible (1 dB) increase in traffic noise level. It's understood that all construction movements will be along Shore Road, hence this has been assessed to determine the potential worst case affected road.

In this instance baseline Annual Average Daily Traffic (AADT) figures have been compared with the flow generated during the construction stage in Table 13.16. The increase in traffic level is less than25% along the access road and hence the increase in noise due to construction traffic will be less than 1 dB which results in a *negative, short-term and imperceptible effect*.

Table 13.16 Change in Noise Levels due to Construction Traffic

RECEIVED: 18/10/2024

Reference	Baseline Traffic AADT		Baseline + Construction Traffic AADT		Resultant Change in Noise Level (dB)	Impact
	LGV	HGV	LGV	HGV		
Shore Road	444	529	502	589	< 1	Imperceptible

13.8.1.3 Vibration

Piling

Potential for vibration impacts during the construction phase programme are likely to be limited to rock breaking and piling activities. In terms of piling, this activity is expected to occur at greater than 30m distance to the nearest sensitive property. Expected vibration levels during piling assuming driven piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of driven piles into granular fill over compact sand (Table D.9, Ref. No. C31) as 2.45mm/s at a distance of 25m.

Considering the additional distance to the receptors and the softer ground type (sandy gravel and loose sand) vibration emissions from this activity will likely be lower than those quoted above. For building occupants there is the potential that vibration levels will be at a level that could cause disturbance, however, TII guidance document *Guidelines for the Treatment of Noise and Vibration in National Road Schemes 2004* indicates that vibration due to construction phase piling is typically tolerated at vibration levels up to 2.5mm/s once the origin of the source is known Hence, it is considered that with prior warning the vibration levels will be tolerable for local residents.

The vibration levels associated with this activity will be well below the limits set out in Section 13.4.1.2 to avoid any cosmetic damage to the closest buildings.

During Phase 1 the impact due to driven piling in terms of human response at receptor R1 is predicted to be *temporary, negative and significant* in the absence of mitigation. The remaining receptors will experience an *imperceptible to slight negative* impact.

During Phase 2 the impact due to driven piling in terms of human response at receptor R2 is predicted to be *temporary, negative and significant* in the absence of mitigation. The remaining receptors will experience an *imperceptible to slight negative* impact.

The impacts due to driven piling in terms of building response during all phases are predicted to be *temporary, negative and not significant* in the absence of mitigation.

It's noted that driven piling is the worst case option when considering vibration, there is the potential for the piling to be undertaken with bored piles which are not impulsive in nature and produce lower levels of vibration, in which case the impact would be *not significant*.

Breaking

During breaking, there is potential for vibration to be generated through the ground. Empirical data for this activity is not provided in the BS 5228-2:2009+A1:2014 (BSI 2014b) standard, however the likely level of vibration from this activity is expected to be significantly below the vibration criteria for building damage on experience from other sites. AWN Consulting Ltd (the Author of the Noise and Vibration chapter) have previously conducted vibration measurements under controlled conditions, during trial construction works, on a sample site where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 PPV (mm/s) to 0.25 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.4 PPV (mm/s) to 0.24 PPV (mm/s) at distances of 10m to 50m respectively.

Whilst these measurements relate to a breaking of concrete, the range of values recorded provides some context in relation to typical ranges of vibration generated by construction breaking activity. Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Section 13.4.1.2.

Additionally it is understood that rock dredging may occur on site. This activity has previously been measured on site at the closest receptors (R2, approximately 100m from the works). During these activities the highest measured value was 0.4 mm/s PPV which is considered to be only just perceptible and below the threshold of significance, this is to be expected given the large distance between the source and the receiver.

The impacts due to breaking are predicted to be *temporary, negative and not significant to slight*.

13.8.2 Operational Phase

13.8.2.1 Operational Plant Noise

During the operational phase of the proposed development there will be a number of items of plant in operation on site in addition to a number of CTV movements to and from the site. A 3D computer-based acoustic prediction model has been prepared in order to quantify the noise level associated with the proposed buildings. Given that existing operations at the port are already accounted for in the baseline surveys, the predicted the noise levels associated with any new or modified plant items, are compared against existing ambient and background noise levels to determine the potential noise effects.

<u>Soft Noise Predictor</u>

Proprietary noise calculation software has been used for the purposes of this modelling exercise. The selected software, SoftNoise 'Predictor', calculates noise levels in accordance with ISO 9613: Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation, 1996.

'Predictor' is a proprietary noise calculation package for computing noise levels in the vicinity of noise sources. 'Predictor' calculates noise levels in different ways depending on the selected prediction

RECEIVED: 18/10/2024

standard. In general, however, the resultant noise level is calculated taking into account a range of factors affecting the propagation of sound.

RECEIVED: 18/10/2024

ISO9613-2: 1996

ISO9613-2:1996 calculates the noise level based on each of the factors discussed previously. However, the effect of meteorological conditions is significantly simplified by calculating the average downwind sound pressure level, L_{AT}(DW), for the following conditions:

- wind direction at an angle of ±45° to the direction connecting the centre of the dominant sound source and the centre of the specified receiver region with the wind blowing from source to receiver, and;
- wind speed between approximately 1ms-1 and 5ms-1, measured at a height of 3m to 11m above the ground.

The equations and calculations also hold for average propagation under a well-developed moderate ground based temperature inversion, such as commonly occurs on clear calm nights.

The basic formula for calculating L_{AT}(DW) from any point source at any receiver location is given by:

$$L_{fT}(DW) = L_W + D_c - A \qquad \textit{Eqn. A}$$

Where:

L_{fT}(DW) is an octave band centre frequency component of L_{AT}(DW) in dB relative to 2 x 10-5 Pa;

L_W is the octave band sound power of the point source;

D_c is the directivity correction for the point source;

A is the octave band attenuation that occurs during propagation, namely attenuation due to geometric divergence, atmospheric absorption, ground effect, barriers and miscellaneous other effects.

The estimated accuracy associated with this methodology is shown in Table 13.17 below:

Table 13.17 Estimated Accuracy for Broadband Noise of L_{AT}(DW)

Height, h*	Distance, d†	
	0 < d < 100m	100m < d < 1,000m
0<h<5m	±3dB	±3dB
5m<h<30m	±1dB	±3dB

* h is the mean height of the source and receiver. † d is the mean distance between the source and receiver.

N.B. These estimates have been made from situations where there are no effects due to reflections or attenuation due to screening.

Sound Power Levels

The following items of plant, locations and associated sound power levels have been provided for the purposes of this assessment.

Table 13.18 Sound Power Levels Utilised in Noise Model

RECEIVED: 18/10/2024

Item	Number	Percentage on Time	Reference	Sound Power Level dB L_{WA}
Forklift	12 movements per hour	N/A	Imagine EU Database	101
CTV	9 movements per hour	N/A	Imagine EU Database	99
Crane	2	20%	BS5228	95
Pump	1	20%	BS5228	96

The assessment has assumed the following:

- All reverse alarms are broadband or turned off for the duration of the night period.
- Forklifts and cranes are powered by diesel motors
- Warehouse doors are only open when vehicles enter or exit the warehouse
- One forklift movement every 5 minutes
- All CTV vehicles will leave the port simultaneously (worst case scenario)

Assessment in Comparison with NG4 Methodology

The output of the model generated predicted noise levels at the closest selected noise-sensitive locations (NSLs are shown in Figure 13.2). Note that the night period has been assessed as it is the most sensitive period and operational works will take place 24/7. The results of the noise model are presented in Table 13.19.

Table 13.19 Comparison of predicted operational noise levels vs. adopted noise criteria

Location	Period	Predicted dB $L_{Aeq,T}$	NG4 – Night-time Limit dB $L_{Aeq,15min}$	Complies?
NSL1	Night	29	45	✓
NSL2		37		✓
NSL3		36		✓
NSL4		34		✓
NSL5		32		✓

Reference to Table 13.19 confirms the predicted noise levels fall significantly below the adopted EPA NG4 noise limits for night-time periods. Noise contours are also presented for the site and immediate surroundings in Figure 13.4 in order to demonstrate the noise impact of the proposed development. The results are presented for a calculated height of 4m above ground representing first floor height of the surrounding buildings.

RECEIVED: 18/10/2024

Figure 13.4 Contours of Predicted Operational Noise

Review of Potential Increases in Noise Level

Table 13.20 presents the predicted changes in noise level associated with the development at the nearest noise sensitive locations to the site. The worst case scenario that is presented assumes that all CTVs leave the port between 05:00 and 07:00hrs, and that forklift and cranage activities occur simultaneously to these departures, and that all vehicles and plant are powered by diesel engines. The baseline ambient noise measurements have been analysed to determine the average noise level occurring during these periods for the purpose of comparison between existing and future noise levels. Again, the night period is presented due to it being the most sensitive period with typically the lowest noise level, and hence, the most likely period to experience a change in noise level.

Table 13.20 Review of Predicted Changes in Ambient Noise Levels

Receptor	Predicted dB $L_{Aeq,\ 15mins}$	Existing Noise Level dB L_{Aeq} (05:00 – 07:00)	Total Noise Level dB	Change (dB)	Impact
NSL2	37	38 to 47	41 to 47	+0.4 to +2.4	Imperceptible to Not Significant

RECEIVED: 18/10/2024

The results of the assessment indicate that the change in ambient noise levels will range from +0.4 to a potential +2.4 dB with impacts ranging from *Imperceptible to Not Significant*. There will likely be an increase above the background noise levels during the quietest periods, however, it will remain within a similar range of background noise levels that are experienced during current operations at the port.

The highest change in noise level occurs between the predicted worst case scenario and an existing scenario when the port is operating minimally. It is understood that operations at the port are currently undertaken 24/7 and hence the local noise environment is considered to vary depending on the operations being undertaken at the port, and hence the local noise environment will fluctuate with existing operations at the port.

The predicted noise level of 37 dB $L_{Aeq,T}$ is not a high noise level in absolute terms, particularly given the context of the local environment. Further reductions in the operational noise are likely given the availability of lower operational noise levels for modern plant (e.g. electric powered plant). Consequently, it is relevant here to assess the potential impact on sleep disturbance for nearby receptors. As discussed in Section 12.4.1.4 an external noise level of 45 dB $L_{Aeq,T}$ will still allow for occupants of a dwelling to have their windows to be open and to still meet the guidance criteria for internal noise levels of 30 dB $L_{Aeq,T}$.

The predicted value of 37 dB L_{Aeq} would result in an internal noise level of 22 dB $L_{Aeq,T}$ with windows open at the closest receptors during the worst-case assessment, which is well below the guidance noise levels.

Giving consideration to the existing character of the noise environment, the low level of absolute noise calculated and the prediction of internal noise levels, it is considered the impact due to the operation of the port will be *negative, slight and long-term.*

13.8.2.2 Change in Noise Level Due to Road Traffic

The traffic data contained in the *Traffic and Transport Assessment* undertaken by Trafficwise, and submitted with this application, indicates that a maximum increase of AADT on any road is predicted to be an increase of 23.2% on the R175 Shore Road. Given that an increase of traffic flow by approximately 25% would be required to increase noise levels by 1 dB, in this instance the change in traffic flows would result in a negligible increase of less than 1 dB. The noise impact of traffic volumes accessing the surrounding network is determined to be *neutral, long term, imperceptible*.

Table 13.21 Change in Noise Levels due to Operational Traffic

Reference	Do Nothing 2032 AADT	Do Something 2032 AADT	Resultant Change in Noise Level (dB)	Impact
Shore Road	2386	2940	< 1	Imperceptible

It's noted that the proposed car park located off Shore Road is approximately 30m from the rear face of the dwellings on Euston St (R2). Typical noise levels 5m beyond the boundary of a car park over a are in the order of 50 dB $L_{Aeq,T}$. This noise level is the result of a calculation informed by previously measured data at an alternative site. The noise levels at receptors are predicted to be 43 dB at the receptor location which is lower than both the external day and night periods extrapolated from

BS8233 guidance and NG4, hence the impact is considered to be *negative, not significant and long-term.*

RECEIVED: 18/10/2024

13.8.2.3 Vibration

No vibration generating activities are predicted as part of the operation of the facility.

13.8.3 Cumulative Effects

13.8.3.1 Construction Phase

In terms of construction noise typically cumulative impacts with the potential to cause significance would only occur when sites are within 100m of a receptor, this is due to the high level of attenuation that occurs over such a distance (approximately 48 dB of attenuation).

The list of projects and plans included in Appendix 1-1 of this EIAR has been considered. A number of minor developments have been granted permission within the surrounding area, these are typically associated with extensions or alterations to single buildings. Given the scope of the proposed development it is expected that construction noise levels will be dominated by the proposed development site. There may be periods where impulsive works are undertaken at the below developments, which may lead to a brief negative increase in construction noise levels in the area, however when assessed cumulatively it would be expected that only a 3 dB increase may occur at nearby receptors during the worst case works.

It's noted that the developments are of such a distance that cumulative vibration impacts will not occur.

Identified developments with the potential for cumulative noise impacts include:

- Lisa and Sean Crudden (Ref: LCC 231);
- Tara and Declan Boyle (Ref: LCC 22614);
- Andrew Bothwell (Ref: LCC 211331);
- Brendan Rafferty (Ref: LCC 211223);
- Valerie Halpenny (Ref: LCC 19202);
- Damien Wynne and Martina McNally (Ref: LCC 2360256);
- Cooley Peninsula Men's Shed (Ref: LCC 23125);
- Hanlon Transport Ltd (Ref: LCC 20362).

13.8.3.2 Operational Phase

As with the construction phase, operational noise levels will also decrease significantly due to distance. In this case the nearest proposed developments with the potential to cause operational noise are located several kilometres from the proposed development, and hence, there will be no cumulative operational noise impacts.

13.8.4 Summary

RECEIVED: 18/10/2024

The following Table 13.22 and Table 13.23 summarise the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 13.22 Summary of Construction Phase Noise Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Demolition	Negative	Slight to Significant	Closest receptors at R1 to R4	Likely	Temporary	Direct / Worst-Case
Piling for Port Buildings	Negative	Slight to Significant	Closest receptors at R1 to R3	Likely	Temporary	Direct / Worst-Case
Quay Wall / Pontoon Piling	Negative	Slight to Moderate	Closest receptors at R1 to R3	Likely	Temporary	Direct / Worst-Case
Construction of Proposed Buildings, Quay Wall and Pontoon & Gangway Installation	Negative	Slight to Significant	Closest receptors at R2	Likely	Temporary	Direct / Worst-Case
Port Entrance Upgrades	Negative	Slight to Very Significant	Closest receptors at R2	Likely	Temporary	Direct / Worst-Case
Dredging (Day)	Negative	Not Significant	All	Likely	Temporary	Direct / Worst-Case
Dredging (Night)	Negative	Significant	R1 – R3	Likely	Temporary	Direct / Worst-Case
Construction Traffic	Negative	Imperceptible	All receptors	Likely	Short-term	Direct

Table 13.23 Summary of Construction Phase Vibration Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Demolition	Negative	Not Significant to Slight	Closest receptors at R1, R2 and R4	Likely	Temporary	Direct
Piling for Port Buildings	Negative	Significant	Closest receptors at R1 to R2	Likely	Temporary	Direct

The following Table 13.24 summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

RECEIVED: 18/10/2024

Table 13.24 Summary of Operational Phase Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Noise Sources	Negative	Slight	All Receptors	Likely	Long-term	Direct
Operational Traffic Noise	Negative	Imperceptible	All Receptors	Likely	Long-term	Direct

13.9 Mitigation

13.9.1 Construction Phase Mitigation

The following recommendations must be considered in conjunction with the detailed guidance set out in the BS 5228-1: 2009+A1: 2014: and BS 5228-2: 2009+A1: 2014.

BS 5228 includes guidance on various aspects of construction site noise & vibration mitigation, including, but not limited to:

- Hours of work;
- Liaison with neighbours;
- Selection of quiet plant;
- Control of noise sources;
- Screening; and
- Noise & vibration monitoring.

These issues are discussed in the following paragraphs. Noise control measures that should be considered include the selection of suitable plant, enclosures and screens around noise sources, consideration of the hours of work and ongoing monitoring.

Hours of Work

Construction works, except for dredging and pile driving works, will generally be limited to the hours 0700 – 2000 Monday to Friday and 0700 – 1600 hours on Saturday.

Some works associated with the pontoon construction and quay wall have to be undertaken at low tide and their construction hours will be linked to tides. Therefore, tidal dependent works may occur outside of these hours.

Pile driving works will be limited to 0800-1800 Monday to Friday and 0800 - 1600 hours on Saturday. It is not envisaged that works will take place on public holidays.

Dredging, due to the nature of the activity, is undertaken on a 24 hour basis. Dredging activities will occur for approximately 8-10 weeks.

If works are required outside of these hours, in exceptional circumstances, the planning authority will be notified in advance.

RECEIVED: 18/10/2024

Liaison with Interested Parties

The contractor will appoint a liaison officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the contractor's CEMP.

Selection of Quiet Plant

Careful consideration must be given to the noise emission levels of plant items when they are being considered for use on the site.

Control of Noise Sources

If the use of low noise plant or replacing a noisy item of plant are not viable or practicable options, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods, often in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that *"as far as reasonably practicable sources of significant noise should be enclosed".* In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures that could be moved around site as necessary may also be used to screen operatives using hand tools such as angle grinders.

BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are relevant and hence are reproduced below. These recommendations should be implemented on the site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.*
>
> *Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*
>
> *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.*

Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

RECEIVED: 18/10/2024

Also note the following outline guidance in relation to specific considerations which may be deployed as required by the contractor..

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover.
- For percussive tools such as pneumatic concrete breakers, rock drills and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For all materials handling ensure that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

<u>Screening</u>

Site hoarding along the boundary between the construction site and the residential receptors that will provide a degree of barrier screening. Any screening will incorporate existing boundary walls on the site (i.e. where a suitable 2 – 2.4m boundary wall exists there is no need to install hoarding in that specific location). Further benefits may be achieved through the use of additional smaller localized screens on the site itself.

The use of screens can be effective in reducing the noise level at a receiver location and should be employed as a complementary measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. The height and length of any screen should, where practicable, be such that there is no direct line of sight between the source and the receiver.

BS 5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the screen should be such that there are no gap or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the barrier rather than the transmission through the barrier itself.

RECEIVED: 18/10/2024

13.9.2 Operational Phase Mitigation

The assessment indicates that operational noise will not cause a significant impact (see Section 13.10.2) hence specific mitigation is not required,

As part of the detailed design of the development, selection of quiet plant items and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties.

13.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

13.10.1 Construction Phase

13.10.1.1 Noise

Table 13.25 presents the predicted daytime noise levels from an indicative construction period on site at the nearest off-site receptors, assuming mitigation measures outlined in Section 13.9 are implemented. Note the calculations assume that construction noise sources for the site are running for 66% of the time and standard 2.4m hoarding/screening is in place where practicable.

Table 13.25 Predicted Construction Noise Levels

Receptor	CNT	Predicted Construction Noise Level, dB $L_{Aeq,T}$ at Various Distances					
		Demolition	Piling for Port Buildings	Quay Wall / Pontoon Piling	Construction of Proposed Buildings, Quay Wall and Pontoon & Gangway Installation	Port Entrance Upgrades	Dredging
R1	75	**77**	**76**	67	67	47	56
R2	65	**74**	**72**	65	61	**70**	54
R3	65	63	64	61	49	50	49
R4	65	**69**	59	57	47	49	45
R5	75	53	57	55	45	46	44

The predictions indicate that some significant impacts will still occur post mitigation, however, it should be noted that this occurs only when construction works are closest to the receptor locations. Mitigation has reduced the number of receptor locations and activities with a significant impact. Additionally, for a large portion of the time the noise levels will likely be lower than those predicted. Notwithstanding, any periods of significance will be brief to temporary in nature. The resultant impacts will be negative, they will range from not significant to significant dependant on the location of the work and the receptor, and the impacts will be brief to temporary.

RECEIVED: 18/10/2024

Table 13.26 and Table 13.28 summarise the identified likely residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 13.26 Summary of Construction Phase Noise Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Demolition	Negative	Slight to Significant	Closest receptors at R1, R2 and R4	Likely	Temporary	Direct / Worst-Case
Piling for Port Buildings	Negative	Slight to Significant	Closest receptors at R1 to R2	Likely	Temporary	Direct / Worst-Case
Quay Wall / Breakwater Pontoon Piling	Negative	Slight to Moderate	Closest receptors at R1 to R3	Likely	Temporary	Direct / Worst-Case
Construction of Proposed Buildings, Quay Wall and Pontoon & Gangway Installation	Negative	Slight to Moderate	Closest receptors at R2	Likely	Temporary	Direct / Worst-Case
Port Entrance Upgrades	Negative	Slight to Significant	Closest receptors at R2	Likely	Temporary	Direct / Worst-Case
Dredging (Day)	Negative	Not Significant	All	Likely	Temporary	Direct / Worst-Case
Dredging (Night)	Negative	Significant	R1 – R3	Likely	Temporary	Direct / Worst-Case
Construction Traffic	Negative	Imperceptible	All receptors	Likely	Short-term	Direct

13.10.1.2 Vibration

For building occupants there is the potential that vibration levels will be at a level that could cause disturbance, however, TII guidance document *Guidelines for the Treatment of Noise and Vibration in National Road Schemes 2004* indicates that piling can typically be tolerated at vibration levels up to 2.5mm/s once the origin of the source is known. Hence, it is considered that with prior warning the vibration levels will be tolerable for local residents with impacts reduced from significant to moderate.

The impact is considered to be *negative, moderate and brief to temporary.*

Table 13.27 Summary of Construction Phase Vibration Effects Post Mitigation

RECEIVED: 18/10/2024

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Demolition	Negative	Not Significant to Slight	Closest receptors at R1 to R2	Likely	Temporary	Direct
Piling for Port Buildings	Negative	Moderate	Closest receptors at R1 to R2	Likely	Temporary	Direct

13.10.2 Operational Phase

13.10.2.1 Noise

Assessment indicates that specific mitigation is not required. Residual effects are negative, slight and long-term for operational noise sources and negative, imperceptible and long-term for operational traffic.

Table 13.28 Summary of Operational Phase Likely Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Outward Operational Noise	Negative	Slight	All Receptors	Likely	Long-term	Direct
Operational Traffic Noise	Negative	Imperceptible	All Receptors	Likely	Long-term	Direct

13.10.2.2 Vibration

There are no vibration generating activities proposed as part of the operation of the port.

13.10.3 Cumulative Residual Effects

Given the distance to other permitted developments it is not considered likely that there will be a cumulative impact.

The additional projects included in the updated List of Cumulative Projects appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea were considered and no additional cumulative effects arising from these projects were identified.

13.11 Interactions

There are interactions between the noise and vibration assessment and Material Assets: Traffic And Transport assessment in Chapter 6. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site. In this assessment, the impact of the interactions between traffic and noise are considered to be imperceptible due to the low level changes in traffic flows associated with the proposed development.

RECEIVED: 18/10/2024

13.12 Monitoring

The contractor will be required to ensure construction activities operate within the noise limits set out within this assessment.

Any noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

There is no monitoring recommended for the operational phase of the development as impacts due to noise and vibration are predicted to be not significant.

13.13 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 13.29 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Construction and Demolition Noise	Selection of quiet plant; control of noise sources; screening, controlling; hours of work; liaison with the public.	As per BS5228

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 13.30 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Outward Plant Noise	Selection of quiet plant, installation of silencers etc, adherence to criteria.	N/A

13.14 Conclusion

AWN Consulting have undertaken an assessment of the potential noise and vibration impacts as a result of the proposed development. A range of mitigation measures have been specified for the construction stages, with no specific mitigation required for the operational stage. With mitigation applied the construction impacts will be reduced although will remain temporarily significant during periods when work is undertaken near to the closest receptors. During the operational stage the mitigation measures will reduce impacts so that they are slight to not significant.

13.15 References and Sources

RECEIVED: 18/10/2024

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1 2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise);
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014b);
- BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration. (BSI 1993);
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (BSI 2008);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS 8233) (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS 4142) (BSI 2019);
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHA 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 1996);
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017), and;
- The UK Department of Transport Calculation of Road Traffic Noise (UK Department of Transport 1988)
- Guidelines for Environmental Noise Impact Assessment IEMA) (2014)

RECEIVED: 18/10/2024

CHAPTER 14

AIR QUALITY

VOLUME II

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Figures

Table of Tables

RECEIVED: 18/10/2024

14 Air Quality

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

14.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development at Greenore Port, Greenore, Co. Louth. A full description of the proposed development is set out in Chapter 2 of this EIAR.

14.2 Expertise & Qualifications

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She has been specialising in the area of air quality, climate and sustainability for 1 year and has prepared air quality and climate assessments for inclusion within EIARs for residential and commercial developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), The Paddocks (Planning Application Ref: 2360349), and Dublin Airport Authority.

This chapter was also prepared and reviewed Dr. Jovanna Arndt, a Senior Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She has been specialising in the area of air quality and climate over 7 years and has prepared air quality and climate assessments for inclusion within EIARs for residential developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), commercial and industrial developments by Dublin Airport Authority, Zoetis, Ipsen, Merck Millipore, Greener Ideas Limited and Abbvie, as well as renewable energy developments such as Codling Wind Park and the Cúil Na Móna Anaerobic Digestion Facility. She also specialises in assessing air quality impacts using air dispersion modelling of transportation schemes such as BusConnects Dublin, major Highways England Road schemes and major rail infrastructure in the form of High Speed 2 (HS2 in the UK). She has prepared air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Microsoft, Greener Ideas Limited, Merck Millipore, Lilly Limerick, Chemifloc, Takeda, Kingspan and Kilshane Energy. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils and assessed the air quality impacts of potential Clean Air Zones in the UK.

14.3 Proposed Development

A full description of the proposed development is set out in Chapter 2 of this EIAR. The following is a summary of the proposed works.

Greenore Port Unlimited Company intend to apply for a 10-year permission for development at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

RECEIVED: 18/10/2024

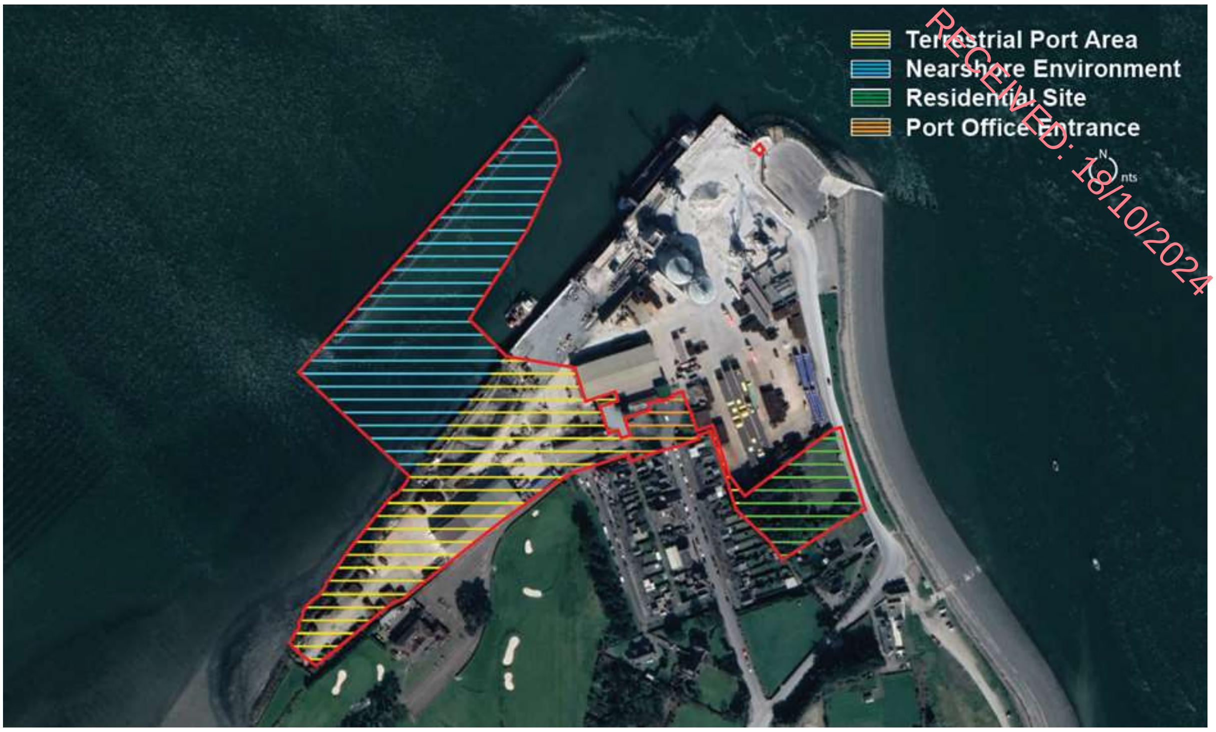
The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. In general, it will comprise of terrestrial (landside) and nearshore works, with three standalone buildings incorporating office, warehouse and ancillary space landside and a pontoon to accommodate Crew Transfer Vessels (CTVs) marine side. To facilitate the proposed development, dredging within the nearshore and the demolition of existing port buildings and a vacant residential property is required.

The Operations and Maintenance Facilities (OMF) will provide twenty-four-seven, year-round support, to three individual offshore renewable energy (ORE) projects that will be owned and operated by entities separate from the applicant. These ORE projects will consist of offshore windfarms on the East Coast of Ireland.

The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

1. 'Terrestrial Port Area', (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing 'engine room', and a communications mast.
2. 'Nearshore Environment' (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
3. 'Residential Site' (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. 'Port Office Entrance' (c. 0.18ha) encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

Figure 14.1 shows a general location plan of the plots identified.



RECEIVED: 18/10/2024

Figure 14.1 General Location Plan of the Scheme

14.4 Methodology

14.4.1 Relevant Legislation & Guidance

Alongside the legislation, policy, and guidance outlined in Chapter 1, the following relevant legislation, policy, and guidance has informed the preparation of this Chapter:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Advice Note on Preparing Environmental Impact Statements - Draft (EPA, 2015);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management (IAQM), 2024);
- Transport Infrastructure Ireland (TII) Guidance Air Quality Assessment of Specified Infrastructure Projects: PE-ENV-01106 (TII, 2022).

14.4.1.1 Development Plans

The Louth County Development Plan 2021 - 2027 (Louth County Council, 2023) outlines specific objectives in relation to air quality in Chapter 11: Environment, Natural Resources and The Coast. Policy Objective PO12 is directly related to air quality:

<u>PO12 Air Quality Policy Objective</u>

"To promote the preservation of best ambient air quality compatible with sustainable development in accordance with the *EU Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC)* and ensure that all air emissions associated with new developments are within Environmental Quality Standards as out in the *Air Quality Standards Regulations 2011 (SI No. 180 of 2011)*, or any updated/superseding documents. "

RECEIVED: 18/10/2024

14.4.2 Criteria for Rating of Impacts

14.4.2.1 Ambient Air Quality Standards

National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland (DEHLG, 2004) and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants to reduce the risk to health from poor air quality. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for NO_2, PM_{10}, and $PM_{2.5}$ being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$ are set out in Table 14.1.

Table 14.1 Ambient Air Quality Standards & TA Luft

Pollutant	Regulation[Note1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI, 2002)	Annual average limit for nuisance dust	350 mg/m²/day
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 μg/m³
		Annual limit for protection of human health	40 μg/m³
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 μg/m³ PM_{10}
		Annual limit for protection of human health	40 μg/m³ PM_{10}
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	20 μg/m³ $PM_{2.5}$

Note 1 EU 2008/50/EC Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (WHO, 2006) (shown in Table 14.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in

2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 μg/m^3. The strategy also acknowledges that *"meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2"*. Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

RECEIVED: 18/10/2024

Table 14.2 WHO Air Quality Guidelines (WHO, 2006)

RECEIVED: 18/10/2024

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50 µg/m³ NO_2	50 µg/m³ NO_2	25 µg/m³ NO_2
		Annual limit for protection of human health	30 µg/m³ NO_2	20 µg/m³ NO_2	10 µg/m³ NO_2
PM (as PM_{10})		24-hour limit for protection of human health	75 µg/m³ PM_{10}	50 µg/m³ PM_{10}	45 µg/m³ PM_{10}
		Annual limit for protection of human health	30 µg/m³ PM_{10}	20 µg/m³ PM_{10}	15 µg/m³ PM_{10}
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5 µg/m³ $PM_{2.5}$	25 µg/m³ $PM_{2.5}$	15 µg/m³ $PM_{2.5}$
		Annual limit for protection of human health	15 µg/m³ $PM_{2.5}$	10 µg/m³ $PM_{2.5}$	5 µg/m³ $PM_{2.5}$

14.4.2.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns, and the EU ambient air quality standards outlined in Table 14.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled *'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)'* (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m²/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the Proposed Development.

14.4.3 Construction Phase Methodology

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

RECEIVED: 18/10/2024

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located 68 km south of the proposed development. A review of Dublin Airport meteorological data indicates that the prevailing wind direction is south-westerly to southerly and wind speeds are generally moderate in nature (see Section 14.6.1 and Figure 14.2 for detail). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Dublin Airport meteorological station indicates that on average 200 days per year have rainfall over 0.2 mm (Met Éireann, 2023). Therefore, it can be determined that 55% of the time dust generation will be reduced.

The Institute of Air Quality Management in the UK (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects: PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (2024) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects: PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and, therefore, does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

RECEIVED: 18/10/2024

14.4.4 Operational Phase Methodology

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the Proposed Development. The TII scoping criteria detailed in Section 14.4.3 was used to determine if any road links are affected by the Proposed Development and require inclusion in a detailed air dispersion modelling assessment. Due to the nature of the Proposed Development, there will be minimal vehicles accessing the site during the operational phase. The Proposed Development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the Proposed Development satisfy the screening criteria (see Section 14.4.3) and a quantitative assessment of the impact of traffic emissions on ambient air quality is not necessary as there is no potential for significant impacts to local air quality.

14.5 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

14.6 Baseline Environment

14.6.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located 68 km south of the proposed development. Dublin Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 14.2). For data collated during five representative years (2018 - 2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.4 m/s over the 30-year period 1991 - 2020 (Met Éireann, 2023).

RECEIVED: 18/10/2024

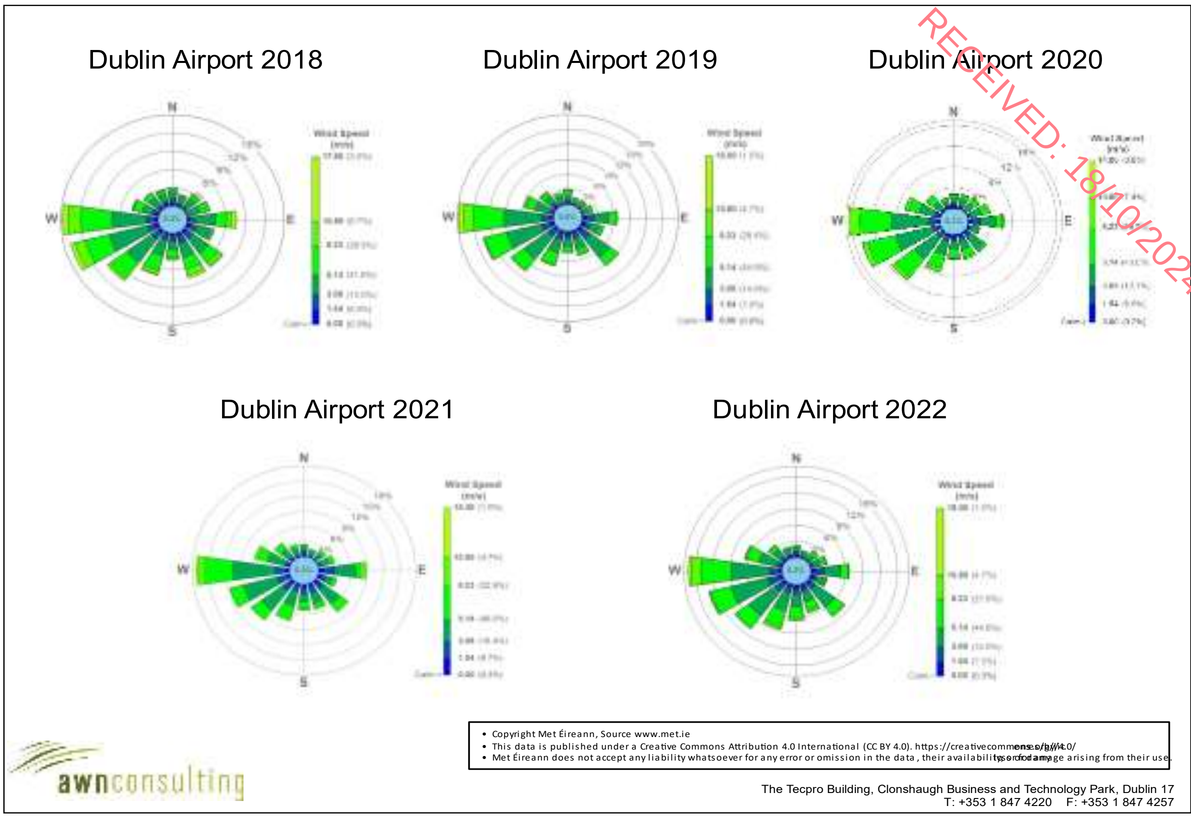


Figure 14.2 Dublin Airport Windroses 2018 - 2022 (Source: Met Éireann, 2023)

14.6.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality In Ireland 2022*" (EPA, 2023). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2023).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2023). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone D (EPA, 2023).

The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported (EPA, 2023) that Ireland was compliant with EU legal air quality limits at all locations; however, this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA Air Quality in Ireland 2020 report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are, therefore, predicted to be an exceptional year and not consistent with long-term trends. For this reason, the 2020 data has been included in the baseline section for representative purposes only and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

RECEIVED: 18/10/2024

14.6.2.1 NO_2

Long-term NO_2 monitoring was carried out at five Zone C and Zone D rural background and suburban background locations of Kilkit, Emo Court, Castlebar, Edenderry, and Dundalk for the period 2018 - 2022, (EPA, 2023). Annual mean concentrations of NO_2 range from 3 - 14 µg/m^3 over the five-year period (**Table 14.3**). Long term average concentrations are below the annual average limit of 40 µg/m^3.

Based on the above information, a conservative estimate of the current background NO_2 concentration in the region of the proposed development is 6.8 µg/m^3.

Table 14.3 Trends in Zone A Air Quality - Nitrogen Dioxide (NO_2)

Station	Averaging Period Note 1	Year				
		2018	2019	2020	2021	2022
Kilkit	Annual Mean NO_2 (µg/m^3)	3	5	2	2	2
	Max 1-hr NO_2 (µg/m^3)	37	59	13	11	19
Emo Court	Annual Mean NO_2 (µg/m^3)	3	4	3	4	3
	Max 1-hr NO_2 (µg/m^3)	91	56	179	64	179
Castlebar	Annual Mean NO_2 (µg/m^3)	8	8	6	6	8
	Max 1-hr NO_2 (µg/m^3)	92	86	85	73	85
Edenderry	Annual Mean NO_2 (µg/m^3)	-	-	-	9	7
	Max 1-hr NO_2 (µg/m^3)	-	-	-	43	84
Dundalk	Annual Mean NO_2 (µg/m^3)	14	12	10	11	10
	Max 1-hr NO_2 (µg/m^3)	91	144	204	165	262

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). 1-hour limit value - 200 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

14.6.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at six Zone C and Zone D rural background and suburban background locations of Cobh Cork Harbour, Kilkit, Claremorris, Askeaton, Dundalk and Rahoon Road from 2018 - 2022. Annual mean concentrations range from 7 - 15 µg/m^3 over the five year period (Table 14.4). Hence, long term concentrations are significantly below the annual limit value of 40 µg/m^3. In addition, there were at most 2 exceedances (in Dundalk) of the 24-hour limit value of 50 µg/m^3 in 2019, albeit 35 exceedances are permitted per year (EPA, 2023). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the development is 11.2 µg/m^3.

Table 14.4 Trends in Zone A Air Quality - PM_{10}

RECEIVED: 18/10/2024

Station	Averaging Period Note 1	Year				
		2018	2019	2020	2021	2022
Cobh Cork Harbour	Annual Mean PM_{10} (µg/m³)	15	13	13	13	14
	24-hr Mean > 50 µg/m³ (days)	0	0	0	1	1
Kilkit	Annual Mean PM_{10} (µg/m³)	9	7	-	-	9
	24-hr Mean > 50 µg/m³ (days)	0	1	-	-	0
Claremorris	Annual Mean PM_{10} (µg/m³)	12	11	10	8.12	7.90
	24-hr Mean > 50 µg/m³ (days)	0	0	0	0	0
Askeaton	Annual Mean PM_{10} (µg/m³)	-	-	7	9	9
	24-hr Mean > 50 µg/m³ (days)	-	-	0	0	0
Dundalk	Annual Mean PM_{10} (µg/m³)	15	14	13	12	12
	24-hr Mean > 50 µg/m³ (days)	0	2	2	0	2
Rahoon Road	Annual Mean PM_{10} (µg/m³)	15	13	-	11	13
	24-hr Mean > 50 µg/m³ (days)	0	0	-	1	0

Note1 Annual average limit value - 40 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). Daily limit value - 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

14.6.2.3 $PM_{2.5}$

Average $PM_{2.5}$ levels in Cobh Cork Harbour, Claremorris, Askeaton and Drogheda over the period 2018 - 2022 ranged from 6 - 8 µg/m³ (Table 14.5). Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 7 µg/m³.

Table 14.5 Trends In Zone A Air Quality - $PM_{2.5}$

Station	Averaging Period Note 1	Year				
		2018	2019	2020	2021	2022
Cobh Cork Harbour	Annual Mean $PM_{2.5}$ (µg/m³)	10.0	8.0	8.0	7.4	7.6
Claremorris	Annual Mean $PM_{2.5}$ (µg/m³)	6.0	4.0	5.1	8.2	6.1
Askeaton	Annual Mean $PM_{2.5}$ (µg/m³)	-	-	4.4	5.7	5.5
Drogheda	Annual Mean $PM_{2.5}$ (µg/m³)	-	-	-	6.1	6.9

Note 1 Annual average limit value - 40 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). Daily limit value - 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

Based on the above information the air quality in rural background and suburban background areas is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2. There is the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2023).

14.6.3 Likely Future Receiving Environment

RECEIVED: 18/10/2024

The ambient air quality at the development area will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments on the site and in the surrounding area, changes in road traffic, etc.). Improvements in air quality can be expected in the future, due to the reduction in vehicle emissions driven by the 2023 Climate Action Plan (DECC, 2023), commitments to public transport developments and a 30% fleet share of electric vehicles. The 2023 Clean Air Strategy for Ireland commits Ireland to achieving final 2021 WHO Air Quality Guidelines by 2040, in line with the proposed EU revisions to the CAFE Directive. Future developments and existing industrial installations will need to comply with these more stringent future air quality standards, which will also result in improvements to air quality.

In a future baseline without the development, no construction works will take place and any impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. Impacts from changes in traffic volumes and associated air emissions will also not occur.

The proposed development will involve the demolition of the existing Open Hydro building. This is permitted under Reg Ref 19807 for storing port commodities such as agricultural food, fertiliser, salt and rock. The imported goods are stored on site before being moved off site to other warehousing / customers as opposed to being transported off site directly from the ship. This material storage, of agricultural foods in particular, generates dust soiling which will cease on demolition of the open hydro building and the goods will once again be transported off site. The proposed development will therefore positively impact the likely future receiving environment.

14.6.4 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, schools and hospitals.

In terms of receptor sensitivity to dust soiling, there are a number of high sensitivity residential properties in close proximity to the site boundary (see Figure 14.4). There are 17 sensitivity residential receptors within 20m of the development boundary. Therefore, the sensitivity of the area to dust soiling impacts is considered **high** based on the IAQM criteria outlined in Table 14.6.

Table 14.6 Sensitivity of the Area to Dust Soiling Effects on People and Property (IAQM, 2024)

RECEIVED: 18/10/2024

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	**High**	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is 14 µg/m^3 and there are 17 high sensitivity receptors within 20m of the proposed development boundary (see Figure 14.4). Based on the IAQM criteria outlined in Table 14.7, the worst-case sensitivity of the area to human health is considered **low**.

Table 14.7 Sensitivity of the Area to Dust Related Human Health Impacts (IAQM, 2024)

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)			
			<20	<50	<100	<250
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	**Low**	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

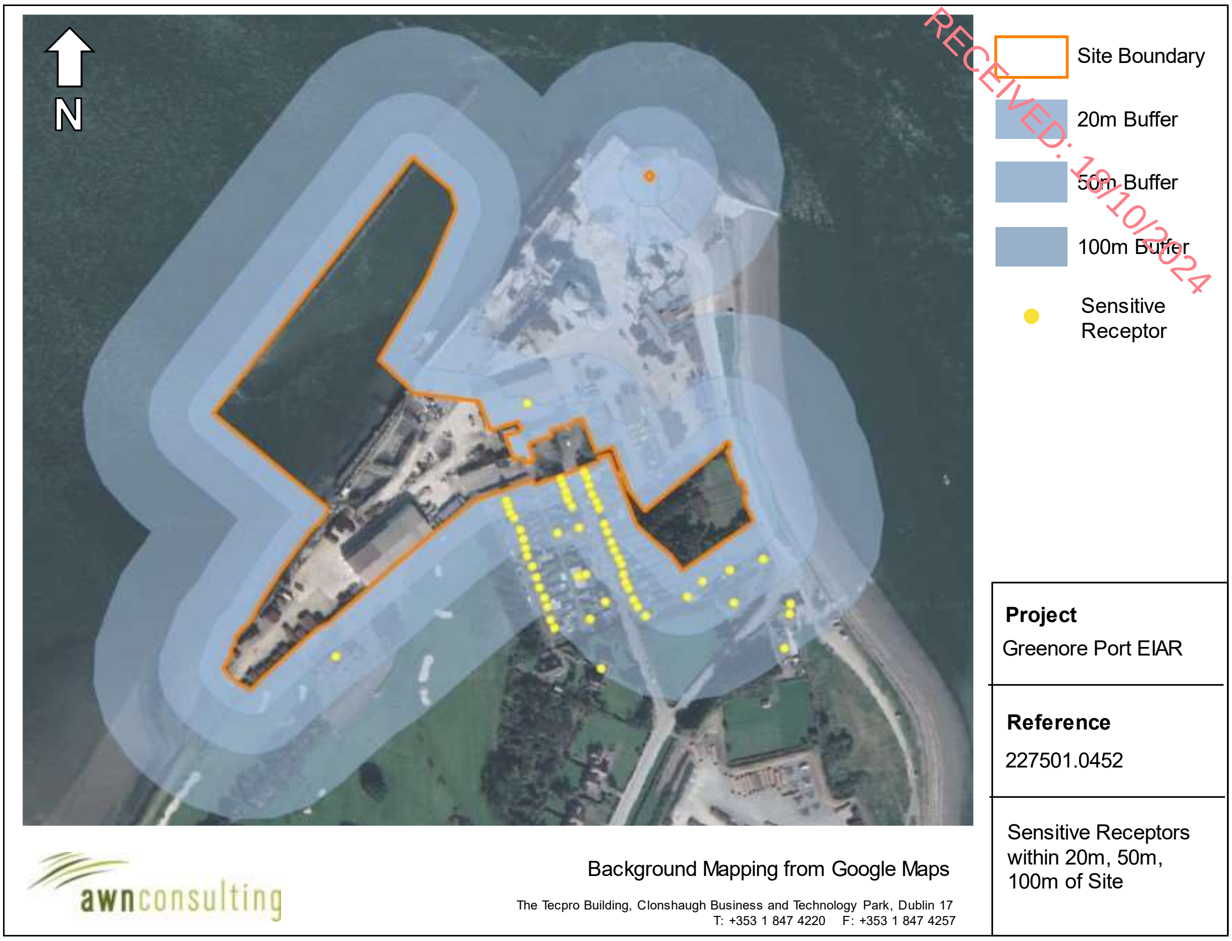


Figure 14.3 Sensitive Receptors within 20 m, 50m and 100m of Site Boundary

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50m from the site and 50m from site access roads, up to 500m from the entrance of a large site. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present.

The closest designated sites are the Carlingford Shore SAC, Carlingford Shore SAC and Carlingford Lough pNHA which are within 50m of the site. High sensitivity ecological receptors are sites with European or National designation with particularly dust sensitive species present (see Figure 14.4). Based on the IAQM criteria outlined in Table 14.8, the worst-case sensitivity of the area for ecology is considered **medium.**

Table 14.8 Sensitivity of the Area to Dust Related Ecological Impacts (IAQM, 2024)

RECEIVED: 18/10/2024

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	**Medium**	Medium
Medium	Medium	Low
Low	Low	Low

Figure 14.4 Ecological Sensitive Receptors surrounding the Site Boundary

14.7 The 'Do Nothing' Scenario

RECEIVED: 18/10/2024

Under the Do-Nothing scenario the proposed development will not be constructed. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area. In the absence of the proposed development the following Greenore Port permitted developments are planned for construction and operation:

- Extension and modification of existing Warehouse, LCC Planning Ref 20268, ABP Ref 307862; and
- New Warehouse, LCC Planning Ref Planning ref 20543, ABP Ref 310184.

14.8 Potential Significant Effects

14.8.1 Demolition and Construction Phase

The potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 14.6.4) to determine the level of dust mitigation required during the proposed works. As per Section 14.4.3, the major dust generating activities are divided into demolition, earthworks, construction and trackout within the IAQM guidance to reflect their different potential impacts.

14.8.1.1 Air Quality

Demolition

There is demolition associated with the proposed development, comprising of the demolition of the existing Open Hydro Warehouse, residential dwelling, Substation and switchroom and part of existing port office. Dust emission magnitude from demolition can be classified as small, medium, or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total building volume >75,000 m^3 potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level;
- **Medium** Total building volume 12,000 m^3 – 75,000 m^3 potentially dusty construction material, demolition activities 6-12 m above ground level; and
- **Small** Total building volume <12,000 m^3 construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.

The dust emission magnitude for the proposed demolition activities can be classified as small as the total building volume will be less than 12,000 m^3. The sensitivity of the area, as determined in Section 14.6.4, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 14.9, this results in an overall low risk of dust soiling impacts and dust-related ecological impacts and a negligible risk of dust-related human health impacts.

Table 14.9 Risk of Dust Impacts: Demolition

RECEIVED: 18/10/2024

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	**Low Risk**
Medium	Medium Risk	Medium Risk	**Low Risk**
Low	Low Risk	Low Risk	**Negligible**

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total site area > 110,000m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds 3-6m in height;
- **Medium** Total site area 18,000m^2 - 110,000m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 - 8m in height;
- **Small** Total site area < 18,000m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4m in height.

The dust emission magnitude for the proposed earthwork activities can be classified as medium as the total site area is between 18,000 and 110,000m^2.

The sensitivity of the area, as determined in Section 14.6.4, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 14.10, this results in a medium risk of dust soiling impacts, a medium risk for ecological impacts and a low risk of human health impacts.

Table 14.10 Risk of Dust Impacts: Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	**Medium Risk**	Low Risk
Medium	Medium Risk	**Medium Risk**	Low Risk
Low	Low Risk	**Low Risk**	Negligible

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total building volume > 75,000m^3, on-site concrete batching, sandblasting;
- **Medium** Total building volume 12,000m^3 - 75,000m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- **Small** Total building volume < 12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

As per Chapter 02 Development Description Table 2-5 the construction of the proposed development will take place over two phases:

RECEIVED: 18/10/2024

- Phase 1 will involve the construction of Building A and associated carpark, re-commissioning of 'Open Hydro' carpark spaces' (60); full extent of capital dredging, 70m quay wall at Berth 3, pontoon to cater for four crew transfer vessels, and the replacement of the communications mast. Associated site and development works, including drainage, lighting and landscaping related to the above elements will be completed in this phase. Demolition of dwelling house at Shore Road and provision of contractor's compound / carpark with pedestrian access through port lands to the O+M site.
- Phase 2 will involve the demolition of existing former Open Hydro building and ESB substation and construction of Buildings B and C, new access road including landscaping and parking areas, substation, Public / private realm upgrade at port entrance, pontoon enlarged to accommodate 10 crew transfer vessels, surface carpark and pedestrian access. Associated site and development works, including pavement upgrade quayside of Buildings A, B and C, drainage, lighting and landscaping related to the above elements will be completed in this phase.

The dust emission magnitude for the proposed construction activities can be classified as large as the total building volume will likely be more than 75,000m^3, based on Phase 2 as this will result in the largest volume of structures constructed. As outlined in Table 14.11, this results in a high risk of dust soiling impacts, a medium risk of ecological impacts and a low risk of human health impacts.

Table 14.11 Risk of Dust Impacts: Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	**High Risk**	Medium Risk	Low Risk
Medium	**Medium Risk**	Medium Risk	Low Risk
Low	**Low Risk**	Low Risk	Negligible

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium** 20 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100m;
- **Small** < 20 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 5 0m.

The dust emission magnitude for the proposed trackout can be classified as small, as at worst-case peak periods there will likely be less than 20 outward HGV movements per day. As outlined in Table

14.12, this results in a low risk of dust soiling impacts, a negligible risk of human health impacts and a low risk of ecological impacts.

RECEIVED: 18/10/2024

Table 14.12 Risk of Dust Impacts: Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	**Low Risk**
Medium	Medium Risk	Medium Risk	**Low Risk**
Low	Low Risk	Low Risk	**Negligible**

Summary of Dust Emission Risks

The risk of dust impacts as a result of the Proposed Development are summarised in Table 14.13 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity to prevent significant impacts occurring.

There is at most a high risk of dust soiling, at most a medium risk of ecological impacts, and at most a low risk of human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, the effects of construction dust are predicted to be ***direct, short-term, negative*** and ***slight***.

Table 14.13 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling Risk	Low Risk	Medium Risk	High Risk	Low Risk
Human Health Risk	Negligible	Low Risk	Low Risk	Negligible
Ecological Risk	Low Risk	Medium Risk	Medium Risk	Low Risk

14.8.1.2 Traffic

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the Proposed Development satisfy the TII scoping assessment criteria in Section 14.4.3. It can, therefore, be determined that the construction stage traffic will have a ***direct, short-term, negative*** and ***imperceptible*** effect on air quality.

14.8.1.3 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Section 14.6.4, the surrounding area is of low sensitivity to dust-related human health impacts. In addition, there is at most a low risk of dust-related human health impacts as a result of the proposed construction works. In the absence of mitigation there is the potential for a ***direct***, ***short-term, negative*** and ***imperceptible*** affect to human health as a result of construction dust emissions.

14.8.2 Operational Phase

RECEIVED 18/10/2024

14.8.2.1 Traffic

The Proposed Development will not change traffic volumes by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the Proposed Development satisfy the screening criteria (see Section 14.4.3). There is the potential for maintenance vehicles accessing the site to result in emissions of NO_2, PM_{10} and $PM_{2.5}$. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved emissions are not predicted to be significant. A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. Operational stage effects to air quality are predicted to be ***direct, long-term, negative*** and ***imperceptible***.

14.8.2.2 Human Health

A traffic related air emissions have the potential to impact air quality which can affect human health. Detailed air dispersion modelling assessment of traffic emissions was conducted and it was determined that emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health. Therefore, it can be determined that the effect to human health during the operational stage is ***long-term, direct, localised, negative*** and ***imperceptible***.

14.8.3 Cumulative Effects

The additional projects included in the updated List of Cumulative Projects appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea were considered and no additional cumulative effects arising from these projects were identified.

14.8.3.1 Construction Phase

According to the IAQM guidance (2024) should the construction phase of the proposed development coincide with the construction phase of any other developments within 500m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. Developments that potentially could overlap during the construction phase (within 500m) are included in Appendix 1-1 Cumulative Impacts—Projects and Plans. A review of relevant, large scale, recent (within the previous 5 years) planning applications within 500m of the site was conducted in order to identify sites with the potential for cumulative impacts. There were 9 no. sites identified within 500m of the proposed development which may have coinciding construction phases, albeit minor in scope, with that of the proposed development. These include:

- Lisa and Sean Crudden (Ref: LCC 231);
- Tara and Declan Boyle (Ref: LCC 22614);
- Andrew Bothwell (Ref: LCC 211331);
- Brendan Rafferty (Ref: LCC 211223);
- Valerie Halpenny (Ref: LCC 19202);
- Damien Wynne and Martina McNally (Ref: LCC 2360256);
- Cooley Peninsula Men's Shed (Ref: LCC 23125);
- Irish Coast Guard (Ref: LCC 22274); and

RECEIVED: 18/10/2024

- Hanlon Transport Ltd (Ref: LCC 20362).

All other planning applications detailed in Appendix 1-1 , are greater than 500m from the proposed development and have no significant potential for cumulative construction phase impacts.

The proposed development has been assessed as having a medium risk of dust soiling impacts during the construction phase. A number of mitigation measures have been proposed and outlined in Section 14.9.1 to ensure significant dust impacts do not occur. Provided these measures are in place for the duration of the construction phase significant cumulative construction dust impacts are not predicted. Cumulative effects on air quality are predicted to be ***direct, short-term, negative*** and ***not significant*** which is overall ***not significant*** in EIA terms.

14.8.3.2 Operational Phase

The traffic data supplied for the operational phase assessment included data for cumulative development within the area. The traffic was reviewed and a detailed air quality assessment of vehicle exhaust emissions was scoped out due to the low-level changes in traffic as a result of the proposed development (see Section 14.4.4). The effect on air quality during the operational phase of the proposed development, including the cumulative effect, will be ***direct, long-term, negative*** and ***imperceptible,*** which is overall ***not significant*** in EIA terms***.***

14.9 Mitigation

14.9.1 Construction Phase Mitigation

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts in the construction phase as a result of earthworks, demolitions, construction and trackout activities (see Section 14.8.1). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

RECEIVED: 18/10/2024

Site Management

- A feedback register will be kept on site detailing all correspondence received in connection with dust or air quality concerns, together with details of any actions carried out.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Avoid site runoff of water or mud through the use of bunds.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, back bucket, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Traffic Management Plan to manage the sustainable delivery of goods and materials.
- Implement a Traffic Management Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- No bonfires or burning of waste materials.

Measure Specific to Demolition

- Prior to demolition blocks should be soft striped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).

- During the demolition process, water suppression should be used, preferably with a hand-held spray. Only the use of cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used.
- Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.

RECEIVED: 18/10/2024

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are identified and put in place where possible.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- A site speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure truck bodies entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.

RECEIVED 18/10/2024

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust and record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for construction dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

14.9.2 Operational Phase Mitigation

There is no mitigation required for the operational phase of the development as effects on air quality are predicted to be ***direct, long-term, negative*** and ***imperceptible***.

14.10 Residual Impact Assessment

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. It will not always be possible or practical to mitigate all adverse effects.

14.10.1 Construction Phase

A series of mitigation measures have been prepared to minimise dust emissions during construction activities, including demolition. Provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality effects during the construction phase are ***direct, short-term, negative,*** and ***not significant***.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see Table 14.1). Therefore, the predicted residual, dust-related, human health effect of the construction phase of the proposed development is ***direct, short-term, negative,*** and ***not significant***.

14.10.2 Operational Phase

The operational stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII scoping assessment criteria in Section 14.4.4. Therefore, the operational phase effect on air quality and human health as a result of increased traffic is ***direct, long-term, negative*** and ***imperceptible,*** which is overall ***not significant*** in EIA terms.

14.10.3 Summary of Post-mitigation Effects

RECEIVED: 18/10/2024

The following table summarises the identified likely residual significant effects during the construction and demolition phase of the proposed development post mitigation.

Table 14.14 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of construction dust from demolition, earthworks, construction and trackout in terms of dust soiling, human health and ecosystems	Negative	Not significant	Study area as per Section 14.6.4	Likely	Short-term	Direct
Impact of construction phase traffic on air quality	Negative	Imperceptible	Detailed assessment and study area scoped out as per Section 14.4.3	Likely	Short-term	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 14.15 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of operational phase traffic on air quality	Negative	Imperceptible	Detailed assessment and study area scoped out as per Section 14.4.4	Likely	Long-term	Direct

14.11 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to air quality associated with the proposed development due to the nature and scale of the development. As per Chapter 02 Development Description, Section 2.2.2.9, a fuel store with a capacity of ≥200,000 litres will be provided in a dedicated area that will be maintained and managed by Greenore Port. Appropriate mitigation measures have been developed to avoid accidental impact.

14.12 Worst Case Scenario

RECEIVED: 18/10/2024

Worst case estimates have been used as part of this assessment. As a result, Section 14.10 details the worst case impact for the proposed development.

14.13 Interactions

14.13.1 Population and Human Health

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between Population and Human Health (Chapter 4) and Air Quality (Chapter 14). An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted effect is ***direct, short-term***, ***negative*** and ***not significant*** with respect to population and human health during construction and ***direct, long-term***, ***negative*** and ***imperceptible*** during operation phase.

14.13.2 Lands, Soils and Geology

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality (Chapter 14) and Land and Soils (Chapter 9) in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between Air Quality and Land and Soils. In this assessment, the effect of the interactions between land and soils and air quality are considered to be ***long-term, imperceptible*** and ***neutral.***

14.13.3 Biodiversity

As set out in Land & Soils (Chapter 9) and Water and Hydrology (Chapter 10), dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example. The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity. In this assessment, the effect of the interactions between biodiversity and air quality are considered to be ***long-term, imperceptible*** and ***neutral.***

14.13.4 Traffic and Transportation

Interactions between Air Quality and Traffic (Chapter 6 Material Assets –Traffic and Transport) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the effect of the interactions between traffic and air quality are considered to be ***direct, long-term***, ***negative*** and ***imperceptible.***

RECEIVED: 18/10/2024

14.13.5 Climate

Air Quality and Climate (Chapter 15) have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate chapter (Chapter 15). There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked. In this assessment, the effect of the interactions between climate and air quality are considered to be ***long-term, imperceptible*** and ***neutral.***

14.14 Monitoring

14.14.1 Construction Phase

Monitoring of construction dust deposition (including dust from demolitions) at nearby sensitive receptors will be carried out to ensure mitigation measures are working satisfactorily. This will be done using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119..

The following monitoring measures are required-

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust and record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
- Monitoring of construction dust deposition (including dust from demolitions) at nearby sensitive receptors will be carried out to ensure mitigation measures are working satisfactorily. This will be done using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m^2/day during the minimum monitoring period of between 28 - 32 days. If construction dust deposition rates exceed 350 mg/m^2/day, site procedures will be reviewed and improved to achieve a level below 350 mg/m^2/day.
- Increase the frequency of site inspections by the person accountable construction dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions

14.14.2 Operational Phase

RECEIVED: 18/10/2024

There is no monitoring recommended for the operational phase of the development as effects on air quality are predicted to be imperceptible.

14.15 Summary of Mitigation and Monitoring

The following table summarises the Construction Phase mitigation and monitoring measures.

Table 14.16 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Impact of construction dust from demolition, earthworks, construction and trackout in terms of dust soiling, human health and ecosystems	Dust control measures as per IAQM Guidance (IAQM, 2024) and Section 14.9.1	Monitoring of construction dust deposition as per Section 14.14.1

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 14.17 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
No mitigation or monitoring required for the operational phase of the development as impacts to air quality are predicted to be imperceptible.		

14.16 Conclusion

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to air quality. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is ***not significant***.

14.17 References and Sources

BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites

Department of the Environment, Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Environmental Protection Agency (2023) Air Quality in Ireland 2022 Report

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

Government of Ireland (2023) Clean Air Strategy for Ireland

Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction Version 2.2

Met Éireann (2023) Met Éireann website: https://www.met.ie/

The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

CHAPTER 15
CLIMATE

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Figures

Table of Tables

15 Climate

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

15.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development at Greenore Port, Greenore, Co. Louth. A full description of the proposed development is set out in Chapter 2 'Development Description' of this EIAR.

15.2 Expertise & Qualifications

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She has been specialising in the area of air quality, climate and sustainability for 1 year and has prepared air quality and climate assessments for inclusion within EIARs for residential and commercial developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), The Paddocks (Planning Application Ref: 2360349), and Dublin Airport Authority.

This chapter was also prepared and reviewed Dr. Jovanna Arndt, a Senior Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She has been specialising in the area of air quality and climate over 7 years and has prepared air quality and climate assessments for inclusion within EIARs for residential developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), commercial and industrial developments by Dublin Airport Authority, Zoetis, Ipsen, Merck Millipore, Greener Ideas Limited and Abbvie, as well as renewable energy developments such as Codling Wind Park and the Cúil Na Móna Anaerobic Digestion Facility. She also specialises in assessing air quality impacts using air dispersion modelling of transportation schemes such as BusConnects Dublin, major Highways England Road schemes and major rail infrastructure in the form of High Speed 2 (HS2 in the UK). She has prepared air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Microsoft, Greener Ideas Limited, Merck Millipore, Lilly Limerick, Chemifloc, Takeda, Kingspan and Kilshane Energy. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils and assessed the air quality impacts of potential Clean Air Zones in the UK.

15.3 Proposed Development

A full description of the proposed development is set out in Chapter 2 of this EIAR. The following is a summary of the proposed works.

Greenore Port Unlimited Company intend to apply for a 10-year permission for development at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

RECEIVED: 18/10/2024

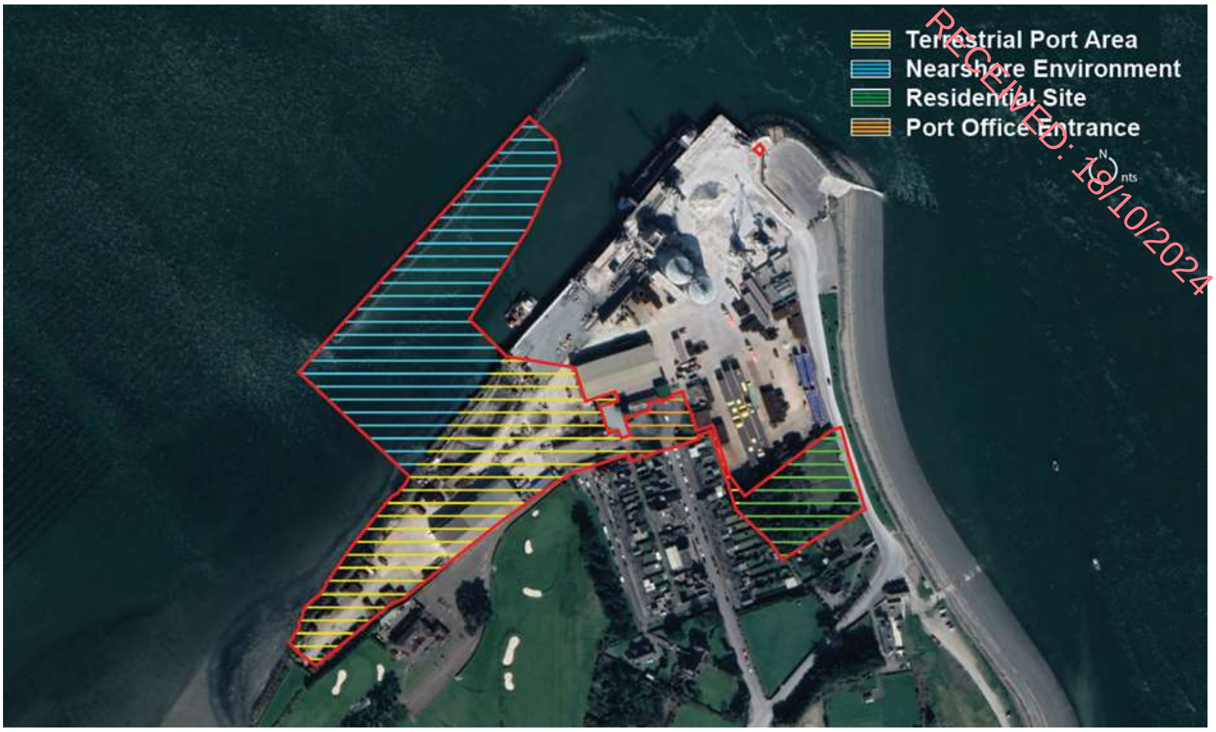
The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. In general, it will comprise of terrestrial (landside) and nearshore works, with three standalone buildings incorporating office, warehouse and ancillary space landside and a pontoon to accommodate Crew Transfer Vessels (CTVs) marine side. To facilitate the proposed development, dredging within the nearshore and the demolition of existing port buildings and a vacant residential property is required.

The Operations and Maintenance Facilities (OMF) will provide twenty-four-seven, year-round support, to three individual offshore renewable energy (ORE) projects that will be owned and operated by entities separate from the applicant. These ORE projects will consist of offshore windfarms on the East Coast of Ireland.

The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

i. 'Terrestrial Port Area', (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing 'engine room', and a communications mast.
ii. 'Nearshore Environment' (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
iii. 'Residential Site' (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
iv. 'Port Office Entrance' (c. 0.18ha) encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

Figure 15.1 shows a general location plan of the plots identified.



RECEIVED: 18/10/2024

Figure 15.1 General Location Plan of the Scheme

15.3.1 Aspects Relevant to this Assessment

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO_2 and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO_2. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude; and
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

15.4 Legislation, Policy and Guidance

RECEIVED: 18/10/2024

15.4.1 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015).

This is referred to in the Act as the 'national transition objective'. The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b) is to provide for the approval of plans "*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050*". The 2021 Climate Act will also "*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy*". The 2021 Climate Act defines the carbon budget as "*the total amount of greenhouse gas emissions that are permitted during the budget period*".

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states 'A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 15.1. The carbon budget can be revised where new obligations are imposed under the law of the

European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in the 2024 Climate Action Plan (DECC, 2023a) and are shown in

RECEIVED: 18/10/2024

Table 15.2. Industry have a 35% reduction requirement and a 2030 emission ceiling of 4 Mt CO_2e.

RECEIVED: 18/10/2024

Table 15.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

RECEIVED: 18/10/2024

Table 15.2 Sectoral Emission Ceilings 2030 (DECC, 2023a)

Sector	Baseline ($MtCO_2e$)	Carbon Budgets ($MtCO_2e$)		2030 Emissions ($MtCO_2e$)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

15.4.2 Policy

In December 2022, CAP23 was published (Government of Ireland, 2022). This is the first CAP since the publication of the carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP23 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP23 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. The IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies. to ensure economic growth can continue alongside a reduction in emissions,

In April 2023 the Government published a draft Long-term Strategy on Greenhouse Gas Emissions Reductions (DECC, 2023b). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan. The strategy will be updated on the basis of a second round of public consultation throughout 2023 with an updated strategy published after this is complete.

The Louth County Council *Climate Change Adaptation Strategy 2019-2024* (LCC, 2023) outlines a number of goals and plans to prepare for and adapt to climate change. There are six key action areas within the plan: Local Adaptation Governance and Business Operations, Infrastructure and Built Environment, Land Use and Development, Drainage and Flood Management, Natural Resources and Cultural Infrastructure and Community Health and Wellbeing. Some of the measures promoted within the Action Plan under the key areas involve building retrofits, energy master-planning, development of segregated cycle routes, development of flood resilient designs, promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Louth County Council area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Climate Adaptation Strategy and incorporate climate friendly designs and measures where possible.

RECEIVED: 18/10/2024

15.4.3 Guidance

The assessment has made reference to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022a);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment (the EIA Directive);
- European Union (EU) Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law');
- 2030 Climate and Energy Policy Framework (European Commission 2014);
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) (Government of Ireland, 2021b);
- Climate Action Plan 2023 (hereafter referred to as the CAP 2023) (Government of Ireland, 2022);
- National Adaptation Framework (hereafter referred to as the NAF) (DECC, 2018);
- Louth County Council (LCC) Climate Change Adaptation Strategy 2019-2024 (LCC, 2023);
- Louth County Council (2021) Louth County Council Development Plan 2021-2027;
- Transport Infrastructure Ireland (TII) -ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2022b);
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019);

- Institute of Environmental Management and Assessment (IEMA) Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition (IEMA, 2022);
- IEMA EIA Guide to: Climate Change Resilience and Adaptation (IEMA, 2020a); and
- IEMA Greenhouse Gas Management Hierarchy (IEMA, 2020b).

RECEIVED: 18/10/2024

15.5 Methodology

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

15.5.1 Greenhouse Gas Assessment

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 15.7.1).

15.5.1.1 Construction Phase

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage embodied carbon using the TII Online Carbon Tool (TII, 2022b). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2022b) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction/maintenance phase. The outputs are expressed in terms of tCO2e (tonnes of carbon dioxide equivalent). Given the nature of the proposed development use of the TII carbon tool is not ideal. However, the approach can be applied to other types of developments to provide a high level assessment prior to detailed design stage.

The TII Carbon Tool (TII, 2022b) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013). The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction/maintenance phase. The outputs are expressed in terms of tCO_2e (tonnes of carbon dioxide equivalent).

Information on the material quantities, site activities, land clearance, waste product and construction traffic were provided by McCarthy Browne for input into the carbon tool. This information was used to determine an estimate of the GHG emissions associated with the development. Detailed information regarding the proposed construction materials was not available at the time of this assessment and will be specified at the detailed design stage. Best estimates have been used in this assessment to provide an estimate of the GHGs associated with the proposed development.

RECEIVED: 18/10/2024

Embodied carbon is carbon dioxide emitted during the manufacture, transport and construction of building materials, together with site activities. As part of the proposed development, construction stage embodied GHG emissions have been calculated under the following headings within the TII Carbon Tool (TII, 2022b) where applicable:

- Pre-Construction;
- Embodied Carbon of Materials;
- Construction Activities;
- Construction Waste; and
- Maintenance.

Pre-construction includes land-use changes and site clearance activities which includes demolition works. There are some minor site clearance works associated with the proposed extension to the existing facility. However, these are minor due to the fact that the proposed development is an extension to an existing facility and the majority of the land is already suitably prepared for construction to commence. There are no significant land-use changes associated with this element of the development. The land-use change options within the carbon tool include changes from agricultural land, forest or peat. There will be some minor land-use change for the temporary contractor's car park during the construction phase. This land is currently grassland, once the construction works are complete the contractor's car park will be established into a permanent staff car park.

Transport GHG emissions associated with delivery of materials to site and removal of waste materials off site were included in the calculator. In addition, construction worker travel to site was also included within the calculations. The exact location of all facilities to be used is not known at this stage, therefore an approximate radius from the site was used for the purposes of this assessment. Where specific locations were known the exact transport distance was included within the calculations.

15.5.1.2 Operational Phase

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The UK Highways Agency DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are no road links that meet or exceed the criteria for further assessment during the operational phase of the proposed development. As a result, a detailed assessment of traffic related carbon dioxide (CO_2) emissions was not conducted.

RECEIVED: 18/10/2024

15.5.1.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. The approach is based on comparing the ‘Do Something’ scenario and the net project GHG emissions (i.e. Do Something – Do Minimum) to the relevant carbon budgets (DECC, 2023a). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO_2 project GHG emissions from the proposed development. The industrial sector emitted approximately 7 $MtCO_2e$ in 2018 and has a ceiling of 4 Mt CO_2e in 2030 which is a 35% reduction over this period (see

Table 15.2).

RECEIVED: 18/10/2024

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should, therefore, be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

Significance is determined using the criteria outlined in Table 15.3 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 15.3 GHGA Significance Criteria

Effects	Significance Level Description	Description
Significant Adverse	Major Adverse	• The project's GHG impacts are not mitigated; • The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and • No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate Adverse	• The project's GHG impacts are partially mitigated; • The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and • Falls short of full contribution to Ireland's trajectory towards net zero.

RECEIVED: 18/10/2024

Effects	Significance Level Description	Description
Not Significant	Minor Adverse	• The project's GHG impacts are mitigated through 'good practice' measures; • The project has complied with existing and emerging policy requirements; and • Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	• The project's GHG impacts are mitigated beyond design standards; • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero.
	Beneficial	• The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration; • The project has gone well beyond existing and emerging policy requirements; and • Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

15.5.2 Climate Change Risk Assessment

The assessment involves an analysis of the sensitivity and exposure of the proposed development to climate hazards which together provide a measure of vulnerability of the proposed development to hazards as a results of climate change.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 15.7, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provides the below list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development by development basis.

RECEIVED: 18/10/2024

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The asset sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below. Asset sensitivity takes into account design mitigation measures.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the proposed development location. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in Table 15.4.

15.5.2.1 Significance Criteria for CCRA

The assessment of vulnerability to climate change combines the outcomes of the sensitivity and exposure analysis with the aim of identifying the key vulnerabilities and potentially significant climate hazards which could impact the proposed development. The vulnerability assessment takes any proposed mitigation into account.

Vulnerability = Sensitivity x Exposure

Table 15.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. A risk that is low or medium is classed as non-significant, while a high or extreme risk is classed as a significant risk.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can, therefore, considered to be not significant. The impact from climate change on the proposed development can therefore considered to be not significant.

Where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022a) if a detailed CCRA is required.

RECEIVED: 18/10/2024

Table 15.4 Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 – High	6 – High	3 – Medium
	Medium (2)	6 – High	4 – Medium	2 – Low
	Low (1)	3 – Medium	2 – Low	1 – Low

The screening CCRA, discussed in Section 15.9.2.2, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 15.10.2.

15.6 Difficulties Encountered

There were no difficulties encountered when compiling this assessment.

15.7 Baseline Environment

PE-ENV-01104 (TII, 2022a) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Climate impacts are assessed at a national level and in relation to national targets and sectoral emission ceilings. The study area for climate is the Republic of Ireland and the baseline is determined in relation to this study area.

15.7.1 Greenhouse Gas Emissions

Greenhouse Gas Emissions Data published in July 2023 (EPA, 2023) predicts that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.72 Mt CO_2e. When the available flexibilities are taken into account, the limit is exceeded by 1 MtCO_2e. The sectoral breakdown of 2022 GHG emissions is shown in Table 15.5. The sector with the highest emissions in 2022 was agriculture at 38.4% of the total, followed by transport at 19.1%. For 2022 total national emissions (excluding LULUCF) were estimated to be 60.76 Mt CO_2e as shown in Table 15.5 (EPA, 2023). This represents a 1.9% increase compared to the 2021 figures.

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022a) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

RECEIVED: 18/10/2024

The future baseline will be determined by Ireland meeting its targets set out in the CAP23, and future CAPs, alongside binding 2030 EU targets. The European Union (EU) enacted 'Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013' (hereafter referred to as the Regulation) (European Union, 2018) to meet the commitments under the Paris Agreement. The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters Including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

Table 15.5 Total National GHG Emissions in 2022 Note 1

RECEIVED: 18/10/2024

Sector	2021 Emissions ($Mt\ CO_2e$)	2022 Emissions ($Mt\ CO_2e$)	% Total 2022 (including LULUCF)	% Change from 2021 to 2022
Agriculture	23.626	23.337	34%	-2.1
Transport	10.978	11.634	17%	6.0
Energy Industries	10.262	10.076	15%	-1.8
Residential	6.992	6.105	9%	-12.7
Manufacturing Combustion	4.614	4.288	6%	-7.1
Industrial Processes	2.475	2.289	3%	-7.5
F-Gases	0.745	0.741	1%	-0.5
Commercial Services	0.765	0.767	1%	0.2
Public Services	0.672	0.659	1%	-1.9
Waste Note 2	0.726	0.867	1%	4.9
LULUFC	7.338	7.305	11%	-0.5
National Total excluding LULUFC	61.955	60.764	89%	-1.9
National Total including LULUFC	62.293	68.069	100%	-1.8

Note 1 Reproduced from Latest emissions data on the EPA website (EPA 2023)

Note 2 Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste

15.7.2 Climate Change Vulnerability

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

RECEIVED: 18/10/2024

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's *State of the Irish Environment Report (Chapter 2: Climate Change)* (EPA, 2020c) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25 per cent by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020c) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020c). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020c).

TII's Guidance document PE-ENV-01104 (TII, 2022a) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in '*Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach'* (EPA 2020d). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060). Mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There will be a substantial decrease of approximately 50% which is projected for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021b) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

RECEIVED: 18/10/2024

In terms of sea level rise, the Intergovernmental Panel on Climate Change (IPCC) *Special Report on the Ocean and Cryosphere in a Changing Climate* (IPCC, 2019) projects a worst case scenario of global mean sea level rise of 1.1 m by 2100 under RCP 8.5. Recent research in Ireland projects mean sea level rise of 0.45 m under RCP4.5 and 0.81 m under RCP8.5 (Paranunzio et. al, 2022).

15.8 The 'Do Nothing' Scenario

Under the Do Nothing Scenario no construction works associated with the overall development will take place and the identified impacts on climate will not occur. Impacts from increased traffic volumes from the proposed development will also not occur. The climate baseline will continue to develop in line with the identified trends (see Section 9.3). This scenario is considered neutral in relation to climate. In the absence of the proposed development the following Greenore Port permitted developments are planned for construction and operation:

- Extension and modification of existing Warehouse, LCC Planning Ref 20268, ABP Ref 307862; and
- New Warehouse, LCC Planning Ref Planning ref 20543, ABP Ref 310184.

15.9 Potential Significant Effects

15.9.1 Greenhouse Gas Assessment

There is the potential for greenhouse gas emissions to atmosphere during the construction and operational phases of the proposed development. As per the TII guidance (2022a), the significance of the effect of GHG emissions on climate is assessed for the total GHG emissions across all proposed development stages (Section 15.9.1.3).

15.9.1.1 Construction Phase

The total GHG emissions arising from the construction of the proposed development have been considered and are summarised in Table 15.6. The embodied carbon within the construction materials has been calculated. This calculation was based on the TII Online Carbon Tool (TII, 2022b), and the quantities provided by the design team. Complete detailed information regarding the proposed construction materials and exact methodologies was not available at the time of this assessment and will be specified at the detailed design stage. Best estimates have been used in this assessment to provide an estimate of the GHGs associated with the proposed development.

RECEIVED: 18/10/2024

The predicted GHG emissions associated with the proposed development are presented in Table 15.6. The proposed development is estimated to result in total construction phase GHG emissions of 3,966 tonnes CO_2e for the material use and construction processes.

The assessment indicates that the key sources of GHG emissions are associated with construction phase is use of diesel by construction plant, accounting for 58% of emissions, followed by the embodied carbon from the materials used, accounting for 21% of emissions.

Table 15.6 Greenhouse Gas Assessment

Source	Elements Considered	GHG Emissions (tCO_2e)	% Of Total	Relevant Sector	Emissions Annualised Over Lifespan as % of Sector Budget
Embodied Carbon / Materials	Aggregates, concrete, road pavement materials (e.g. asphalt), steel	839	21%	Industry	0.001%
Material Transport	HGV (50 km trip distance assumed)	397	10%	Transport	0.0003%
Clearance and demolition	Site preparation and demolition	1.2	0.03%	Industry	0.000001%
Excavation	Rock, topsoil and other excavation	64	2%	Industry	0.0001%
Plant Use	Energy use (diesel) by plant during construction	2,305	58%	Electricity	0.003%
Construction Worker Travel to Site	Car trips	68	2%	Transport	0.00005%
Construction Waste Disposal	Aggregate and soil, concrete, brick, tile and ceramics, mixed construction and demolition, wood, mixed metals	48	1%	Waste	0.0002%
Construction Waste Transport	HGV (50 km trip distance assumed)	245	6%	Transport	0.0002%
Total		**3,966 tonnes CO_2e**			

The predicted GHG emissions (as shown in Table 15.6) can be averaged over the full construction phase and the lifespan of the proposed development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

In Table 15.7, GHG emissions have been compared against the carbon budget for the electricity, transport, industry and waste sectors in 2030 (DECC, 2023a), against Ireland's total GHG emissions in 2022 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (33 Mt CO_2eq) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total construction phase GHG emissions, when annualised over the 50-year proposed development lifespan, are equivalent to 0.0003% of Ireland's total GHG emissions in 2022 and

0.0005% of Ireland's non-ETS 2030 emissions target. The estimated GHG emissions associated with energy use during the construction phase are equivalent to 0.003% of the 2030 Electricity budget, while the total GHG emissions associated with transport-related activities are 0.0005% of the 2030 Transport budget, construction waste GHG emissions are 0.0002% of the Waste budget and industry-related activities are 0.001% of the 2030 Industry budget (DECC, 2023a).

RECEIVED: 18/10/2024

Table 15.7 Estimated GHG emissions relative to sectoral budgets and GHG baseline

Target/Sectoral Budget	(tCO_2e)	Annualised Development GHG Emissions	% of Relevant Target/Budget
Ireland's 2022 Total GHG Emissions (existing baseline)	60,746,000	Total GHG Emissions	0.0003%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.0005%
2030 Sectoral Budget (Industry Sector)	4,000,000	Total Industry Emissions	0.001%
2030 Sectoral Budget (Transport Sector)	6,000,000	Total Transport Emissions	0.0005%
2030 Sectoral Budget (Electricity Sector)	3,000,000	Total Electricity Emissions	0.003%
2030 Sectoral Budget (Waste Sector)	1,000,000	Total Waste Emissions	0.0002%

15.9.1.2 Operational Phase

There is the potential for increased traffic volumes to impact climate during the operational phase. However, traffic related impacts have been screened out of this assessment as per the criteria in Section **Error! Reference source not found.**. There are no additional sources of GHG emissions due to t he operational phase of the proposed development.

15.9.1.3 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 15.10 has therefore been taken into account when determining the significance of the proposed development's GHG emissions. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible, the development will comply with the do-minimum standards set through regulation (NZEB and Part L 2021). Additionally, the proposed development is enabling and supporting infrastructure for offshore wind farms, and therefore renewable energy production.

According to the TII significance criteria described in Section 15.5.1.3 and Table 15.3, the significance of the GHG emissions during the construction and operational phase is ***minor adverse.***

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase which is ***direct, long-term, negative*** and ***slight***, which is overall not significant.

RECEIVED 18/10/2024

15.9.2 Climate Change Risk Assessment

15.9.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 15.5.2.1. However, consideration has been given to the proposed development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 15.10:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

15.9.2.2 Operational Phase

In order to determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning, hail, landslides and fog. Wildfire and landslides were not considered relevant to the proposed development due to the project location and have been screened out of the assessment.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. Table 15.8 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 15.4. The results of the vulnerability assessment are detailed in Table 15.8 below.

Table 15.8 Climate Change Vulnerability Assessment

RECEIVED: 18/10/2024

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (coastal, pluvial, fluvial)	1 (Low)	1 (Low)	1 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Drought	1 (Low)	2 (Medium)	2 (Low)
Extreme Wind	1 (Low)	2 (Medium)	2 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The proposed development has a worst-case low vulnerability to the identified climate hazards. The Site-Specific Flood Risk Assessment (SSFRA) completed by McCarthy Browne indicates that the site is predominantly contained within Flood Zone C. The OMF facility buildings, offices and warehouse fit into Flood Zone B category and so will have a defence level designed for coastal flooding for a 1 in 200-year event. The external facility of operational yards and pontoons and quay space can be classified at Flood Zone A. The eastern border and south-western corner contain areas in Flood Zone B and Flood Zone A, as shown in Figure 15.2.

The main flooding risk for the proposed development is coastal/tidal flooding due to its proximity to Carlingford Lough. Coastal flooding results from high sea levels or waves causing overflow onto land. However, the development is unlikely to be affected by coastal flooding. Fluvial flooding, stemming from the southwest, is a potential risk but is also deemed unlikely. Poor maintenance of drainage systems can lead to pluvial flooding, but no past incidents were recorded, and maintenance is assumed under GPC maintenance programme. Groundwater flooding, caused by rising water tables, is not a concern for the development.

Adequate attenuation and drainage in accordance with relevant standards have been incorporated into the design of the development which allows for additional rainfall as a result of climate change thereby reducing the risk for the site. Finished Floor Levels (FFL) will be set above the road levels and surrounding garden levels to ensure any seepage of groundwater onto the development does not flood into the properties. The lowest FFL is set at 3.650m AOD. The risk of flooding is mitigated by providing SUDS for the development which can store water for the 1-in-100-year storm event plus a 30% allowance for climate change.

In summary, based on the findings of the SSFRA and the drainage incorporated into the design of the proposed development, the vulnerability of the proposed development to flooding is considered low.

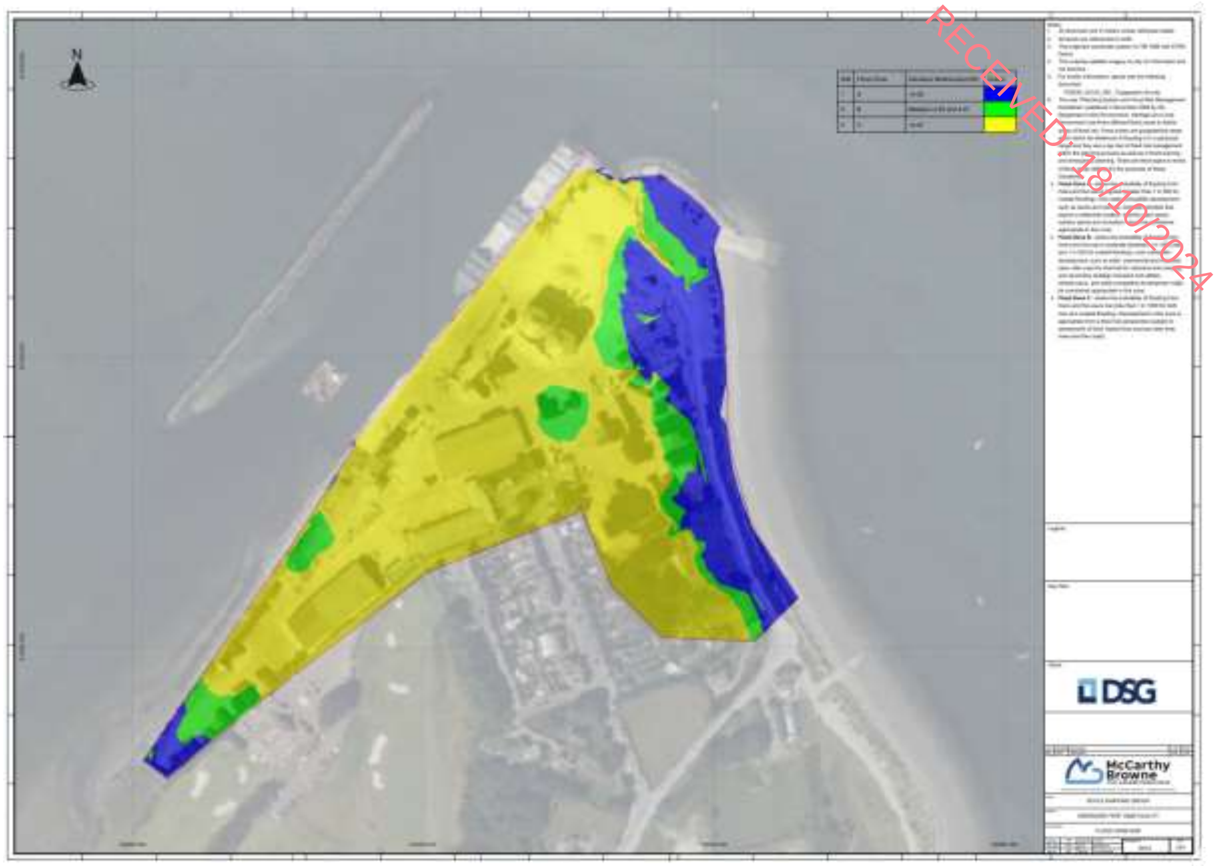


Figure 15.2 Flood Map Delineating Flood Zone A, B and C

In relation to extreme temperatures, both extreme heat and extreme cold, these have the potential to impact the building materials and some related infrastructure. However, the building materials selected at the detailed design stage will be of high quality and durability. Therefore, extreme temperatures are not considered a significant risk.

15.9.2.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change during the construction phase is ***direct, short-term, negative*** and ***imperceptible*** and during the operational phase is ***direct, long-term, negative*** and ***imperceptible***.

15.9.3 Cumulative Effects

A list of planning applications in the vicinity of the proposed development is given in Appendix 1-1.

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022) states that *"for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable."*

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

RECEIVED: 18/10/2024

The additional projects included in the updated List of Cumulative Projects appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea were considered and no additional cumulative effects arising from these projects were identified.

15.10 Mitigation

15.10.1 Incorporated Design Mitigation

Specific measures have been incorporated into the design of the proposed development to reduce GHG emissions during the construction phase:

- Some excavated material, bricks, tiles and ceramics, metals and timber and will be diverted from waste processing by recycling or disposal in landfill, and will instead be reused on-site. This will reduce the associated CO_2 by approximately 32.6 tonnes.

A number of measures have been incorporated into the design of the development to mitigate the impact of GHG emissions during the operational phase. These are discussed in more detail in Section 15.10.3.

A number of measures have been incorporated into the design of the development to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see Section **Error! Reference source not found.**).

15.10.2 Construction Phase Mitigation

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Waste materials will be re-used on site where possible and where re-use is not possible on-site they will be sent off-site for recycling, re-use or recovery.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.
- Materials with a reduced environmental impact will be incorporated into the construction design through re-use of materials or incorporation of recycled materials in place of conventional building materials. The following materials will be considered for the construction phase:

RECEIVED: 18/10/2024

- Ground Granulated Blast Furnace Slag (GGBS) & Pulverised Fuel Ash - used where feasible as replacements for Portland cement to increase sustainability and carbon footprint of civil and structural works; and
- Steel - the carbon emissions emitted during the production of virgin steel can be higher than some other structural materials on a tonne by tonne basis, and therefore, recycled steel will be used where possible. Additionally, where possible the steel reinforcement used will be supplied directly from stocks within the port or backloads from the reinforcement providers for the port development, thereby reducing CO_2 emissions associated with its transportation.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements.

The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

15.10.3 Operational Phase Mitigation

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Climate Action and Energy Statement prepared by Belton Consulting Engineers and submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- Achieve air permeability rate of 3 $m^3/m^2/hr$ @ 50Pa;
- Ensure every effort is made to reduce the risk pf thermal bridging by upgrading the façade to ensure continuity of insulation. This is to limit local thermal bridging as much as practically possible where an existing construction element to be retained shows risk of thermal bridging;
- Building fabric U-Value calculations will be completed to at least meet the requirements of TGD Part L in relation to thermal performance;
- Central ventilation systems with heat recovery will be used to retain as much heat as possible. Amenities will be designed for mechanical ventilation with occupancy sensing to minimize the time for overrun;
- The space heating and domestic hot water system will likely be provided by a central heat pumps system with optional back up/tie-in to future district heating system. The final system will be selected based on operating cost and efficiency mandated by TGD Part L. it is likely that VRF Air condition systems will be utilised to meet the space heating demand and NZEB requirements;
- The following NZEB technologies will be considered for this development:

RECEIVED: 18/10/2024

- Centralized air to water heat pumps
- Photovoltaic system for on-site electricity use
- District Heating
- Combined heat and power (CHP) for thermal and electricity generation

The electrical design will require that all lighting be LED with occupancy sensing where required.

These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals, relevant policies and objectives of the Louth County *Council Development Plan 2021-2027* (LCC, 2021) and *Climate Change Adaptation Strategy* (LCC, 2023), including climate mitigation measures. Further details on some of the incorporated design measures can be found in the Climate Action and Energy Statement prepared by Belton Consulting Engineers in respect of this planning application.

15.11 Residual Impact Assessment

15.11.1 Greenhouse Gas Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible, the development will comply with the do-minimum standards set through regulation (NZEB and Part L 2021). Additionally, the proposed development is enabling and supporting infrastructure for offshore wind farms, and therefore renewable energy production.

As per the assessment criteria in Table 15.3 the impact of the proposed development in relation to GHG emissions is considered minor adverse. In accordance with the EPA guidelines (EPA, 2022), this equates to a significance of effect of GHG emissions during the construction and operational phase which is ***direct, long-term, negative*** and ***slight***, which is overall ***not significant***.

15.11.2 Climate Change Risk Assessment

In relation to climate change vulnerability, with mitigation in place, it has been assessed that the effect on the proposed development as a result of climate change during the construction phase is ***direct, short-term, negative*** and ***imperceptible*** and during the operational phase is ***direct, long-term, negative*** and ***imperceptible***

15.11.3 Summary of Post-mitigation Effects

The following table summarises the identified likely residual significant effects during the construction and demolition phase and operational phase of the proposed development post mitigation.

RECEIVED: 18/10/2024

Table 15.9 Summary of Climate Effects Post Mitigation

RECEIVED: 18/10/2024

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Impact of proposed development greenhouse gas emissions on climate	Negative	Not significant	Ireland's climate, specifically Ireland's CAP24 targets	Likely	Long-term	Direct
Impact of climate change hazards on proposed development during construction phase	Negative	Imperceptible	Proposed development	Likely	Short-term	Direct
Impact of climate change hazards on proposed development during operational phase	Negative	Imperceptible	Proposed development	Likely	Long-term	Direct

15.12 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to climate associated with the proposed development due to the nature and scale of the development. As per Chapter 02 Development Description, Section 2.2.2.9, a fuel store with a capacity of ≥200,000 litres will be provided in a dedicated area that will be maintained and managed by Greenore Port. Appropriate mitigation measures have been developed to avoid accidental impact.

15.13 Worst Case Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 15.11 details the worst case impact for the proposed development.

15.14 Interactions

15.14.1.1Hydrology

Climate has the potential to interact with a number of other environmental attributes. The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas. The overall impact of this interaction is considered ***negative*** and ***not significant*** in EIA terms.

RECEIVED: 18/10/2024

15.14.1.2Waste Management

Interactions across many areas can be used to minimise the GHG emissions from both the construction and operational and operational phases. For instances, waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration. The overall impact of this interaction is considered ***negative*** and ***slight*** in EIA terms.

15.14.1.3Building Design

The risk to building design in terms of material vulnerability to climate change, specifically extreme heat and cold, has been considered. These aspects of climate interact with drainage design, operational power, landscaping and building design. The overall impact of this interaction is considered ***negative*** and ***not significant*** in EIA terms.

15.15 Monitoring

No monitoring is required for the development during the construction or operational phase.

15.16 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 15.10 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Mitigation measures as per Sections 15.10.1 and 15.10.2.	No monitoring is required for the development during the construction phase.
Impact of climate change hazards on proposed development.	Mitigation measures, as per Section 15.10.2.	No monitoring is required for the development during the construction phase.

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 15.11 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Impact of proposed development greenhouse gas emissions on climate.	Mitigation measures as per Sections 15.10.1 and 15.10.2.	No monitoring is required for the development during the operational phase.
Impact of climate change hazards on proposed development.	Mitigation measures, primarily relating to drainage, as per Section 15.10.3.	No monitoring is required for the development during the operational phase.

15.17 Conclusion

RECEIVED: 18/10/2024

This chapter has reviewed and analysed the potential and the predicted impacts of the proposed development with regards to climate. These impacts have been considered for both the construction and operational phases of the proposed development. The cumulative impact of the proposed development and surrounding developments have also been considered.

Provided all mitigation measures as set out in this chapter, the overall predicted effect of the proposed development is not significant in relation to GHG emissions and climate change risk.

15.18 References and Sources

Department of Housing, Planning & Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment

Department of Environment, Climate and Communications (DECC) (2023a) Climate Action Plan (CAP) 2024

Department of Environment, Climate and Communications (DECC) (2023b) Long-term Strategy on Greenhouse Gas Emissions Reductions (draft)

Environmental Protection Agency (EPA) (2020a) State of the Irish Environment Report (Chapter 2: Climate Change)

Environmental Protection Agency (EPA) (2020b) Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach.

Environmental Protection Agency (EPA) (2021) Critical Infrastructure Vulnerability to Climate Change Report no. 369

Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports

Environmental Protection Agency (EPA) (2023) Ireland's Final Greenhouse Gas Emissions 1990-2021

European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment

European Commission (2014) 2030 Climate and Energy Policy Framework

European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report

European Commission (2021a) Technical guidance on the climate proofing of infrastructure in the period 2021-2027

European Commission (2021b) 2030 EU Climate Target Plan

European Union (2018) Regulation 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2021a) Climate Action Plan 2021

Government of Ireland (2021b) Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021)

Government of Ireland (2022) Climate Action Plan 2023

Institute of Environmental Management & Assessment (IEMA) (2020) EIA Guide to: Climate Change Resilience and Adaptation

Institute of Environmental Management & Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance

Intergovernmental Panel on Climate Change (IPCC) (2019) Special Report on the Ocean and Cryosphere in a Changing Climate.

Louth County Council (2021) Louth County Council Development Plan 2021-2027

Louth County Council (2023) The Louth County Council Climate Change Adaptation Strategy 2019-2024

Paranunzio, R.; Guerrini, M.; Dwyer, E.; Alexander, P.J.; O'Dwyer, B. Assessing Coastal Flood Risk in a Changing Climate for Dublin, Ireland. J. Mar. Sci. Eng. 2022, 10, 1715.

Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database

Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document

Transport Infrastructure Ireland (TII) (2022b) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

CHAPTER 16

CULTURAL HERITAGE: ARCHEOLOGICAL HERITAGE

VOLUME II

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

Table of Figures

RECEIVED: 18/10/2024

Table of Tables

RECEIVED: 18/10/2024

16 Cultural Heritage: Archaeological Heritage

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

16.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on Archaeological Heritage.

It should be read in conjunction Chapter 2, Project Description; Chapter 17, Built Heritage, and EIAR Appendix 16.1, Cultural Heritage Assessment, submitted with the planning application.

16.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Niall Brady, BA MA PhD FSA, director of the Archaeological Diving Company Ltd (ADCO).

Niall Brady holds a BA in Archaeology and Geography (UCD 1983); an MA in Archaeology (UCD 1986); an MA in Medieval Studies (Cornell University 1994), and a PhD in Medieval Studies (Cornell University 1996). He is a Fellow of the Society of Antiquaries of London since 2006 and is an associate of Trinity College Dublin's Centre for Environmental History since 2019. Niall Brady has directed the Medieval Rural Settlement Project for the Discovery Programme, Ireland's centre for advanced archaeological research (2002-10), sits on several national and international archaeological committees, and is co-founding director of ADCO (1999-present). He has carried out a wide range of archaeological assessments on land and underwater and been involved in the preparation of EIARs for the following projects:

- Corrib Onshore Pipeline 2010
- Dublin Port Company's Alexandra Basin Redevelopment Project, 2014
- Dublin Port Company's MP2 Project, 2020

16.3 Proposed Development

A full description of the proposed development is set out in Chapter 2 of this EIAR. The following is a summary of the proposed works.

Greenore Port Unlimited Company intend to apply for a 10-year permission for development on a site at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

1. **‘Terrestrial Port Area’**, (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing ‘engine room’, and a communications mast.
2. **‘Nearshore Environment’** (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as ‘Berth 3’.
3. **‘Residential Site’** (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. **‘Port Office Entrance’** (c. 0.18ha) encompassing a portion of the existing office building, known as the ‘Seafarers room’, hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

RECEIVED: 18/10/2024

The following is a general location plan of the plots identified above.

Figure 16.1 Development Areas

Three standalone operation and maintenance buildings incorporating office, warehouse and ancillary space (canteen, welfare, plant, cycle parking etc.) are proposed within the ‘terrestrial port’ area. Each building has a gross floor area of c.1,670 sq.m and a maximum height of 13.5m.

A new quay wall will be developed at Berth 3 (70m length). This will include a new quay wall face and upgraded deck. A pontoon will be constructed to accommodate crew transfer vessels (CTVs), for use by the operators to travel out to the offshore windfarms. The CTV’s will be accessed via an access ramp connected to the quay wall and deck. Approx 45,000m^3 of material will be dredged to facilitate navigable access at this location, and it will be disposed of on land. Where rock is encountered (estimate max of 1,000m^3), it will be reused on site.

Adjacent to the buildings, space is allocated for 76 car parking spaces, with a further 135 spaces proposed in the surface carpark at the ‘Residential Site’ on Shore Road. The existing carpark associated with the former Open Hydro building (60 spaces) will be used during the construction phase and Phase 1 of the development.

RECEIVED: 18/10/2024

Pedestrian and motor vehicle access is via the existing entrance beside the Port's office, which served the previous Open Hydro development. Heavy goods vehicles will access the buildings via the Port's existing heavy goods entrance on Shore Road (R175). Pedestrian access from the surface car park to the OMF buildings will be provided along a new pedestrian route within the Port's landholding.

To facilitate the development, demolition works are required, including the former Open Hydro building, an ESB substation, a small portion of the Port's office accommodation and the vacant dwelling at the 'residential site' on Shore Road.

Improvement works to the public / private realm in the foreground of the existing Greenore Port office building will comprise of an enhancement to existing road and pathways to facilitate improved pedestrian and vehicular access to the proposed O&M Facilities, a new feature entrance wall, removal of 6 no. port car parking spaces, link to new pedestrian route from the new Shore Road carpark and hard and soft landscaping. These works are located within the Greenore Architectural Conservation Area (ACA). The aim is to redesign the space to improve the character of the ACA at this point; provide a more user friendly space with pedestrian priority; and improve the existing access arrangements to the site. Inside the proposed main entrance to the site, it is proposed to integrate the existing engine shed wall and include this as a feature within the landscape design.

Ancillary development will include the installation of drainage infrastructure, landscaping, lighting, signage, boundary treatments, rooftop solar photovoltaic panels, an ESB substation, a communications mast, a bunded fuel storage tank and waste management areas etc.

The infrastructure described above will likely be delivered over two phases. However, this could extend to three phases, or the sequence of the works may vary,, depending on the delivery of future ORE projects and the associated Offshore Renewable Energy Auctions

16.3.1 Aspects Relevant to this Assessment

The marine works will include capital dredging, a piling programme to support a floating pontoon and construction of a new wall to Berth 3 over a 70m-length.

In the demolition works required on the landside, such works will retain the existing upstanding elements of the former engine room wall and will not impact on other historic buildings and boundary walls within the applicant's overall landholding.

16.4 Methodology

16.4.1 Relevant Legislation & Guidance

The principal legislative, guidance and policy context that operates across the land and marine environment in Ireland is governed archaeologically by the requirements of the National Monuments Act 1930-2004, which is being replaced by the Historic and Archaeological Heritage and Miscellaneous

Provisions Act 2023, and the Planning and Development Act 2000, As Amended, and is supported by policies governing archaeology and built heritage nationally and locally.

RECEIVED: 18/10/2024

The assessment is conducted in line with the following legislative procedures and guidelines listed in Table 16-1.

Table 16.1 Legislation, policy and guidance documents relevant to Cultural Heritage (including Archaeological, Industrial & Architectural).

Legislation / Policy / Guidance	Reference	Geographic Coverage
The National Monuments Act 1930-2004	Govt. of Ireland, 1930 - 2004	Ireland, Republic of
Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023	Govt. of Ireland, 2023	Ireland, Republic of
Planning and Development Act 2000, As Amended	Govt. of Ireland, 2000- present	Ireland, Republic of
Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act	Govt. of Ireland, 1999	Ireland, Republic of
Marine Area Planning Act 2021	Govt. of Ireland, 2021	Ireland, Republic of
The Foreshore Act 1933 and 2014	Govt. of Ireland, 1933 updated 2014	Ireland, Republic of
Heritage Act, 1995	Govt. of Ireland, 1995	Ireland, Republic of
Architectural Heritage Protection Guidelines for Planning Authorities (2011)	Govt. of Ireland, 2011	Ireland, Republic of
European Convention on the Protection of the Archaeological Heritage (Valetta Convention)	EU, 1992	EU
The Convention for the Protection of the Architectural Heritage (the Grenada Convention)	EU, 1985	EU
Department of Arts, Heritage, Gaeltacht and the Islands (DAHGI) Framework and Principles for the Protection of the Archaeological Heritage	DAHGI, 1999a	Ireland, Republic of
DAHGI Policy and Guidelines on Archaeological Excavation	DAHGI, 1999b	Ireland, Republic of
International Council on Monuments and Sites (ICOMOS) guidance, non-governmental international organisation	ICOMOS, 2011	Global

dedicated to the conservation of the world's monuments and sites – several charters and related reference texts		

RECEIVED: 18/10/2024

16.4.2 Site Surveys/Investigations

The present assessment is based on desktop review of existing sources (Table 16.2) and non-disturbance visual recording based on site inspection underwater and on land.

Table 16.2 Principal sources to inform known Cultural Heritage (including Archaeological, Industrial & Architectural).

Data Source	Topic Focus
Historic Maps, Ordnance Survey and Admiralty Charts	Landscape and Seascape
Register of Monuments and Places (RMP), also known as the Sites and Monuments Record (SMR)	Terrestrial Archaeology
Louth CC Register of Protected Structures	Archaeology & Built Heritage
National Inventory of Architectural Heritage (NIAH)	Terrestrial Archaeology
Topographical Files, National Museum of Ireland	Terrestrial Archaeology
Historic Shipwreck Inventory maintained by the National Monuments Service (NMS) at the Department of Housing, Local Government and Heritage.	Shipwreck, recorded and known
Integrated Mapping for the Sustainable Development of Ireland's Marine Resource' (INFOMAR) project.	Shipwreck, known
Excavations database	Licensed archaeological interventions

Site work was carried out with a view to completing an *in situ* non-disturbance record of any features observed to a level that would enable an archaeologist who has not seen the site to comprehend its components, layout and sequences, based on a detailed record of selected elements of the site.

The site work was completed on 24 and 25 August 2023 as an underwater dive inspection within and extending beyond the development footprint for the new CTV berths; an intertidal inspection of those elements exposed at Low Water, and a walkover inspection of the wider port area, extending from Shore Road in the east to the western boundary of the port (Figure 16-2) (Appendix 16.1).

The in-water survey area measured 407m long (northeast-southwest) by 157m wide (northwest-southeast).

The underwater and intertidal elements were launched from a Dive Support Vessel and the dive work operated Surface Supplied Diving Equipment, with the archaeological diver towed across the site area to ensure maximum and complete coverage. Dive work was completed at Low Water, which resulted in shallow diving except for those elements that ran along the dredge slope created when deepening

Berth 2. A metal detector was employed underwater to assist in the identification of material of significance.

The walkover inspection was conducted across the application site and wider port area and was limited to external consideration of buildings and structures.

Attention was paid to recording the seascape and landscape topography and any features of archaeological and cultural heritage interest. Record was made in writing and supported by photography. A handheld GPS unit was available to record the locations of any features of interest.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

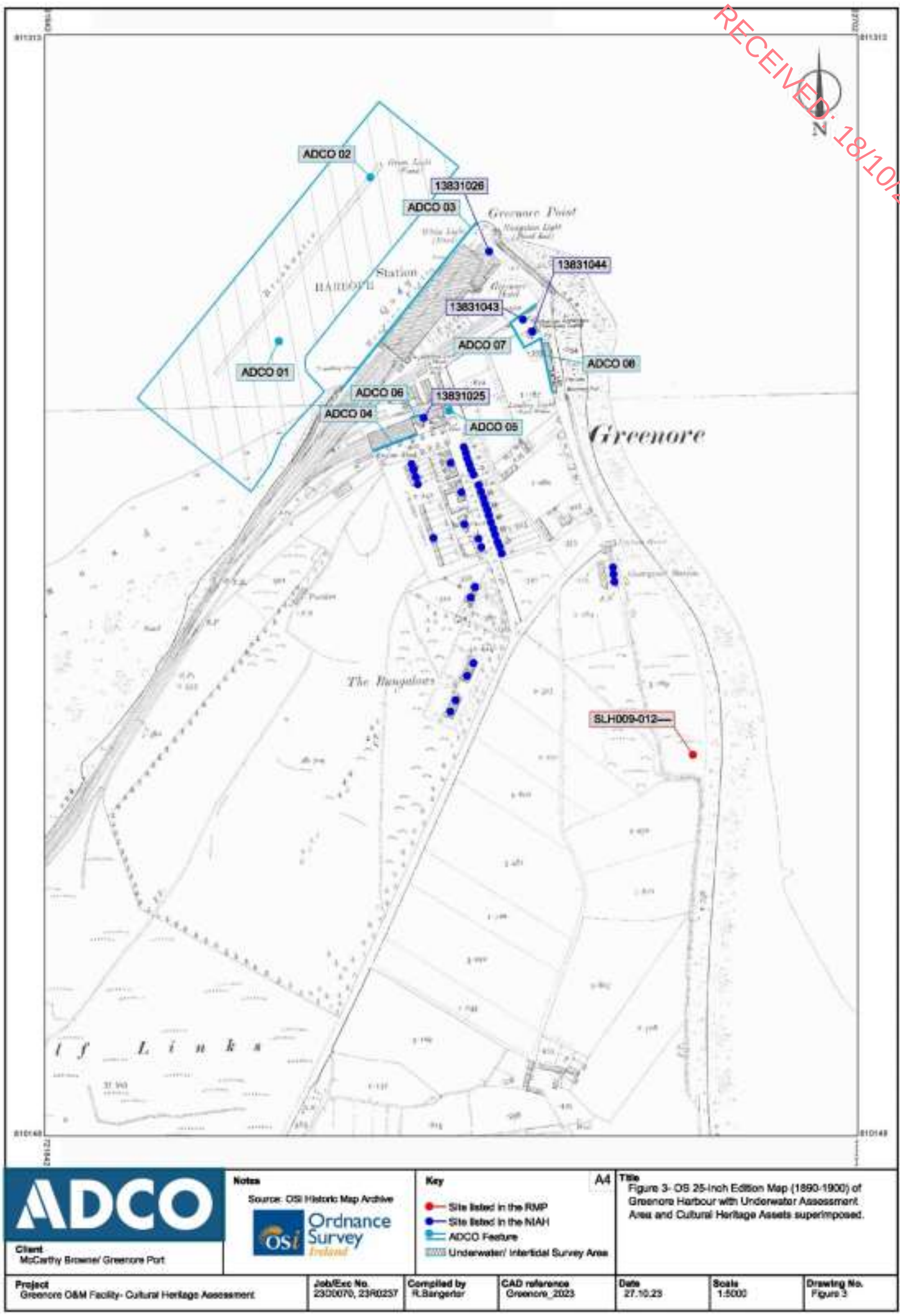


Figure 16.2 Detail from historic Ordnance Survey 25-inch sheet (1890-1900) with Underwater Archaeological Assessment area and Cultural Heritage assets overlaid

Source: ADCO survey report.

16.4.3 Consultation

RECEIVED: 18/10/2024

A Section 247 pre-planning consultation meeting was held with Louth County Council on 20th May 2024 and did not raise any issues on this matter.

16.5 Difficulties Encountered

No difficulties were encountered in the course of the archaeological inspections. Sea state was calm and underwater visibility was good during the in-water survey. Full access across the landside elements of the development area was provided.

16.6 Baseline Environment

16.6.1 Historical background and cartographic sources

The port at Greenore is located on the south side of Carlingford Lough, a location well known for its rich cultural heritage close to the entrance to Carlingford Lough, and a pinch point at that entrance between Greencastle on the north shore and Greenore Point on the south. There are no recorded archaeological sites within the footprint of the development, but the wider landscape setting highlights Greenore as a location that can retain archaeological potential. The Port itself retains elements of its nineteenth-century narrative, when it was built as a new harbour with its own railhead.

The Ordnance Survey (OS) First Edition six-inch map of the 1840s shows only a small development at Greenore Point, comprising a Lighthouse and some cottages running down the eastern shore of the Point. Carlingford Lough leads inland to the important commercial centre of Newry and is challenging to navigate with many sand bars accumulating naturally along its course, which in part explains the presence of the lighthouse complex.

The decision to construct a new harbour at this location in the late 1800s was informed by a plan to engage directly with rail and ferry services to England.[1] Construction of the harbour to the north of the lighthouse was preceded by a study of the soundings taken across the Lough, with some limited dredging of the Carlingford Bar.

The new harbour was built on an area of undeveloped land with a sand/shingle shoreline. There is no indication on the historic OS map of relict shoreline features, such as fish traps, oyster beds, shipwrecks or other features of cultural heritage interest.

The Topographical Files in the National Museum of Ireland (NMI) include reference to a collection of prehistoric-period flint flakes that are provenanced to Greenore townland (reference NMI 1975:307-583). The collection includes flint scrapers, blades, bar forms, cores and awls as well as generic flakes; the sum representing a classic range of stone tools dating most probably to the Neolithic period. There is no clear indication of where they were collected from within the townland, so a specific provenance is not known, although the Sites and Monuments Record (SMR), also known as the Register of Monuments and Places (RMP), maintained by the National Monuments Service (NMS) has identified

[1] Canice O'Mahony, 'Iron rails and harbour walls. James Barton of Farndreg', *Journal of the County Louth Archaeological and Historical Society* 22.2 (1990), pp 134–149.

one location as a possible source area (RMP LH0090-012), some 500m southeast of and outside application site and wider port area (Figure 16-2). Inspection of the location in 2007 did not reveal any indication of lithics here.[2] The flint pieces are part of a collection made by Dr Liversage and was given to the Ulster Museum by the Queen's University Belfast, and from there to the NMI in Dublin. A note in the NMI records dated 2002 calls the Greenore provenance into question, suggesting that the material may be from Greencastle, Co. Donegal, rather than Greenore, since the rest of Liversage's material (NMI 1975:279-298) is from Donegal sites.

RECEIVED: 18/10/2024

In terms of known archaeological sites, there are no recorded RMP sites within the development area, and the closest site is that of the supposed flint scatter referred to above, located outside the development site on the beach to the southeast (Figures 16-2).

There are some 43 recorded historic shipwreck events within Carlingford Lough, based on the Historic Shipwreck Inventory maintained by the NMS, but there are none associated directly with the Port. There is however a single recorded wreck associated with Greenore, and that is the vessel *Kilkeel*, which was lost in 1892 at Greenore. The event is described as a steamship that was in a derelict state when she was noted by the lighthouse keeper at Carlingford; the vessel was driven ashore but was got off. The position was not recorded.

16.6.2 Recorded monuments, protected structures, industrial heritage sites and other features

The existing tangible cultural heritage assets speak to the development of the port area during the nineteenth century, and in the present context are principally related to a small selection of buildings. The recorded sites and features identified in the desktop review are summarised in Table 16-3 and presented in Figure 16-2. Table 16.3 also lists a series of new observations made in the course of the present study (ADCO 01–ADCO 08) (described below in 16.6.3).[3] The sites considered in Chapter 16 deal specifically with the Port area. The architectural history and sites of the village of Greenore are described in Chapter 17.

[2] Rex Bangerter, 'Underwater archaeological assessment: Phase 2 development at Greenore Port, Carlingford Lough, Co. Louth. 07D0016, 07R0067', unpublished report of the Archaeological Diving Company Ltd, 2007, p. 6.

[3] Detailed descriptions of the archaeological sites and observations are presented Appendix 16.1.

Table 16.3 Cultural Heritage Assets within Greenore Port and in proximity to the O&M facility project area (including Archaeological, Industrial & Architectural). Note the architectural history and sites of the village of Greenore are described in Chapter 17.

RECEIVED: 18/10/2024

Reference	Site type	Status	Impacts from O&M project	Rating
NIAH 13821043; RPS Lhs 009-043	Lighthouse	Standing	None	Regional
NIAH 1321044; RPS Lhs 009-044	Lighthouse Keeper's House	Standing	None	Regional
NIAH 13831026	Hotel	Largely demolished. One wall length standing	None	Regional
NIAH 13831025; RPS Lhs 009-001	Water Tower	Standing	None	Regional
ADCO 01	Seabed			Not rated
ADCO 02	Breakwater	Standing	None	Not rated because not on NIAH
ADCO 03	Quay	Buried	None	Not rated because not on NIAH
ADCO 04	Engine Shed	Largely demolished One wall length standing	None	Not rated because not on NIAH
ADCO 05	Building	Standing	None	Not rated because not on NIAH
ADCO 06	Building	Standing	None	Not rated because not on NIAH
ADCO 07	Boundary wall	Standing	None	Not rated because not on NIAH
ADCO 08	Boundary wall	Standing	None	Not rated because not on NIAH

The two earliest sites are those of Greenore Point Lighthouse and the associated Lighthouse Keeper's House, which were constructed *c.* 1830. They are entered into the National Inventory of Architectural Heritage (NIAH), references 13831043 and 13831044 respectively, and are registered protected structures (RPS Lhs 009-043 and Lhs 009-044 respectively). The lighthouse was designed by George Halpin Senior, who designed many of the lighthouses along Ireland's east coast at this time.

As recorded on the OS First Edition map (*c.* 1840), the lighthouse and its accommodation were built at the most northern tip of Greenore Point. Subsequent reclamation works extended the shoreline to the north and west and facilitated the construction of the new harbour. The harbour was built between 1869 and 1873, when Greenore became a railhead for the London and North Western Railway. The harbour and the railhead were designed by railway engineer James Barton, who is also associated with the construction of the Boyne Aquaduct. The railhead included a large hotel that was integrated into the railway station, the whole unit reaching over 130 m in length (NIAH 13831026) and running parallel with the quayside. Only a short length of walling survives. A second railhead lay just south of the hotel, and its water tower survives as a protected structure that is today re-used as offices for Greenore Port, NIAH 13831025 (RPS Lhs 009-001).

RECEIVED: 18/10/2024

The harbour comprises a detached breakwater (ADCO 02) constructed some 105m off the quayside (ADCO 03) (Figure 16-2). Neither the breakwater nor the quay are protected structures. The breakwater (ADCO 02) extends for over 280m in length and was furnished with the 'Green Light' navigation aid (Figure 16-3). Also recorded as a 'groyne' in modern mapping, the breakwater protects the quay from northerly weather, and may originally have served to induce tidal scour along the quayside to facilitate berthing. Historic mapping records sectional profiles through the breakwater, showing three rows of timber uprights driven in the seabed, and rubble mass added to the base, and dated 1894 and 1896 respectively.[4] It continues to offer protection to the quay from northerly weather but the history of its construction is not referred to in a paper describing Barton's role in building the harbour.[5] Barton is known to have conducted some dredging within Carlingford Lough to improve navigation access but the sources that might reveal whether this included dredging alongside the quay and in association with the breakwater are currently not known.

Figure 16.3 View looking north along east-facing side of the breakwater/groyne, ADCO 02.

The quay (ADCO 03) has been upgraded as the port developed and currently provides two berths (Figure 16-4). While the historic quay is not a registered feature, its design by James Barton in 1869

[4] Reference 028-img2319, Irish Railway Record Society, 2018.

[5] O'Mahony, 'Iron rails and harbour walls, pp 145–146.

was innovative at the time. Barton, in common with Bindon Blood Stoney in Dublin, wrestled with the concept of using mass concrete to create substantial blocks that would serve as foundations for quay walls. The use of relatively small units, weighing between 3 and 4 tonnes in weight was known, but Barton was able to lay 100-ton blocks for the sub-tidal section at Greenore, extending for a distance of 800 yards (731.52 m).[6] Blood Stoney would excel further in Dublin, where he designed 350-ton blocks to create the North Wall Quay Extension that would establish a new deepwater basin; namely Alexandra Basin. Blood Stoney's work captured the imagination of the time and is remembered as an engineering marvel of the 1880s. Barton's work at Greenore a decade earlier was part of the same innovative processes that are a hallmark of the Victorian Age.

RECEIVED: 18/10/2024

Figure 16.4 View along façade of stone-built quay (ADCO 03) in 2017 before it was buried in the development of Berth 2. The stone work was constructed above the 100-ton blocks that served as the foundation element to the quay.

The quay has been upgraded in stages since *c.* 2000 and the old stone façade is now buried behind a combi-wall that uses driven tubular and sheet piles inserted into the seabed in front of the stone quay, with tie rods extending across the quay deck to a line of anchor piles driven through the deck. The deck level is then raised and finished with a new reinforced concrete cap.

Capital dredging has been carried out to bring the ruling depth of the berth pockets to –7.5m Chart Datum, with silt removal in 2001 and rock dredging at Berth 1 in 2015. Berth 2 was redeveloped since 2019.

[6] Ibid.

Archaeological assessment and monitoring of the ground disturbance works within the port area, the quay construction works and the associated capital dredging has taken place.[7] The monitoring that was carried out during the Berth 2 works observed a small section of intact railway line associated with the former rail head, and that section was preserved as part of the industrial heritage of the port and county.

RECEIVED: 18/10/2024

16.6.3 Observations

16.6.3.1 Sub-tidal/Intertidal element, ADCO 01

The underwater archaeological inspection area ADCO 01 is indicated on Figure 16-2. The un-dredged areas of seabed were similar across the surveyed area. The seabed surface is made up of a sandy bottom with rounded and sub-rounded pebble and small cobble inclusions, typically measuring less than 50mm in diameter. The sandy surface outside the breakwater is gently rippled. Sea shells, including razor clam and native Irish oyster, are frequent, and there is a wide scatter of seaweed clumps throughout. There is good penetration of the surface sand up to *c.* 100mm.

The nature of the seabed changes dramatically along the dredge slope, which is angled at approximately 45 degrees and the bed levels drop rapidly from a surface depth of –2.5m to –10.5m at the base of the dredge pocket. The soft sand matrix gives way to a dark grey-coloured silty clay (marl), with occasional boulder, mussel shell and starfish inclusions. The marl is relatively soft, with penetration depth up to 1.5m experienced.

There was little evidence for debris rubbish on the seabed; a single metal bottle top (Vodka) was observed in the course of diving. The metal detection did not add further insight.

The seabed alongside the breakwater retains two loose timbers that measure up to 11m in length. The timbers retain scarf joints, lie in a haphazard manner, and are elements of the breakwater (ADCO 02) that have fallen from the structure and lie abandoned on the seabed.

The shoreline where it is proposed to develop Berth 3 has a gravel and shingle surface that rises above the sub-tidal area and presents a narrow expanse of intertidal foreshore. A line of concrete cubes set on to the foreshore forms the current boundary, with rock armour added behind the cubes to infill the ground area between the shore and the port area.

The un-dredged portion of the seabed has good holding capacity and is regarded as a stratum that retains archaeological potential. Capital dredging works are proposed as part of the proposed development, to create the berthing capacity of Berth 3 and across the pontoon area. Such works will impact on ADCO 01.

[7] Audrey Gahan, 'Greenore Harbour, Greenore, Co. Louth. 01D056', www.excavations.ie; Martin Fitzpatrick, 'Greenore Harobur. 01E0988', www.excavations.ie; Niall Brady, 'Cultural heritage assessment, Greenore Port Berrth 2, Greenore, Co. Louth. 17D0032, 17R0051', ADCO report, 2017; Colm Flynn, 'Final archaeological monitoring report for development of a new quay at Berth 2, Greenore, Co. Louth. 19E0506', 2022.

16.6.3.2 Breakwater, ADCO 02

RECEIVED: 18/10/2024

The breakwater has two principal elements, comprising an openwork timber superstructure that stands approximately 3.5m above a rubble rock armour base that is some 1.9m high and reaches *c*. 4m east of the visible uprights (Figure 16-3).[8] The breakwater is unregistered in the cultural heritage registers.

The timber superstructure is formed of two visible lines of square-sectioned timber piles that are staggered to create a zig-zag linear formation which runs the length of the breakwater. The uprights stand to various heights and are separated by approximately 2m intervals but there are variations both greater and smaller. Historic mapping indicates a third line of uprights, which received angled braces on the south side. While the braces remain today, the third line of vertical timbers is not visible and must be buried by the rubble armour.[9] The two visible lines of vertical timber uprights are braced horizontally by a series of cross beams which form lintels at the top of the feature and also lower down where the rubble mound buries the base of the piles. The vertical piles are cut with simple scarf joins to receive the lintels, which are then fixed to the piles with iron bolts. A series of timbers also brace the vertical piles as buttresses set at 45-degree angles, and these are fixed to the piles by means of steel plates. The buttress timbers are only seen on the east-facing side of the breakwater, facing the quay, as recorded in the late nineteenth-century profile drawings.

As noted in section 16.6.3.1, two of the timber braces have fallen away and lie on the seabed off its east-facing side.

A series of steel beams fixed to the west-facing side of the breakwater at its north end appear to serve a similar bracing purpose, but they are probably a later addition as they are not continued along the length of the breakwater.

A poured concrete pier is located at the centrepoint of the breakwater's length. The pier rises almost to the same height as the timber piles. It appears to have functioned as a central anchor point.

The remains of a metal pole fitted with a circular grid lies off the north end of the breakwater on its west-facing side. This appears to have been a navigation aid that has fallen down, and may be the remnants of the Green Light fixture, or a version thereof, recorded on the historic OS map (Figure 16-2).

The base of the piles are not visible, as the base of the breakwater has a mound of granite rubble that offers rock-armoured protection to the feature. The rubble mound stands *c.* 1.9m above current seabed level and reaches *c.* 4m east of the visible extent of the timberwork. There are no obvious set stones forming a wall line and the rubble mound is substantial.

The function of the breakwater and its role in the history of the port's development is not documented in the sources accessed for the present study. It remains an integral component of the historic fabric of Greenore, and the current project will ensure that the breakwater is not impacted negatively.

---

[8] Measurements based on interpolation of point cloud survey completed for the port. Measurements courtesy of McCarthy Browne consulting engineers.

[9] Reference 028-img2319, Irish Railway Record Society, 2018.

RECEIVED: 18/10/2024

It is likely that the breakwater was constructed both to offer protection to the quay from adverse northerly weather, and to induce tidal scour alongside the quay, using the dynamic tidal conditions that exist at Greenore to maintain adequate depth for shipping berthed at the quay. When trying to secure the shipping channel into Dublin City across the tidal flats of the River Liffey, Dublin Corporation first constructed a timber breakwater that was detached from the city's quays and reached out into the active channel, between what is today Pigeon House Harbour and Poolbeg Lighthouse. Known simply as 'The Piles', the works were recorded in 1757 by the cartographer John Rocque as a parallel line of timber-post couplets. The Piles were subsequently replaced by a substantial stone wall that survives today as the Great South Wall. The Piles in Dublin are no longer visible but bear comparison with the breakwater in Greenore. If the comparison is valid, the breakwater in Greenore is a rare surviving example of maritime engineering in Ireland.

The superstructure element of ADCO 02 will not be impacted by the works associated with the proposed development during construction or operation. However, repair works to the rock armour base of the breakwater may be required. Such works may include the addition of rock armour where there are gaps or localised settlement, and reconstruction or reinforcement of the toe. The superstructure will be protected against all such impacts, direct and indirect. Those members of the superstructure that have fallen on to the seabed will be recovered during the dredging works so that they can be available to reattach to the superstructure when appropriate. A point cloud survey of the superstructure serves as a detailed baseline record of ADCO 02.

16.6.3.3 Landside inspection, ADCO 03–ADCO 08

The protected structures of the Lighthouse and Lighthouse Keeper's House survive and lie outside the development area. However, it is clear that many of the landside elements of the nineteenth-century harbour no longer stand above ground, including the historic quay (ADCO 03). Figure 16-2 shows the extent of the railhead complex *c.* 1890-1900, while the annotations describe those elements that remain standing today, and a further series of ADCO numbers are assigned to provide easy reference to them. There is cross-over of these elements with details covered in Chapter 17.

The hotel does not stand, and only an element of the railway station wall remains intact.

While the water tower stands and is used as office space, the engine shed that abutted it is largely gone, except for a wall length that serves today to separate a parking area to the south from an operational zone to the north (ADCO 04). The wall length retains a series of architectural features, including a fractured wall end, six blocked-up window opes and one blocked-up doorway ope. A point cloud survey has been carried out for the port of the standing wall length. The survey serves as a detailed baseline record of ADCO 04.

ADCO 05 is a square-shaped stone building that stands to the east of the water tower.

ADCO 06 refers to elements of the building to the north of the tower that are clearly retained within current sheds.

The boundary wall that defines the curtilage of the Lighthouse and Lighthouse Keeper's House also warrants inclusion (ADCO 07).

Review of the 1890-1900 OS map shows further boundaries to the south along Shore Road and a row of buildings that no longer survive. ADCO 08 refers to the boundary wall on Shore Road that retains

RECEIVED: 18/10/2024

stretches of stone construction that would be original features, while other elements have been replaced with breeze-block walling.

Elsewhere across the operational area of the port, there is little evidence of former structure standing, with the space occupied either by modern sheds and silos or as open surface.

The four standing structures that are proposed to be demolished as part of the development comprise the former Open Hydro works building; part of the port's office accommodations; an ESB substation, and an unoccupied residential bungalow built before the 1970s. None of these four structures retain cultural heritage interest but consideration should be given to monitoring their demolition in the event that buried horizons are observed in the foundation levels of same.

16.6.3.4 Conclusions

Greenore Harbour is historically an important construction of the late 1800s, as one of few new-build harbours in Ireland at that time. Its construction was developed under the watchful eye of renowned railway engineer James Barton.

The surveyed area was inspected comprehensively above and below the waterline.

16.7 The 'Do Nothing' Scenario

In a 'Do Nothing' scenario, the existing baseline environment may be changed in accordance with the extant permissions for Greenore Port as permitted developments; namely:

i. Extension and modification of existing Warehouse, LCC Planning Ref 20268, ABP Ref 307862
ii. New Warehouse, LCC Planning Ref Planning ref 20543, ABP Ref 310184

In the case of LCC Planning Ref 20268, ABP Ref 307862, which considers the demolition of the Open Hydro building, the opportunity will be presented to monitor archaeologically the ground surfaces that will be exposed in the course of said demolition, and record any features that may be exposed in the course of such works. Such is likely to expose elements of the former railhead that have not been recorded prior to the construction of the warehouse.

In the case of LCC Planning Ref 20543, ABP Ref 310184, permission was granted to demolish the remaining upstanding wall element of the former railway hotel (NIAH 13831026), and the Engine Shed wall recorded in this chapter as ADCO 04.

The demolition of the upstanding wall element of the former hotel is not proposed as part of this development and is outside the application site boundary. The Engine room wall is being kept in the proposed development and incorporated into the landscape design.

16.8 Potential Significant Effects

RECEIVED: 18/10/2024

Impact/effect categories devised by the Environmental Protection Agency (EPA) for archaeological matters are categorised as having a direct impact, an indirect impact or as having no predicted impact. Each impact is qualified both in terms of magnitude of impacts (high, medium, low) and in terms of significance of impacts by being considered profound, significant, moderate, slight or imperceptible. The duration of effects is also assessed in terms of a scale ranging from temporary to permanent.[10] The impacts assessed for the O&M facility project are summarised in Table 16-4.

Table 16.4 Impact assessment on Cultural Heritage Assets and locations within the Greenore Port and the O&M facility project area (including Archaeological, Industrial & Architectural).

Reference	Site type	Status	Impacts from O&M project	Impact Magnitude	Impact Significance[11]
NIAH 13821043; RPS Lhs 009-043	Lighthouse	Standing	None	n/a	n/a
NIAH 1321044; RPS Lhs 009-044	Lighthouse Keeper's House	Standing	None	n/a	n/a
NIAH 13831026	Hotel	Largely demolished One wall length standing	None	n/a	n/a
NIAH 13831025; RPS Lhs 009-001	Water Tower	Standing	None	n/a	n/a
ADCO 01	Seabed	Un-dredged	Dredging Piling	High	Direct, Negative, Signficant, Permanent
ADCO 02	Breakwater	Standing	Repair works to rock armour	Medium	Direct, Positive, Moderate, Permanent
ADCO 03	Quay	Buried	None	n/a	n/a
ADCO 04	Engine Shed	Largely demolished One wall length standing	None	n/a	n/a
ADCO 05	Building	Standing	None	n/a	n/a
ADCO 06	Building	Standing	None	n/a	n/a

[10] EPA 'Guidelines for Information to be Contained in EIAR' 2022, 'Guidelines on the information to be contained in Environmental Impact Statements', 2002; 'Advice notes on Current Practice (in preparation of Environmental Impact Statements), 2003 and Revised Draft 2015, EPA; and Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, 2006, National Roads Authority.

[11] Following impact/effect categories devised by the EPA; see note 9 above.

Reference	Site type	Status	Impacts from O&M project	Impact Magnitude	Impact Significance[11]
ADCO 07	Boundary wall	Standing	None	n/a	n/a

RECEIVED: 18/10/2024

The majority of the cultural heritage assets listed in Table 16-4 will not be impacted by works associated with the O&M facility. However, the proposed works will have impacts on the seabed (ADCO 01) by way of capital dredging and marine piling. Such works will require archaeological mitigation, while the landside works present the opportunities for archaeological monitoring and recording.

16.8.1 Demolition Phase

The demolition of the four modern standing structures (namely, the former Open Hydro works building; part of the port's office accommodations; an ESB substation, and an unoccupied residential bungalow built before the 1970s) represent direct impacts. Archaeological monitoring will be carried out to observe, record and recover any material of archaeological interest that occurs.

16.8.2 Construction Phase

While the breakwater (ADCO 02) superstructure will not be impacted, repair works to the rock armour base of the breakwater may be required. Such works may include the addition of rock armour where there are gaps or localised settlement, and reconstruction or reinforcement of the toe. Such impacts will be considered direct and positive impacts insofar as they will help to further stabilise the structure. They should be limited in scope and consequently may be deemed to be moderate in scale and will be permanent in nature. Archaeological monitoring will be carried out to ensure the opportunity is present to observe, record and recover any material of archaeological interest that occurs.

Construction of new buildings, car park and the landscaping proposed along the southern perimeter of the Port area have the potential to expose previously unrecorded archaeological levels and archaeological monitoring will be carried out to observe, record and recover any material of archaeological interest that occurs.

16.8.3 Operational Phase

It is not anticipated that impacts will occur during the operational phase. However, should impacts, direct and indirect, occur, an Archaeology Management Plan will be in effect to ensure the observation, recording and recovery of any material of archaeological interest that occurs at this time.

16.8.4 Cumulative Effects

The cumulative assessment takes into account the impacts associated with the proposed development together with other proposed and reasonably foreseeable projects, plans and existing and permitted projects. The projects and plans selected as relevant to the cumulative assessment presented within this chapter are based upon the results of a screening exercise that draws on Planning applications; Strategic Infrastructure Developments (SIDs); EPS licence applications; Local Area plans and

Aquaculture licenses (listed in Appendix 1-1 of this EIAR). Each project and plan has been considered on a case-by-case basis for screening in or out of this chapter's cumulative assessment.

RECEIVED: 18/10/2024

Extant planning permissions within the project area are screened out because it is not feasible to implement previously granted permissions in combination with the subject scheme. There are no planning applications located within the archaeological study area that need to be screened in.

There are no SIDs within the archaeological study area that need to be screened in.

There are no EPA licenses within the archaeological study area that need to be screened in.

The subject site is located within the functional area of Louth County Council and is governed by the Louth County Development Plan 2021-2027 (LCDP), which was adopted by the members of Louth County Council (LCC) at a Special Council Meeting on the 30th of September 2021. The Plan came into full effect on the 11th of November 2021.There are no further Plans such as Local Area Plans in place within the archaeological study area.

Sixteen (16) no. Licensed Aquaculture Sites were identified within a 1.5 km Zone of Influence (ZoI) from the subject site at Greenore, Co. Louth, of which three sites, T01-026A, T01-089A and T01-044A are located within 500m of the proposed marine dredging and pontoon construction site. Licences T01-026A and T01-089A are granted to Keenan Oysters Ltd, and T01-044A to Carlingford Oyster Company Ltd.

The sensitivity of the aquaculture sites are deemed to be of high vulnerability. The sensitivity of the receptor is therefore considered to be high.

No intrusive works will take place within the Aquaculture licensed areas. The cumulative impact is predicted to be of local spatial extent, short term duration, intermittent and low reversibility. It is predicted that the impact may affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Overall, the magnitude of the cumulative impact is deemed to be negligible and the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of slight adverse significance, which is not significant in EIA terms.

The additional projects included in the updated List of Cumulative Projects appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea were considered and no additional cumulative effects arising from these projects were identified.

16.8.5 Summary

RECEIVED: 18/10/2024

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 16.5 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Seabed, ADCO 01	Moderate	Significant	Slight	Moderate	Permanent	Dredging and piling activities
Breakwater, ADCO 02	Moderate	Significant	Slight	Low	Permanent	Dredging activities
Landside ground works	Moderate	Moderate	Moderate	Moderate	Permanent	Demolition works exposing buried surface levels

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 16.6 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Seabed, ADCO 01	Moderate	Imperceptible	Slight	Low	Permanent	Dredging and piling activities
Breakwater, ADCO 02	Moderate	Imperceptible	Slight	Low	Permanent	Dredging activities

16.9 Mitigation

16.9.1 Incorporated Design Mitigation

No specific design mitigation measures are being proposed.

16.9.2 Demolition Phase Mitigation

The following archaeological monitoring and management measures will be undertaken:

- An archaeologist experienced in maritime archaeology will be retained by the developer for the duration of the relevant works i.e. all terrestrial, inter-tidal/foreshore and seabed disturbances associated with the development.

- An Archaeology Management Plan will be prepared by the archaeologist to prepare the protocols that ensure proper management and response to archaeological monitoring, recording and resolution that will be required in the course of the project.

- Archaeological monitoring will be carried out by suitably qualified and experienced maritime archaeological personnel licensed by the DHLGH. Archaeological monitoring is conducted during all terrestrial, inter-tidal/foreshore and seabed disturbances associated with the development. The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed and that require consideration during the course of the works. The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland.

- Archaeological licences for monitoring and site investigations of terrestrial and nearshore environments will be acquired from the Department of Housing, Local Government and Heritage (DHLGH), as necessary.

- Discovery of archaeological material. In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material.

- Archaeological material. Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will agreed with the licensing authorities.

- Archaeological dive team. Where any archaeologically significant/potential material is identified in the course of the seabed disturbance activities, these works will stop pending a dive inspection by an archaeological dive team. The dive team would deal with any rescue excavation required. The dive team and all in-water work will conform to the Port's safety protocols for Diving at Work. .

- Secure wet storage facilities will be provided on site to facilitate the temporary storage of artefacts that may be recorded during the course of the site work.

- Buoying/fencing of any such areas of discovery will be necessary if discovered during excavation.

- Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs.

- Spoil will not be dumped on any of the selected sites or their environs.

RECEIVED: 18/10/2024

- All site work will be conducted in strict compliance and accord with STATUTORY INSTRUMENTS: S.I. No. 299 of 2007: Safety, Health and Welfare at Work (General Application) Regulations, 2007; and STATUTORY INSTRUMENTS: S.I. No. 254 of 2018 as amended by S.I. No. 180 of 2019, HSA Safety, Health and Welfare at Work (Diving) Regulations, 2018-2019, where required.
- Post-construction project report and archive. It is a condition of archaeological licensing that a detailed project report is lodged with the DHLGH within 12 months of completion of site works. The reports will be particular to each licence granted. The reports should be to publication standard and should include a full account, suitably illustrated, of all archaeological features, finds and stratigraphy, along with a discussion and specialist reports. Artefacts recovered during the works need to meet the requirements of the National Museum of Ireland in terms of recording, conservation and storage

RECEIVED: 18/10/2024

16.9.3 Construction Phase Mitigation

Archaeological monitoring of the ground and seabed works associated with the Berth 3 upgrade, the dredge works and the piling activities associated with the pontoon, with the proviso to resolve fully any material of archaeological interest recovered at that point.

Dredging in the vicinity of the breakwater to ensure that the dredging does not undermine the base of the breakwater and avoid impacts to superstructure.

16.9.4 Operational Phase Mitigation

There are no potential significant archaeological issues predicted during the operational phase and therefore no mitigation is required.

16.10 Residual Impact Assessment.

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

It is not anticipated that there will be residual impacts on Archaeology arising from the proposed development.

16.11 Risk of Major Accidents or Disasters

It is not anticipated that there will be risk of impacts on Archaeology arising from the vulnerability of the project to risks of major accidents or disasters.

16.12 Interactions

This chapter on interacts most closely with Chapter 17 Cultural Heritage: Built heritage.

16.13 Monitoring

The mitigation measures included in Section 16.9 include a number of monitoring requirements during the construction phase. No monitoring is proposed for the operational phase.

16.14 Summary of Mitigation and Monitoring

RECEIVED: 18/10/2024

A summary of mitigation and monitoring measures is included in Chapter 19 of this EIAR.

16.15 Conclusion

Greenore Harbour is historically an important construction of the late 1800s, as one of few new-build harbours in Ireland at that time. Its construction was developed under the watchful eye of renowned railway engineer James Barton.

The surveyed area was inspected comprehensively above and below the waterline.

Much of the historic fabric of Greenore Harbour is now lost to view. This report identifies those elements that are still visible above ground in addition to the three protected structures.

Impact avoidance is the principle mitigation recommended. Where impacts are required, archaeological monitoring is the mitigation recommended. Archaeological monitoring is licensed by the Department of Housing, Local Government and Heritage through the National Monuments Service.

16.16 References and Sources

Bangerter, Rex, ‘Underwater archaeological assessment: Phase 2 development at Greenore Port, Carlingford Lough, Co. Louth. 07D0016, 07R0067’, report of the Archaeological Diving Company Ltd, 2007.

Brady, Niall, ‘Cultural heritage assessment, Greenore Port Berth 2, Greenore, Co. Louth. 17D0032, 17R0051’, report of the Archaeological Diving Company Ltd, 2017.

Brady, Niall, ‘Cultural heritage assessment, Greenore O&M facility, Greenore, Co. Louth. 23D0070, 23R0237’ ADCO report for Greenore Port 2023.

EPA ‘Guidelines for Information to be Contained in EIAR’ 2022.

EPA ‘Guidelines on the information to be contained in Environmental Impact Statements’, 2002.

EPA, Advice notes on Current Practice (in preparation of Environmental Impact Statements), 2003 and Revised Draft 2015.

Fitzpatrick, Martin, ‘Greenore Harobur. 01E0988’, www.excavations.ie.

Flynn, Colm, ‘Final archaeological monitoring report for development of a new quay at Berth 2, Greenore, Co. Louth. 19E0506’, 2022.

Gahan, Audry, ‘Greenore Harbour, Greenore, Co. Louth. 01D056’, www.excavations.ie.

NRA/TII, Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, 2006, National Roads Authority.

O’Mahony, Canice, ‘Iron rails and harbour walls. James Barton of Farndreg’, *Journal of the County Louth Archaeological and Historical Society* 22.2 (1990), pp 134–149.

Online sources:

Historic Environment Viewer, DHLGH, accessed 08 December 2023
http://webgis.archaeology.ie/historicenvironment/

National Inventory of Architectural Heritage (NIAH), accessed 08 December 2023
https://www.buildingsofireland.ie/buildings-search/building/13831040/

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

CHAPTER 17

CULTURAL HERITAGE: BUILT HERITAGE

VOLUME II

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table of Figures

RECEIVED: 18/10/2024

Table of Tables

17 Cultural Heritage: Built Heritage

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

17.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the built heritage of the historic village of Greenore, Co Louth.

It should be read in conjunction with EIAR Chapters 1,2 & 16 of this EIAR, along with the design statement and other plans and reports submitted with the planning application.

17.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Fergal Mc Namara of 7L Architects.

Fergal Mc Namara MRIAI is a RIAI Grade 1 Conservation Architect with over twenty years of experience in building conservation. He founded 7L Architects in 2018 and has an interest in industrial heritage, with projects for transport, mining and food production sites, as well as coastal built heritage. His thesis (M.Arch.Sc 2002. UCD) was on the urban morphology of Dublin's Docklands.

He has experience in the preparation of Architectural Impact Assessments in a wide range of contexts and has contributed to EIARs for the following projects:

- Ballinasloe Flood Relief Scheme
- Bus Connects
- Maynooth Transfer Pipeline

17.3 Proposed Development

A full description of the proposed development is provided in **Chapter 2** of this EIAR. The following is a summary of the proposed works:

Greenore Port Unlimited Company intend to apply for a 10-year permission for development at Greenore Port and site of dwelling house on Shore Road (A91DD42), Greenore, Co. Louth, (total site area c.4.88 hectare).

The development will provide for Operations and Maintenance (O&M) Facilities serving as a support base for future offshore windfarm projects. In general, it will comprise of terrestrial (landside) and nearshore works, with three standalone buildings incorporating office, warehouse and ancillary space landside and a pontoon to accommodate Crew Transfer Vessels (CTVs) marine side. To facilitate the proposed development, dredging within the nearshore and the demolition of existing port buildings and a vacant residential property is required.

The Operations and Maintenance Facilities (OMF) will provide twenty-four-seven, year-round support, to three individual offshore renewable energy (ORE) projects that will be owned and operated by entities separate from the applicant. These ORE projects will consist of offshore windfarms on the East Coast of Ireland.

RECEIVED: 18/10/2024

Three standalone operation and maintenance buildings incorporating office, warehouse and ancillary space (canteen, welfare, plant, cycle parking etc.) are proposed within the 'terrestrial port' area. Each building has a gross floor area of c.1,670 sq.m and a maximum height of 13.5m.

A new quay wall will be developed at Berth 3 (70m length). This will include a new quay wall face and upgraded deck. A pontoon will be constructed to accommodate crew transfer vessels (CTVs), for use by the operators to travel out to the offshore windfarms. The CTV's will be accessed via an access ramp connected to the quay wall and deck. Approx 45,000m^3 of material will be dredged to facilitate navigable access at this location, and it will be disposed of on land. Where rock is encountered (estimate max of 1,000m^3), it will be reused on site.

Adjacent to the buildings, space is allocated for 76 car parking spaces, with a further 135 spaces proposed in the surface carpark at the 'Residential Site' on Shore Road. The existing carpark associated with the former Open Hydro building (60 spaces) will be used during the construction phase and Phase 1 of the development.

Pedestrian and motor vehicle access is via the existing entrance beside the Port's office, which served the previous Open Hydro development. Heavy goods vehicles will access the buildings via the Port's existing heavy goods entrance on Shore Road (R175). Pedestrian access from the surface carpark to the OMF buildings will be provided along a new pedestrian route within the Port's landholding.

To facilitate the development, demolition works are required, including the former Open Hydro building, an ESB substation, a small portion of the Port's office accommodation and the vacant dwelling at the 'residential site' on Shore Road.

Improvement works to the public / private realm in the foreground of the existing Greenore Port office building will comprise of an enhancement to existing road and pathways to facilitate improved pedestrian and vehicular access to the proposed O&M Facilities, a new feature entrance wall, removal of 6 no. port car parking spaces, link to new pedestrian route from the new Shore Road carpark and hard and soft landscaping. These works are located within the Greenore Architectural Conservation Area (ACA). The aim is to redesign the space to improve the character of the ACA at this point; provide a more user friendly space with pedestrian priority; and improve the existing access arrangements to the site. Inside the proposed main entrance to the site, it is proposed to integrate the existing engine room wall and include this as a feature within the landscape design.

Ancillary development will include the installation of drainage infrastructure, landscaping, lighting, signage, boundary treatments, rooftop solar photovoltaic panels, an ESB substation, a communications mast, a bunded fuel storage tank and waste management areas etc.

The infrastructure described above will likely be delivered over two phases. However, this could extend to three phases, or the sequence of the works may vary, depending on the delivery of future ORE projects and the associated Offshore Renewable Energy Auctions.

The proposed scheme is distributed over several individual plots, and for ease of reference, they are described as follows:-

1. **'Terrestrial Port Area'**, (c.1.9ha) which includes, a port commodity warehouse (former Open Hydro building), hardstanding areas, remnant wall associated with the pre-existing 'engine room', and a communications mast.
2. **'Nearshore Environment'** (c.2.3ha) encompassing part of Carlingford Lough and an existing caisson quay wall, known as 'Berth 3'.
3. **'Residential Site'** (c. 0.5ha) a greenfield site with a single-storey unoccupied residential dwelling with frontage to the R175, Shore Road.
4. **'Port Office Entrance'** (c. 0.18ha) encompassing a portion of the existing office building, known as the 'Seafarers room', hardstanding and parking area to the front of the port office with pockets of green space, that front Euston Street.

The following is a general location plan of the plots identified above.

Figure 17.1 Development Areas

17.3.1 Aspects Relevant to this Assessment

Proposals for new facilities at Greenore Port will involve changes to the wider setting of an Architectural Conservation Area and a number of protected structures. No protected structures are located within the boundary of the proposed site area.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

17.4 Methodology

17.4.1 Site Surveys & Investigations

To inform this impact assessment, a field survey was undertaken in October 2023 of the proposed site area and the Architectural Conservation Area along with protected structures within the environs. Structures of interest were photographed as well as key views within the site area and its environs and the ACA. Prior to and following this survey, available online resources were accessed so that the historical background to the village could be better understood. We also consulted and gave advice to the design team as they developed their proposals in relation to potential impacts on the built heritage and possible mitigations.

The baseline study comprised a comprehensive desktop review of existing heritage datasets within the Study Area, which established the baseline cultural heritage sites. Sources included:

- Sites and Monuments Record (SMR), compiled and maintained by the Archaeological Survey of Ireland (ASI) unit of the NMS;
- NIAH Building Surveys, for details regarding buildings, structures, demesnes, designed landscapes and historic gardens of architectural importance;
- Louth County Development Plan (2016-2022) for Greenore ACA;
- Ordnance Survey Ireland for historic cartographic and aerial image sources;
- Online aerial image sources (e.g. Google Earth, Apple Maps);
- Previous reports containing relating to the historic environment of the Site.
- National Library Digital Collection Photographs

17.4.2 Relevant Legislation & Guidance

The Department of Housing, Local Government and Heritage (DHLGH) is responsible for the conservation, preservation, protection and presentation of the cultural heritage of Ireland. The protection of archaeological heritage is the responsibility of the National Monuments Service (NMS); architectural heritage being the responsibility of the Built Heritage Policy Section including the Architectural Heritage Unit (AHU) and the National Inventory of Architectural Heritage (NIAH). Relevant legislation includes:

- National Monuments Acts, 1930 to 2004;
- Heritage Act, 1995;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999;
- Planning and Development Acts, 2000 to 2020;
- Convention concerning the Protection of the World Cultural and Natural Heritage (1972);
- Louth County Development Plan 2021-2027;
- Greenore Architectural Conservation Area (15, Appendix 11, LCDP 2021-2027)
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) – EPA;
- Framework and Principles for the Protection of the Archaeological Heritage (1999);

17.5 Difficulties Encountered

RECEIVED: 18/10/2024

There were no difficulties encountered in our field survey for accessing or viewing relevant sites or their settings, sufficient for the preparation of the built heritage assessment in this chapter.

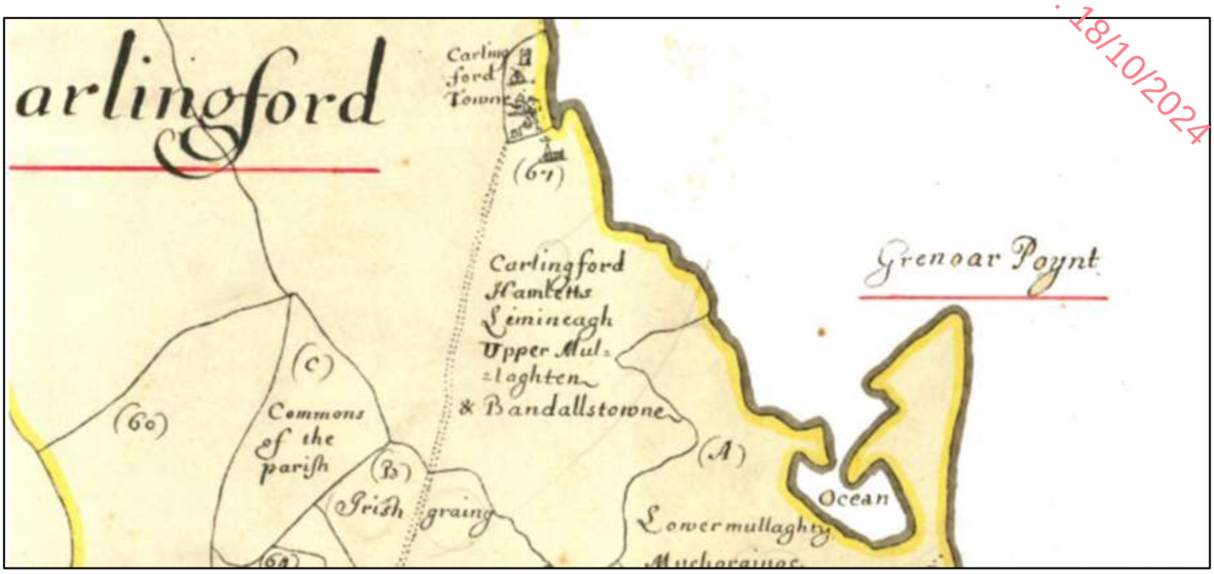


Figure 17.2 Extract from Down Survey map of 1655 in the barony of Dundalk Lower showing Grenoar Poynt (source www.downsurvey.tcd.ie)

17.6 Baseline Environment

17.6.1 Historic Origins

Greenore (an Ghrianfoirt) is a planned village located at the entrance to Carlingford Lough. It is thought that its name means ‘sunny-port’ for its open aspect and deep natural port or ‘sandy bank’ where flint shards (SMR ref. LH009-012----) were left on the beach in prehistoric times. Shown as *Grenoar Point* on the 1655 Down Survey map, the spit reaches north to form the mouth of the Lough. Nearby Carlingford was a Norse port settlement and a thriving town from the twelfth century overlooked by King John’s Castle.

RECEIVED: 18/10/2024

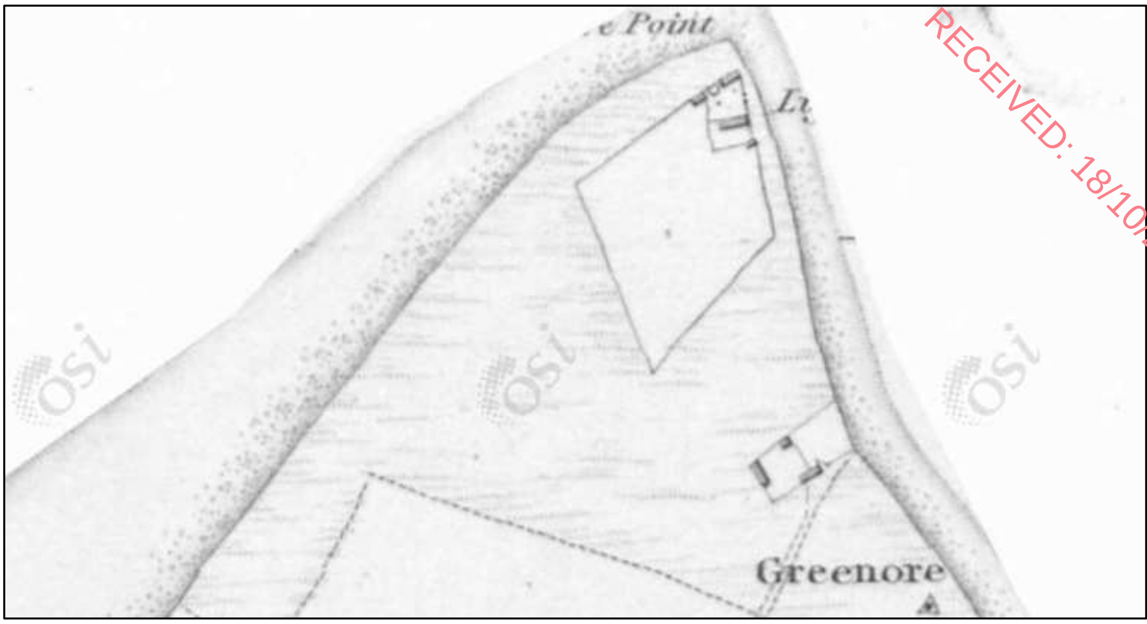


Figure 17.3 Extract from First Edition six-inch scale Ordnance Survey map of ca. 1840 showing Greenore Point following the construction of the lighthouse and the coastguard station (source archaeology.ie).

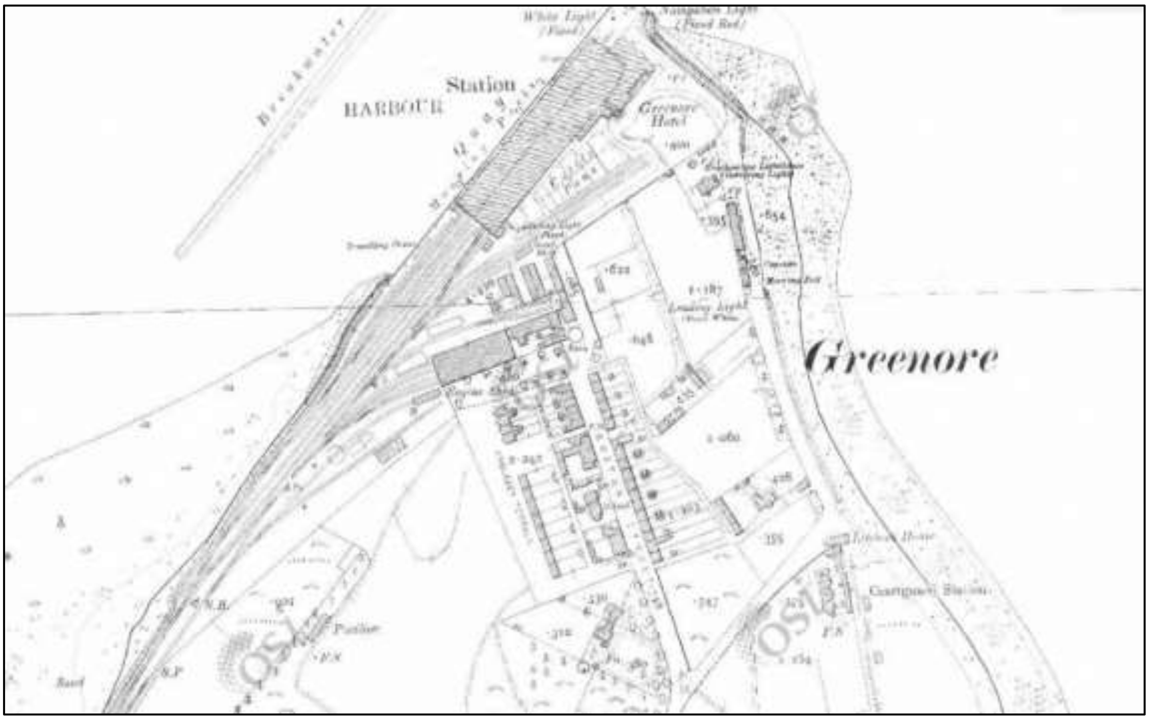


Figure 17.4 Extract from First Edition 25-inch scale Ordnance Survey map of ca. 1900 showing the village of Greenore and its port with railway station following the extensive development of the 1870s.

RECEIVED: 18/10/2024

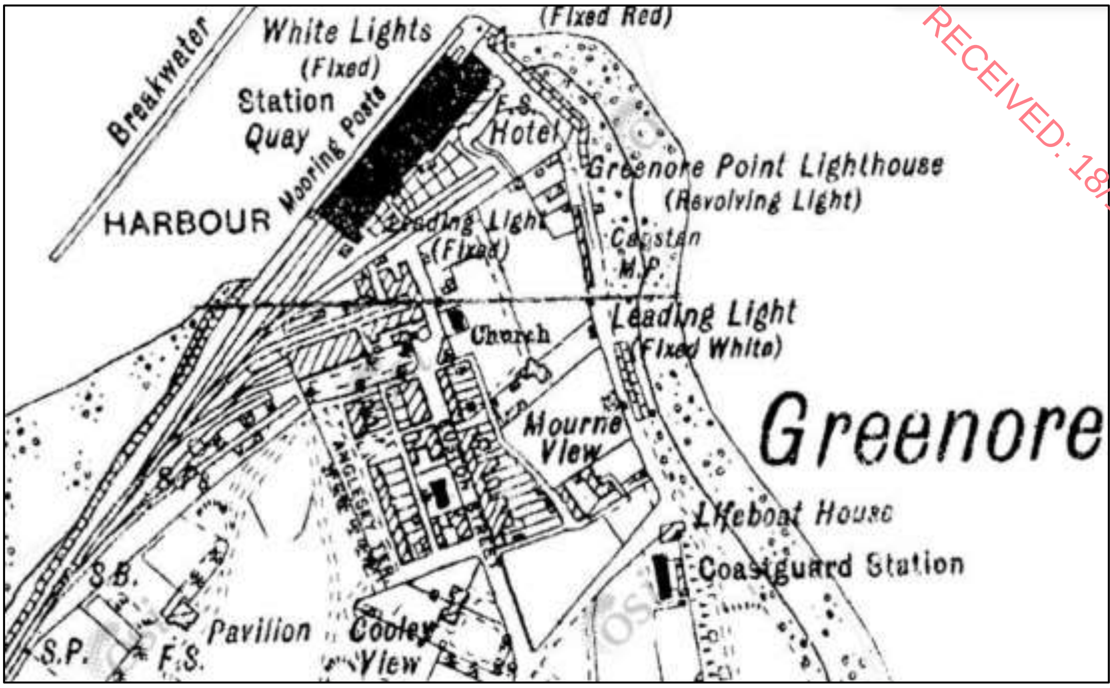


Figure 17.5 Extract from Last Edition 25-inch scale Ordnance Survey map of ca. 1950 showing little change other than the addition of a church close to the port entrance which has long been removed.

17.6.2 Lighthouse & Coastguard Station (1830s)

There was little development at Greenore until a lighthouse (NIAH reg. 13831043) and the keeper's cottage (NIAH reg. 13831044) was constructed in 1830 to the designs of George Halpin Snr. A group of five coastguard houses (NIAH reg. 13831038-42) along with a boathouse were built soon afterwards along the beach to the south with views out to sea from their upper levels but facing towards the new road.

17.6.3 Port & Railway (1870s-)

A new coastal railway planned by the London & North-Western Railway linking Dundalk via Greenore to Newry was commenced in 1863 and was completed by 1876. It was essentially a spur of the Great Northern Railway to serve a new deepwater port sheltered by a breakwater for passenger services from Britain. Land was reclaimed behind new quays walls upon which a - railway station; hotel; cattle pens; cranes; signal box; goods and engine sheds were erected over a short period of development involving a large amount of investment.

This port was constructed by 1867 and served Hewsham and Fleetwood in Lancashire initially, later serving Holyhead on the island of Anglesey in Wales and another service across the Lough to Greencastle. Railway services at the port ceased in 1952, along with ferry traffic, with freight shipping slowly recovering over the following decades.

RECEIVED: 18/10/2024

Figure 17.6 View of former railway hotel, railway station, lighthouse in the early twentieth century (source www.nli.ie)

Figure 17.7 View along Euston Street ca. 1900 prior to the prominent brick chimney being removed (source www.nli.ie)

17.6.4 Greenore Village

Alongside the port and railway station, a purpose-built village was constructed by the London & Northwest Railway to house company staff. James Barton (1826-1913), the railway company engineer was the principal designer of the port. He laid out two streets that were named after popular destinations. The principal is Euston Street (NIAH reg. 13831007-31) which was constructed on axis with the port entrance and named for the London railway station. Consisting of two-storey terraced houses to the east side, there is a mixture of larger terraced houses with the addition of a schoolhouse and a house for the master; the Greenore Co-operative Society & assembly rooms; constabulary barracks; to the west side. Anglesey Terrace runs parallel to the rear (west) of Euston Street, separated by a narrow lane. A terrace of eight modest terraced houses (NIAH reg. 13831033) and a short terrace of larger houses (NIAH reg. 13831034-37) have been joined in recent decades by replica infill dwellings. On the approach to the village, larger houses on expansive gardens were constructed for senior staff (NIAH reg. 13831005-6). A golf course was developed at the port in 1896, overlooked by Arts & Craft houses (known as *The Bungalows*) in 1895 (NIAH reg. 13831001-4), attributed to the designs of railway architect WH Mills (1834-1918).

RECEIVED: 18/10/2024

17.6.5 Later Development

The former railway hotel (NIAH reg. 13831026) faced out over the point, partially screening and forming the entry into the station hall. Both of these structures have been removed, with a length of the western wall of the station left standing in the modern port. Another prominent landmark that was removed from the port was the brickwork chimney that terminated the view along Euston Street. The most prominent survival of the railway is the three-stage limestone and brick water tower (NIAH reg. 13831025). A nearby iron oil tank on a limestone base, now covered by ivy and supporting signage for the port which is not included on the NIAH or included on the Record of Protected Structures. Behind a gate, a section of the former engine room survives to the southwest of the water tower. This wall stands approximately 3m in height and approximately 40m in length. Now freestanding, it is the sole standing survival of built heritage within the site area and is not included on the NIAH survey or the Record of Protected Structures.

Figure 17.8 Recent view along Euston Street towards the port entrance.

RECEIVED: 18/10/2024

Figure 17.9 Recent view of parking area to the south of the water tower and port entrance.

Figure 17.10 View of the historic water tower (NIAH reg. 13831025) with the seafarer's rooms to the south and modern office block to the east.

RECEIVED: 18/10/2024

Figure 17.11 View of the historic water tower (NIAH reg. 13831025) with the seafarer's rooms to the south and modern office block to the east.

Figure 17.12 Recent view of south side of historic oil tank and modern office block at port entrance.

RECEIVED: 18/10/2024

Figure 17.13 Recent view to NE corner of historic oil tank that is not included in the NIAH or RPS.

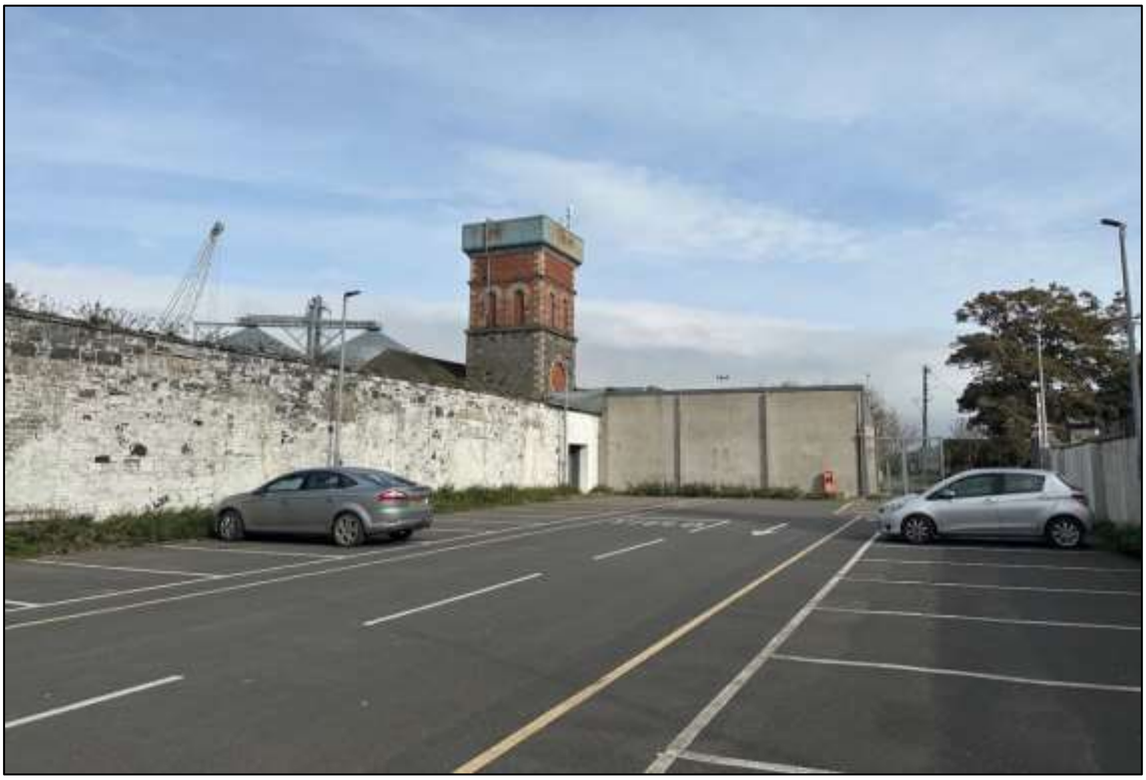


Figure 17.14 View looking eastward along surviving engine room wall towards water tower and seafarers' rooms.

RECEIVED: 18/10/2024

Figure 17.15 View looking towards west end of engine room wall.

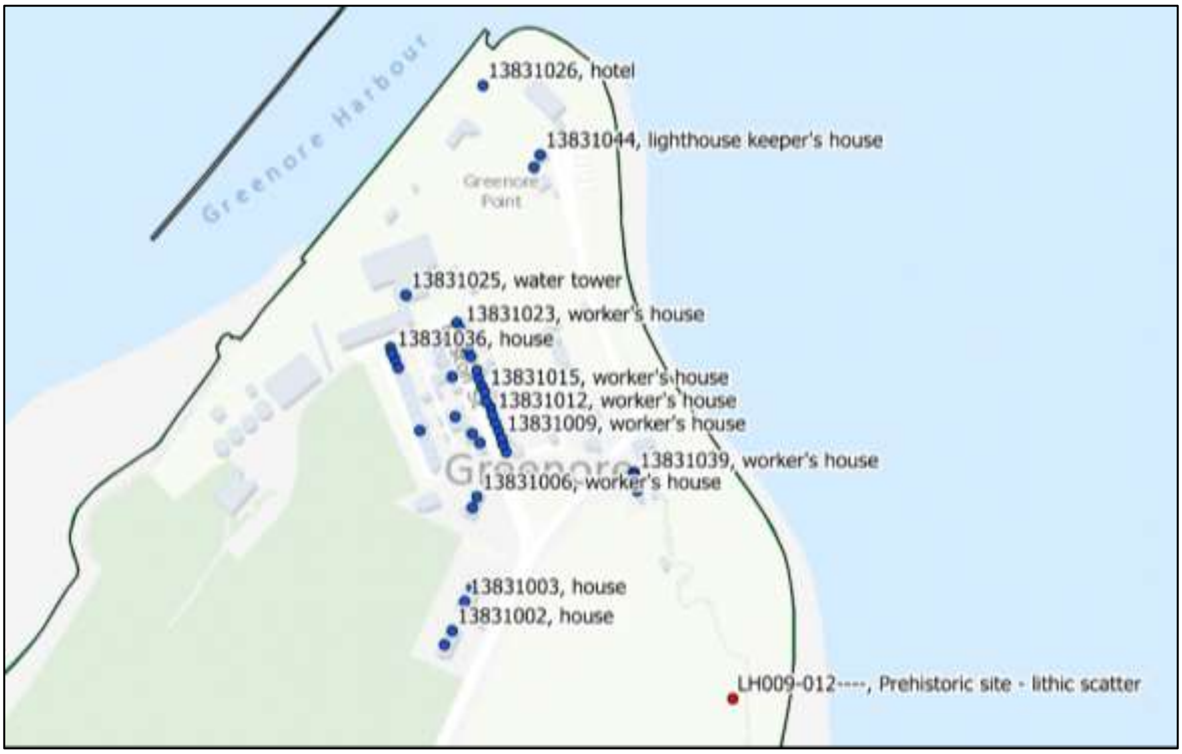


Figure 17.16 Map extract from National Inventory of Architectural Heritage Co Louth Survey (source www.buildingsofireland.ie)

RECEIVED 18/10/2024

17.6.6 Surviving Built Heritage

Greenore village is recognised as one of the most architecturally significant planned industrial villages in the country. It contains fine examples of domestic and civic architecture laid out to a coherent plan in a good state of preservation. Buildings are well-designed and robustly constructed using quality materials such as yellow and red brick dressings and chimneys; squared limestone rubble with fine granite quoins, smooth, ruled ashlar render and slate roofs with carved timber barges, cast iron rainwater goods and terracotta ridges. Brick details and timber joinery representative of this period has survived well to some of the buildings although there are unfortunate examples of where PVC or aluminium has been used as replacements. Historic street surfaces have generally been replaced; cast iron lanterns are modern.

17.6.7 Statutory Protections

The built heritage significance of this village has been recognised in its designation as an Architectural Conservation Area (ACA). Its coastal industrial heritage in the form of the lighthouse, keeper's and coastguard housing has survived but following the cessation of services in the mid-twentieth century, the railway and ferry built heritage has been reduced to isolated fragments. The ACA boundary is limited to the coastguard and lighthouse buildings and the residential and civic buildings of Greenore. Of the former railway and port buildings, only the water tower and nearby oil tank are within the ACA boundary, along with the modern office block placed in front of the goods shed wall in between. Between the two tanks is a two-storey wing containing offices with textured concrete block facing of modest built heritage value. Another similar modern single storey wing to the south of the water tower contains the seafarers' rooms is proposed to be partially demolished to widen the entrance gates.

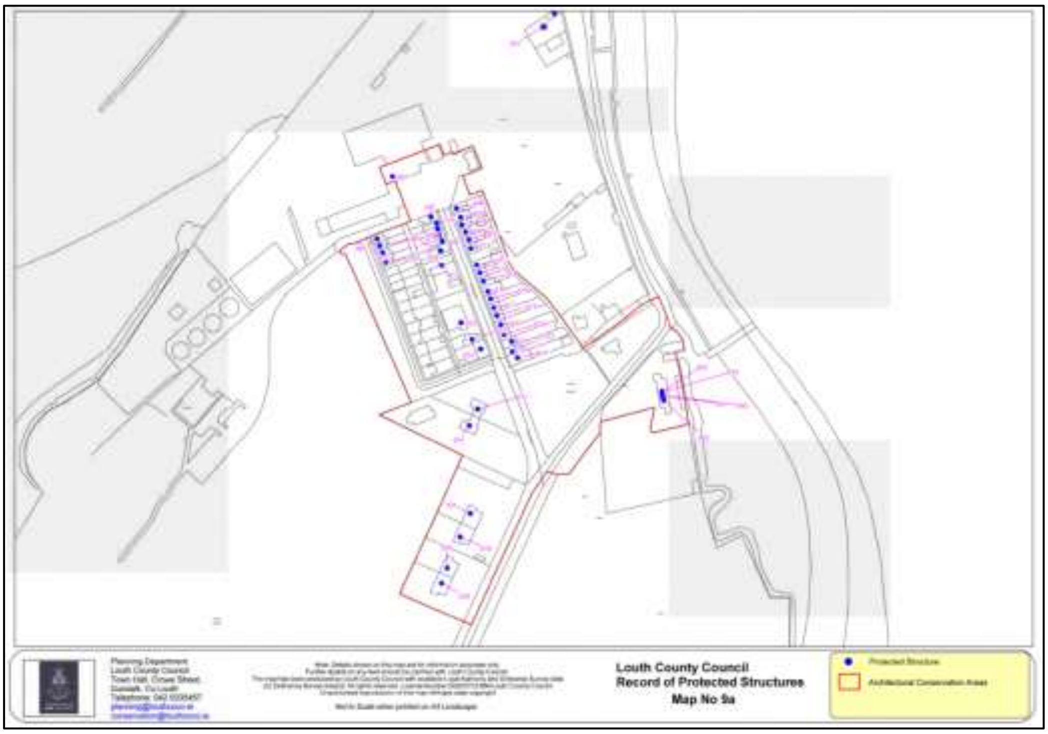


Figure 17.17 Map No9a from Louth County Development Plan showing ACA boundary and protected structures (source www.louthcoco.ie)

The ACA states that - *Greenore is an outstanding example of a purpose-built, English-style industrial village in a coastal setting. The stone and brick terraces of Euston Street, brick schoolhouse, and timber frame bungalows are one of the finest groupings in Ireland.*

RECEIVED: 18/10/2024

Two views are protected in the ACA:

1. *Along Euston Street, north to the Mournes.*
2. *Eastward from the coastguard houses and the seafront.*

Objectives of the ACA are as follows:

1. To preserve the special character of the village and its setting through positive management of changes to the built environment, in particular, by requiring that the height, scale, design and materials of any proposed development within the village and in the surrounding area should complement the character of the village and not diminish its distinctiveness of place.
2. To protect the landscape setting of the village and the views outwards.
3. To preserve the historic street pattern and character of the village, by the retention of buildings and materials as described above, and the retention of existing boundary features, walls, and railings.
4. To require the preservation and reinstatement of traditional details and materials on existing buildings and in the streetscape where improvements or maintenance works are being carried out.
5. To use appropriate materials, street furniture and lighting in any public development of the area.

In the Record of Protected Structures included in the Lough County Development Plan 2021-2027, fifty-five different structures are protected, terraces being included as groups under thirty-one separate entries. Not included are the more modern houses to the south end on Anglesey Terrace that are included on the NIAH Survey, rated as Regional Interest. A historic tank of similar design and materials to the east of the water tank is not included on the NIAH or RPS. There are no protected structures or NIAH sites located within the proposed site area. The station and engine room are now represented by the free-standing brick and limestone wall; the hotel having been demolished. Stores along the seafront have been reduced down to painted boundary walls for extensive yards for stockpiling freight. The half-timbered golf pavilion has been replaced, and the tall brick chimney that once terminated the vista along Euston Street demolished.

17.6.8 Conclusion

Our assessment of the baseline environment is summarised as follows:

Context: Greenore is located on a sandy point at the entrance to Carlingford Lough to the northeast of County Louth.

Character: Greenore is a coastguard station, planned village and port, once serving a railway and passenger ferries, that developed in two main phases in the 1830s and 1870s. Although no longer functioning as a ferry port or railway, it remains a thriving place to live and a busy working port for freight.

RECEIVED: 18/10/2024

Significance: Greenore is one of the most intact and best preserved examples of an industrial planned town in the country, recognised by the number of protected structures and its designation as an Architectural Conservation Area.

Sensitivity: Given the developments in transport and industry over the one hundred and fifty years since the village was constructed, Greenore has suffered losses to its built heritage. While statutory protections are now in place, risks of cumulative losses could be considered to remain, as well as risks to the settings of the historic structures in the village and port.

17.7 The 'Do Nothing' Scenario

If the Proposed Development does not proceed, i.e. the 'do-nothing' scenario, there would be no change to the existing baseline environment. However, Greenore Port has existing permitted developments that might be progressed as follows -

- **LCC Planning Ref 20268, ABP Ref 307862** Extension and modification of existing Warehouse.
- **LCC Planning Ref Planning ref 20543, ABP Ref 310184** New Warehouse

Should the existing permitted proposal for the new warehouse (ref. 20543) be progressed, in this scenario, the former Station Hall and the Engine room walls that are currently freestanding within the port would be demolished.

17.8 Potential Significant Effects

The potential significant effects from the proposals on the built heritage of Greenore are set out below:

Positive Effects: The further development and adaptation of the port to serve wind energy industry should contribute to its further viability and continuity of use as a working port. Enhancement of the public realm to the front of the water tower at the end of Euston Street will improve presentation in this location. The surviving historic walls within the site area are being maintained and are otherwise unaffected by the proposed works. The retention of the Engine Room wall in particular will enhance the historic character of the port area on the approach to the new facilities. The new shore road carpark will be fronted with a new ~~boundary wall constructed to be more sympathetic to the historic character of the wall in front of~~ hedge along the boundary to soften the landscape on the approach to the lighthouse. Additional soft landscaping is being proposed for the public realm at the port entrance at the end of Euston Street.

As demonstrated on Photomontage 04b in the photomontages submitted with this application, the view along Anglesey Terrace towards the Mourne Mountains will be improved by the new development which involves the removal of the existing Open Hydro warehouse.

Neutral Effects: The placement of the new facilities have no direct impacts on the two principal views set out in the ACA, or the curtilages or historic fabric of protected structures in Greenore. The removal of the south end of the modern Port office building, to the south of the water tower (seafarers' rooms) has a neutral effect on the built heritage of Greenore.

RECEIVED: 18/10/2024

Negative/Adverse Effects: Increased traffic from construction could soil or damage historic surfaces of the surviving historic walls, even accidentally should improper or insufficient construction management procedures be put in place. It is proposed that all HGV construction traffic will enter and exit the site via the existing port HGV entrance on Shore Road.

17.8.1 Demolition Phase

Demolition phase effects are moderate. While there are works proposed in the parking area at the end of Euston Street, there are no historic surfaces surviving at this location, and it is only proposed to enhance the setting rather than propose new development. The demolition of four modern buildings within the site area will have no significant effect on the built heritage of Greenore.

17.8.2 Construction Phase

Construction phase effects are moderate and relate to potential increased soiling or accidental damage from construction traffic to and from the port, and to the historic fabric such as the water tower and the surrounding walls while construction is ongoing. It is proposed that all HGV construction traffic will enter and exit the site via the existing HGV port entrance on Shore Road.

17.8.3 Operational Phase

Operational phase effects are slight and relate to potential increased soiling or accidental damage from increased traffic to and from the port. It is proposed that all HGV traffic will enter and exit the site via the existing HGV port entrance on Shore Road. The level of traffic using Euston Street will be comparable to levels when the Open Hydro building was operational up until the end of 2018.

17.8.4 Cumulative Effects

The cumulative impact assessment (CIA) assesses impacts associated with the proposed development together with other permitted, proposed and reasonably foreseeable projects. The projects selected as relevant to the CIA presented within this chapter are based upon the results of a screening exercise that draws on current planning applications; Strategic Infrastructure Developments (SIDs); EPS licence applications; and Local Area Plans. Existing planning permissions within the project site area are not considered because the implementation of the current application will mean that they will not be implemented.

The subject site is located within the functional area of Louth County Council and is governed by the Louth County Development Plan 2021-2027 (LCDP), which was adopted by the members of Louth County Council (LCC) at a Special Council Meeting on 30 September 2021, with the Plan coming into full effect on 11 November 2021.

Overall, the magnitude of the cumulative impact is deemed to be negligible in respect of the built heritage of Greenore.

The additional projects listed in the updated Cumulative Projects List appended to Chapter 1, i.e. the proposed ORE developments in the Irish Sea, were considered, and no additional cumulative effects from these projects were identified.

17.8.5 Summary

RECEIVED: 18/10/2024

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 17.1 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Damage to water tower and surrounding walls	Moderate	Slight	Slight	Moderate	Temporary Reversible	Do Nothing
Damage to protected structures or ACA from construction traffic	Moderate	Slight	Slight	Moderate	Temporary Reversible	Do Nothing

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 17.2 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Accidental damage to soiling	Moderate	Slight-Moderate	Slight	Likely	Temporary Reversible	Do Nothing
Resultant damage to soiling	Moderate	Slight-Moderate	Slight	Likely	Temporary Reversible	Do Nothing

17.9 Mitigation

17.9.1 Incorporated Design Mitigation

The proposed development is largely located outside the ACA boundary, and at a distance from nearby protected structures. Works in front of the port office building are partly within the ACA and adjacent to a Protected Structure – the water tower. Design mitigation has been included within the proposals with the sensitive redevelopment of the public realm at the end of Euston Street and the new entrance to the proposed port facilities. Additional soft landscaping has been incorporated using planters and planting beds.

The proposed new ~~wall~~ hedge to the front boundary of the carpark along the Shore Road ~~will be sympathetic of the historic character of its setting~~ soften the visual appearance on the approach to the lighthouse.

The proposed landscape design has included a mix of native trees and shrubs to form buffers separating rows cars and circulation routes from the wall.

All works will be carried out in line with best practice and to the Architectural Heritage Protection Guidelines for Planning Authorities (2011) and the Advice Series issued by the Department of Arts Heritage and the Gaeltacht.

The rear boundary wall is built of limestone rubble with cock & hen capping, and forms the boundary of the ACA. It is to be conserved by first treating and removing encroaching vegetation. Crude and localised repairs in brick and concrete will then be removed, and then the masonry wall consolidated by infilling voids and gaps with suitable salvaged limestone rubble facing stones, bedded and pointed up using lime mortar.

The existing opening will be retained and improved by removing concrete blockwork and consolidating the piers with limestone rubble. These will be topped with squared limestone capping.

Views protected under the Architectural Conservation Area include north along Euston Street towards the Mourne Mountains and eastwards from the coastguard houses and the seafront. Photomontage images were commissioned from Pivotal Animations from viewing positions at key locations around Greenore looking towards the development, including the protected view along Euston Street. Also included were views along Anglesey Terrace and at the north end of Euston Street looking towards the port entrances. The photomontages demonstrate that views from Greenore ACA are not significantly impacted by the proposed development.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Figure 17.18 Photograph from viewing position 03.

Figure 17.19 Photomontage from viewing position 03 demonstrating that there are no significant visual impacts looking north along Euston Street due to the proposals. (source Pivotal Animations)

RECEIVED: 18/10/2024

Figure 17.20 Photograph from viewing position 04.

Figure 17.21 Photomontage from viewing position 04 demonstrating visual impact looking north along Anglesey Terrace due to the proposals. (source Pivotal Animations)

RECEIVED: 18/10/2024

Figure 17.22 Photograph from viewing position 02.

Figure 17.23 Photomontage from viewing position 02 demonstrating visual impact looking north from the end of Euston Street towards port entrance due to the proposals, revised to show new planting beds and planters. (source Pivotal Animations)

RECEIVED: 18/10/2024

Figure 17.24 Photograph from viewing position 02a

Figure 17.25 Photomontage from viewing position 02a demonstrating visual impact looking west from the north end of Euston Street towards proposed new entrance gate as part of the proposals. (source Pivotal Animations)


RECEIVED: 18/10/2024

Figure 17.26 Photograph from viewing position 04b.

Figure 17.27 Photomontage from viewing position 04b demonstrating visual impact looking northwest from the north end of Anglesey Terrace towards proposals. (source Pivotal Animations)

17.9.2 Demolition Phase Mitigation

RECEIVED: 18/10/2024

No mitigation measures are required as part of demolition works to facilitate the proposed development.

17.9.3 Construction Phase Mitigation

No specific mitigation measures are required for architectural and cultural heritage during the construction phase due to the construction of the proposed development. The Outline Construction and Environmental Management Plan prepared by McCarthy Browne provides the methodology for general protection measures during the construction phase.

17.9.4 Operational Phase Mitigation

No specific mitigation measures are required for architectural and cultural heritage during the operational phase of the proposed development.

17.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

As no mitigation measures are proposed in terms of Built Heritage, the residual impacts on Built Heritage arising from the proposed development will remain as described in Section 17.8.

17.11 Risk of Major Accidents or Disasters

This risk is not relevant to the assessment of the built heritage at Greenore.

17.12 Worst Case Scenario

The worst case scenario is that over time, without proper construction management procedures or routine maintenance into the future leaving it susceptible to damage from weather events or other *force majeure* incidents, the former Engine room wall begins to deteriorate further and over time stone is lost or there is a complete or partial collapse.

17.13 Interactions

This chapter on built heritage interacts most closely with Chapter 16 Cultural Heritage: Archaeology and Chapter 5 Landscape & Visual.

17.14 Monitoring

No post construction monitoring of the Built Heritage of Greenore is proposed.

17.15 Conclusion

RECEIVED: 18/10/2024

The proposed development at Greenore Port has been designed to minimise visual impacts on the nearby historic village of Greenore, an Architectural Conservation Area with numerous protected structures. The continued development of port activities at Greenore requires new and improved facilities over time, maintaining its industrial heritage value. The proposed development retains the surviving historic engine room, and the station hall walls are unaffected, which otherwise have planning approval to be demolished.

17.16 References and Sources

Department of the Arts, Heritage and the Gaeltacht (2011). *Architectural Heritage Protection – Summary of the Guidelines for Planning Authorities.* Dublin: Stationery Office.

Environmental Protection Agency (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports.* Dublin: Stationery Office.

John Cronin & Associates (2019) 'Greenore Port Built Heritage Strategy'. unpublished report

Kharchenko, Y. (2012). *Optimism and Promise: The Dundalk, Newry and Greenore Railway and the Greenore Community, 1873-1951*. Journal of the County Louth Archaeological & Historical Society Vol. 27, No. 4 (2012) 626-648.

Lewis, S. (1837). *A Topographical Dictionary of Ireland, 2 vols*, London.

Louth County Council (2021). *Louth County Development Plan 2021-2027.* Dundalk: Louth County Council.

Online sources

Historic Environment Viewer, DHLGH, accessed 08 December 2023
http://webgis.archaeology.ie/historicenvironment/

Down Survey Maps accessed 08 December 2023, http://downsurvey.tcd.ie/down-survey-
Lawrence Collection (National Library of Ireland) accessed 08 December 2023

http://catalogue.nli.ie/Collection/vtls000313414

National Inventory of Architectural Heritage (NIAH), accessed 08 December 2023

https://www.buildingsofireland.ie/buildings-search/building/13831040/

RECEIVED: 18/10/2024

CHAPTER 18
INTERACTIONS OF THE FOREGOING

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

Table of Figures

No table of figures entries found.

Table of Tables

18 Interactions of the Foregoing

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

18.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights in Table 18.1 (located at the end of this section) those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

This chapter was prepared by Louise O'Leary, BA MRUP, Dip EIA Management, MIPI. Louise an Associate Director with over 18 years' experience in planning and development projects including experience directing and contributing to the preparation of environmental impact assessments for a variety of projects including port lands, infrastructure and commercial i.e.:-

- Waterford North Quays Reg. Ref. 19/928 – a mixed use development of a brownfield site encompassing retail, leisure, office and residential uses. The permitted development included the removal of existing quayside and wharf and the placement of a piled foundation, alongside and within an SAC. This application included an EIAR and a NIS.
- Cherrywood Infrastructure Development – various applications for the development of roads, drainage and public parks on a greenfield site of c. 300 acres. The permitted developments provided critical infrastructure to enable the development of individual plots to proceed in line with the phasing requirements of the approved SDZ Planning Scheme.

18.2 Population & Human Health

During the construction phase, all environmental factors interact with population and human health. The following are the key areas of interaction:

- **Landscape and Visual -** Construction processes, plant and hoarding used during the construction phase may give rise to visual impacts.
- **Material Assets – Traffic & Transport:** Increased construction traffic movements on the local road network during the construction phase may give rise to noise, dust, and road safety impacts.
- **Material Assets – Built Services:** Excavation during the construction phase may give rise to risks to human health as a result of any excavation work in areas where built services exist through coming into contact with live electricity lines or damaging watermains.
- **Noise & Vibration:** There is potential for effects on human health associated with noise during the construction phase which may impact upon amenity.

- **Air Quality:** There is potential for impact on human health from dust associated with construction activities and thus impacting air quality.

RECEIVED: 18/10/2024

The potential impact on human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

During the operational phase, the following are the key areas of interaction with population and human health:

- **Landscape & Visual:** The landscape plan will impact on the quality of the private and public open spaces, which could impact on people's health and well-being.
- **Material Assets: Traffic and Transport:** Traffic flows towards the site has the potential to create safety risks for pedestrians and cyclists**.**
- **Air Quality:** Energy efficient design within the proposed development may give rise to reduced electricity consumption by future tenants, potentially decreasing dependence on fossil fuels for energy generation, resulting in improved air quality. There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.
- **Climate:** Energy efficient design within the proposed development may give rise to reduced electricity consumption by future residents, potentially decreasing dependence on fossil fuels for energy generation, resulting in significant CO_2 savings.

The potential significant impacts on human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

18.3 Landscape & Visual

During the construction and operational phase, the following aspects have potential to interact with landscape and visual:

- **Biodiversity**: The potential for interactions with Biodiversity to occur will largely be beneficial effects as a result of implementing the proposed landscape masterplan, which includes measures to increase the level of beneficial planting across the existing site with a range of species including native species and pollinator rich species in keeping with the All-Ireland Pollinator Plan. Some minor loss of trees includes 6 no. that are required to be removed due to accommodate the Proposed Development plus 1 no. due to poor health. However, new tree coverage will compensate any losses. The proposed mix of planting species to be used and installation of the planting site will include collaborating with the project ecologist to ensure this new landscaping doesn't negatively impact Carlingford Lough SAC and SPA.
- **Material Assets: Traffic & Transport**: The potential for interactions with Traffic & Transport will be indirect effects upon the landscape character and visual amenity as result of changes to existing traffic levels within the immediate surroundings during the demolition, construction, and operational phases. Positive effects are likely to occur with the emphasis through the design which will improve the flow of traffic on Euston Street and around the existing port buildings and OFM buildings. The car park provisions ensures a concentration of

parking within the site so as not to impact on the existing residence parking along the surrounding streets and streetscape character within the ACA. Similarly, the flow of pedestrians from the surface car park at Shore Road to the OMF site and to the small amenity space at the Port office entrance is improved through the dedicated and separated link through the port's lands.

- **Land and Soils:** The potential for interactions with Land and Soils will occur during the demolition and construction phases with movement of material through/off the site and its temporary storage on site. There will be opportunities to reuse the soil lifted from the residential site for the new carpark surface and transport it to those areas of the terrestrial port area, the main site, which are currently hardstanding and lacking the depth and quality of soil needed for the various proposed planting areas, thus helping to reduce the need to import soil from an outside source.

The potential significant effects on landscape and visual arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

18.4 Material Assets: Traffic & Transport

During the construction phase, the following aspects have potential to interact with traffic & transport:

- **Noise & Vibration:** There are interactions between the traffic assessments and the noise & vibration assessments. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site.
- **Air Quality:** With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site.
- **Climate:** There are interactions between the traffic assessments and the noise/vibration and air quality/climate assessments. With increased traffic movements due to construction traffic, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise and air quality environment are assessed by reviewing the change in traffic flows on roads close to the site.

During the operational phase, the following aspects have potential to interact with traffic & transport:

- **Noise & Vibration:** There are interactions between the traffic assessments and the noise & vibration assessments. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site.
- **Air Quality:** Interactions between Air Quality and Traffic (Chapter 6 Material Assets –Traffic and Transport) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the

RECEIVED 18/10/2024

proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site.

- **Climate:** There are interactions between the traffic assessments and the noise/vibration and air quality/climate assessments. With increased traffic movements due to staff travelling to site, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise and air quality environment are assessed by reviewing the change in traffic flows on roads close to the site.

RECEIVED: 18/10/2024

The potential significant effects on traffic and transport arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

18.5 Material Assets: Built Services

During the construction an operational phase, the following aspects have potential to interact with built services:

- **Population and Human Health:** Excavation during the construction phase may give rise to risks to human health as a result of any excavation work in areas where built services exist through coming into contact with live electricity lines or damaging live gas or watermains.
- **Land and Soils:** There are interactions with the land and soils chapter given the proposed infiltration from permeable paving into surrounding soils. Excavations and removal of hardstanding, topsoil and earthworks for the installation of new drainage and utilities may give rise to the erosion of subsoils and subsequent sediment generation.
- **Landscape and Visual:** The proposed permeable paving, substation infrastructure and NZEB plant requirements will have an effect on the visual appearance of the development and are therefore considered in the LVIA.
- **Climate:** The built services have been designed with climate impact in mind including NZEB compliant buildings, SuDS drainage design and landscaping.
- **Water and Hydrology:** There are interactions with the water and hydrology chapter due to the proposed discharge of stormwater to existing outfalls. There will be an increased demand on potable water supply.

The potential significant impacts on built services arising from these interactions have been considered within the relevant discipline, and mitigation measures have been outlined where required. With mitigation measures implemented, no significant permanent residual negative impacts will occur.

18.6 Material Assets: Waste

During the construction phase, the following aspects have potential to interact with material assets: waste:

- **Population & Human Health:** The potential impacts on human beings are in relation to incorrect management of waste during construction, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity.

- **Material Assets: Traffic & Transport:** Local traffic and transport will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction phase of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be *temporary* in duration.
- **Land & Soils:** During the construction phase, dredged material and some of the excavated soil and stone generated from the excavations will largely be removed off-site. If material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.
- **Climate**: Interactions across many areas can be used to minimise the GHG emissions from the construction phase. For instances, waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration.

RECEIVED: 18/10/2024

During the operational phase, the following aspects have potential to interact with material assets: waste:

- **Population & Human Health:** The potential impacts on human beings are in relation to incorrect management of waste during operation, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity.
- **Material Assets: Traffic & Transport:** Local traffic and transport will be impacted by the additional vehicle movements generated by removal of waste from the site during the operational phase of the proposed Development. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movements will be imperceptible in the context of the overall traffic and transportation increase.
- **Climate**: Interactions across many areas can be used to minimise the GHG emissions from the operational phase. For instances, waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration.

The potential significant effects on waste arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

18.7 Land & Soils

During the demolition and construction phase, the following aspects have potential to interact with land and soils:

- **Air Quality:** Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between Air Quality (Chapter 14) and Land and Soils (Chapter 9) in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between Air Quality and Land and Soils.

RECEIVED: 18/10/2024

- **Material Assets: Transport, Built Services and Waste:** Excavated soil and stone will be generated from the excavations required to facilitate site levelling, construction of new foundations and installations of site services. Excavated material will partly need to be removed off-site with the remaining balance being reused on site. There will also be dredging undertaken to facilitate navigable access and suitable berthing. If material has to be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.
- **Water & Hydrology:** Site preparatory works (i.e., site clearance, re-profiling etc.) and dredging during the construction stage have the potential to impact on the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water run-off and accidental spills etc.
- **Biodiversity:** There is potential for silt laden material or pollution to enter nearby surface waterbodies and impact on local biodiversity and European sites downstream from the works. Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

During the operational phase, the following aspects have potential to interact with land and soils:

- **Water & Hydrology:** The operational phase of the proposed development has the potential to interact negatively on groundwater and surface water quality via the proposed surface water network which involves discharging to Carlingford Lough during high tide periods.

The potential significant impacts on land and soils arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

18.8 Water & Hydrology

During the demolition and construction phase, the following aspects have potential to interact with water & hydrology:

- **Land & Soils:** Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to result in increased sediment runoff which has the potential to interact on surface water quality
- **Biodiversity:** Impacts to water quality during the construction phase, such as accidental pollution/spillage events, may give rise to impacts on sensitive aquatic receptors, such as habitats and fauna, that are hydrologically linked to the site.
- **Air Quality:** Demolition of existing infrastructure construction phase activities such as land clearing, excavations, and stockpiling of materials etc. have the potential for interactions between air quality and water and hydrology in the form of dust emissions that may deposit in surface waters.

During the operational phase, the following aspects have the potential to interact with water & hydrology:

- **Material Assets Built Services:** There will be an increased demand on potable water supply and on the municipal drainage systems. The use of SuDS during operations will mean that the development will result in neutral water impacts in the operational phase with regard to runoff rates and flooding risk. As a part of the SuDS features, it is anticipated that small amounts of hydrocarbon sludge waste and debris may be generated in the hydrocarbon interceptors which will treat the surface water run-off.
- **Biodiversity:** There is potential for impacts to biodiversity associated with uncontrolled discharges to surface water (Carlingford Lough). In this instance the existing and proposed surface water system discharges into Carlingford Lough for the O&M Facility Site and is proposed to discharge to ground for the Shore Road Car Park. Therefore, there is a direct hydrological connection to Carlingford Lough and the Natura 2000 sites located therein (Carlingford Shore SAC & Carlingford Lough SPA).

- **Climate:** Climate change has the potential to lead to increased rainfall in future years which may result in flood impacts and interactions between Hydrogeology and Hydrology, and Land, Soils and Geology.

The potential significant effects on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

RECEIVED: 18/10/2024

18.9 Biodiversity

During the construction and operation phase, the following aspects have potential to interact with biodiversity:

- **Land & Soils:** there is overlap with the biodiversity chapter in that the potential impact of the construction works, through excavation, construction etc., have the potential to adversely affect the receiving environment, both geological and ecological. The mitigation measures in both chapters overlap somewhat as they deal with protecting the receiving environment from the construction works e.g., protecting waterbodies from pollution and sedimentation.
- **Water & Hydrology:** Impacts to water quality during the construction phase, such as accidental pollution events, may give rise to impacts on sensitive aquatic receptors, such as habitats and fauna. The mitigation measures proposed in these chapters address the potential for the Construction Phase to impact receiving waterbodies and ecology.
- **Landscape & Visual:** The proposed landscaping of the Site interacts with its biodiversity through the changes that will occur to the existing habitats and flora at the Site. The landscaping proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect its ecology. The Site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.
- **Air Quality:** A series of mitigation measures have been prepared to minimise dust emissions and they are set out in Chapter 14, Air Quality. It is concluded that provided the dust minimisation measures outlined in the plan are adhered to, the predicted residual air quality effects during the construction phase including demolition are direct, short-term, negative, and not significant. Best practice mitigation measures are proposed for the construction phase

of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see Table 14.1). Therefore, the predicted residual, dust-related, human health effect of the construction phase of the proposed development is direct, short-term, negative, and not significant.

RECEIVED: 18/10/2024

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

18.10 Coastal Processes

During the construction phase, the following aspects have potential to interact with coastal processes:

- **Biodiversity:** Given the close vicinity of multiple licensed aquaculture sites within 1.5km of the proposed development, dredging operations have the potential to interact with aquaculture sites. This potential impact is described and assessed in Chapter 12 (Biodiversity).
- **Population & Human Health:** Dredging operations have the potential to interact with population and human health where there is a risk that this activity may give rise to effects on the aquaculture sites and in turn the farmers / businesses operating them.

There are no potential interactions during the operational phase.

The potential significant impacts arising on coastal processes from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

18.11 Noise & Vibration

During the construction and operational phases, the following aspects have potential to interact with noise and vibration:

- **Material Assets: Traffic And Transport**: There are interactions between the noise and vibration assessment and Material Assets: Traffic and Transport assessment in Chapter 6. With increased traffic movements, the noise levels in the surrounding area increase. The impacts of the proposed development on the noise environment are assessed by reviewing the change in traffic flows on roads close to the site.
- **Population & Human Health:** There is potential for interaction with population and human health associated with noise and vibrations generated during the construction phase. To a lesser extent, there is a potential for interaction during the operational phase associated with noise from the use of the surface carpark and the pedestrian path through port lands.

The potential significant impacts on noise and vibration arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

RECEIVED: 18/10/2024

18.12 Air Quality

During the construction phase, the following aspects have potential to interact with air quality:

- **Population and Human Health:** An adverse impact due to air quality in the construction phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits.
- **Traffic and Transportation:** With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site.
- **Land & Soils:** Construction phase activities such as land clearing, excavations, stockpiling of materials etc. may give rise to dust emissions.
- **Biodiversity:** Stripping of topsoil and excavation during the construction phase will remove some vegetation such as trees and scrub, and may give rise to dust emissions.
- **Climate:** Air quality and climate are strongly linked, as the burning of fossil fuels during the construction phase may give rise to air quality effects.

During the operational phase, the following aspects have potential to interact with air quality:

- **Population and Human Health:** There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.
- **Traffic and Transportation:** Possible increases in traffic movements during the operational phase may give rise to increased vehicular emissions.
- **Climate:** Air quality and climate are strongly linked, as the burning of fossil fuels during the operational phase may give rise to both air quality and climate impacts.

The potential significant impacts arising on air quality from these interactions have been considered within the relevant discipline, and mitigation measures have been outlined where required. With mitigation measures implemented, no significant permanent residual negative impacts will occur.

18.13 Climate

During the construction phase, the following aspects have potential to interact with air quality:

- **Air Quality:** Air Quality and Climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts.
- **Material Assets: Waste**: Interactions across many areas can be used to minimise the GHG emissions from the construction phase. For instances, waste management measures will be

put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration.

RECEIVED: 18/10/2024

During the operational phase, the following aspects have potential to interact with air quality:

- **Air Quality:** Air Quality and Climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts.
- **Population and Human Health:** Energy efficient design within the proposed development may give rise to reduced electricity consumption by future residents, potentially decreasing dependence on fossil fuels for energy generation, resulting in significant CO_2 savings.
- **Material Assets: Waste**: Interactions across many areas can be used to minimise the GHG emissions from the operational phase. For instances, waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration.
- **Water & Hydrology:** Climate has the potential to interact with a number of other environmental attributes. The impact of flood risk has been assessed and the surface water drainage network designed to cater for run-off from the building and the surrounding hardscaped areas.

The potential significant impacts arising on climate from these interactions have been considered within the relevant discipline, and mitigation measures have been outlined where required. With mitigation measures implemented, no significant permanent residual negative impacts will occur.

18.14 Cultural Heritage - Archaeological

During the construction phase, the following aspects have the potential to interact with archaeological heritage:

- **Land and Soils:** Site clearance works may impact on sub-surface archaeology.
- **Cultural Heritage: Built Heritage:** This chapter interacts most closely with Chapter 17 Cultural Heritage: Built Heritage.

No potential operational interactions were identified.

The potential significant impacts on archaeology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

18.15 Cultural Heritage - Built Heritage

During the construction phase, the following aspects have the potential to interact with archaeological heritage:

- **Cultural Heritage: Archaeology:** This chapter interacts most closely with Cultural Heritage: Archaeology.

- **Landscape & Visual:** The emergence of construction plant and hoarding to secure the development site would interact with the landscape and visual environment in the short term.

During the operational phase, the following aspects have the potential to interact with built heritage:

- **Landscape and Visual:** Indirect operational phase visual impacts are anticipated on the setting of Greenore ACA and the protected structure in the vicinity of Greenore Port.
- **Population and Human Health:** The proposed development includes public realm improvements to part of the Greenore ACA and the existing port carpark at the top of Euston Street. These works are an improvement to the village and ACA setting. The proposed works will also increase awareness of the value of the ACA designation and the protection of protected structures, NIAH structures and heritage features etc.

The potential significant impacts on built heritage arising from these interactions have been considered within the relevant discipline, and mitigation measures have been outlined where required. With mitigation measures implemented, no significant permanent residual negative impacts will occur.

18.16 Conclusion

As outlined above, the proposed development has the potential to impact on various environmental aspects, with interactions and inter-relationships between these aspects as described above. The EIAR has considered these interactions and inter-relationships throughout the appraisal, firstly through the design and layout of the proposed developments, to avoid impacts where possible, and also in the definition of suitable mitigation measures to minimise the impacts.

No significant likely impacts arising from interactions are identified.

RECEIVED: 18/10/2024

RECEIVED: 18/10/2024

Table 18-1 Interactions with Potential for Significant Impacts Before the Implementation of Mitigation Measures

Interaction	Pop&HH		L&V		MA:T&T		MA:BS		MA:Wst		Land&S		Water&H		BioDiv		CoastalP		Noise&V		AirQual		Climate		CH:Arch		CH:BH	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Population & H. Health			×	×	×	×	✓	×	✓	✓	×	×	×	×	×	×	✓	×	✓	✓	✓	✓	×	✓	×	×	×	✓
Landscape & Visual	✓	✓			×	×	×	✓	×	×	×	×	×	×	✓	✓	×	×	×	×	×	×	×	×	×	×	✓	✓
MA: Traffic & Transport	✓	✓	✓	✓			×	×	✓	✓	✓	×	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×	×	×
MA: Built Services	✓	×	×	×	×	×			×	×	✓	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	×
MA: Waste	×	×	×	×	×	×	×	×			✓	×	×	×	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×
Land & Soils	×	×	✓	×	×	×	✓	✓	✓	×			✓	×	✓	×	×	×	×	×	✓	×	×	×	✓	×	×	×
Water & Hydrology	×	×	×	×	×	×	×	✓	×	×	✓	✓			✓	×	×	×	×	×	×	×	×	✓	×	×	×	×
Biodiversity	×	×	✓	✓	×	×	×	×	×	×	✓	×	✓	✓			✓	×	×	×	✓	×	×	×	×	×	×	×
Coastal Processes	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			×	×	×	×	×	×	×	×	×	×
Noise & Vibration	✓	×	×	×	✓	✓	×	×	×	×	×	×	×	×	×	×	×	×			×	×	×	×	×	×	×	×
Air Quality	✓	✓	×	×	✓	✓	×	×	×	×	✓	×	✓	×	×	×	×	×	×	×			✓	✓	×	×	×	×
Climate	×	✓	×	×	✓	✓	×	✓	✓	✓	×	×	×	✓	×	×	×	×	×	×	✓	✓			×	×	×	×
CH: Archaeology	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			✓	×
CH: Built Heritage	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×		

C - Construction Phase | O - Operational Phase | ✓ - Potential Significant Interaction | × - No Significant Interaction

RECEIVED: 18/10/2024

CHAPTER 19
SUMMARY OF MITIGATION MEASURES

VOLUME II
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

RFI Response October 2024

Table of Contents

RECEIVED: 18/10/2024

Table of Figures

No table of figures entries found.

Table of Tables

19 Summary of Proposed Mitigation and Monitoring Measures

RECEIVED: 18/10/2024

It is noted that for ease of reference all changes from the original chapter are shown in blue. Where text has been removed it is shown as ~~strikethrough~~.

19.1 Introduction

Article 5(1) of the EIA Directive sets out what the developer has to include as a minimum in the EIA Report including mitigation or compensation measures: measures to avoid, prevent or reduce, and offset any identified adverse effects on the environment shall be provided by the developer (Article 5(1)(c) and Annex IV.7).

This chapter summarises the mitigation measures proposed for the construction and operational stage of the proposed development as set out in the preceding assessments contained in Chapters 4 to 17.

All mitigation measures are deemed adopted for the purpose of the Outline Construction and Environmental Management Plan (CEMP) that accompanies this application for permission.

19.2 Incorporated Design Mitigation Measures

The measures outlined in Table 19-1 have been incorporated into the design of the proposed development for the Demolition & Construction and Operational Stage, as appropriate.

Table 19.1 Incorporated Design Mitigation

Aspect	Mitigation
Population & Human Health	▪ The proposed development complies with the Building Regulations, to safeguard users of the buildings and the health of occupants. ▪ The proposed development complies with the requirements of Part M of the Building Regulations and incorporates the principles of universal design so that the development will be readily accessible to all, regardless of age, ability, or disability. ▪ Provision of segregated pedestrian entrance and separation of vehicular traffic. ▪ The inclusion of landscaping elements and a highly accessible layout of the scheme including segregated and safety improved pedestrian walkways will provide for a high quality work place for future employees and the enhancements of the public realm and design of the overall layout will improve the setting of the wider village.
Landscape & Visual	▪ The proposed landscape consists of robust planting species specifically selected to cope with the harsh coastal environment so to minimise the risk of planting failures. ▪ The careful design and placement of building to create new elevations, features and focal points in the views available. While offset from the historic structures within the port so to not impact on their visibility. ▪ The softening of the setting and framing of the elevations with the proposed planting mixes including trees, specimen shrubs and hedgerow to reduce the visual mass of the new building, soften and integrate the development over time from various viewpoints, as identified in the assessment, thereby minimising the visual impacts and generally enhancing the current outlook for many viewpoints.

Table 19.1 Incorporated Design Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ Tree and shrub planting to help break up the carparking areas throughout the site and implementation of suitable SUD planting in the carparks. ▪ The design of the public realm scheme at the end of Euston Street to a high standard and seamless integration of the Port end off Euston Street and surrounding streetscape within Greenore ACA. ▪ The design has considered the movement of vehicles, cyclists and pedestrians within the site and surrounding area and improves upon the existing access to minimise disruption. Proposed pedestrian routes through the site will have strong legibility by using contrasting paving materials. ▪ Integration of the proposed planting with all other proposed services so that these services don't affect the new planting and existing vegetations long term growth and maintenance ▪ The site layout has been designed, for each phase, so that there is adequate levels of parking within the site lands to accommodate employees vehicles of the OMFs and those of the existing Port operations so that no parking will occur within the surrounding streets and minimise disturbance to character of the ACA.
Material Assets: **Traffic & Transport**	▪ The proposed development access is achieved through the existing port office entrance at Euston Street which it is proposed will be modified and enhanced in the interest of increases efficiency of vehicular entry and in the interest of pedestrian safety. ▪ Access to the new car park is provided directly from Shore Road. The location of the proposed new car park will ensure that Shore Road continues to provide an element of orbital function to Euston Street aiding in the distribution of traffic away from the centre of Greenore. ▪ The specific attributes of the scheme design and public realm enhancements at the northern end of Euston Stret contributes to achieving objectives of DMURS and includes well designed pedestrian crossing facilities along the key travel desire lines through the scheme. ▪ The enhancements at the port office entrance and entrance to the OMF buildings was designed with careful consideration for pedestrians and efficient movement of vehicles to and from the port offices and the proposed development. ▪ The proposed works include a segregated footway which will become the future link between Shore Road and the port office and OMF buildings. Internal provision for pedestrians includes for 2.0m segregated facilities on the main access road. ▪ High quality and slip resistant materials will be used in the construction of crossings and gradients at dropped crossings will be sufficiently shallow to allow access for users of all abilities. ▪ Sightlines at the new car park junction on Shore Road are provided in accordance with DMURS from a maximum setback of 2.4m. Roadside features and landscaping is so positioned not to obstruct visibility for drivers approaching or emerging from the Shore Road car park junction.
Material Assets: **Built Services**	▪ All new infrastructure will be designed in accordance with relevant standards and Codes of Practice. ▪ Surface water drainage systems have been designed in accordance with the Louth County Council Development Plan 2021-2027, Greater Dublin Strategic Drainage

Table 19.1 Incorporated Design Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	Study and CIRIA SuDS Manual 2015. This ensures that the surface water discharges are in line with sustainability standards. Specific measures include: ○ The provision of permeable paving ○ Stormwater attenuation tank provision ○ Rainwater harvesting ○ Flow control devices ○ Chemical interceptors ▪ Fuel and chemical storage areas will be double skinned and/or bunded in accordance with best practice. ▪ Wastewater networks have been designed in accordance with current regulations and standards. Efficiencies in water usage will be considered throughout the engineering design of the development. ▪ Buildings will be designed to achieve TGD Part L, NZEB 2002 compliance which incorporates renewable energy technologies and measures to avoid energy losses. These will have a positive effect on the electrical demand of the proposed development.
Material Assets: Waste	▪ The principles of the 'Waste Hierarchy' and 'Circular Economy' have been applied in the design. ○ The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. ○ The circular economy principle aims to keep materials, components, and products in-use in the economy for as long as possible. In circularity, the key objective is to design consumption and production systems to create and retain value. Both principles.
Land & Soils	<u>Waste Water Drainage</u> ▪ A new network of foul sewers will be installed to serve the proposed development, discharging to the existing connections to the foul collection tank located within the application site. The collection tank is an Uisce Eireann asset, and they empty the chamber for off-site disposal to Dundalk Wastewater Treatment Plant (WWTP). <u>Surface Water Drainage</u> ▪ The surface water system proposed to service the development comprises of various drainage components including positive stormwater networks, attenuation systems and several Sustainable Drainage System (SuDS) elements. The proposed surface water drainage is designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), Draft WSD Guidelines and CIRIA SuDS Manual, 2015. The design of the attenuation storage system has been carried out for the 1 in 100-year event with a 20% allowance for climate change. ▪ There are two separate drainage proposals for the proposed development, one for the O&M facility and a separate system for the Shore Road carpark **O&M Facility** ○ There is no discharge to ground proposed as part of the surface water drainage strategy from the O&M site and the existing outfall into Carlingford Lough will

Table 19.1 Incorporated Design Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	be utilised. Therefore there are no effects on the land, soils and geology at the proposed development. ○ There is existing capacity sufficient to cater for the proposed new development. The surface catchment area will increase in comparison with the existing situation, however, for the O&M facility site, as the outfall is directly to sea, full attenuation for a 100 year return storm is not required. This is as per the Greater Dublin Strategic Drainage Study, Section 6.6, Vol.2. Instead, the principal issue is water quality not quantity. ○ A bypass separator will be installed to intercept pollutants such as petroleum and oil before the Surface water outfalls to sea. **Shore Road Car Park** ○ Surface water drainage will discharge by a series of filter drains into an underground stone-filled reservoir attenuation system. This system has been designed using the results of the soakaway tests in accordance with BRE 365, 2016. These results are included in the Engineering Report by CSEA included with this application. ○ It is proposed to limit the surface water discharge to the equivalent Qbar value to 2.13 l/s/ha in compliance with the Greater Dublin Strategic Drainage Study (GDSDS), Water Services Guidelines for Planning Authorities (Draft – 2018) and CIRIA SuDS Manual, 2015. A “Hydrobrake Optimum” (downstream of the attenuation unit) vortex flow control devices to restrict the flows to the amounts calculated. ○ A bypass interceptor will be installed to capture pollutants such as petroleum and oil and prevent their entry to the public drainage system or groundwater or groundwater where an infiltration system is utilised. ○ Surface water will discharge to the public surface water pipe on Shore Road **Storage of Hazardous Material** ▪ A fuel storage facility with a capacity of ≥200,000 liters will be provided in a dedicated area that will be maintained and managed by Greenore Port. This quantity of proposed fuel storage is significantly below the applicable threshold of 2,500 tonnes for petroleum products and alternative fuels detailed in Part 2 of Schedule 1 of the Control of Major Accident Hazards (COMAH) Regulations 2015. ▪ In addition to this the tanks will be bunded or double skinned so in the event of a spill no discharge to ground will occur. ▪ Surface water will be drained from this area into the proposed network with petrol interceptors included to ensure no hydrocarbon contamination exits the site through the surface water drainage system.
Water & Hydrology	**Surface Water Drainage** ▪ Storing surface water during high tides to limit discharge rates at the outfall to the sea. ▪ Tide locking the outfall during extreme high tide events, with a closure period of up to 6 hours. ▪ Assuming no outfall rate during the entire 6 hours of tide lock in the worst-case scenario.

Table 19.1 Incorporated Design Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ Draining roofs, yards, internal roads, and parking areas through a sealed drainage system, collected and conveyed through stormwater pipes before discharging into an underground attenuation tank. ▪ Draining car parks, parking bays, and access roads through permeable paving and supplementary gully system, with surface water pipework discharging into a Stormtech Attenuation system. ▪ Introducing stormwater manholes at appropriate spacing distances for maintenance purposes (no greater than 90m). ▪ Draining the satellite car park catchment area through proposed filter drains, collecting surface water runoff from impermeable vehicular aisles and discharging into a stone-filled attenuation system. ▪ Using stormwater drainage network pipework with diameters ranging from 225mm to 450mm, depending on flow capacity. ▪ Ensuring the proposed surface water network can handle up to a 30-year critical storm event plus a 20% climate change allowance without causing flooding. ▪ The proposed surface water drainage system designed for this development also includes a number of Sustainable Urban Drainage Systems (SuDS) measures such as permeable paving/ grasscrete, filter drains and attenuation systems. These measures will be incorporated to reduce run-off volumes and improve run-off water quality. The design of the attenuation storage system has been carried out for the 1 in 100-year event with a 20% allowance for climate change. The design of the 2 no. attenuation systems has been completed as follows: o Underground Arch-Type Attenuation Storage: The attenuation storage systems shall comprise of underground Arch-type storage units, i.e., stormtech systems or similar approved. Its final discharge destination will be Irish Sea through by-pass petrol separators. o Underground Stone-Fill Reservoir Attenuation System: Surface water drainage from the Satellite Car Park shall discharged into an underground stone-fill reservoir designed using the results of soakaway tests in accordance with BRE 365, 2016. Its final discharge destination will be the 100mm diameter pipe along Shore Road. ▪ The catchment at the Shore Road carpark will be connected to the public Louth County Council surface water collection on the public road. It is proposed to limit the surface water discharge from the Shore Road carpark catchment zone of the development to the equivalent Qbar value to 2.13 l/s/ha in compliance with the Greater Dublin Strategic Drainage Study (GDSDS), Water Services Guidelines for Planning Authorities Draft (2018) and CIRIA SuDS Manual, 2015. It is proposed to use a "Hydrobrake Optimum" (downstream of each attenuation unit) vortex flow control devices to restrict the flows to the amounts calculated. **Foul WasteWater Drainage** ▪ A new network of foul sewers will be installed to serve the proposed development, discharging to the existing collection tank. There will be no direct or indirect foul water discharge into Carlingford Lough. **Potential Impacts on Water Framework Directive Status** ▪ A fuel store with a capacity of ≥200,000 litres will be provided in a dedicated area that will be maintained and managed by Greenore Port. The overall volume will be stored in 1-2 bunded tanks and located in a secure area of the site to avoid accidental

RECEIVED: 18/10/2024

Table 19.1 Incorporated Design Mitigation

Aspect	Mitigation
	impact. The tanks will be fitted with overfill prevention, bund alarm and automatic shut off valves to mitigate risk of spills. ▪ Surface water will be drained from this area into the proposed network with petrol interceptors included. ▪ The proposed stormwater drainage network design includes sustainable drainage systems (SuDS) these measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the Carlingford Lough ▪ It is proposed to separate the surface water and foul drainage networks, which will serve the proposed development, and provide independent connections to the local public surface water and foul sewer networks respectively. ▪ The surface water discharges from the site are indirect, and will be adequately attenuated via SuDS measures, hydro-brake (or equivalent) and oil/water separator ensure there is no long-term negative impact to the WFD water quality status of the (Carlingford Lough) and (Dundalk GWB).
Biodiversity	▪ The design integrates enhancement measures for swifts in the form of 10 swift boxes per OMF building, for a total of 30 boxes. ▪ The landscape design is carefully considered to ensure that all species are capable of thriving within this coastal setting. Native species are included together with pollinators as advised by the All Ireland Pollinator Plan.
Coastal Processes	None
Noise & Vibration	None
Air Quality	None
Climate	Construction Phase ▪ Some excavated material, bricks, tiles and ceramics, metals and timber and will be diverted from waste processing by recycling or disposal in landfill, and will instead be reused on-site. This will reduce the associated CO_2 by approximately 32.6 tonnes
Cultural Heritage - Archaeology	▪ Project design to avoid impacts on known archaeological features where possible.
Cultural Heritage – Built Heritage	▪ Works in front of the port office building are partly within the ACA and adjacent to a Protected Structure – the Watertower. Design mitigation has been included within the proposals with the sensitive redevelopment of the public realm at the end of Euston Street and the new entrance to the proposed port facilities. ▪ ~~The proposed new wall to the carpark along the Shore Road will be sympathetic of the historic character of its setting.~~ ▪ The proposed new hedge to the front boundary of the carpark along the Shore Road will soften the visual appearance on the approach to the lighthouse.

19.3 Mitigation Measures

RECEIVED: 18/10/2024

The recommended mitigation measures for the Demolition & Construction and Operational Stages are summarised in Tables 19-2 and 19-3 below.

Table 19.2 Demolition & Construction Mitigation

Aspect	Mitigation
Population & Human Health	▪ **Construction and Environmental Management Plan (CEMP)**: The appointed contractor(s) will update the Outline CEMP submitted with the application and submit to Louth County Council prior to the commencement of development. ○ The CEMP will comply with all appropriate legal and best practice guidance for construction sites. ○ The purpose of a CEMP is to provide a mechanism for the implementation of the various mitigation measures which are described in this EIAR and to incorporate relevant conditions attached to a grant of permission. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority. ○ All construction personnel will be required to understand and implement the requirements of the Contractor's CEMP and shall be required to comply with all legal requirements and best practice guidance for construction sites. ○ All mitigation and monitoring measures included in the Summary of Mitigation and Monitoring Measures in Chapter 19 of this EIAR will be included in the CEMP and adhered to. ▪ **Community Liaison Officer**: The contractor will appoint a liaison officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the contractor's CEMP. ▪ **Construction Working Hours**, except for dredging and pile driving works, will generally be limited to the hours 0700 – 2000 Monday to Friday and 0700 – 1600 hours on Saturday. Some works have to be undertaken at low tide and their construction hours will be linked to tides (for example works associated with the pontoon construction and quay wall). ○ Pile driving works will be limited to 0800-1800 Monday to Friday and 0800 - 1600 hours on Saturday. It is not envisaged that works will take place on public holidays. ○ Dredging, due to the nature of the activity, is undertaken on a 24 hour basis to achieve the maximum production rates within tidal envelopes Dredging activities will occur for approximately 8-10 weeks. ○ If works are required outside of these hours, in exceptional circumstances, the planning authority will be notified in advance ▪ Project supervisors for the construction phase (PSCS) will be appointed in accordance with the Health, Safety and Welfare at Work (Construction Regulations) 2013, and a Preliminary Health and Safety Plan will be formulated during the detailed design stage which will address health and safety issues from the design stages, through to the completion of the construction phase. ▪ The Resource Waste Management Plan (RWMP) will be updated by the Contractor, as necessary, as per mitigation outlined in Chapter 8.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ **Aquaculture Protection:** All suitable and appropriate mitigation measures included in Table 4 of the Risk Assessment for Shellfish Aquaculture, given below, are recommended to be deployed during the dredging works and included in the Contractor(s) CEMP. Dredging: local resuspension of sediments and increased sedimentation rates on intertidal / subtidal foreshore ▪ Planning of excavation to avail of minimal tidal dispersion effects ▪ Use of closing backhoe bucket, in areas of soft sediment, to minimise spillage ▪ Avoidance of side-casting of excavate prior to barge loading ▪ Deployment of turbidity monitoring and recording buoys with automated real time alarms ▪ Deployment of buoy mounted oxygen monitoring and recording sensors with automated real time alarms ▪ Aerial monitoring of sediment dispersion/dredging plume conducted by drone surveillance once per week on peak flood and ebb when dredging. ▪ Management of unloading/transhipment to avoid spillage ▪ All suitable and appropriate mitigations to be included in the **Construction Environmental Management Plan** Dredging: Transport of sediments, particularly of finer fractions, and release of contaminants to other areas, resulting in an increase in contaminant levels, most notably TBT/DBT ▪ Use of closing backhoe bucket, in areas of soft sediment, to minimise spillage ▪ Planning of excavation to avail of minimal tidal dispersion effects ▪ Avoidance of side-casting of excavate prior to barge loading ▪ Deployment of turbidity monitoring and recording buoys with automated real time alarms ▪ Aerial monitoring of sediment dispersion/dredging plume conducted by drone surveillance once per week on peak flood and ebb when dredging. ▪ Management of unloading/transhipment to avoid spillage ▪ All suitable and appropriate mitigations to be included in the **Construction Environmental Management Plan** Dredging: release of nutrients, consumption of oxygen resulting in reduced oxygen saturation of the water body ▪ Planning of excavation to avail of minimal tidal dispersion effects ▪ Use of closing backhoe bucket, in areas of soft sediment, to minimise spillage ▪ Avoidance of side-casting of excavate prior to barge loading ▪ Deployment of turbidity monitoring and recording buoys with automated real time alarms ▪ Deployment of buoy mounted oxygen monitoring and recording sensors with automated real time alarms ▪ Aerial monitoring of sediment dispersion/dredging plume conducted by drone surveillance once per week on peak flood and ebb when dredging. ▪ Management of unloading/transhipment to avoid spillage ▪ All suitable and appropriate mitigations to be included in the **Construction Environmental Management Plan**

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	<u>Dredging and installation of quay wall extension and floating pontoons: contamination/pollution of water body by hydrocarbons/liquid contaminants</u> ▪ Prepare protocol for the management of hydrocarbons and cement. ▪ For cement, specifically this should detail measures to: o Assess where any wastewater associated with the use of cement will run and the most appropriate way to dispose of it. o Ensure that appropriate measures are in place to avoid the potential for the run-off of cement into the marine area. Further ensure there is no potential for the run-off of cement into stormwater drains or that drains and gutters in the vicinity have been blocked off. o Use spill mats to contain any spills o Use sandbags or diversion booms to direct the any run-off to an appropriate safe location away from marine areas. o Set up a designated Washdown Area away from marine areas or with potential to run-off to it. o Ensure proper management in the event of an accidental spill. ▪ For hydrocarbons, mitigations should require: o All hydrocarbons to be stored in bunded containers at least 20m away from marine areas. o All plant and machinery and vessels should be regularly checked for leaks (fuel, oil and coolant). o Drip trays will be used underneath any mobile plant and drums whilst in use on site. o All machinery and vessels to have an on-board spill kit. o A hydrocarbon oil boom to be available at all times onsite in the event of it needing to be deployed. o If required, generators to be on a hydrocarbon mat at all times
Landscape & Visual	▪ Appropriate site management measures as contained within the site's Construction and Environmental Management Report will when implemented help keep potential temporary disturbance to landscape and visual receptors to a minimum. These measures will include: the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, agreed working hours, etc. ▪ The construction traffic route has been designed so that site traffic/deliveries will run via Shore Road to ensure minimal disturbance to residences within the core of the village during the works. ▪ Visual impact during the construction phase will be mitigated through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish. Any temporary lighting will be directed down and away from the residences and will only be switched on only when necessary to ensure works can be safely carried out. ▪ The retained trees along the boundaries will be protected by installation of fencing in accordance with BS5837:2012: Trees in Relation to Construction around the root protection areas (RPAs) as per the arborists Arboricultural Impact Assessment (AIA) report. ▪ Site hoarding, where necessary, will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate
Material Assets: **Traffic & Transport**	▪ A Construction Traffic Management Plan will be prepared by the appointed contractor(s), including measures to provide information to affected parties, including

RECEIVED: 18/10/2024

Table 19.2 Demolition & Construction Mitigation

Aspect	Mitigation
	advising land and property owners in advance of any diversions. Local access shall be maintained at all times. In addition, it is proposed that temporary signage shall be put in place to minimise disruption and ensure all road users understand that construction works are in progress. ▪ 'Construction Environmental Management Plan'(CEMP) shall include details on working hours, , construction traffic including deliveries, parking arrangements and incorporate the mitigation measures outlined here. ▪ All HGV vehicle movements will be restricted to the Main Port Entrance on Shore Road.
Material Assets: Built Services	▪ A site-specific Construction and Environmental Management Plan will be enacted by the Contractor. ▪ Pre-construction consultation and authorisation will be achieved for all the relevant infrastructure connections. ▪ Any works required to material assets on or around the Site will be carried out in conjunction with the relevant provider to ensure minimal disruption to the existing users. ▪ Any works required to material assets on or around the Site will be carried out strictly in accordance with the relevant provider's Code of Practices
Material Assets: Waste	▪ Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 8.1) in agreement with LCC and in compliance with any planning conditions, or submit an addendum to the RWMP to LCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream. ▪ The Contractor will implement the RWMP throughout the duration of the proposed demolition phase and should treat the document as outlined in the guidance as a live document. <u>Demolition</u> ▪ On-site segregation of waste materials will be carried out where practicable. The following waste types will always be segregated: o Glass o Concrete, Bricks, Tiles, Ceramics o Plasterboard o Asphalts o Metals and o Timber ▪ Any suitable demolition materials to be re-used on-site, where possible; ▪ All waste materials will be stored in skips or other suitable receptacles in designated areas of the site; ▪ Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, and oils) will be segregated and will be stored in appropriate receptacles (double-skinned, if required). ▪ A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition works; ▪ All staff will be provided with training regarding the waste management procedures; ▪ All waste receptacles leaving the site will be covered or enclosed.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation

	▪ All waste requiring off-site management will be reused, recycled, recovered or disposed of at a facility with the appropriate registration, permit or licence.
	▪ All waste leaving the site will be directed for reuse, recycling or recovery, where possible, to limit the volume of material designated for disposal.
	▪ All waste leaving the site will be recorded, and the main Contractor will maintain copies of relevant documentation.
	<u>Construction</u>
	▪ Building materials will be chosen to 'design out waste';
	▪ Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
	▪ All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
	▪ Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
	▪ A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
	▪ All construction staff will be provided with training regarding the waste management procedures;
	▪ All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
	▪ All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
	▪ All waste leaving the site will be recorded and copies of relevant documentation maintained.
	▪ The project design team have estimated that approx. 2,960 m^3 of excavated soils and approx. 45,000m^3 of soft dredged material will be removed offsite. The material will be correctly classified and segregated (where necessary) to ensure that any potentially contaminated materials are identified and disposed of in an appropriate manner at a suitably licenced facility.
	  ○ Where excavated materials meet the definition of By-Product, they will be notified to the EPA as such, using the Article 27 process.
	  ○ The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean, inert material may be used as fill material in other construction projects or engineering fill for waste-licensed sites.
	  ○ If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Act 1996* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended.
	  ○ Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	○ In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately from any non-hazardous material. It will be treated off-site at a suitably licenced facility or disposed of abroad via Transfrontier Shipment of Wastes (TFS). ▪ While it is not envisaged that bedrock will be encountered in the dredge if it is encountered, any volume would be small. A nominal value of approx. 1,000m^3 has been considered. If bedrock is to be crushed onsite, the appropriate mobile waste facility permit will be obtained from Louth County Council. ▪ Silt and petrochemical interception will be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite. ▪ C&D waste, which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboard, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the main contractor's waste team to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle. ▪ If any asbestos or ACMs are found onsite, they will be removed by a suitably competent contractor and disposed of as asbestos waste before the demolition works begin. All asbestos removal or encapsulation work must be carried out per *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* ▪ On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately. ▪ It is currently not envisaged that the crushing of waste materials will occur onsite, however if the crushing of material is to be undertaken a mobile waste facility permit will first be obtained from LCC and the destination of the excepting waste facility or if an application under regulation 28 will be made using National End-of-Waste Decision EoW-N001/2023, will be supplied to the LCC waste unit. ▪ Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arising on site. ▪ All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM. ▪ All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RM will maintain a copy of all waste collection permits on-site.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project RM. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records. ▪ Building materials will be chosen to 'design out waste'. ▪ Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required. ▪ During the construction phase the project Construction Environmental Management Plan (CEMP) will be followed in regard to implementing and managing all environmental management requirements. o This CEMP explains the construction techniques and methodologies which will be implemented during the construction of the proposed development. o The CEMP mitigation measures will be implemented to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection. ▪ The CEMP will be implemented and adhered to by the C&D contractors and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, RM and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures
Land, Soils & Geology	<u>Construction Phase</u> • The Outline CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures. ▪ The Outline CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site. All mitigation measures outlined here, and within the Outline CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to consent conditions which may be imposed ▪ An emergency response plan will be developed by the construction contractor. This plan will outline a well-defined procedure for effectively managing emergencies as they arise. Furthermore, it's imperative to disseminate this emergency protocol to all site personnel during the site induction process. This plan will include for events such as: o Pollution incidents: These may involve spillages, the malfunction of temporary structures, embankment collapse, acts of vandalism, fires, and other related events. o Extreme weather occurrences: Events such as heavy rainfall, flooding, are important factors to consider due to their potential impact on the construction process.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation

	▪ The Contractor will be required to implement emergency response procedures that align with industry best practice guidance. All personnel working on the site will be informed of the emergency measures in place.
	Soil Excavation, Removal and Infill
	▪ Excavated soils and stones that are in excess of the requirements for reuse within the proposed development site will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.
	▪ Excavated soft dredge arisings will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.
	▪ The effects of soil stripping and stockpiling will be mitigated through the implementation of an earthworks handling protocol by the Contractor.
	▪ Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment is free of nuisance dust and dirt on roads.
	▪ A suitably qualified person will carefully monitor excavation works at the location to identify and segregate any potentially contaminated soil from clean/inert soil. In the unlikely event that any potentially contaminated soils are encountered, the soil will be tested and classified as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication, HazWasteOnline tool or similar approved method. The material will then need to be classified as inert, non-hazardous, stable non-reactive hazardous or hazardous in accordance with *EC Decision 2003/33/EC*. It will then be removed from the site by a suitably permitted waste contractor to an authorised waste facility.
	Sources of Engineering Fill and Aggregates
	▪ All imported fill and aggregate that may be required for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for:
	  o Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
	  o Environmental Management status; and
	  o Regulatory and Legal Compliance status of the Company
	Fuel and Chemical Handling
	▪ Designation of a bunded refuelling areas on the site if refuelling cannot be undertaken off site;
	▪ Provision of spill kit facilities across the site;
	▪ Where mobile fuel bowsers are used the following measures will be taken:
	  o Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.
	  o The pump or valve will be fitted with a lock and will be secured when not in use.
	  o All browsers are to carry a spill kit.
	  o Operatives must have spill response training.
	  o Drip trays will be used on any required mobile fuel units.
	▪ In the case of drummed fuel or other potentially polluting substances which may be used during construction, the following measures will be adopted:

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	○ Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area; ○ Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage; ○ All drums to be quality approved and manufactured to a recognised standard; ○ If drums are to be moved around the site, they will be secured and on spill pallets; and ○ Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment. ▪ All contractors will be required to implement mitigation measures discussed above. ▪ All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed by the contractor prior to works being carried out which will include measures to prevent discharge of alkaline waste waters or contaminated storm water to the underlying subsoil. Wash-down and washout of concrete transporting vehicles will take place at a designated wash out point on site. <u>Environmental Procedures</u> ▪ There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage of all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.
Water & Hydrology	<u>Demolition Phase</u> None <u>Construction Phase</u> ▪ The Outline CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures. ▪ The Outline CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site. All mitigation measures outlined here, and within the Outline CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to consent conditions which may be imposed ▪ An emergency response plan will be developed by the construction contractor. This plan will outline a well-defined procedure for effectively managing emergencies as they arise. Furthermore, it's imperative to disseminate this emergency protocol to all site personnel during the site induction process. This plan will include for events such as: ○ Pollution incidents: These may involve spillages, the malfunction of temporary structures, embankment collapse, acts of vandalism, fires, and other related events. ○ Extreme weather occurrences: Events such as heavy rainfall, flooding, are important factors to consider due to their potential impact on the construction process.

RECEIVED: 18/10/2024

Table 19.2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the site will be informed of the emergency measures in place. **Surface Water Run-Off** ▪ Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. ▪ Should any discharge of construction water be required during the construction phase, discharge will be to the surface water network. Therefore there will be interaction between silt laden construction water and surface water quality combined with Pre-treatment and silt reduction measures on site and hydrocarbon interceptors. All refuelling will be carried out at adequate distances away from waterbodies from doubled skinned bowsers and spill kits will be available at all times. ▪ Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction. It is estimated that the inflow rate of groundwater will be low and limited to localised perched water. It is therefore proposed that the water be discharged via the existing stormwater sewer network. The use of slit traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to the sewer. There shall be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept relatively dry, however this is expected to be low due to the low permeability of the subsoils and the relatively shallow nature for excavations. Likewise, infiltration to the underlying aquifer is not anticipated (Refer to Chapter 9 (Land, Soils, Geology and Hydrogeology) for further details). ▪ Run-off water containing silt will be contained on-site via settlement tanks/lagoons and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds). ▪ The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted and/or backbucketed to reduce runoff and graded to aid in runoff collection. This will prevent any potential negative impact on the stormwater drainage and the material will be stored away from any surface water drains. Movement of material will be minimised to reduce the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Soil from works will be stored away from existing drainage features to remove any potential impact. ▪ Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site and the suitable distance of topsoil piles from surface water drains will be maintained. **Fuel and Chemical Handling** ▪ The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts: o Designation of a bunded refuelling areas on the site; o Provision of spill kit facilities across the site;

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	○ Where mobile fuel bowsers are used the following measures will be taken: Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use. The pump or valve will be fitted with a lock and will be secured when not in use. All bowsers to carry a spill kit. Operatives must have spill response training. Bowsers to be double skinned. ▪ In the case of drummed fuel or other potentially polluting substances which may be used during construction, the following measures will be adopted: ○ Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area; ○ Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage; ○ All drums to be quality approved and manufactured to a recognised standard; ○ If drums are to be moved around the site, they will be secured and on spill pallets; and ○ Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment. **Cement/Concrete Works** ▪ Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. ▪ No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Uisce Éireann. ▪ The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures. **Soil Removal and Compaction** ▪ Excavated soil and stone surplus to requirements on-site will be taken for appropriate offsite reuse, recovery, recycling and/or disposal. ▪ Dredge material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal. ▪ Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. The material will be stored away from any surface water drains and surface waterbodies (Carlingford Lough). Movement of material will be minimised to reduce degradation of soil structure and generation of dust. ▪ All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor. **Environmental Procedures**

RECEIVED: 18/10/2024

Table 19.2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures
Biodiversity	**Mitigation Measure No. 1** Where feasible, the timing of the clearing of the vegetation within the 'Residential Site' will avoid the bird breeding season (March-August inclusive). Where the construction programme does not allow this seasonal restriction to be observed, a pre-clearance check of that area of the proposed development site for nests will be carried out by a suitably qualified ecologist in advance of commencing the clearance. Where it can be confirmed that no nesting birds are present, the clearance will commence. Where breeding birds are confirmed to be present, the clearance must not commence until it can be confirmed that the chicks have fledged. **Mitigation Measure No. 2** Prior to any works commencing the Outline Construction Environment Management Plan (OCEMP) included with this application will be reviewed and updated by the Contractor to become the Construction Environment Management Plan (CEMP) . It will, *inter alia*, include all of the mitigation measures detailed in this section. The CEMP will be reviewed by a qualified ecologist to ensure it meets the requirements of this chapter and the Natura Impact Statement. The CEMP will include details of the following: ▪ Details of all chemical/fuel storage areas (including location and bunding to contain run-off of spillages and leakages). ▪ Details of how and where hazardous wastes such as oils, diesel and other hydrocarbon or other chemical waste are to be stored and disposed of in a suitable manner. ▪ Details of emergency plan to deal with the containment of chemical spillage, cement spillage. ▪ Truck wheel wash details (including measures to avoid and treat runoff). ▪ Site run-off management, including details of appropriate containment measures to be put in place at the quayside to prevent contamination of the lough. ▪ A Waste Management Plan (WMP) which clearly sets out the Contractor's proposals regarding the treatment, storage and disposal of waste. ▪ In addition, the CEMP will detail the relevant person with overall responsibility for the implementation for the CEMP. **Mitigation Measure No. 3** Care will be taken at all times to avoid contamination of the environment with cementitious material. Such measures will be detailed in the CEMP. Specifically, this should detail measures to: ▪ Assess where any wastewater associated with the use of cement will run and the most appropriate way to dispose of it. ▪ Ensure that an appropriate area of the site, at least 50m from the marine area, is designated for concrete washout. Further, ensure this area is away from

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	stormwater drains or that drains and gutters in the vicinity have been blocked off. ▪ Use spill mats to contain any spills. ▪ Use sandbags or diversion booms to direct any run-off to an appropriate safe location away from marine areas. ▪ Ensure proper management in the event of an accidental spill. **Mitigation Measure No. 4** The assessment of impacts indicated that the accidental spillage of hydrocarbons had the potential to lead to a localised significant impact on the receiving environment. Therefore, the following mitigation will be implemented during the construction phase to avoid the possibility of accidental spillage of any hydrocarbons associated with the use of plant, machinery or inshore vessels (if used). The proper use and storage of oils and fuels as set out below will be implemented by the appointed contractor. ▪ A designated area within the site compound will be established for the storage of plant, machinery and materials during the construction phase of the project. The site compound will be suitably located with due regard for the receiving environment and in particular the sensitive receiving waters. ▪ Where feasible plant and machinery will be refuelled at a dedicated refuelling area within the site compound with appropriate spill controls in place. ▪ All plant and machinery will be regularly checked for leaks. ▪ Any hydrocarbons used on the project site will be contained within a bunded container or area. ▪ A hydrocarbon oil boom to be available at all times onsite in the event of it needing to be deployed. ▪ If required, generators to be on a hydrocarbon mat at all times. OR appropriately self binned ▪ Spill kits to deal with any accidental spillage of hydrocarbons will be available at the project site. ▪ The roles and responsibilities of construction and associated staff regarding the protection of the receiving environment will be clearly set out and documented. **Mitigation Measure No. 5** The assessment of impacts indicated the potential for the introduction of IAS associated with plant and small vessels working in the intertidal and subtidal areas. Therefore, the following mitigation will be implemented by the developer: Boats, barges and marine equipment working in the intertidal and nearshore area will be free of fouling by the use of appropriate application of antifouling paints and/or washdowns for smaller boats and plant. All visible hitchhikers will be removed from any tracked plant and equipment entering the intertidal area. **Mitigation Measure No. 6** Where feasible, any pile driving element of the marine piling works will not take place between the 20th of May and the 30th of June. Where the construction programme does not allow this seasonal restriction to be observed, a pre-construction check of the

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	breakwater for nesting black guillemot will be carried out by a suitably qualified ecologist in advance of commencing the pile driving works. Where it can be confirmed that no nesting birds are present, the pile driving will commence. Where birds are confirmed to be present, the pile driving works must not commence until it can be confirmed that the chicks have fledged, and the site has been abandoned. **Mitigation Measure No. 7** Where feasible, any rock-breaking element of the capital dredge will not take place between the 20th of May and the 30th of June. Where the construction programme does not allow this seasonal restriction to be observed, a pre-construction check of the breakwater for nesting black guillemot will be carried out by a suitably qualified ecologist in advance of commencing the rock-breaking works. Where it can be confirmed that no nesting birds are present, the rock breaking will commence. Where birds are confirmed to be present, the rock-breaking works must not commence until it can be confirmed that the chicks have fledged, and the site has been abandoned. **Mitigation Measure No. 8** To mitigate any startle effect from the pile-driving element of the piling works on overwintering birds, a suitably qualified observer will monitor that aspect of the works, and piling driving will start later than the general construction operation commencement on each day to ensure a slow start-up to habituate the birds. **Mitigation Measure No. 9** NPWS (2014) provides guidance to manage the risk to marine mammals from man-made sound sources in Irish waters. This document provides guidance and mitigation measures to address key potential sources of anthropogenic sound that may impact negatively on marine mammals in Irish waters. The mitigation methods should follow the guidance prescribed by the NPWS to avoid PTS. The guidance set out in NPWS (2014), **Mitigation Measure No. 10** A suitably qualified, and experienced Marine Mammal observer is to supervise piling and dredging to implement NPWS (2014) Guidelines (and any amendments) **Mitigation Measure No. 11** A pre-demolition bat survey of structures proposed for demolition will be carried out by a suitably qualified ecologist. **Mitigation Measure No. 12** If marine pile driving or rock dredging activity is simultaneous with similar activities associated with the proposed ORE projects indicated in Table 11.22, depending on the distance and the rate of sound attenuation, we will ensure sound exposure is not above internationally approved noise exposure levels for marine mammals, following consultation with the NPWS.
Coastal Processes	▪ A documented Accident Prevention Procedure will be put in place before commencement. ▪ A documented Emergency Response Procedure will be put in place before commencement.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
Noise & Vibration	**Hours of Work** ▪ Construction Working Hours, except for dredging and pile driving works, will generally be limited to the hours 0700 – 2000 Monday to Friday and 0700 – 1600 hours on Saturday. Some works have to be undertaken at low tide and their construction hours will be linked to tides (for example works associated with the pontoon construction and quay wall). Pile driving works will be limited to 0800-1800 Monday to Friday and 0800 - 1600 hours on Saturday. It is not envisaged that works will take place on public holidays. Dredging, due to the nature of the activity, is undertaken on a 24 hour basis to achieve the maximum production rates within tidal envelopes Dredging activities will occur for approximately 8-10 weeks. If works are required outside of these hours, in exceptional circumstances, the planning authority will be notified in advance **Liaison with Interested Parties** ▪ The contractor will appoint a liaison officer to ensure that any issues from the local community are dealt with promptly and efficiently during construction. These details will be included in the contractor's CEMP **Selection of Quiet Plant** ▪ Careful consideration must be given to the noise emission levels of plant items when they are being considered for use on the site. **Control of Noise Sources** ▪ If the use of low noise plant or replacing a noisy item of plant are not viable or practicable options, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods, often in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. ▪ BS5228 states that *"as far as reasonably practicable sources of significant noise should be enclosed".* In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures that could be moved around site as necessary may also be used to screen operatives using hand tools such as angle grinders. ▪ BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are relevant and hence are reproduced below. These recommendations should be implemented on the site. ○ *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.* ○ *Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.*

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	○ *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.* ○ *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.* ○ *Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.* ○ *Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."* ▪ Also note the following outline guidance in relation to specific considerations which may be deployed as required by the contractor. ○ For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling. ○ For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover. ○ For percussive tools such as pneumatic concrete breakers, rock drills and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. ○ For all materials handling ensure that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. ○ For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. ○ Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary. ○ All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. **Screening** ▪ Site hoarding along the boundary between the construction site and the residential receptors that will provide a degree of barrier screening. Any screening will incorporate existing boundary walls on the site (i.e. where a suitable 2 – 2.4m boundary wall exists there is no need to install hoarding in that specific location). Further benefits may be achieved through the use of additional smaller localized screens on the site itself.

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ The use of screens can be effective in reducing the noise level at a receiver location and should be employed as a complementary measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. The height and length of any screen should, where practicable, be such that there is no direct line of sight between the source and the receiver. ▪ BS 5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the screen should be such that there are no gap or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the barrier rather than the transmission through the barrier itself.
Air Quality	**Communications** ▪ Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses. ▪ The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details. **Site Management** ▪ A feedback register will be kept on site detailing all correspondence received in connection with dust or air quality concerns, together with details of any actions carried out. **Preparing and Maintaining the Site** ▪ Plan site layout so that machinery and dust causing activities are located away from sensitive receptors, as far as is possible. ▪ Avoid site runoff of water or mud through the use of bunds. ▪ Keep site fencing, barriers and scaffolding clean using wet methods. ▪ Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. ▪ Cover, back bucket, seed or fence stockpiles to prevent wind whipping. **Operating Vehicles / Machinery and Sustainable Travel** ▪ Ensure all vehicles switch off engines when stationary - no idling vehicles. ▪ Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. ▪ Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). ▪ Produce a Traffic Management Plan to manage the sustainable delivery of goods and materials. ▪ Implement a Traffic Management that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing) **Operations**

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. ▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. ▪ Use enclosed chutes and conveyors and covered skips. ▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. ▪ Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. **Waste Management** ▪ No bonfires or burning of waste materials. **Demolition Phase** ▪ Prior to demolition blocks should be soft striped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). ▪ Water suppression should be used, preferably with a hand-held spray. Cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used. ▪ Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed. ▪ Avoid explosive blasting, using appropriate manual or mechanical alternatives. **Earthworks** ▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. ▪ Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. ▪ Only remove the cover in small areas during work and not all at once. ▪ During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. **Construction** ▪ Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are identified and put in place where possible. ▪ Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. ▪ For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. **Trackout**

RECEIVED: 18/10/2024

Table 19.2 Demolition & Construction Mitigation

Aspect	Mitigation
	▪ A site speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles. ▪ Avoid dry sweeping of large areas. ▪ Ensure truck bodies entering and leaving sites are covered to prevent escape of materials during transport. ▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. ▪ Record all inspections of haul routes and any subsequent action in a site log book. ▪ Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. ▪ Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). ▪ Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. ▪ Access gates to be located at least 10m from receptors where possible.
Climate	▪ Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. ▪ Ensure all plant and machinery are well maintained and inspected regularly. ▪ Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. ▪ Waste materials will be re-used on site where possible and where re-use is not possible on-site they will be sent off-site for recycling, re-use or recovery. ▪ Sourcing materials locally where possible to reduce transport related CO2 emissions. ▪ Materials with a reduced environmental impact will be incorporated into the construction design through re-use of materials or incorporation of recycled materials in place of conventional building materials. The following materials will be considered for the construction phase: o Ground Granulated Blast Furnace Slag (GGBS) & Pulverised Fuel Ash - used where feasible as replacements for Portland cement to increase sustainability and carbon footprint of civil and structural works; and o Steel - the carbon emissions emitted during the production of virgin steel can be higher than some other structural materials on a tonne by tonne basis, and therefore, recycled steel will be used where possible. Additionally, where possible the steel reinforcement used will be supplied directly from stocks within the port or on backloads from the reinforcement providers for the port development, thereby reducing CO_2 emissions associated with its transportation.
Cultural Heritage: Archaeological Heritage	▪ An Archaeologist experienced in maritime archaeology will be retained by the developer for the duration of the relevant works i.e. all terrestrial, inter-tidal/foreshore and seabed disturbances associated with the development. ▪ An Archaeology Management Plan will be prepared by the archaeologist to prepare the protocols that ensure proper management and response to archaeological monitoring, recording and resolution that will be required in the course of the project. ▪ Archaeological monitoring will be carried out by suitably qualified and experienced maritime archaeological personnel licensed by the DHLGH. Archaeological monitoring is conducted during all terrestrial, inter-tidal/foreshore and seabed

Table 19.2 Demolition & Construction Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	disturbances associated with the development. The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed and that require consideration during the course of the works. The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland. ▪ Archaeological licences for monitoring and site investigations of terrestrial and nearshore environments will be acquired from the Department of Housing, Local Government and Heritage (DHLGH), as necessary. ▪ In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material. Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will be a matter for discussion between the client and the licensing authorities. ▪ Where any archaeologically significant/potential material is identified in the course of the seabed disturbance activities, these works will stop pending a dive inspection by an archaeological dive team. The dive team would deal with any rescue excavation required. The dive team and all in-water work will conform to the Port's safety protocols for Diving at Work ▪ Secure wet storage facilities will be provided on site to facilitate the temporary storage of artefacts that may be recorded during the course of the site work. ▪ Buoying/fencing of any such areas of discovery will be necessary if discovered during excavation. ▪ Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs. ▪ Spoil will not be dumped on any of the selected sites or their environs. ▪ All site work will be conducted in strict compliance and accord with STATUTORY INSTRUMENTS: S.I. No. 299 of 2007: Safety, Health and Welfare at Work (General Application) Regulations, 2007; and STATUTORY INSTRUMENTS: S.I. No. 254 of 2018 as amended by S.I. No. 180 of 2019, HSA Safety, Health and Welfare at Work (Diving) Regulations, 2018-2019, where required. ▪ It is a condition of archaeological licensing that a detailed project report is lodged with the DHLGH within 12 months of completion of site works. The reports will be particular to each licence granted. The reports should be to publication standard and should include a full account, suitably illustrated, of all archaeological features, finds and stratigraphy, along with a discussion and specialist reports. Artefacts recovered during the works need to meet the requirements of the National Museum of Ireland in terms of recording, conservation and storage ▪ Dredging in the vicinity of the breakwater to ensure that the dredging does not undermine the base of the breakwater and avoid impacts to superstructure.
Cultural Heritage: Built Heritage	None

RECEIVED: 18/10/2024

Table 19.3 Operational Mitigation

Aspect	Mitigation
Population & Human Health	None
Landscape & Visual	**Lighting** ▪ Lighting has been designed to minimise the potential for light spillage into the surrounding area through the use of suitable directional lighting centred to fall within the site. ▪ The lighting will be only on as required to provide safe access through the site during operations and for security cover of the site. **Maintenance** ▪ The landscape scheme will be implemented and maintained in accordance with the proposed landscape plans and specifications.
Material Assets: Traffic & Transport	▪ The Occupants will prepare a Modal Management Plan and encourage sustainable travel to work
Material Assets: Built Services	▪ SuDS features will be maintained appropriately throughout the operational phase of the development by the relevant management body. ▪ Interceptors & COSHH stores will be maintained during the Operational phase of the development by the relevant management body. ▪ NZEB technologies employed in the development will continue to be maintained throughout the operational phase of the development by the relevant management body.
Material Assets: Waste	▪ All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins, skips or other suitable receptacles in a designated, easily accessible areas of the site. o The Operator(s) / Facilities Manager of the Site during the operational phase will be responsible for ensuring – allocating personnel and resources, as needed – for the authoring and implementation of an Operational Waste Management Strategy, ensuring a high level of recycling, reuse and recovery at the site of the proposed development. o The Operator / Facilities Manager will regularly audit the onsite waste storage facilities and infrastructure, and maintain a full record of waste documentation for all waste movements from the site. ▪ The Operator will ensure on-Site segregation of all waste materials into appropriate categories, including (but not limited to): o Organic waste; o Dry Mixed Recyclables; o Mixed Non-Recyclable Waste; o Glass;

Table 19.3 Operational Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	○ Waste Oil; ○ Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment; ○ Batteries (non-hazardous and hazardous); ○ Light bulbs; ○ Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and ○ Bulky Items ▪ The Operator will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials; ▪ The Operator will ensure that all waste collected from the site of the proposed development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and ▪ The Operator will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.
Land, Soils & Geology	None
Water & Hydrology	None
Biodiversity	**Mitigation Measure No. 13** The assessment of impacts indicated that the accidental spillage of hydrocarbons from smaller vessels using the pontoon had the potential to lead to a localised impact on the receiving environment. Therefore, the following mitigation will be implemented during the operational phase of the project to avoid the possibility of accidental spillage of any hydrocarbons: ▪ Refuelling of vessels via decanting from containers will not be permitted at the pontoon or within the port area. ▪ Bilges and/or ballast water (if relevant) will not be emptied at the pontoon. ▪ Detergent will not be used to clear up small spills of hydrocarbons. Oil absorbent cloths will be used instead. ▪ Greenore Port will maintain a kit of oil absorbent cloths and small booms to deal with accidental spillages. ▪ Oil absorbent collars will be fitted around the fuel nozzle to catch any drips or overflow. ▪ Clear signage indicting refuelling protocols will be displayed at the pontoon. **Mitigation Measure No. 14** The assessment of impacts indicated the potential for the introduction of IAS through small boats using the marina. Therefore, the following mitigation will be implemented by the developer: ▪ Recreational vessels will not be permitted to use the pontoon. ▪ Ballast water (if relevant) will not be discharged within the port area. ▪ Regular inspections of the hulls of visiting vessels for obvious IAS will be carried out by the operators.

Table 19.3 Operational Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ Clear signage indicating biosecurity protocols will be displayed at the pontoon. ▪ Staff will be trained in the identification of obvious IAS. ▪ Fouled vessels should not be allowed to enter the pontoon area. ▪ Any IAS recorded will be reported to the National Biodiversity Data Centre. **Mitigation Measure No. 15** Outside of Carlingford Lough, disturbance to marine mammals during operation may occur as vessel traffic will increase. The new quay wall and pontoons will provide berths for up to 11 CTV which will access the North Irish Sea from Greenore. These vessels will be required to use existing channels on the approach to and from the port. Each vessel pilot and captain is responsible to act accordingly and slow speeds to match environmental conditions and restrict any risk of wake. Once clear of the Lough vessels will reach operational speed, which could cause disturbance and a collision risk to marine mammals. In accordance with Maritime Notice 15, a speed limit of 7knots is to be adhered to when encountering areas of mammal populations. These routes have not yet been established and disturbance and displacement will need to be considered by each ORE project through the environmental assessment undertaken for those projects. **Mitigation Measure No. 16** Post-construction (Phase 1 and Phase 2) survey of seals in June and September to ensure haul out sites still being used by common and grey seals.
Coastal Processes	None
Noise & Vibration	▪ As a general mitigation, As part of the detailed design of the development, Selection of quiet plant items and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties. ▪ a range of 'good practice' measures are recommended for operatives that arrive to site from the Shore Road Car Park: ○ Vehicle engines shall not be left idling once on site. ○ Drivers should minimise impact sounds whilst exiting or entering their vehicle. ○ All radios and amplified music in the vehicles shall be turned off prior to the doors being opened. ○ There should be no unnecessary shouting or communicating in raised voices whilst on site. ○ There should be no unnecessary sounding of horns whilst on site.
Air Quality	None
Climate	▪ Achieve air permeability rate of 3 m3/m2/hr @ 50Pa; ▪ Ensure every effort is made to reduce the risk of thermal bridging by upgrading the façade to ensure continuity of insulation. This is to limit local thermal bridging as much as practically possible where an existing construction element to be retained shows risk of thermal bridging; ▪ Building fabric U-Value calculations will be completed to at least meet the requirements of TGD Part L in relation to thermal performance; ▪ Central ventilation systems with heat recovery will be used to retain as much heat as possible. Amenities will be designed for mechanical ventilation with occupancy sensing to minimize the time for overrun;

Table 19.3 Operational Mitigation

RECEIVED: 18/10/2024

Aspect	Mitigation
	▪ The space heating and domestic hot water system will likely be provided by a central heat pumps system with optional back up/tie-in to future district heating system. The final system will be selected based on operating cost and efficiency mandated by TGD Part L. it is likely that VRF Air condition systems will be utilised to meet the space heating demand and NZEB requirements; ▪ The following NZEB technologies will be considered for this development: o Centralized air to water heat pumps o Photovoltaic system for on-site electricity use o District Heating o Combined heat and power (CHP) for thermal and electricity generation ▪ The electrical design will require that all lighting be LED with occupancy sensing where required.
Cultural Heritage: Archaeological Heritage	None
Cultural Heritage: Built Heritage	None

19.4 Monitoring Measures

Tables 19-4 and 19-5 below summarise the recommended monitoring measures for the demolition, construction, and operational stages.

Table 19.4 Demolition & Construction Monitoring

Aspect	Monitoring
Population & Human Health	None
Landscape & Visual	None
Material Assets: Traffic & Transport	▪ The contractor will be required to ensure construction activities operate within the parameters set out in the Contractors CEMP and the Construction Traffic Management Plan.
Material Assets: Built Services	None
Material Assets: Waste	▪ Recording of waste generation should be maintained to advise on future developments. ▪ The appointed Resource Manager will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. ▪ Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues.
Land, Soils & Geology	Construction ▪ Regular inspection of surface water run-off and sediments controls (e.g., silt traps); ▪ Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; ▪ Excavation works to be monitored to record any signs of potentially contaminated soil;

RECEIVED: 18/10/2024

Table 19.4 Demolition & Construction Monitoring	
Aspect	**Monitoring**
	▪ Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc). ▪ Soil sampling of excavated soils and monitoring of surface water run off will be required in case of accidental discharges to underlying geology.
Water & Hydrology	▪ Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 20 m from surface water receptors. ▪ Regular inspection of surface water run-off and sediments controls will be implemented throughout the construction phase and full adherence to the Outline Construction Environmental Plan will be maintained. ▪ Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life. ▪ Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and ▪ Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc). ▪ Monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the stormwater network.
Biodiversity	None
Coastal Processes	None
Noise & Vibration	▪ The contractor will be required to ensure construction activities operate within the noise limits set out within this assessment. ▪ Any noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.
Air Quality	**Site Management** ▪ During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions. ▪ Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust and record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary. ▪ Monitoring of construction dust deposition (including dust from demolitions) at nearby sensitive receptors will be carried out to ensure mitigation measures are working satisfactorily. This will be done using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 $mg/m^2/day$ during the minimum monitoring period of between 28 - 32 days. If construction dust deposition rates exceed 350 $mg/m^2/day$, site procedures will be reviewed and improved to achieve a level below 350 $mg/m^2/day$.

Table 19.4 Demolition & Construction Monitoring	
Aspect	**Monitoring**
	▪ Increase the frequency of site inspections by the person accountable construction dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Climate	None
Cultural Heritage: Archaeological Heritage	The mitigation measures included in Section 16.9 include a number of monitoring requirements during the construction phase.
Cultural Heritage: Built Heritage	None

RECEIVED: 18/10/2024

Table 19.5 Operational Monitoring	
Aspect	**Monitoring**
Population & Human Health	None
Landscape & Visual	▪ Inspection of planting to ensure the planting becomes established over the initial years and any failed planting is duly replaced
Material Assets: Traffic & Transport	None
Material Assets: Built Services	▪ Appropriate measures to maintain surface water drainage systems and infrastructure shall be put in place such as tank & bund monitoring alarms.
Material Assets: Waste	▪ waste generation volumes should be monitored by the Operator / Buildings Management ▪ There may be opportunities to reduce the number of bins and equipment required in the Waste Storage Area (WSA's), where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.
Land, Soils & Geology	▪ Maintenance of the surface water drainage system, including separators / interceptors, and foul sewers is recommended to minimise any accidental discharges to soil or groundwater. ▪ Monitoring of surface water run off will be required in case of accidental discharges to underlying geology
Water & Hydrology	▪ Oil separators will be maintained and cleaned out in accordance with the manufacturer's instructions. ▪ Maintenance of the surface water drainage system and foul sewers is recommended to minimise any accidental discharges to surface water.
Biodiversity	None
Coastal Processes	None
Noise & Vibration	None
Air Quality	None
Climate	None
Cultural Heritage: Archaeological Heritage	None

Table 19.5 Operational Monitoring	
Aspect	**Monitoring**
Cultural Heritage: Built Heritage	None

RECEIVED: 18/10/2024