August 2025

Stage 1: Appropriate Assessment - Screening and Stage 2: Natura Impact Statement

Proposed Offshore Renewable Energy ('ORE') Capable Berth on a 250m Wharf Extension & Ancillary Operational Support Infrastructure

Calafort Phort Láirge
Port of Waterford

On behalf of

Port of Waterford Company

Port of Waterford, Belview, Co. Kilkenny

MALONE O'REGAN ENVIRONMENTAL

QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

MALONE O'REGAN

Form ES - 04

MALONE O'REGAN ENVIRONMENTAL

Ground Floor – Unit 3
Bracken Business Park
Bracken Road, Sandyford
Dublin 18, D18 V32Y
Tel: +353- 1- 567 76 55
Email: enviro@mores.ie

Title: Stage 1: Appropriate Assessment - Screening and Stage 2: Natura Impact Statement, Proposed ORE Capable Berth on a 250m Wharf Extension & Ancillary Operational Support Infrastructure, Port of Waterford Company, Port of Waterford, Belview, Co. Kilkenny

Job Number: E2068

Prepared By: Amelia Keane **Signed:** _____

Checked By: Kevin O'Regan **Signed:** _____

Approved By: Dyfrig Hubble **Signed:** _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	29/08/25	NIS Report	Final	AK	KOR	DH

Stage 1: Appropriate Assessment - Screening and Stage 2: Natura Impact Statement
Proposed ORE Capable Berth on a 250m Wharf Extension & Ancillary Operational Support Infrastructure
Port of Waterford Company

Contents

FIGURES

TABLES

PLATES

APPENDICES

1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') have been commissioned by the Port of Waterford Company ('the Applicant') to undertake an Appropriate Assessment to assess the likely significant effects, if any, of the proposed port facilities comprising of a circa ('ca.') 250-metre ('m') wharf extension to support proposed Offshore Renewable Energy ('ORE') development and general port development, land reclamation, ancillary works and a Biodiversity Enhancement Area ('the Proposed Development') on nearby sites with European conservation designations (i.e., Natura 2000 sites).

The Proposed Development will be located partly on land and partly in the near shore area of the coastal planning authority (Kilkenny County Council) at the Port of Waterford, Belview, Co. Kilkenny ('the Site') (ITM OS Reference: 666422; 613637).

The Site has a gross site area of ca. 8 hectares ('ha') and is made up of the following sections:

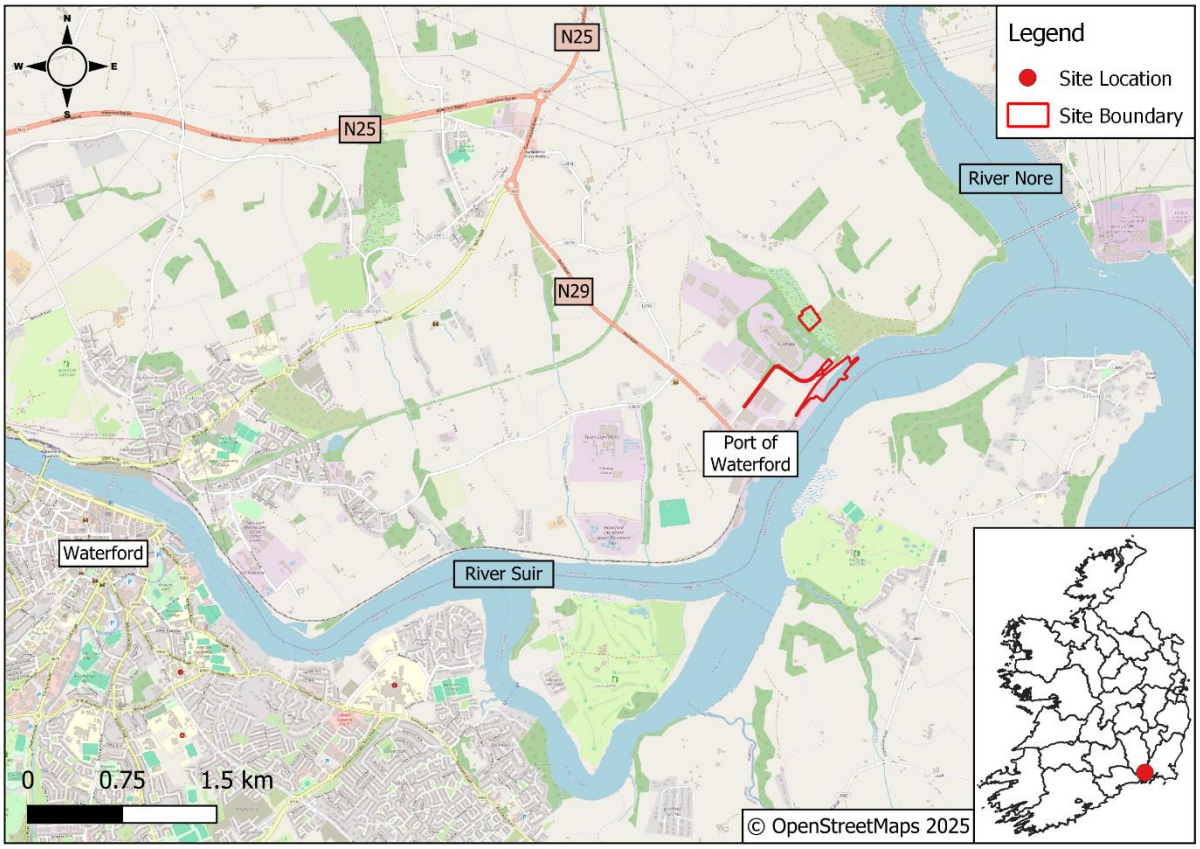
- ca. 4.9ha of development within the existing Port of Waterford landownership;
- ca. 1.3ha of reclaimed area within the Lower Suir Estuary using reclaimed materials and quarried rock; and,
- ca. 1.8ha of a Biodiversity Enhancement Area located to the northwest of the wharf development.

The proposed Site layout drawing is illustrated in Appendix A.

This report has been prepared to inform the Planning Authority with regard to Stage 1 (Screening) and Stage 2 (Appropriate Assessment) of the Proposed Development through the research and interpretation of best scientific, geographic and engineering knowledge and in view of the conservation objectives of European sites. This report seeks to determine whether the Proposed Development will, on its own or in-combination with other plans / projects have a significant effect on European sites within a defined zone of influence of the Site.

On completion of the Appropriate Assessment Screening Report, it was found necessary to progress to a Stage 2 of the Appropriate Assessment process and prepare a Natura Impact Statement ('NIS') to assess effects on the integrity of European sites.

Figure 1-1: Site Location



1.1 Statement of Authority

This report was reviewed and approved by Mr. Dyfrig Hubble, Associate Director - Ecologist. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management ('CIEEM'). Dyfrig has over 18 years' experience working in the ecological consultancy sector, including habitat surveys and appraisals and specialist protected species surveys in support of Appropriate Assessments.

As part of this assessment, a Benthic Ecology Report has been prepared and input from this report has been included as part of this NIS. The Benthic Ecology Report was prepared by Aquafact International Services Ltd. (APEM Group) ('Aquafact'). This report has been submitted as part of this application and should be read in conjunction with this report.

In addition, as part of this NIS, MOR Environmental Ecologist worked with Dr. Martin O'Farrell to undertake a review of fisheries information and data to inform the impact assessment for this planning application.

1.2 Applicant

Port of Waterford, originally known as Waterford Harbour Commissioners, was established more than 200 years ago in 1816. In 1999, the organisation was incorporated as the Port of Waterford Company and now operates in the commercial semi-state sector in Ireland, reporting to the Department of Transport. Since its foundation, the organisation has played a vital role in the development of Waterford City and the region.

In the early 1990s, commercial shipping operations moved to Belview, ca. 8km downstream of Waterford City and closer to the sea. The Port of Waterford now offers facilities for lift-on / lift-off ('LoLo'), bulk and breakbulk, liquid bulk and container cargoes.

The current commercial port comprises some 960m of marginal quays at Belview, together with open and covered storage areas and warehouses within a 265ha area of the designated Belview Port Zone, including a partly developed 55ha Industrial Development Agency ('IDA') strategic Foreign Direct Investment ('FDI') industrial land reserve. The Port is backed by a very significant industrial area located on adjoining landbanks and is the base of a very significant, regionally important employment zone. In addition, there are 280m of lay-by quays at Waterford City Centre, known as the Frank Cassin Wharf. The Frank Cassin Wharf is currently used for cruise vessels on an occasional basis.

The Port of Waterford operates in imports / exports with a focus on bulk and breakbulk, liquid bulk, general cargoes, cement, GGBS, eco-cement production, concrete batching, agricultural products, orientated strand board ('OSB') and container handling through its licenced stevedores and manufacturers. Current bulk activity within the Port is 1.7m tonnes per annum ('TPA'). Total Capacity at the Port with this new development will be 4.0m TPA, which is the volume indication for 2035 in the Port of Waterford Masterplan (see Section 2.3). The Port of Waterford can accommodate large vessels, with ship drafts of up to 9m and lengths of up to 190m. The Port is serviced by the N29 national primary road and by the Rosslare-Limerick Railway line.

The Port of Waterford is a State-owned commercial company responsible for the management and development of the Port. The Port of Waterford is the fourth largest of the State commercial ports in terms of total tonnage handled and the fifth largest port when including Rosslare Europort, and the facilities are considered an infrastructure asset of national importance [1]. The Port of Waterford is designated as a Port of National Significance (Tier 2) within the terms of the National Ports Policy [1].

According to the National Ports Policy [1], Tier 2 ports are those that:

- '*are responsible for at least 2.5% of overall tonnage through Irish ports;*
- *have the clear demonstrable potential to handle higher volumes of unitised traffic; and,*
- *have the existing transport links to serve a wider, national marketplace beyond their immediate region.'*

The Port of Waterford is Ireland's closest multi-modal port to mainland Europe and enjoys excellent transport links with Ireland's major cities through both its connection with the national road network and the railway network. The Southern Assembly Regional Spatial and Economic Strategy ('RSES') supports the development of the Port as a major international gateway and its achievement of Tier 1 status [2].

The Port of Waterford is committed to sustainability and reducing its carbon footprint where possible. The Port of Waterford also implements a strict Environmental Policy for managing ship waste, energy usage, managing cargo / projects and utilising new technologies. The Port of Waterford has obtained EcoMerit and ISO 14001 environmental certifications. The Port of Waterford is a member of the European Sea Ports Organisation's ('ESPO') 'EcoPort' Network, which is a marine environmental initiative for the European port sector [3]. The EcoPort's Ports Environmental Review System ('PERS') is the only port-sector-specific environmental management standard that incorporates the general requirements of environmental management standards such as ISO14001 and builds on the policy recommendations of ESPO. Over the last 20 years, PERs have been implemented by 23 ports throughout Europe, including the Port of Waterford. The Port's 2023 PERS Report is available on the Port of Waterford's website [4]. PERS implementation is independently reviewed by the Dutch Accreditation Council, the RVA [3].

The Port of Waterford is also an active partner of the Sustainable Energy Authority of Ireland ('SEAI') and in addition, the Port is involved in sustainability projects, including the EU DiadES Programme - an EU initiative aimed at conserving vulnerable migratory fish species [5].

1.3 Site Context

The Port of Waterford, also known as Belview Port, currently comprises ca. 960m of quays on the northern bank of the River Suir, known as the Lower Suir Estuary according to the EPA, and has open and closed storage areas / warehousing within the ca. 256ha area designated as the Belview Port Zone.

The Site covers an area of ca. 8ha and is located partly on land and partly in the Lower Suir Estuary within the industrial landscape of the Port of Waterford, Belview, Co. Kilkenny (see Figure 1-2). The Site is accessed via local road L7852 off the N29 national road. The Site is bordered to the north and west by a primarily industrial landscape, and within the wider area are the sites of SmartPly Europe, Southeast Port Services Ltd., Target Fertilisers, the wider Belview Port and more. Across the Lower Suir Estuary is Faithlegg, Co. Waterford, an area of one-off residential housing, agricultural lands, forestry and marshlands.

The terrestrial portion of the Site covers the downstream end of the existing Belview Quay, the existing weighbridge, the existing substation, an area along the local road to the downstream access to Belview Quay and existing areas of hardstanding. Within the Site, on the downstream end of the Belview Quay, there is currently a permitted waste facility that handles ferrous metals (Waste Code: 19 12 02) and is registered to McKenzies Metals (Ireland) Ltd. (Permit No: WFP-KK-21-0006-01). This permit will expire in February 2027 and by this time or prior, depending on the timing of the construction of the Proposed Development, this scrap metal facility will be decommissioned in accordance with the requirements of their permit to the satisfaction of Kilkenny County Council.

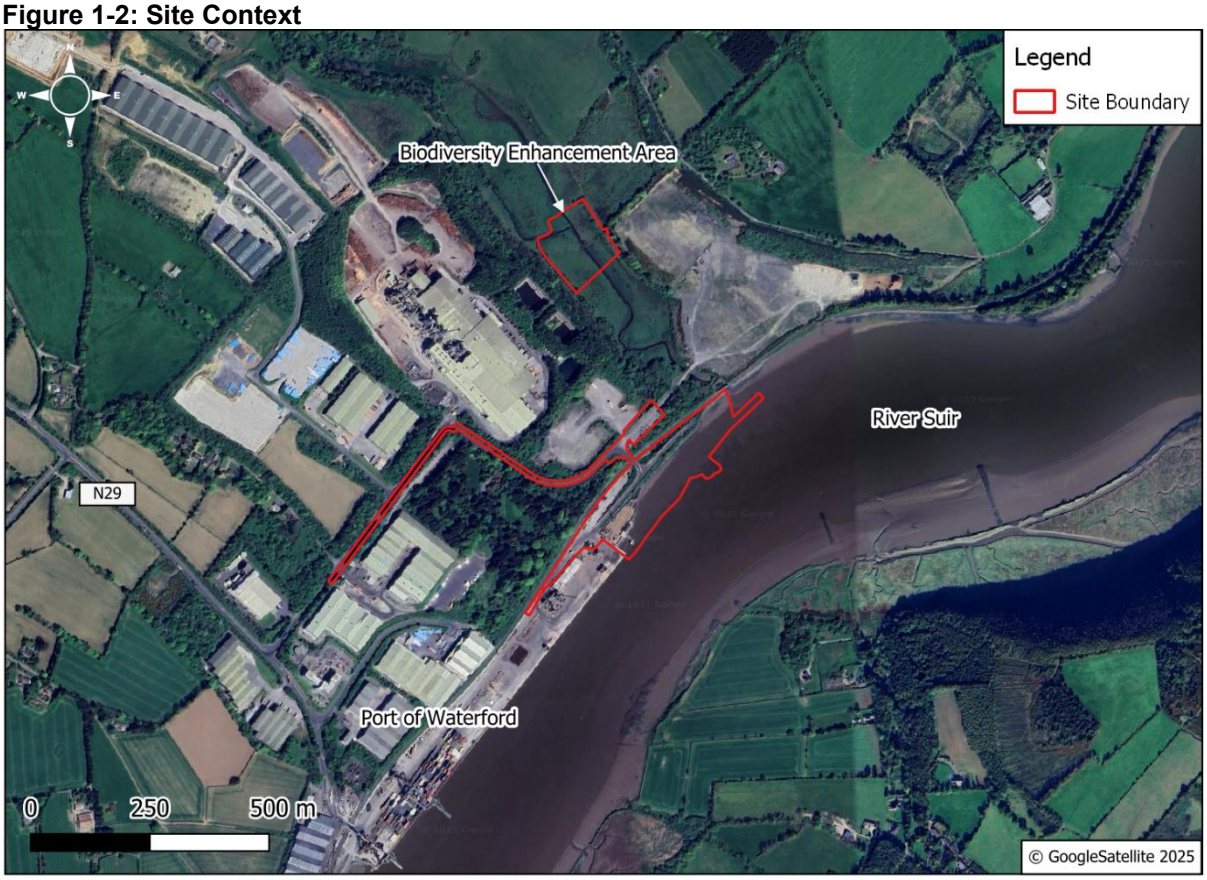
The Site boundary also includes an area identified as a proposed Biodiversity Enhancement Area located north of the proposed wharf extension. This area is currently comprised of a mosaic of agricultural wet grassland and areas of rushes. Cattle regularly utilise this area from the adjacent fields due to the lack of fencing within this area.

The portion of the Site located within the Lower Suir Estuary is considered to be located in the 'Nearshore' as defined in the Marine Area Planning Act 2021 ('MAPA'). The section of the Lower Suir Estuary in which the Site is located is a designated Special Area of Conservation ('SAC'), the Lower River Suir SAC, and flows in a northeasterly direction, where it joins the River Barrow. The River Barrow is ca. 1.8km east of the Site and is designated as the River Barrow and River Nore SAC. The River Barrow flows in a southeasterly direction, eventually discharging into the Waterford Estuary.

The Waterford Estuary, located in southeast Ireland, is a semi-enclosed coastal waterbody open to the sea through an entrance ca. 4.25km wide between Hook Head and Dunmore East. Just inside the mouth of the estuary is Creadan Head, in the lee of which are a series of beaches and tidal flats extending as far north as Passage East. The estuary is tidal for ca. 60km up the estuary, from the entrance at Hook Head, on the Lower Suir Estuary, and ca. 55km on both the Rivers Barrow (to St Mullin's) and Nore (to Inistioge). The water surface area covers ca. 80km², being, for the most part, relatively shallow riverine sections; however, a series of deep pockets occur within the Waterford Estuary.

The Port of Waterford's authority limits extend ca. 6.5km south of a line between Hook Head and Falskirt Rock, encompassing the majority of the Waterford Estuary and extending 15km westward from a centre line of the Killoteran Pill and due northwest to a position in the townland of Licketstown on the Kilkenny side of the Lower Suir Estuary.

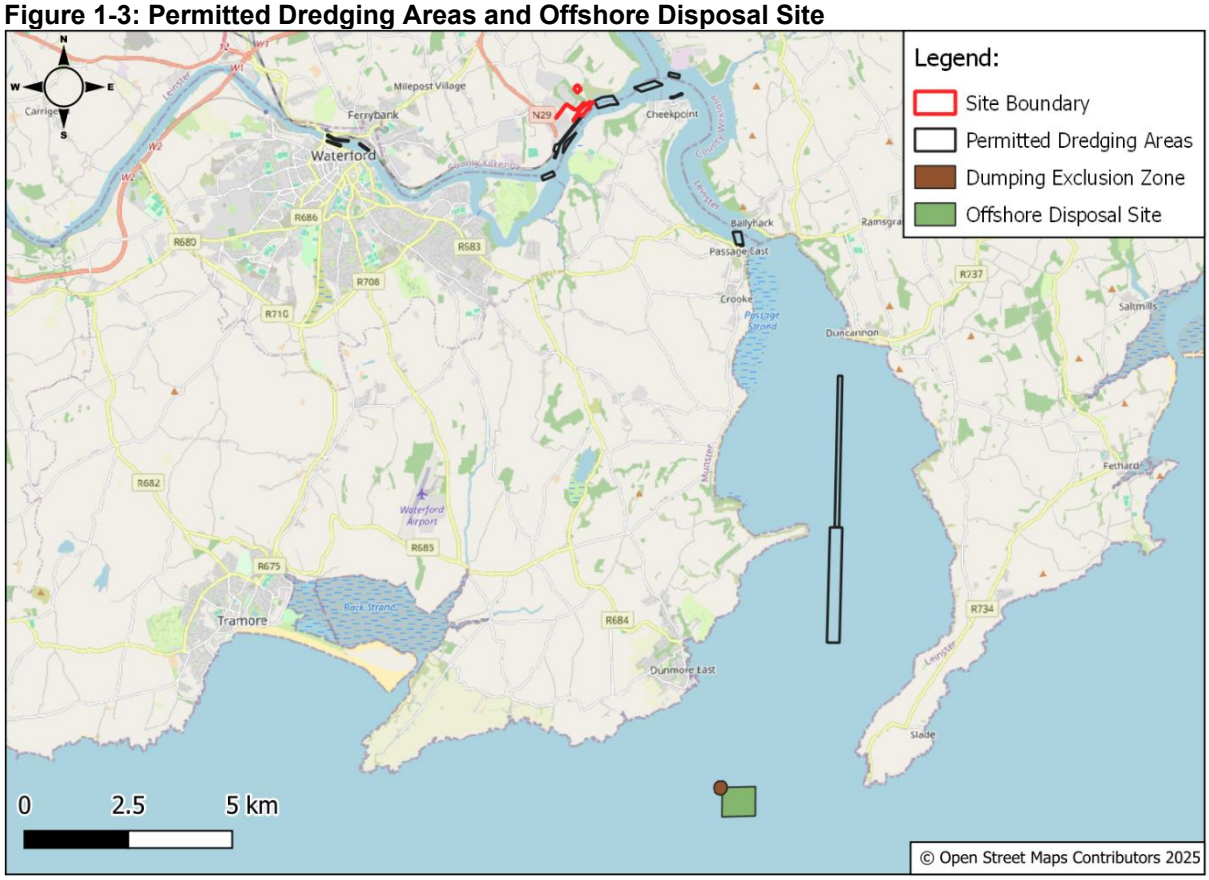
Figure 1-2: Site Context



Given that the Port of Waterford is an active Tier 2 port, there is regular navigational traffic through the Waterford Estuary and the Celtic Sea. As such, in order to maintain safe navigational depth within the Waterford Estuary, the Port of Waterford has implemented a maintenance dredging programme under licence and permit for several decades. The Port of Waterford currently undertake maintenance dredging at 16 locations within the Waterford Estuary under the current Foreshore Licence (Licence Reg. No. FS006684) and dispose of the dredged material within the offshore disposal site under the current Dumping at Sea ('DaS') permit (Permit Reg. No. S0012-03); see Figure 1-3. The off-site disposal site has been utilised for dredging activities since 1996 and is located at ca. 2.6km southwest of Hook Head.

The current Foreshore Licence (Licence Reg. No. FS006684) and DaS permit (Permit Reg. No. S0012-03) are both set to expire on the 31st December 2025. Therefore, the Port of Waterford submitted an application to the Environmental Protection Agency ('EPA') for a new DaS permit on the 9th February 2024 (Permit Reg. No. S0012-05) and has submitted an application for a Maritime Usage Licence ('MUL') to MARA (Ref: LIC230025).

Figure 1-3: Permitted Dredging Areas and Offshore Disposal Site



1.4 Watercourses within the Vicinity of the Site

The Site is partially located within the Lower Suir Estuary, classified as a transitional waterbody according to the EPA, and forms part of the Lower River Suir SAC. This watercourse flows in a northeast direction and drains into the Barrow Suir Nore Estuary ca. 2.3km downstream of the Site, which forms part of the River Barrow and River Nore SAC.

It should be noted that this section of the Lower Suir Estuary is currently categorised as a "Heavily Modified Waterbody" by the EPA, due to existing port quays and groynes, along with marine vessel traffic.

Under the Water Framework Directive ('WFD') 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland (EPA, 2022). According to the river waterbody WFD 2016-2021, the water quality within the Lower Suir Estuary and the River Barrow are considered to be '*at risk,'* and the status of these watercourses are considered *'moderate'* [6].

In addition, the Drumdowney Lower Stream discharges into the Luffany Stream within the Biodiversity Enhancement Area. The Luffany Stream bisencts through the Biodiversity Enhancement Area and flows into the Luffany River. The confluence of the Luffany River and the Lower Suir Estuary is located ca. 10m downstream of the area in which the Proposed Develompent will be located.

Under the WFD, the EPA classifies the river waterbody WFD 2016-2021, the water quality within the Luffany River , Luffany Stream and the Drumdowney Lower Stream are considered to be '*moderate,'* and the status of these waterbodies are considered *'under review'* [6].

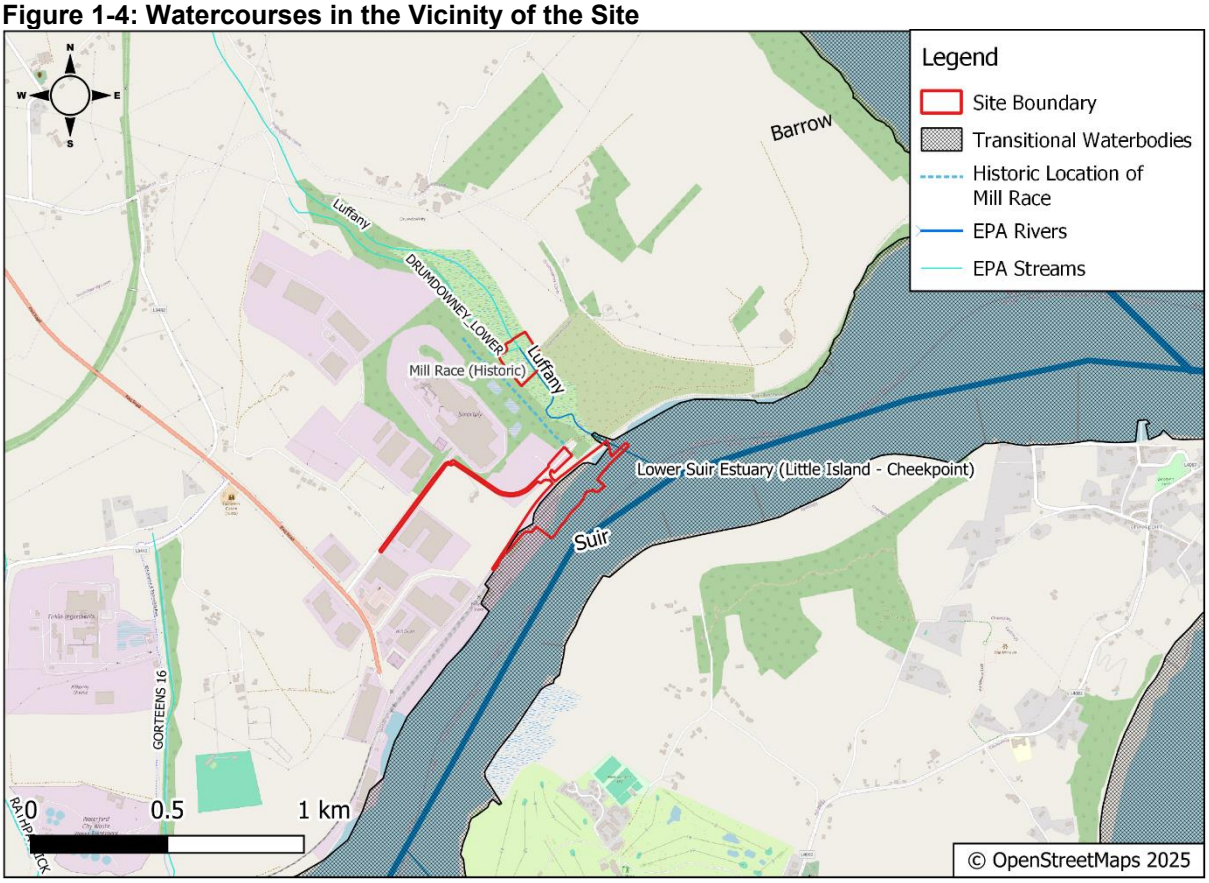
In addition to the above-mentioned watercourses, the Mill Race Stream is historically known to be located ca. 30m to the west of the Biodiversity Enhancement Area. However, this

watercourse is not listed on EPA Maps and there is no data available on the exact location or length of the Mill Race. Based on Historic OSI 25-inch Maps, the Mill Race flowed in a southerly direction to a 'mill pond' at the Gorteens Old Mill Building and to a sluice that discharged into the Lower Suir Estuary. It appears that the mill pond has since been infilled. Details on the exact location of the Mill Race Stream are not available.

The Site is situated within the Suir WFD Catchment [Catchment_ID: 16] and the Blackwater [Kilmacow]_SC_010 subcatchment [Subcatchment_ID: 16_29] [6].

The location of the key surface water features in the vicinity of the Site are illustrated in Figure 1-4 below.

Figure 1-4: Watercourses in the Vicinity of the Site



1.4.1 Drainage Ditch Network

The OPW Flood Maps identifies Drainage Districts, Arterial Drainage Schemes and Benefited Areas [7]. Arterial Drainage Schemes were works that were carried out under the Arterial Drainage Act, 1945 to improve land for agriculture and to mitigate flooding. The Benefited land identifies land that was drained as part of the Drainage District with the aim to improve land for agriculture and to mitigate flooding.

Surveys of the Site have noted a drainage ditch along the western perimeter of the Biodiversity Enhancement Area that connects the Drumdowney Lower Stream to the Luffany River (See Figure 4-1). However, a review of the OPW Flood Maps shows that the drainage ditch is not part of the Arterial Drainage Scheme or Drainage Districts [7].

1.5 Regulatory Context

The following guidance documents were adhered to for the preparation of this NIS report:

- OPR Practice Note PN01, *Appropriate Assessment for Screening for Development Management*, The Office of the Planning Regulator [8];
- *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, European Commission [9];
- *Guidelines for Ecological Impact Assessment in the UK and Ireland*, Chartered Institute of Ecology and Environmental Management [10];
- *Managing Natura 2000 Sites:* The Provision of Article 6 of the Habitats Directive 92/43/EEC [11]*;*
- *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities,* DoEGLH [12]; and,
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10*, DoEGLH [13]*.*

This NIS was prepared in accordance with and in compliance with the following legislation:

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as “The Habitats Directive”. This provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000.

For completeness, the Planning and Development Act 2000 (as amended) states “European site” means:

a. A candidate site of Community Importance;
b. A site of Community Importance, (‘SCI’);
c. A Special Area of Conservation (‘SAC’);
d. A candidate Special Area of Conservation (‘cSAC'); or,
e. A Special Protection Area (‘SPA’).

These are Special Areas of Conservation (‘SACs’) designated under the Habitats Directive and Special Protection Areas (‘SPAs’) designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC) (better known as “The Birds Directive”).

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment.

> *“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public”*

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the Appropriate Assessment ('AA') process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest ('IROPI' test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

1.6 Stages of Appropriate Assessment

There are four distinct stages to undertaking an AA as outlined in current European Union ('EU') and Department of Environment, Heritage and Local Government ('DoEHLG') guidance:

Stage 1: Screening

This process identifies the potential impacts of a plan or project on a Natura site, either alone or in combination with other plans and projects and considers whether these impacts are likely to be significant. If potentially significant impacts are identified the plan or project cannot be screened out and must proceed to Stage 2.

Stage 2: Appropriate Assessment

Where potentially significant impacts are identified, an assessment of the potential mitigation of those impacts is required; this stage considers the appropriateness of those mitigation measures in the context of maintaining the integrity of the Natura 2000 sites. If potential significant impacts cannot be eliminated with appropriate mitigation measures, the assessment must proceed to Stage 3.

Stage 3: Assessment of Alternatives Solutions

This process examines alternative ways to achieve the objectives of the plan or project that avoid adverse impacts on the integrity of the Natura 2000 site if mitigation measures are deemed insufficient.

Stage 4: Imperative Reasons of Overriding Public Interest ('IROPI')

Assessment where no alternative solution exists for a plan or project and where adverse impacts remain. This includes an assessment of compensatory measures, where in the case of projects or plans, can be considered necessary for IROPI.

2 METHODOLOGY

2.1 Determining Zone of Influence

The starting point for this assessment was to determine the Zone of Influence. The Zone of Influence comprises of the area in which the Proposed Development may potentially affect the conservation objectives (or qualifying interests) of a European site.

Previous guidance for 'Appropriate Assessment of Plans and Projects in Ireland' noted that a distance of 15km is recommended for the identification of relevant European sites [12]. However, guidance from the Office of the Planning Regulator ('OPR') and guidance from the National Parks and Wildlife Service ('NPWS') recommend that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative) [13, 8]. For some projects the distance could be greater than 15km, and in some cases less than 100m.

Definition of the zone of influence for the proposed works includes evaluating the following:

- Identification of the European sites that are situated within, in close vicinity or downstream within the zone of influence of the Proposed Development;
- Identification of the designated habitats and species and conservation objectives for the identified European sites;
- Identification of the environmental conditions that stabilise and increase the qualifying interests of the European sites towards favourable conservation status;
- Identification of the threats / impacts, actual or potential, that could negatively impact the conservation objectives for the European sites;
- Identifying the activities of the proposed works that could give rise to significant adverse impacts; and,
- Identification of other plans or projects, for which in-combination impacts would likely have significant adverse effects.

2.1.1 Source-Pathway-Receptor Model

European sites are only at risk from significant effects where a source-pathway-receptor link exists between a Proposed Development and a European site. This can take the form of a direct impact (e.g., where the Proposed Development is located within / in close vicinity to the boundary of a European site), or an indirect impact where impacts occur outside of the European site but affect ecological receptors within the European site (e.g., impacts to water quality which can affect estuarine habitats at a distance from the impact source).

The likely effects of the Proposed Development on any European site have been assessed using a source-pathway-receptor model. A source-pathway-receptor model is a standard tool used in environmental assessment and is recommended by OPR Guidance [14] [15]. The model comprises of:

- A source: any potential impacts from the Proposed Development, e.g., the runoff of sediment / construction pollution;
- A pathway: the means or route by which a source can affect the ecological receptor; and,
- A receptor: the qualifying interests and / or special conservation interests of the European sites.

In order to establish the Zone of Influence of the Proposed Development works, the likely key environmental impacts / changes associated with the Proposed Development were determined having regard to the project characteristics set out in Section 3.3 of this report. The Zone of Influence for various potential impact pathways are discussed in Section 4.1.

2.2 Desk-based Review

A desk-based review of information sources was completed, which included the following sources of information:

- Review of aerial maps of the Site and surrounding area;
- The NPWS website was reviewed with regard to the most up-to-date details on conservation objectives for the European sites relevant to this assessment [16];
- The Kilkenny County Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [17];
- The Waterford County Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [18];
- The Wexford County Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [19];
- The Department of Housing, Local Government and Heritage's planning portal – the National Planning Application Database was reviewed to obtain details about existing / proposed developments in the vicinity of the Site [20];
- The Wexford County Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [19];
- Review of Delft Hydraulics [21] and ABP Marine Environmental Research Ltd. ('ABPmer') modelled reports (2017 & 2023) [22, 23] for the Waterford Estuary that assess the ongoing estuary processes, trends and physical characteristics and assess the physical effects, if any, of ongoing port operations, including maintenance dredging and disposal;
- The National Biodiversity Data Centre ('NBDC') website was reviewed with regard to species distributions [24]; and,
- The Environmental Protection Agency ('EPA') Maps website was reviewed to obtain details about watercourses in the vicinity of the Site [6].

2.2.1.1 Fisheries Studies

Dr. Martin O'Farrell of Aztec Management Consultants prepared a Fish Report in support of the Port of Waterford Maintenance Dredging Programme (Dumping at Sea EPA Reg. No.: S0012-05) [25]. This report was reviewed, and MOR Environmental Ecologists worked with Dr. Martin O'Farrell to inform the impact assessment for this application with the relevant fisheries information and data.

2.3 Field-Based Studies

2.3.1 Habitat Survey

An initial Site assessment was undertaken on the 15th February 2021 by two suitably qualified and experienced MOR Environmental Ecologists. The survey aimed to identify the extent and quality of habitats present on the Site and to identify any potential ecological receptors.

During this assessment, a habitat survey was undertaken at the Site using the using the Heritage Councils – '*A Guide to Habitats in Ireland'* [26] *and was conducted in line with the*

Heritage Council's 'Best Practice Guidance for Habitat Survey & Mapping' [27]. This is the standard habitat classification system used in Ireland and includes both a desk-based and field-based assessment. The surveys were also undertaken utilising the Irish Ramsar Wetlands Committee's *'Irish Wetland Types- an identification guide and field survey manual* [28]*'* In addition the surveys also aimed to identify any habitats corresponding to Annex I of the Habitats Directive using the *Interpretation Manual of European Union Habitats* [29].

Updated habitat surveys were completed on:

- 31st July 2024;
- 25th March 2025; and,
- 28th July 2025.

These surveys were undertaken by a team of suitably qualified and experienced MOR Environmental Ecologists to confirm that the extent and quality of habitats present onsite and the potential ecological receptors onsite had not changed from the previous assessments.

The Site was also assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,
- Ireland Red List No. 10: Vascular Plants [30].

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation

2.3.2 Otter Survey

During the initial survey on 15th February 2021, MOR Environmental Ecologists assessed the Port and surrounding areas for potential suitability to support otter. In addition, during this survey, the ecologists assessed the proposed areas for safe access.

Otter surveys have been carried out at the Site on a predominantly monthly basis, since 15th February 2021 to March 2025. These surveys have been carried out by two suitably qualified and experienced MOR Environmental Ecologists.

The surveys included a full bankside surveys, boat surveys, and targeted camera trap surveys, aimed to identify and examine areas where otter might occur by noting any evidence of otter observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattened areas of mud or vegetation);
- Couches (resting areas where the grasses or bank substrates have been flattened);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales and shellfish); and,
- Spraints (faeces containing food remains); and,
- Anal jellies & smears (gelatinous secretions that is typically brown in colour with the characteristic otter odour).

In line with best practice, a 200 m buffer zone was applied during the surveys where holts or potential breeding sites were identified. This approach follows NatureScot's '*Standing Advice for Planning Consultations – Otters*' [31], which specifies that where otters are known or

suspected to be breeding, an exclusion zone of at least 200m should be established. The application of this buffer is consistent with recognised guidance and ensures that survey activity does not result in disturbance to otters

The surveys were undertaken primarily along the Kilkenny shoreline of the Lower Suir Estuary in three locations:

- The accessible shoreline within the Site boundary;
- The accessible shoreline to the north of the Site boundary; and,
- The accessible shoreline to the south of the Site boundary between the Belview Port and the O'Briens Quay.

The areas that could be safely accessed for the otter surveys are illustrated in Figure 2-1.

The field survey of the Site was conducted in line with the following relevant guidance for otter:

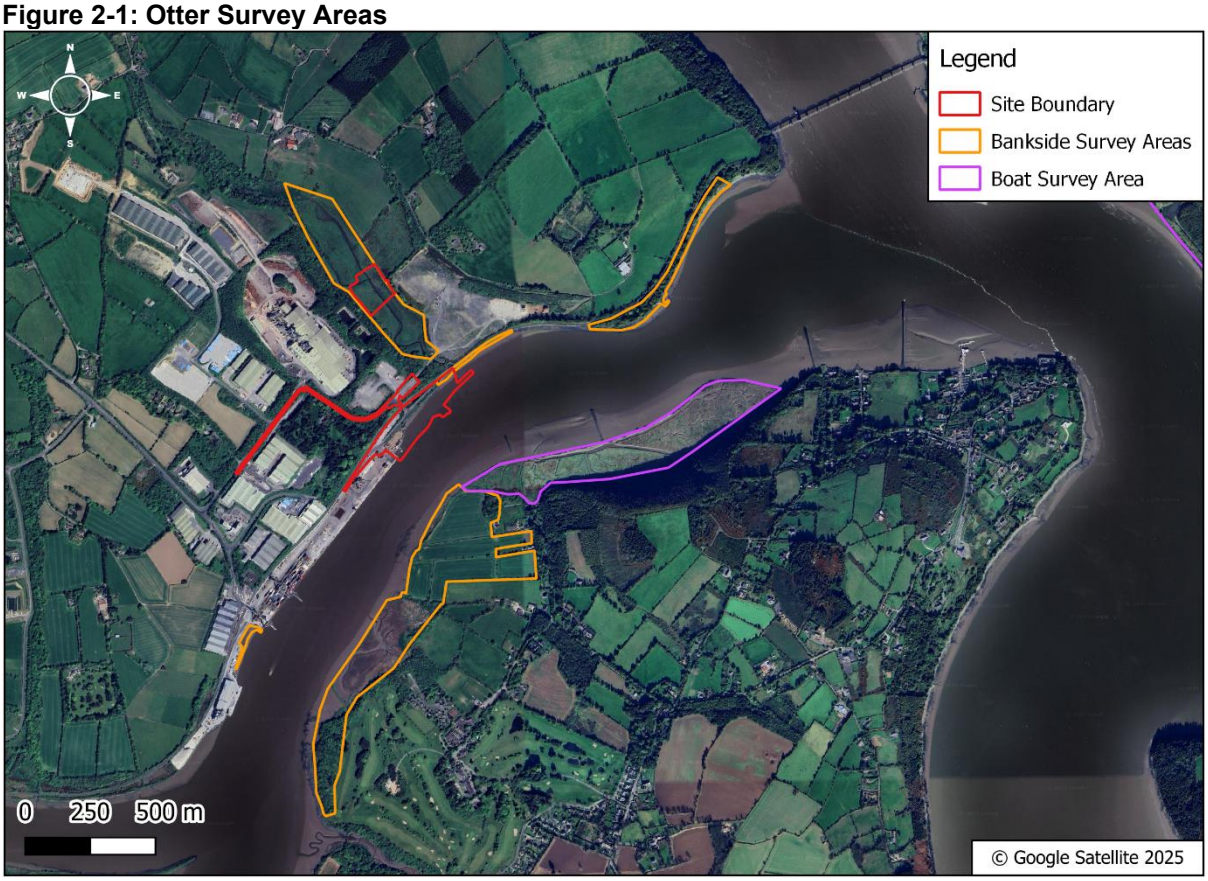
- Scottish Natural Heritage ('SNH'), 'Technical Advice Note #2: Otter Surveys' [32];
- DoAHG, 'National Otter Survey of Ireland 2010 / 12' [33]; and,
- National Road Authority ('NRA'), now Transport Infrastructure Ireland ('TII'), 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes [34],'
- NatureScot, '*Standing Advice for Planning Consultations – Otters'* [31].

Sightings of otter observed during bird surveys undertaken within the Port of Waterford area were also recorded.

In addition, on 27th January 2021, 27th April 2021, 10th June 2021, 27th January 2022, 17th June 2022, 3rd April 2025 and 9th April 2025, two MOR Environmental Ecologists undertook boat surveys around the Belview Port and the wider Waterford Estuary to assess areas inaccessible by land.

Furthermore, on the 14th March 2022 and the 1st of February 2023, MOR Environmental ecologists undertook bankside surveys along the shoreline of Faithlegg to survey for otter activity and potential sett locations.

Figure 2-1: Otter Survey Areas



Surveys were timed to coincide with the spring tides, where possible, with weather and daylight constraints.

Given the tidal nature of this section of the Lower Suir Estuary, bankside surveys were carried out during low tide to access all potentially suitable areas. Boat surveys were carried out at high tide to gain access to areas inaccessible during low tide and included the wider Waterford Estuary.

The dates that these surveys were undertaken are listed in Table 2-1 below.

Table 2-1: Otter Survey Dates

Date	Survey Type
15/02/2021	Bankside Survey
26/03/2021	Bankside Survey
27/04/2021	Boat Survey
26/05/2021	Bankside Survey
10/06/2021	Boat Survey
27/07/2021	Bankside Survey
24/08/2021	Bankside Survey
21/09/2021	Bankside Survey
21/10/2021	Bankside Survey
19/11/2021	Bankside Survey
17/12/2021	Bankside Survey
18/01/2022	Bankside Survey
27/01/2022	Boat Survey

Date	Survey Type
22/02/2022	Bankside Survey
14/03/2022	Bankside Survey
29/04/2022	Bankside Survey
24/05/2022	Bankside Survey
25/05/2022	Bankside Survey
17/06/2022	Boat Survey
15/07/2022	Bankside Survey
25/08/2022	Bankside Survey
26/08/2022	Bankside Survey
26/09/2022	Bankside Survey
27/09/2022	Bankside Survey
10/10/2022	Bankside Survey
22/11/2022	Bankside Survey
06/12/2022	Bankside Survey
19/01/2023	Bankside Survey
31/03/2023	Bankside Survey
19/04/2023	Bankside Survey
26/05/2023	Bankside Survey
26/06/2023	Bankside Survey
20/07/2023	Bankside Survey
28/09/2023	Bankside Survey
09/11/2023	Bankside Survey
11/01/2024	Bankside Survey
29/03/2024	Bankside Survey
26/04/2024	Bankside Survey
28/05/2024	Bankside Survey
28/06/2024	Bankside Survey
31/07/2024	Bankside Survey
23/08/2024	Bankside Survey
27/09/2024	Bankside Survey
17/10/2024	Bankside Survey
26/11/2024	Bankside Survey
16/12/2024	Bankside Survey
15/01/2025	Bankside Survey
23/01/2025	Bankside Survey
18/02/2025	Bankside Survey
26/03/2025	Bankside Survey
03/04/2025	Boat Survey
09/04/2025	Boat Survey

Camera Trap Surveys

During the 2021 and 2022 otter surveys, camera trap surveys were undertaken to identify areas of regular use by otter. The camera trap surveys were undertaken using a Browning Strike Force HD Pro X Trail Cameras.

The camera traps were programmed to take three consecutive shots at each detection with a 1-second delay between each photo. The dates in which the camera traps were operating are listed in Table 2-2 below.

Table 2-2: Camera Trap Start and End Dates

Start Date	End Date
14/05/2021	26/05/2021
27/07/2021	13/08/2021
21/09/2021	21/10/2021
20/10/2021	10/11/2021
17/12/2021	10/01/2022
14/03/2022	28/03/2022
15/07/2022	28/07/2022
26/08/2022	30/08/2022

2.3.3 Invasive Species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [35] such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to impact on local biodiversity.

2.3.4 Biodiversity Enhancement Area

An initial site assessment of the proposed Biodiversity Enhancement Area was undertaken by two suitably qualified and experienced MOR Environmental Ecologists on 27th January 2021. Updated surveys were completed on 17th August 2023 and 10th July 2024 to assess the area and determine if there had been any changes in the onsite habitats. The surveys aimed to identify the extent and quality of habitats present on the Site.

These surveys were undertaken at the Site using the *A Guide to Habitats in Ireland'* [26] and was conducted in line with the Heritage Council's *'Best Practice Guidance for Habitat Survey & Mapping'* [27]. This is the standard habitat classification system used in Ireland and includes both a desk-based and field-based assessment. The surveys were also undertaken utilising the Irish Ramsar Wetlands Committee's *'Irish Wetland Types- an identification guide and field survey manual'* [28]. The surveys aimed to identify the extent and quality of habitats present within the Biodiversity Enhancement Area.

2.3.5 Survey Limitations

The otter surveys were aimed to be undertaken during suitable weather conditions, i.e., no rain, little to no wind, bright conditions, etc. However, during the winter months, it was not possible to ensure dry weather windows and as such, light drizzles to slight rain was experienced during some of the surveys. However, given the large dataset gathered as part of this assessment, it was not considered that this survey limitation will have affected the survey results.

2.4 External Field Studies

2.4.1 Subtidal Benthic Survey

A specialist subtidal benthic survey was carried out by AQUAFACT International Services Ltd. ('Aquafact') on 1st June 2021 from the Keltoi Warrior vessel. During this survey, four subtidal

samples were taken within the Site boundary (see Figure 2-2). The station coordinates and depths of these samples are shown in Table 2-3.

Three grab samples were taken for faunal analysis, and one sample was collected for sediment grain size and organic carbon analysis. Upon retrieval of the grab, a description of the sediment type was noted in the sample data sheet. Notes were also made on colour, texture, smell and presence of animals. The grab sampler was cleaned between stations to prevent cross-contamination.

Aquafact have an in-house standard operational procedure for benthic intertidal sampling, and these procedures were followed during the sampling. Additionally, the National Marine Biological Analytical Quality Control Scheme ('NMBAQC') report "*Guidelines for processing marine macrobenthic invertebrate samples: a processing requirements protocols*" [36] were adhered to. Please see Appendix B for full details.

Figure 2-2: Grab sample locations

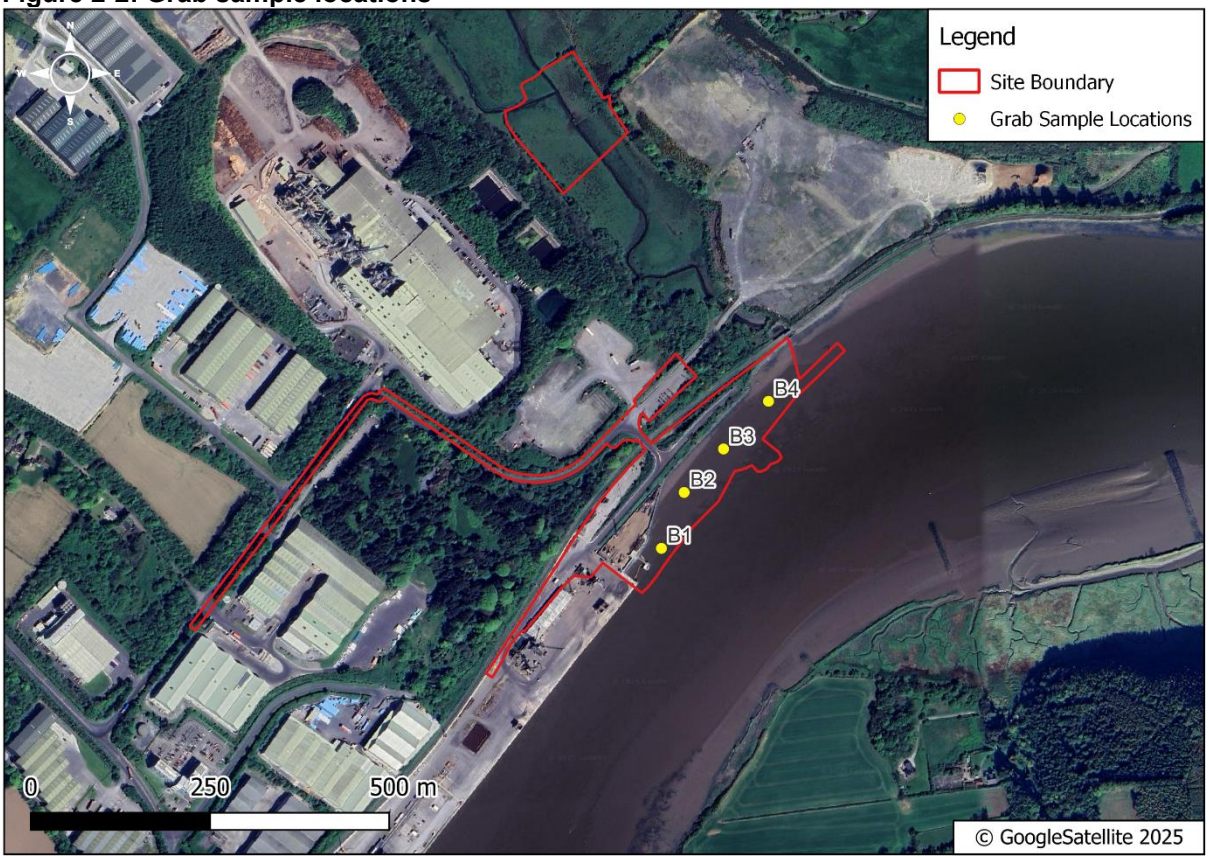


Table 2-3: Coordinates and Depths at the Grab Stations

Grab Station	Latitude	Longitude	Depth (m)
B1	52.2695155	-7.0272737	15
B2	52.2701497	-7.0269006	8
B3	52.2706634	-7.0261855	7
B4	52.271342	-7.0252424	4

2.4.2 Site Investigations

The investigations undertaken as part of this assessment included the collection of sediment samples within the Site between the 20th and 21st April 2023, in order to assess the quality and physical characterisation of the sediment within the Lower Suir Estuary. Sampling locations are shown in Figure 2-3 below.

Figure 2-3: Sediment Sampling Locations

SOCOTEC Environmental Chemistry collected seven samples at representative locations within the Site (MPSS1 to MPSS7), within the Lower Suir Estuary (see Appendix 7-1). An accredited laboratory conducted physical grain size analysis on the collected samples, determining the sediment classification based on grain size and type.

An accredited laboratory also undertook geochemistry of sediments and leachate testing on the samples. This laboratory analysis was used to assess criteria for possible reuse on-site or removal off-site to licensed waste facilities in accordance with the EPA's Waste Classification List [37]. Parameters for leachate samples are compared to Waste Acceptance Criteria ('WAC') [38] to establish if the material would be suitable for landfills.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Description of the Proposed Development

The Proposed Development will comprise a proposed ORE Capable Terminal located on a ca. 250m wharf extension, land reclamation, ancillary works and a Biodiversity Enhancement Area (gross area ca. 8ha), partly on land and partly in the near shore area of the coastal planning authority (Kilkenny County Council) at Port of Waterford, Belview, Co. Kilkenny.

The Proposed Development will comprise:

- A ca. 250m extension to the existing wharves at the container / bulk handling terminal at Belview port, as a continuation of the existing wharves, comprising a reinforced concrete suspended deck supported on reinforced concrete beams and steel piles socketed into bedrock below the Lower River Suir Special Area of Conservation ('SAC') and partly on land with a retaining structure to the rear;
- Land reclamation, covering an area of ca. 1.3ha primarily using imported quarried rock and, if suitable, treated dredged material, retained by the wharf structure and a rock-armoured embankment beneath the wharf and to the downstream end of the development;
- Two separate quayside ORE Operator support facilities (annotated Operator 1 and Operator 2 on drawings) located at the downstream area of the Port, supported on piled foundations, with associated support and warehousing / workshop buildings, berthing pontoons, yard areas and crane installations;
- A three-storey administrative office and staff facilities building for Operator 1 located in the downstream area of the Port and supported on piled foundations, and associated car parking to the east of the railway bridge crossing;
- A three-storey administrative office and staff facilities building for Operator 2 located on the north side of the Rosslare-Limerick railway line and supported on piled foundations, and associated car parking for staff;
- Associated underground services, water supply and drainage to include a pumped rising main to discharge foul water from the development to the Uisce Éireann network;
- An Electricity Substation to replace the existing Substation;
- Additional lighting and lighting pylons;
- Relocation of existing weighbridges and security cabin;
- Partial demolition of both the existing downstream ramp and the existing dolphin to facilitate the development;
- Minor works to the existing quay to facilitate structural interfacing between existing and proposed structures;
- Roof-mounted solar photovoltaic ('PV') arrays;
- Biodiversity Enhancement Area (ca. 1.8ha) located to the northeast of the wharf extension in existing agricultural wet grassland that is bisected by the Luffany Stream;
- Diversion, extension and relocation of the outfall to the existing drainage pipe serving the SmartPly facility; and,
- All associated Site development works.

The proposed Site Layout is illustrated in Appendix A. Further details on the above elements of the Proposed Development are provided below.

3.1.1 250m Wharf Extension

The Proposed Development will include a ca. 250m extension to the existing wharves at the container / bulk handling terminal at Belview Port, located at the downstream end of the Belview Port.

The quay will comprise a reinforced concrete suspended beam and slab structure measuring ca. 23.5m in width by ca. 250m in length and will be a continuation of the existing wharves.

The quay will be supported on ca. 200 - 240 steel piles. The level of the front elevation of the quay will be nominally 6.3 metres above Ordnance Datum ('mOD') Poolbeg.

The wharf extension will support two ORE Operator Facilities and will provide additional space for port-related activities. As part of the port-related activities, it is proposed that an additional mobile harbour crane be installed, which will be in line with the existing Belview Port mobile harbour cranes that have a maximum lifting capacity of ca. 84t and a maximum lifting height of ca. 48m.

3.1.2 ORE Operator Facilities

The Proposed Development will also comprise of two distinct ORE Operator Facilities to serve the needs of future ORE projects in the Celtic Sea off the southern coast of Ireland. The ORE operator facilities have been designed to operate independently of one another. Each facility has separate infrastructure, utilities and access arrangements to ensure autonomy in their management; please see further details below.

<u>Operator 1 Facility:</u>

- A three-storey building located on the proposed wharf extension that will include warehousing, workshop, welfare areas, office space, electrical stores, switch room and control rooms, which will include:
    - Dimensions of ca. 41m in width, ca. 27m in length and ca. 17m in height; and,
    - Floor areas of ca. 1750 m² at ground floor, ca. 700 m² at first floor and ca. 700 m² at second floor.
- Solar PV panels will be mounted on the rooftops, where possible;
- Yard area of ca. 2,575m^2;
- One quayside fixed crane installation (max height of ca. 6m);
- One dedicated fuel tank with 90,000-litre ('L') capacity which will be located in a bunded area designed to hold 110% of the tank volume. The fuel loading and unloading will take place within a contained area;
- One 80m berthing pontoon designed to accommodate up to two 30m Crew Transfer Vessels ('CTV');
- Berthing space along the wharf extension designed to allow for up to one 100m Service Operations Vessel ('SOV');
- 38 car parking spaces; and,
- Stormwater and foul water drainage; see Section 3.1.5 below for further details.

Operator 2 Facility:

- A two-storey building with that will include warehousing, workshop and welfare areas, which will include:
    - Dimensions of ca. 75m in width, ca. 28m in length and ca. 11m in height; and,
    - Floor areas of ca. 1050 m² at ground floor and ca. 250m² at first floor.
- A three-storey building located on the north side of the Rosslare-Limerick railway line, which will include office space, welfare areas, electrical stores, server room and control rooms, which will include:
    - Dimensions of ca. 30m in length, 12m in width and 14m in height; and,
    - Floor area of ca. 370 m² at each level.
- Solar PV panels will be mounted on the rooftops, where possible;
- Yard area of ca. 1,455m^2;
- One quayside fixed crane installation (max height of ca. 6m);
- One dedicated fuel tank with 90,000-litre ('L') capacity which will be located in a bunded area designed to hold 110% of the tank volume. The fuel loading and unloading will take place within a contained area;
- One 80m berthing pontoon designed to accommodate up to two 30m CTVs;
- Berthing space along the wharf extension designed to allow for up to one 100m SOV;
- 38 car parking spaces; and,
- Stormwater and foul water drainage; see Section 3.1.5 below for further details.

3.1.3 Energy Supply

The existing substation at the Port of Waterford wharf has a maximum import capacity ('MIC') supply of 750kVA. Presently, this substation supplies power to the existing lighting, general services and crane requirements for the port. The existing 750kVA MIC is expected to be sufficient to supply the power requirements for the Proposed Development.

In order to comply with the current ESB standards, it is proposed to replace the existing substation with a new ESB-compliant substation. Therefore, the Proposed Development will involve the construction of a new 750kV substation and switch room. This substation will replace the existing 750kV substation. The new substation will have the capacity to supply energy to the Proposed Development and the existing Port of Waterford operations.

Power and communications will be supplied to separate locations within the new wharf extension via new low voltage ('LV') and extra low voltage ('ELV') ducting to a number of dual-compartment mini pillars and external metering units, depending on the electrical requirements needed at specific areas of the wharf.

ORE operators have indicated that future SOV and CTV vessels may be electrically powered in the future. Therefore, the design of the proposed substation will allow for future capacity for potential electric SOVs and CTVs.

In addition, rooftop-mounted solar PV panels will be installed on the ORE Operator facilities, which will cover a combined maximum area of ca. 2,100m^2 across the buildings. The estimated annual electricity generation was calculated using the Sustainable Energy Authority of Ireland ('SEAI') baseline for a well-sited domestic solar PV system, which produces approximately

2,600kWh/year from a 20m^2 array [39]. Based on this data, the 2,100m^2 array has a potential maximum generation of approximately 273,000kWh of electricity per annum.

For full details, please refer to Malone O'Regan Consulting Engineering Report submitted in support of this application.

3.1.4 Water Supply

3.1.4.1 Potable Water

Potable water will be supplied to the ORE facilities on the quayside and for bunkering vessels berthed alongside the ca. 250m wharf extension by extending the existing potable supply network as shown on the drawings.

Potable water for the Operator 2 office building, located north of the Rosslare-Limerick railway line, will be supplied from the existing port watermain in the industrial access road.

Uisce Éireann have confirmed feasibility for the ORE operator facilities, which will be subject to a connection agreement with Uisce Éireann. Confirmation of feasibility from Uisce Éireann was received on 28th May 2025. For full details, please refer to Malone O'Regan Consulting Engineering Report submitted in support of this application.

3.1.4.2 Fire Water Supply

Fire water supply will be provided to the Proposed Development by extending the existing port area fire main, which is connected to the existing large capacity static firefighting water tank located adjacent to the Port offices at the upstream entrance to the Port.

This tank, in turn, is fed by an existing borewell with primary back up from a second borewell and secondary back up from the Uisce Eireann network. Fire supply to the Proposed Development will be provided by extending to the fire main, incorporating hydrants as indicated on the drawings, to meet the firefighting requirements of the Offshore Renewable Energy facilities and the port extension. For full details, please refer to Malone O'Regan Consulting Engineering Report submitted in support of this application.

3.1.5 Drainage

3.1.5.1 Stormwater Drainage

Operator 2 Office Building Surface Water Drainage

It is proposed to provide permeable paving to allow stormwater generated in the proposed parking areas to discharge to the ground.

Stormwater runoff from the roof of Operator 2's office building, located to the north of the railway line, will be collected via rainwater downpipes and will be discharged into the proposed surface water drainage network. This stormwater runoff will be discharged under controlled flow into the existing surface water network to the east of the Site, which discharges to the Luffany Stream downstream of the existing tidal flap along this stream.

Quayside Stormwater Drainage

Stormwater runoff from the wharf extension and reclaimed area will be collected via longitudinal heavy-duty channels and gullies to discharge to an underground drainage network, which will be routed to a proposed settling tank (ca. 2.5m wide x ca. 12m long x 3.5m depth) on the quay before draining through a hydrocarbon bypass interceptor before discharging to the Lower Suir Estuary through the proposed new outfall pipe. The works will include modifications to the existing storm drainage to facilitate the extended wharf structure and associated work areas.

The settling tank will have a V-notch weir fitting, composite sampling equipment and continuous pH and conductivity probes. In the unlikely event of a major spill or a fire occurring at the Port, contaminated run-off will be diverted to an Emergency Holding Tank (capacity of 636m^3) where the liquid will be contained for further testing. All contaminated run-off water will be removed off-site for treatment at an appropriate waste facility in strict accordance with the requirements of the Waste Management Regulations.

Additionally, as part of the Proposed Development, the existing 600mm diameter outfall discharging existing stormwater runoff from the port will be extended to an outfall within the proposed new revetment.

Operator 1 & 2 Quayside Stormwater Drainage

Stormwater from the roofs of the new ORE buildings will be collected via rainwater downpipes and discharged to the proposed surface water piped network. Surface water from the proposed ORE yards will be directed into the new network through road gullies and channels that will link into the quayside stormwater drainage.

SmartPly Discharge Pipe

As part of the Proposed Development, the existing 600mm diameter outfall discharge pipe from the SmartPly site located to the northwest will be diverted and extended to the outfall within the proposed new revetment. There will be no changes to the current discharge rates / capacity to the discharge pipe as a result of the Proposed Development. As this discharge is strictly regulated by the EPA under IE Licence P0001-05, Smartply Europe DAC, the licence holder, will need to obtain the Agency's consent for these works.

Quayside Fuel Tank Loading and Unloading Area

As mentioned, each ORE Operator will have a 90,000L dedicated bunded fuel tank. A dedicated containment area will be provided immediately adjacent to the two fuel tank bunds to mitigate any impact from potential spillages or leakages during the filling of the fuel tanks by fuel delivery tankers.

The stormwater generated in the re-fuelling zone and bunded areas will flow through an automated shut-off valve, activated on detection of hydrocarbons, and will discharge through a forecourt interceptor to the surface water network. The fuel delivery tankers will be subdivided into four compartments, each with a 7,600-litre capacity. The forecourt interceptor will therefore have the capacity to retain the entirety of one of the 7,600 litre delivery compartments.

In addition, each ORE Operator will have a separate underground pipeline that will connect the fuel tank to a manifold on the wharfs that will be used for refuelling of the CTVs and SOVs.

For full drainage details, refer to Malone O'Regan Consulting Engineering Report submitted in support of this application.

3.1.5.2 Foul Water Drainage

ORE Operator Facilities

A new foul water drainage system is proposed to collect foul water from the ORE Operator facilities and to discharge via a gravity and pumped system to the Uisce Éireann network subject to a connection agreement with Uisce Éireann and in accordance with the Uisce Éireann Code of Practice for Wastewater Infrastructure. Uisce Éireann provided a Confirmation of Feasibility.

Port of Waterford

However, no additional drainage infrastructure was deemed necessary to accommodate the additional 30 employees as the existing drainage system for the Port of Waterford Marine Point Offices and Terminal Building have the capacity to accept the additional staff.

For full drainage details, refer to Malone O'Regan Consulting Engineering Report submitted in support of this application.

3.1.6 Fire-fighting Facilities

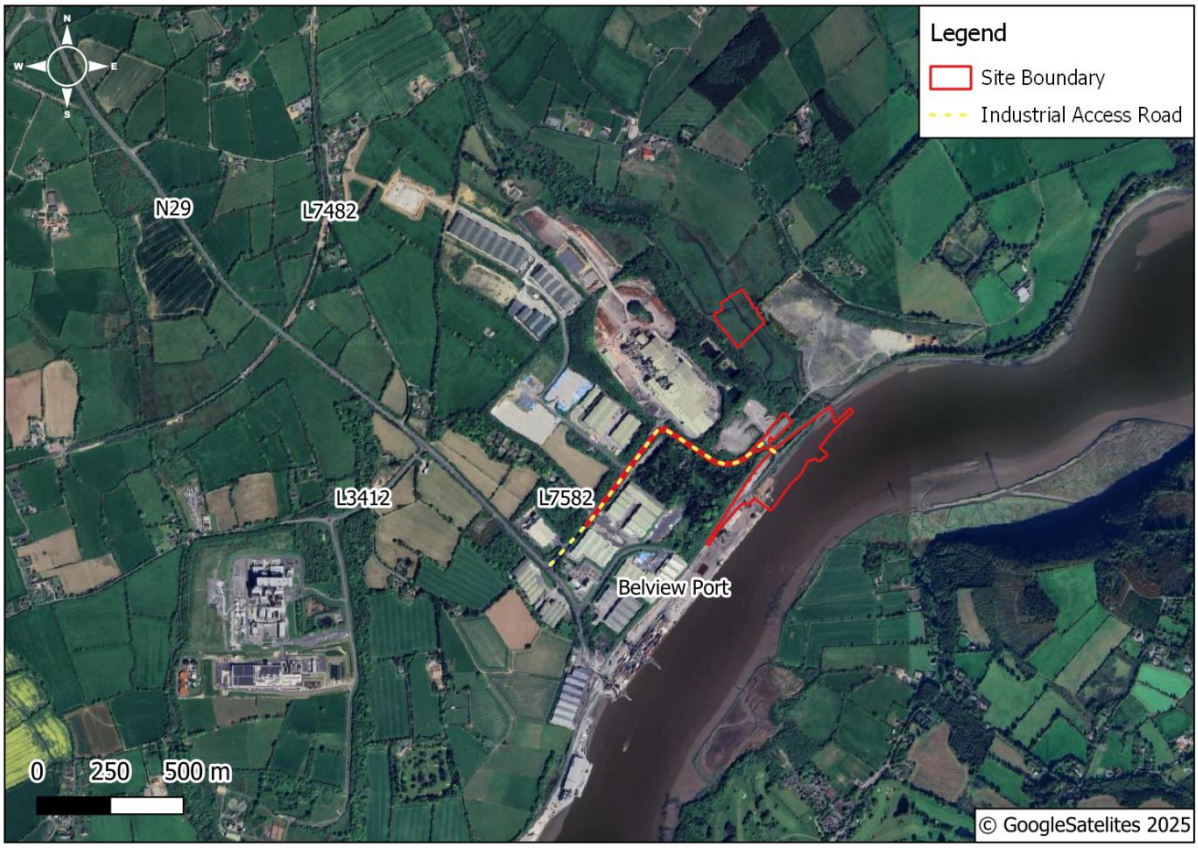
The Proposed Development will include the following fire-fighting facilities, which will include:

- Tie-in to the existing fire mains as described in Section 3.1.4 above;
- A new fire hydrant system including three new double-headed hydrants;
- Fire hose reels within the buildings;
- Installation of Fire alarms as per BS 5839 / IS 3218 within the on-site buildings; and,
- Hand-held fire extinguishers at key locations within the buildings.

3.1.7 Site Access

Access to the Proposed Development will be primarily via the existing downstream Port of Waterford entrance.

Figure 3-1: Access Road and Proposed Haulage Road



3.1.8 Parking

The Proposed Development has been designed to incorporate 70 standard car parking spaces, 35 of which will be located on the elevated site north side of the Rosslare-Limerick

railway line, 35 of which will be located to the south of the railway line and six disabled parking spaces, two adjacent to each of the ORE operator offices and buildings. In total, there will be 76 parking spaces serving the Proposed Development.

Parking will also be available at the existing Port of Waterford offices or at the terminal parking area adjacent to the existing upstream main entrance to the Belview Port, in line with the current Port operations.

3.1.9 Weighbridges

The two existing downstream weighbridges within the Port of Waterford will be relocated as part of the Proposed Development.

3.1.10 Lighting

The Proposed Development will operate on a 24-hour basis, and proposed lighting will be provided to align with the requirements of the ORE Operators. New general lighting has been proposed for the wharf area, pontoons, staff carparks, pedestrian walkways, access roadways and office areas.

Luminaires have been selected on the merit of their efficiency and minimal glare, back light and up light spill characteristics to ensure minimal light pollution to surrounding areas.

External Lighting control shall be completed by means of timeclocks and external photocell units.

Lighting will be at the following lux levels:

- Roads - 15 to 20 lux;
- Wharves - 10 to 30 lux;
- Pontoons - 5 to 8 lux;
- External areas around buildings - 10 to 20 lux; and,
- Car parking areas - 15 to 20 lux.

The lighting strategy has been specifically designed to minimise light pollution to surrounding areas and avoids excessive lighting. For full details, please refer to the Lighting Reality report submitted in support of this application.

3.1.11 Biodiversity Enhancement Area

As part of the Proposed Development, an area of ca. 1.8ha will be managed to enhance local biodiversity. The proposed works will include:

- Installation of stock proof fencing around the Biodiversity Enhancement Area to exclude cattle but allow the free movement of other species, including otter, badger, deer, etc;
- The creation of pond complexes within the Biodiversity Enhancement Area with natural regeneration of wetland species;
- Enhancement of existing hedgerows with additional species-rich riparian woodland planting along the eastern and western boundaries;
- Allowing for the natural regeneration of wet grassland habitat and reed and large sedge swamp habitat following the removal of livestock from the area; and,
- The provision of wildlife shelters providing nesting opportunities for protected and locally important species, including sand martin nest bank, kingfisher nest bank, bat boxes, habitat piles / hibernaculum, deadwood habitat and artificial otter holts.

3.2 Demolition and Construction Procedures

The construction works are currently planned to begin in Q3 2026 and will take ca. 18-24 months to complete.

3.2.1 Construction Programme

The construction works will be undertaken in six phases. Summary details for the different phases are outlined below. The construction phases will be:

Table 3-1: Construction Programme

Construction Phase	Estimated Duration (Months)*
Site Set-up	0.5 – 1
Demolition Works	1
Capital Dredging & Land Reclamation Works	6 – 9
Construction of Wharf	9 – 12
Building Construction	12 – 15
Works Completion	2 – 3
Estimated Duration of Construction	**18-24 Months**

***Note:** The construction programme for the works will involve the various construction activities occurring simultaneously in different areas of the Site as the works progress.

3.2.1.1 Site Set-up

The temporary Contractor's compound will initially be established on the elevated area in the northern section of the Site, north of the Rosslare-Limerick railway lines. As the works progress and reclamation makes further areas available, the Contractor will establish a secondary compound adjacent to the construction works for the wharf in the main Belview Port area.

Site set-up activities will also include establishing secure perimeter fencing, controlled access points, and clear site signage to manage vehicle and pedestrian movement. Temporary welfare facilities will be installed, and existing port facilities will be utilised where feasible. Wheelwash systems will be provided at exit points to prevent debris and sediment from reaching public roads, and internal haul routes will be prepared with appropriate surfacing to reduce dust and sediment runoff into adjacent waters.

Additional preparatory measures will include minor grading or clearance works, the installation of temporary drainage infrastructure such as silt traps to manage surface water, and the provision of bunded storage areas for fuels, oils, and other hazardous materials. Designated waste segregation areas will be established to ensure that inert, recyclable and general waste streams will be managed appropriately. All enabling works will be carried out under strict environmental controls to safeguard local water quality, minimise dust and noise emissions and limit disruption to port operations and surrounding communities.

3.2.1.2 Demolition Works

The Proposed Development will involve the demolition of the following:

- The existing downstream ramp will be partially demolished to facilitate the development of the wharf extensions. This demolition work will involve the removal of

ca. 3,000m^3 of material. The materials from this demolition work will be reused as part of the infill material in the reclaimed area;

- The existing dolphin, comprising a reinforced concrete deck on steel piles, together with a steel access gangway, will be partially demolished. Piles will be cut at bed level and left in place. Demolished concrete will be transported to a land-based area within the Site for crushing and reuse as part of the fill material for reclamation, subject to meeting relevant specification;
- The existing fendering at the downstream end of the wharf. This fendering will be removed and returned to the Port of Waterford for future reuse; and,
- The existing supporting steel framing within the downstream end of the wharf will be removed and taken offsite for recycling (if suitable) or appropriately disposed of by a licenced contractor.

Materials arising from demolition works that will not be suitable for reuse on-site will be removed to licenced facilities for recycling or disposal.

3.2.1.3 Land Reclamation Works

Capital Dredging Works

Capital dredging will be required to be carried out locally at the downstream end of the wharf extension to achieve the proposed berth depth of -10mOD Poolbeg. There will be a need to remove ca. 7,000m^3 of material from the riverbed to facilitate the construction of the wharf extension. The dredging works will be carried out using appropriate dredging methods and equipment to loosen the compacted material. Loading will take place under controlled conditions, with material removed from the bed transferred by a suction pipe directly to the vessels' holding tanks.

Dredged material suitable for treatment and reuse will remain on-site to be treated and reused as fill material. Unsuitable material will be loaded onto tipper trucks and transported to a suitably permitted / licensed facility for recovery and/or disposal.

Reclamation Works

Approximately 160,000 tonnes of rock will be imported from a local quarry, as much as practicable, to the Site. This rock will infill the area behind the open wharf and will be brought up to the same level as the wharf. A subbase layer will be placed on top of the infill material. Concrete paving will be finished at the surface, and therefore, there will be minimal pouring of concrete required within this portion of the Proposed Development.

3.2.1.4 Construction of Wharf

The sequence of the wharf construction will consist of the following:

- Removal of the existing rock armour in the area of the wharf extension using floating plant and retention onsite for re-use, if suitable;
- Removal of material from the footprint of the development and from the proposed berth via capital dredging and disposal off-site to a suitably licenced facility, as outlined in Section 3.3.1.3 above;
- Placement of fill material from the shore to the reclaimed areas within the river, commencing at the upstream end. Placement of fill to be undertaken in layers;
- Setting out and installation of the steel piles using floating plant, and/or other appropriate methodology, to socket the piles into the bedrock to support the wharf and the pontoons;

- Infilling of material to the profile of the revetment, placement of geogrid geotextile membrane and placement of rock armouring;
- Placement of reinforced concrete precast beam sections on the piles and casting of the reinforced concrete in-situ concrete pile heads;
- Placement of the precast prestressed deck slab units and casting of the reinforced concrete in-situ slab;
- Installation of the tie rods and precast in-situ anchor walls and completion of the filling;
- Installation of the cone fender units, fender panels and mooring bollards; and,
- Installation of underground services and underground tanks will be progressed during the filling works.

3.2.1.5 Building Construction

The construction of the ORE facilities will commence when the wharf construction and reclamation works will be advanced.

Piles will be driven to support the buildings, followed by construction of the reinforced concrete pile caps, ground beams and ground floor slabs, erection of the steel frames, installation of the upper floors, roof and wall cladding, installation of the building services and building fit-out.

External works will be completed latterly to include the elevated site to the north of the railway and will comprise external finishes, lighting, fencing and gates.

3.2.1.6 Works Completion

Works completions will include the delivery and installation of the pontoons and gangways, fabricated office, erection of external lighting, fencing, gates, application of road making and erection of signage and delivery and installation of the ORE wharf-mounted cranes, two fuel tanks and fuel tank bund enclosures.

3.2.2 Construction Management

3.2.2.1 Construction Access

The primary access during the construction period will be via the existing Port of Waterford secure entrances.

3.2.2.2 Construction Employment

It is anticipated that the number of construction workers will range between 20 and 100 during the different phases of construction over an estimated 18-24 month period.

3.2.2.3 Hours of Work

The hours of construction work are intended to be:

- Monday – Friday: 07:00 – 19:00; and,
- Saturday: 07:00 – 14:00.

Pile installation works will be limited to 08:00 – 18:00 Monday to Friday, and 8:00 – 14:00 on Saturdays.

As per any construction works programme, there may be the occasional requirement for specific works that will be required outside these hours. Any works that take place outside the agreed hours will be notified to the Planning Authority in advance.

3.2.2.4 Marine Traffic

The Port of Waterford will maintain normal port operations during the Construction Phase. Therefore, the Port of Waterford will notify all port users of the construction works and will notify the Marine Survey Office as necessary.

Navigation marks and lighting will be established if necessary to warn other marine users of any works potentially interfering with navigations.

3.2.2.5 Construction Management

During the Construction Phase, the methods of work will comply with all relevant legislation and best practices in reducing the environmental impacts of the works. The impacts will be reduced as far as practicable through compliance with the mitigation measures stated in this EIAR and current construction industry guidelines as outlined in relevant chapters of this EIAR.

As part of the pre-construction preparation, a preliminary Construction Environmental Management Plan ('pCEMP') has been developed and will accompany this application. To ensure the Construction Environmental Management Plan ('CEMP') is relevant to the project and the current environment at the time of construction, it will be prepared by the appointed Contractor in advance of the commencement of construction works.

The CEMP prepared by the Contractor will outline in a single document the procedures for monitoring the effectiveness of the environmental protection measures. The CEMP will, as a minimum, include the following:

- Incorporate all Environmental Commitments and Mitigation Measures in the contract documents, which will include all mitigation and prevention measures identified in Chapters 5 to 18 of this EIAR and the NIS submitted as part of this planning application, and any conditions of any permission as may be granted and any further requirements of Statutory Bodies;
- Provide a method of documenting compliance with these Environmental Commitments and Mitigation Measures;
- List all relevant environmental legislative requirements;
- State methods by which construction work will be managed to avoid, reduce or remedy potential adverse impacts on the environment;
- The contractor shall ensure that all personnel working onsite will be trained and made aware of the measures detailed within the CEMP;
- A detailed Dust Management Plan ('DMP') will be prepared in accordance with best practice guidelines;
- A detailed Construction Resource and Waste Management Plan ('CRWMP') will be prepared in accordance with best practice guidelines;
- A detailed Construction Traffic Management Plan ('CTMP') will be prepared in accordance with best practice guidelines; and,
- A detailed Greenhouse Gas ('GHG') Reduction Plan will be prepared in accordance with best practice guidelines.

The CEMP will be required to take into account best practice guidance, such as:

- CIRIA C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [40];

- CIRIA C584 – Coastal and Marine Environmental Site Guide for Protection of Water Quality and, in turn, Aquatic Life, During the Construction Phase of the Works [41];
- CIRIA C648 - Control of Water Pollution from Linear Construction Projects: Technical Guidance [42];
- CIRIA C649 - Control of Water Pollution from Linear Construction Projects: Site Guide [43];
- CIRIA C674 – The Use of Concrete in Maritime Engineering – Guide to Good Practice [44];
- CIRIA C811 – Environmental Good Practice on Site (5th edition) [45];
- CIRIA C753 – The SuDS Manual [46]; and,
- CIRIA C774 – Coastal and Marine Environmental Site Guide (Second Edition) [47].

All works will be undertaken in accordance with the following documents:

- IFI, 'Requirements for the Protection of Fisheries Habitat during Construction and Development' [48];
- NRA, 'Guidance for the Treatment of Otters Prior to the Construction of National Road Schemes' [49];
- NRA, 'Guidance on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' [50];
- NRA, 'Guidance for the Treatment of Bats Prior to the Construction of National Road Schemes' [51];
- Department of Arts, Heritage and the Gaeltacht ('DAHG'), 'Guidance to Manage the Risk to Marine Mammal from Man-made Sound Sources in Irish Waters' [52];
- Guidance on Marine Baseline Ecological Assessments and Monitoring Activates for Offshore Renewable Energy Projects Part 1 [53];
- Guidance on Marine Baseline Ecological Assessments and Monitoring Activities for Offshore Renewable Energy Projects Part 2 [54];
- OSPAR - Guidelines for the Management of Dredged Material [55];
- BS 5228-1 + A1:2014: Code of Practice for noise and vibration control on construction and open sites- Part 1: Noise [56] and Part 2 Vibration [57];
- Statutory Instrument ('S.I.'): S.I. No. 299 of 2007: Safety, Health and Welfare at Work (General Application) Regulations, 2007 [58]; and,
- 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 [59] (where required).

3.3 Monitoring Works

An Ecological Clerk of Works ('ECoW') will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that they will be completed in line with the mitigation measures detailed within this NIS and the CEMP, and that the mitigation measures will be effective.

It is important to note that for the avoidance of doubt, mitigation measures have not been considered in determining whether or not the Proposed Development will likely have a significant effect on any European site.

The ECoW will also either deliver or provide the resident engineer with sufficient environmental information to deliver a Site induction to all personnel working on-site.

3.4 Operational Phase

3.4.1 Operational Phase Employment

The Proposed Development will generate approximately 100 full-time permanent jobs during the Operational Phase; this will include:

- 35 personnel for ORE Operator 1;
- 35 personnel for ORE Operator 2; and,
- 30 personnel for the additional space for port-related activities at the Port of Waterford.

3.4.2 Operational Hours

It is intended that the Proposed Development will operate 12 months a year, 7 days a week, on a 24-hour basis in line with the current Port of Waterford operations.

Working hours may vary for the different types of employment that will be created by the Proposed Development, which will include:

- **Office Staff**: Office staff will work during normal office hours of ca. 08:00 – 18:00;
- **Warehousing Staff**: Warehousing staff will work primarily during normal working hours, ca. 08:00 – 18:00, Monday to Friday. However, 24-hour access will be required to the warehouses;
- **Operation and Maintenance ('O&M') Technicians**: Each ORE operator will require technicians to facilitate the O&M works required at the offshore wind farms:
    - O&M works utilising CTVs will be undertaken in 12-hour shifts. Personnel will arrive to the Port and will commence loading and refuelling of the CTVs from ca. 06:00 to 07:00. The CTVs will depart from the Site at ca. 07:00 and go to the offshore wind farms. The CTVs will then return to the Port at ca. 19:00 and the plant / equipment will be unloaded until ca. 20:00; and,
    - In addition, SOVs required for O&M works will remain at the offshore wind farm for up to two weeks and will only return to the Port of Waterford for supplies, crew change and refuelling. Loading and fuelling of the SOVs will commence from ca. 07:00 to 18:00. The SOVs will depart from the Site after loading is complete, ca. 18:00, and go to the offshore wind farms for a period of two weeks.
- **Port Staff**: Within the design of the Proposed Development, the proposed ca. 250m wharf extension will also be utilised for ongoing port operations. It is proposed that these port operations will operate on a 24-hour basis, in line with the current Port of Waterford operations.

The Proposed Development has been designed to cater for two ORE Operators. At this time, it is not possible to determine the exact operations for ORE Operators in the South Coast. Therefore, the Proposed Development has been designed to accommodate a range of vessels; however, different scenarios may arise at the time of operation based on the requirements of the ORE Operators. Therefore, for the purposes of this EIAR, the assessments have been based on a 'worst-case scenario' in which the two ORE Operators utilise the CTV operations and utilise two CTVs each, i.e., a total of four CTVs moving in and out of the Port on a daily basis.

3.5 Decommissioning

The MAC for the Proposed Development has a term of 60 years. At the end of this 60-year term, a new MAC will be sought, and all other appropriate consents. Given the nature of the Proposed Development, it is proposed that the development will be either continued or re-purposed.

The Proposed Development has been designed to support offshore wind infrastructure in the Celtic Sea, which typically has a lifespan of ca. 25-40 years. However, it is envisioned that with continued technological advancements and improvements in engineering practices, the operational lifetime of ORE developments will potentially increase. In addition, it is considered possible to extend the lifetime of an ORE development by 'repowering' or replacing turbines / foundations with newer specifications and designs. Therefore, if the lifetimes of the ORE developments are extended, then the ORE facilities within the Proposed Development will continue to be utilised.

The Proposed Development will also provide space for the Port of Waterford to utilise for general port operations.

Therefore, in the unlikely event that the ORE developments should be decommissioned and the ORE facilities are not required, then the Proposed Development will be used solely for port-related activities.

Furthermore, it should be noted that the MAC received from MARA on the 16th June 2025 outlines the requirement for rehabilitation of the consented area prior to the expiration of the MAC, in accordance with Condition 19. However, according to the MAC, the rehabilitation works must be completed in accordance with the Rehabilitation Schedule; however, this will only be provided following the grant of development permission. Therefore, at this time, the Rehabilitation Schedule is not currently known.

4 STUDY RESULTS

4.1 Desk-Based Study Results

4.1.1 NBDC Records

CIEEM's guidelines recommend that consideration be given to the biodiversity conservation value of the species that occur within this zone of influence (as appropriate) [10]. For this desk-based assessment, a search of a 2km grid square for designated species for both Lower River Suir SAC and the River Barrow and River Nore SAC was undertaken.

The NBDC held no records of legally protected or otherwise notable species protected under the Lower River Suir SAC, River Barrow and River Nore SAC, that occur within 2km of the Site (Grid Squares: S61S, S61M, S61L, S61R, S61W, S61X, S6814, S6815, S6312, S6313, S6314, S6411, S6511, S6611, S6711, S6812, S6813) [24].

4.1.2 Fisheries Studies

As part of this assessment, a desk-based fisheries assessment has been undertaken for the type of fish found in Waterford Estuary and has been peer-reviewed by Dr Martin O'Farrell of Aztec Management Consultants.

This section provides a summary of the current status of fish in Waterford Estuary (Barrow-Nore-Suir estuary) and designated fish species in the estuary, based on best scientific knowledge and an assessment of the potential effects of the wharf extension.

This desk-based assessment has utilised IFI National WFD surveillance monitoring programme data [60, 61] and the Fish Report prepared by Dr Martin O'Farrell in support of the Port of Waterford Maintenance Dredging Programme (DaS EPA Reg. No.: S0013-05) that includes survey results for fish impingement studies carried out by Dr Martin O'Farrell at Great Island thermal electricity generating station cooling water system ('CWS') during the years 2017, 2018, 2020, 2021, 2022 and 2023 [62, 63, 64, 64, 65, 66].

It should be noted that although the survey methodology used for the IFI WFD surveillance monitoring programme was identical in all survey years (2010, 2013, 2016 and 2019), the estuarine fish metrics used to assess status by way of Estuarine Multi-metric Fish Index ('EMFI') and Ecological Quality Ratio ('EQR') during the 2016 and 2019 surveys were more sophisticated than those used during the earlier surveys. Furthermore, it is clear that the number of species recorded using different survey methodologies (WFD – beach seines / fyke nets / trawl; Fish Impingement Studies at Great Island – station cooling water abstraction) differed among sampling methods, with the highest number of species recorded during the fish impingement studies. However, sampling fish for the WFD cannot involve exhaustive and unduly costly survey methodology and it is understandable why some species groups are more or less represented among the species recorded by different sampling methods.

A generalised categorisation of fish in estuaries for part or all of their lives would include:

- Marine - species that spawn at sea;
- Freshwater - species that spawn in fresh water;
- Estuarine-resident - species that complete their life cycle within the estuary; and,
- Diadromous - species that feed at sea and migrate into fresh water to spawn (anadromous[1]) or undergo the reverse migration (catadromous[2]).

[1] Anadromous species include the Atlantic salmon (*Salmo salar*) and river lamprey (*Lampetra fluviatilis*).
[2] Catadromous species include species such as the European eel (*Anguilla anguilla*).

The fish species that occur within the Waterford Estuary include primarily estuarine species and diadromous species, with other marine and freshwater opportunistic species occurring in the estuary as well.

For fish species inhabiting the Waterford Estuary for all or part of their lives, there are corresponding preferential ranges of salinity, temperature and oxygen concentrations. Varying turbidity / suspended solids levels are normal for any estuarine regime, and for many species, high turbidity and high suspended solids levels facilitate their avoidance of piscivorous fish.

It is well documented that the Waterford Estuary is designated for five fish species under the River Barrow and River Nores SAC:

- Atlantic salmon (*Salmo salar*);
- Sea lamprey (*Petromyzon marinus*);
- Brook lamprey (*Lampetra planeri*);
- River lamprey (*Lampetra fluviatilis*); and,
- Twaite shad (*Alosa fallax*).

However, of the species listed above, it should be noted that brook lamprey has not been recorded within the Waterford Estuary as this species lives their entire lifecycle within freshwater habitat.

IFI, the competent authority, carried out survey work within the Southern River Basin District, Barrow, Nore and Suir Estuary, as part of the National WFD surveillance monitoring programme during the years 2016 and 2019 [61] [60]. The overall results of this surveillance monitoring are presented in Table 4-1 below.

Table 4-1: IFI WFD Fish Monitoring Results from the 2016 and 2019 Surveys

Monitoring Year	Total No. of Fish Caught	Total No. of Species	No. Designated Species Caught and Relative Overall Abundance in the Sampling (%)
2019	3482	31	Atlantic salmon – 7 (0.20%) Sea lamprey – 0 (0%) River lamprey – 1 (0.03%) Twaite shad – 9 (0.26%)
2016	9449	29	Atlantic salmon – 2 (0.02%) Sea lamprey – 0 (0%) River lamprey – 0 (0%) Twaite shad – 42 (0.44%)

In addition to the IFI WFD programme, this assessment also considered the fish impingement studies undertaken by Dr. Martin O'Farrell at Great Island CWS [62, 63, 64, 64, 65, 66]. During these surveys, a total of 48 species of fish have been recorded from 2017-2023, which included records of river lamprey, twaite shad, sea lamprey and Atlantic salmon smolt.

Therefore, following a review of the above WFD surveillance monitoring reports and the fish impingement studies undertaken at Great Island CWS, a total of 49 different fish species have been recorded in the Waterford Estuary, including the designated fish species (excluding brook lamprey).

A study published in 2013 by Harrison and Kelly lists 70 fish species as representative of reference / undisturbed Irish estuaries [67]. Of the species listed by Harrison and Kelly, a total

of 49 species have been recorded in Waterford Harbour during the various fish surveys detailed above.

A description of each designated species known to utilise the Waterford Estuary is provided below.

Atlantic Salmon

The Atlantic salmon is an anadromous species, spawning in freshwater and migrating to sea, typically after one or more years of life in freshwater (depending on the productivity of the freshwater habitat and the temperature regime of the freshwater habitat, which can both be related to latitude) throughout its geographic range.

Atlantic salmon smolt pass seaward through Waterford Estuary rapidly, and all the available evidence on the duration of passage of Atlantic salmon through estuaries suggests that they pass through the estuary during a period lasting perhaps one to several days. Salmon smolt passing seaward will continue feeding during their seaward migration through Waterford Estuary.

The duration of passage through the estuary of maturing adult salmon on their return migration to their natal river will depend on the flows emanating from their natal river. During droughts, when there is limited freshwater flow in rivers, returning adults will have prolonged residence within the Waterford Estuary. Whereas during non-drought conditions, returning adult salmon will pass rapidly through Waterford Estuary and enter their natal river when adequate freshwater flows are available to facilitate their entry and upstream migration in their natal river.

Typically, early running multi-sea-winter ('MSW') fish enter natal rivers during the spring months, while one-sea-winter ('1SW') and MSW summer fish will enter their natal rivers during the summer months. It should be noted that mature adults on their return migration do not feed within the estuary during their migration. Therefore, it can be stated that they have very little dependency on the estuarine environment.

Sea Lamprey

The spawning adult sea lamprey migrate from the sea through Waterford Estuary and to freshwater spawning habitat during the late spring months and typically spawn in suitable shallow flowing water habitat with stony substrate during the months of May and June. The juveniles (ammocoetes) spend several years in suitable silty substrates before they transform (metamorphose), typically during the autumn months, and make their downstream migration to the sea.

These transformers have been recorded in Waterford Estuary during the November fish impingement studies at Great Island. It is believed that the transformers typically migrate through the estuary quickly and enter the open sea, where they attach to suitable hosts and commence feeding on host blood and other body fluids. There is evidence that sea lamprey are disloyal to their natal river. Accordingly, this species can be considered to have at least regional populations from which adults ascend into suitable spawning rivers, which are not necessarily their natal river to spawn and die.

River Lamprey

The spawning adult river lamprey also migrate from the sea through Waterford Estuary and to freshwater spawning during the early spring months. This species typically spawn in suitable shallow flowing water habitat with stony substrate during the months of April and May, after which they die. The juveniles (ammocoetes) spend several years before they transform (metamorphose) and make their downstream migration to the sea, typically during the spring months.

These transformers have also been recorded in Waterford Estuary during November fish impingement studies at Great Island and adults have been recorded during fish impingement studies carried out during June. However, unlike sea lamprey, river lamprey spend all their adult lives in an estuarine / coastal environment where they attach to suitable hosts and commence feeding on host blood and other body fluids. Accordingly, river lamprey are highly estuary-dependent during their adult lives. There is no evidence that adults return to their natal river to spawn, and it is likely that regional populations exist which spawn in a number of local rivers, which are not necessarily their natal river.

Twaite Shad

In Waterford Estuary, adult Twaite shad are known to enter the lower reaches of the River Barrow, where they spawn in the vicinity of St Mullins in April and May each year. Spawning activity peaks during May, and eggs will hatch in a short time afterwards. Then, the young shad begin to drift into the estuary proper, where conditions of relatively low salinity are experienced.

While Twaite shad is considered a diadromous species, estuarine residence time for juveniles can be prolonged. There is evidence from Waterford Estuary that fish in their first and second year of life continue to reside in the estuary. This evidence comes from WFD surveillance monitoring surveys carried out by Inland Fisheries Ireland [60, 61] and from the fish impingement studies carried out at Great Island thermal electricity generating station cooling water system. [64]. The fork-length frequency distribution of Twaite shad washed off the band-screens at Great Island CWS during November 2022 confirms the presence of 0+(<13.5cm), 1+ (15.5-22.4cm) and a small number of older fish (>24.0cm) [65].

Overall Ecological Status of Fish in Waterford Estuary

The WFD surveillance monitoring survey work and other research within the Waterford Estuary have identified a wide range of fish species present in Waterford Estuary. These species represent various categories which relate to their level of dependency on the estuarine environment to complete their life cycles.

The WFD surveillance monitoring survey carried out during 2016 and 2019 by the IFI, the competent authority in the Republic of Ireland, concluded that the ecological status of fish in Waterford Estuary was of '*good'* status [60, 61]. In addition, the Barrow-Nore-Suir Complex was designated by the IFI as having '*good*' status in 2022 [68].

4.1.3 Waterford Estuary - Suspended Solid Concentration and Sedimentation

The Waterford Estuary is estuarine waterbody and is subject to naturally occurring tidally generated suspended solid ('SS') concentrations that vary at different locations. Naturally occurring, tidally generated SS concentrations were modelled by Delft Hydraulics [21], which is publicly available on the EPA website:

- Tidally generated SS concentrations range from 50 and 500mg/l at both Belview Point in the Lower Suir Estuary and at Garraunbaun Rock near Ferry Point in the White Horse Reach of the River Barrow;
- Tidally generated SS concentrations at Cheekpoint, the confluence of the River Barrow and the Lower Suir Estuary, were typically less than 150mg/l;
- Tidally generated SS concentrations downstream in the Lower Suir Estuary, between Passage East and Buttermilk Point, exceeded 1,000mg/l; and,
- Tidally generated SS concentrations at Duncannon Bar within the Suir Estuary were above 100mg/l at bed and mid-water on spring tides.

There is strong tidal action in Waterford Estuary, resulting in the mean spring tidal range varying from 3.6m at Dunmore East to 3.9m at New Ross, and the mean neap tidal range varying from 2.2m at Dunmore East to 2.4m at New Ross.

Sedimentation in the upper estuary is dominated by the tides, with greater sedimentation during spring tides, due to the greater amount of energy present. Flood tides (when the tidal current is flowing inland) transport sediment up the estuary in the water column or as bed load. However, the majority of the ebb tides (when the tidal current is flowing seaward) are not strong enough to keep the material in suspension and push the sediment back down the estuary. As a result of this, the sediment accumulates in the areas of lowest velocity. Therefore, in the outer estuary sedimentation is primarily storm-driven and thus highly variable.

Therefore, Waterford Estuary is considered to be complex and dynamic in its sedimentation movement, and the sedimentation is considered to be highly variable and unpredictable.

4.2 MOR Environmental Field-Based Study Results

4.2.1 Habitat Survey

The following section provides details of the field-based assessment that was undertaken for the Site on 15th February 2021, 31st July 2024, 25th March 2025 and 28th July 2025 and the assessments undertaken for the proposed Biodiversity Enhancement Area on 27th January 2021, 17th August 2023 and 10th July 2024.

A description of the habitats and features of ecological significance are outlined below and illustrated in Figure 4-1.

On-site Habitats

Buildings and Artificial Surfaces (BL3)

The majority of the shoreside habitats within the Site were comprised of artificial surfaces, given the fact that ca. 60% of the Site is located within the existing Belview Port. Furthermore, the entire bank of the estuary along this section of the watercourse has been heavily modified over the years as part of the development of the Port and railway. At present, the Port operates 24 hours a day and functions as a busy industrial hub, with quaysides in constant use for bulk cargo storage, container movements, and the handling of goods such as steel, timber, grain and fertilisers. Heavy machinery, cranes and trucks operate daily to load and unload vessels, and large project components, including wind turbine blades, are frequently managed on-site, giving the area a highly active and industrial character.

These areas of artificial surfaces comprise hard standing and bare ground. There was limited vegetation growth within these areas, given the nature of these habitats and recent disturbances at the Site, and vegetation growth was limited primarily to cracks in the pavement / gaps in the concrete slabs within the pedestrian walkways. The species noted onsite primarily consisted of grasses, dandelion (*Taraxacum officinale*), black medick (*Medicago lupulina*), hawksbeard (*Crepis biennis*), spear thistle (*Cirsium vulgare*) and ivy (*Hedera helix*).

Dry Meadows and Grassy Verges (GS2)

This habitat was located between the shore and the Port access roads. Species present within this habitat were false oat grass (*Arrhenatherum elatius*), cock's foot (*Dactylis glomerata*), common bentgrass (*Agrostis capillaris*), Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), seashore sea mayweed (*Tripleurospermum maritimum*), creeping thistle (*Cirsium arvense*), hogweed (*Heracleum sphondylium)*, buttercup (*Ranunculus repens*), common ragwort (*Jacobaea vulgaris*), bitter dock (*Rumex obtusifolius*), field mustard (*Rhamphospermum arvense*), fringed willowherb (*Epilobium ciliatum*), narrowleaf hawksbeard (*Crepis tectorum*), hairy willowherb (*Epilobium hirsutum*), ivy, old man's beard (*Clematis*

vitalba), forget me not (*Myositis spp.)*, wild carrot (*Daucus carota*), grey speedwell (*Veronica polita*), lady's purse (*Capsella bursa-pastoris*) and dandelion. This section gradually transitions into a more scrubby habitat towards to shoreline.

Scrub (WS1)

Areas of scrub were noted throughout the Site. This habitat was comprised predominantly of bramble (*Rubus fruticosus*), gorse (*Ulex europaeus*), stinging nettles (*Urtica dioica*) and ivy, false oat grass, cleavers (*Galium aparine*), butterfly bush (*Buddleja davidii)* and old man's beard. Areas of more mature trees were noted growing in the scrub habitat. These trees included sycamore (*Acer pseudoplatanus)*, pedunculate oak (*Quercus robur*), turkey oak (*Quercus cerris*), rowan, pedunculate oak and young willow (*Salix spp.).*

Mixed Broadleaved Woodland (WD1)

This habitat was located on the northern side of the railway line. This habitat was comprised of goat willow (*Salix caprea*), hawthorn (*Crataegus monogyna*), laurel (*Laurus spp.*), Lawson's cypress (*Chamaecyparis lawsoniana*), beech (*Fagus sylvatica*), birch (Betula spp.), holly (*Fagus sylvatica*), ash (*Fagus sylvatica*), grey willow (*Fagus sylvatica*), sycamore and butterfly bush. The understory was dominated by ivy and bramble; however, other species located in this section included hedge bindweed (*Calystegia sepium*), stinging nettle, common ragwort (*Jacobaea vulgaris*), butterfly bush, tutsan (*Hypericum androsaemum*), shield fern (*Polystichum setiferum*), hogweed (*Heracleum sphondylium*), creeping thistle (*Cirsium arvense*), gorse and ivy.

Recolonising Bare Ground (ED3)

The area within close proximity to the railway was dominated by this habitat. At the time of the surveys, this habitat was used for storing materials at the Port. As such, given the recent disturbances, limited vegetation growth was noted. The vegetation recorded within this area included common ragwort, butterfly bush, fringed willowherb, cock's foot, false oat grass, bramble, perennial ryegrass and ivy.

Muddy Sand Shores (LS3)

Muddy sand shores were located along the Lower Suir Estuary within the Site boundary. The shore comprises sediment, including sand and mud. This muddy sand shore was slightly sloped towards the Lower Suir Estuary and was considered to be relatively sheltered, but overall remains water-saturated throughout the tidal cycle. The dominant species identified was bladderwrack (*Fucus vesiculosus*).

Sea Walls, Piers and Jetties (CC1)

A stone wall was identified along the muddy sand shore. This stone wall was almost completely covered with bladderwrack (*Fucus vesiculosus*), and during high tide, this wall was inundated by seawater.

Tidal River (CW2)

This section of the Lower Suir Estuary is classified as a tidal river. As previously mentioned, ca. 1.3ha of the Site is located within the Lower Suir Estuary. In addition, this tidal river is linked with the Annex I habitat 'estuaries.' This habitat is part of a dynamic coastal ecosystem influenced by tidal activity. The benthic habitats within this location has been classified by Aquafact as JNCC biotope SS.SMu.SMuVS.PolCvol *Polydora ciliate* and *Corophium volutator* in variable salinity infralittoral firm mud or clay (EUNIS Code: A5.321) and belong classified as belonging to the benthic community habitat 'muddy estuarine community complex,' full details of the benthic species recorded within this habitat are described in Section 4.3 below and in Appendix B. Estuaries are classified as a qualifying Annex I habitat within the River Barrow and River Nore SAC; however, are not designated under the Lower River Suir SAC.

Biodiversity Enhancement Area Habitats

Improved Agricultural Grassland (GA1) / Wet Grassland (GS4)

The Biodiversity Enhancement Area was predominantly comprised of agricultural grassland utilised for grazing cattle and was heavily poached at the time of the surveys with areas of pooled stagnant water were noted throughout the disturbed ground. There were small areas of wet grassland noted in the area, which were limited in size due to overgrazing and poaching of the ground. While the grassland is not intensively managed, the habitat is strongly influence by cattle grazing, which has resulted in the grassland being modified by these activities.

Species present within this habitat included perennial rye-grass (*Lolium perenne*), common rush (*Juncus effusus*), common marsh bedstraw (*Galium palustre*), broad-leaved dock (*Rumex obtusifolius*), silverweed (*Potentilla anserina*), water forget-me-not (*Myosotis scorpioides*), dandelion, water mint (*Mentha aquatica*), common ragwort, white clover (*Trifolium repens*), leer's sedge (*Carex leersii*), shortawn foxtail (*Alopecurus aequalis*), yellow flag iris *(Iris pseudacorus*), meadow buttercup (Ranunculus acris), clustered dock (*Rumex conglomeratus*), marsh thistle (*Cirsium palustre*), big trefoil (*Lotus pedunculatus*) and reed mannagrass (*Glyceria maxima*).

Reed and Large Sedge Swamps (FS1)

The habitat along the edges of the stream within the proposed Biodiversity Enhancement Area comprised of common reed, common rush pendulous sedge (*Carex pendula*), brookweed (*Samolus valerandi*), common spike-rush (*Eleocharis palustris*), common duckweed (*Lemna minor*), common fleabane (*Pulicaria dysenterica*), spiked sedge (Carex spicata), water plantain (*Alisma plantago-aquatica*), soft stem bullrush (*Schoenoplectus tabernaemontani*), bulrush (*Typha latifolia*), reed mannagrass, common marsh bedstraw and water mint.

Drainage Ditch (FW4)

A drainage ditch ran along the western boundary of the proposed Biodiversity Enhancement Area linking the Drumdowney Lower Stream and Luffany River. The drainage ditch was full of water, with a silty bottom, but no visible flow. The drainage ditch connected to a stream after culvert south.

The species within and surrounding the drainage ditch comprised reed mannagrass common duckweed, water-plantain, water mint, water forget-me-not, stinging nettle, common reed (*Phragmites australis*), bramble, ivy, horsetails (*Equisetum spp*.) and mushrooms (*Fungus spp*.).

Hedgerow / Treeline (WL1 / WL2)

Hedgerows and treelines provided the primary field boundaries of the proposed Biodiversity Enhancement Area and were also present along the access track north of the Port. The quality of the hedgerows varied from well-structured and diverse to patchy and sparse.

The hedgerow / treeline comprised hawthorn, grey willow (*Salix cinerea*), wych elm (*Ulmus glabra*), ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), turkey oak, crab apple *(Malus sylvestris*), sycamore, Butterfly bush and alder (*Alnus glutinosa)*.

The understorey of these features contained a variety of common species such as cow parsley (*Anthriscus slyvestris*), gorse, hedge bindweed, stinging nettles, broad-leaved dock, ivy, bramble, thistles, hairy willowherb (*Epilobium hirsutum)*, buttercup and water forget-me-not.

Mixed Broadleaved Woodland (WD1)

An area of woodland was located along the left boundary of the Biodiversity Enhancement Area. The habitat was comprised of a dense mix of ash, oak (*Quercus spp*.), hawthorn

(*Crataegus monogyna*), willow (*Salix spp.),* beech (*Fagus sylvatica*) and alder. The understory comprised bramble, stinging nettle, ivy, thistle (*Cirsium spp.)*, hogweed and hairy willowherb.

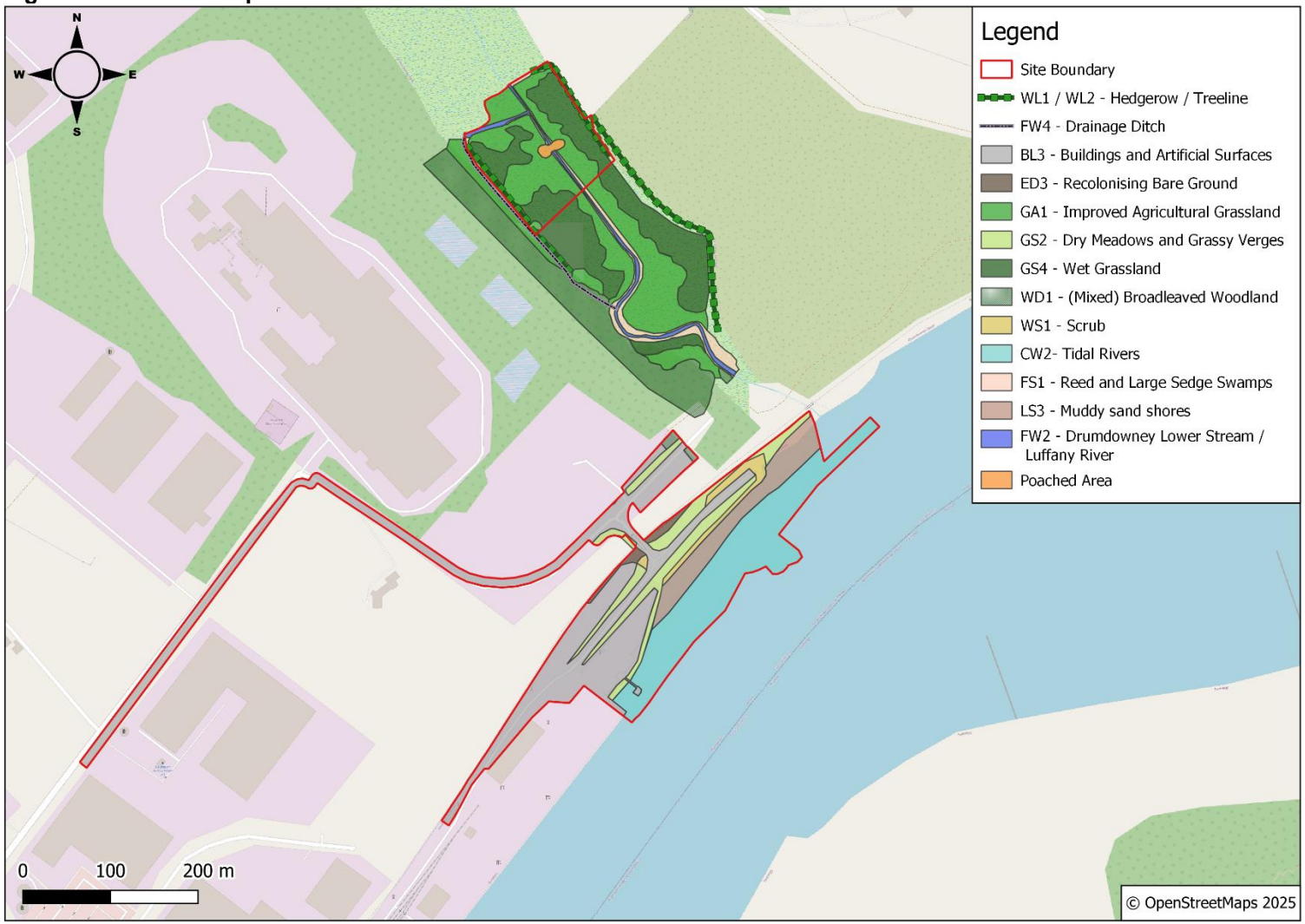
Drumdowney Lower Stream / Luffany River (FW2)

A watercourse identified as the Drumdowney Lower Stream was recorded to the north of the proposed Biodiversity Enhancement Area. The stream exhibited a silty substrate and supported dense emergent and marginal vegetation. Dominant plant species included reed mannagrass, common duckweed, broadleaf water plantain, water mint, true forget-me-not, horsetail, stinging nettle, common reed, bramble and common ivy.

The Drumdowney Lower Stream discharges into the Luffany River, which flows through the centre of the Biodiversity Enhancement Area and subsequently enters the Lower Suir Estuary approximately 160 metres downstream.

In the northern section of the Luffany River, where partial flooding was observed, the riverbed was primarily sandy. Aquatic and riparian vegetation included common duckweed (*Lemna minor*), yellow flag iris, cattails (*Typha* spp.) and soft-stem bulrush (*Schoenoplectus tabernaemontani*).

Figure 4-1: Habitat Map



4.2.2 Species

4.2.2.1 Otter Survey

During the surveys, areas of regular otter activity were identified, as these areas had the regular presence of otter footprints (see Plate 4-1), spraints (see Plate 4-2), foraging remains, couching areas and live sightings (see Figure 4-1 and Plate 4-3). In addition, camera trap footage has shown otters regularly using these areas (see Plate 4-4).

These areas shown on Figure 4-2 show locations where otters activity has been recorded within the Belview-Faithlegg-Cheekpoint area during the surveys. The full areas have been visually assessed by boat for the presence of otter activity / holts. However, it should be noted that while the entirety of the coastline could not be regularly accessed (i.e., on a monthly basis) given the limited access. However, it is assumed that otter utilise the full coastline in this area.

During the extensive otter surveys, no otter holts or couches were identified within the accessible areas. In addition, no otter holts or couches were located within 200m of the Site. This buffer is aligned with NatureScot's 'Standing Advice for Planning Consultations – Otters' [31], which specifies that where otters are known or suspected to be breeding, an exclusion zone of at least 200 m should be established.

Otter were identified commuting and foraging along the Lower Suir Estuary and along the mudflats located within the Site boundary. Furthermore, otter were observed regularly utilising the open area under the existing Belview Quay as a commuting corridor.

Camera trap footage identified a couching area that otters regularly utilise downstream of the Site along the Kilkenny-side of the Lower Suir Estuary, ca. 780m northeast of the Site. Otter were noted eating fish and engaging in play at these locations during the camera trap surveys.

Regular otter sightings were also made during the bird surveys, and live sightings of up to two otter at once have been seen within the Lower Suir Estuary. Additionally, in 2022, three otter (two adults and one juvenile) were recorded at the couch area downstream of the Site via camera trap footage.

In addition, anecdotal evidence from people working at the port notes that otter sightings are a regular occurrence.

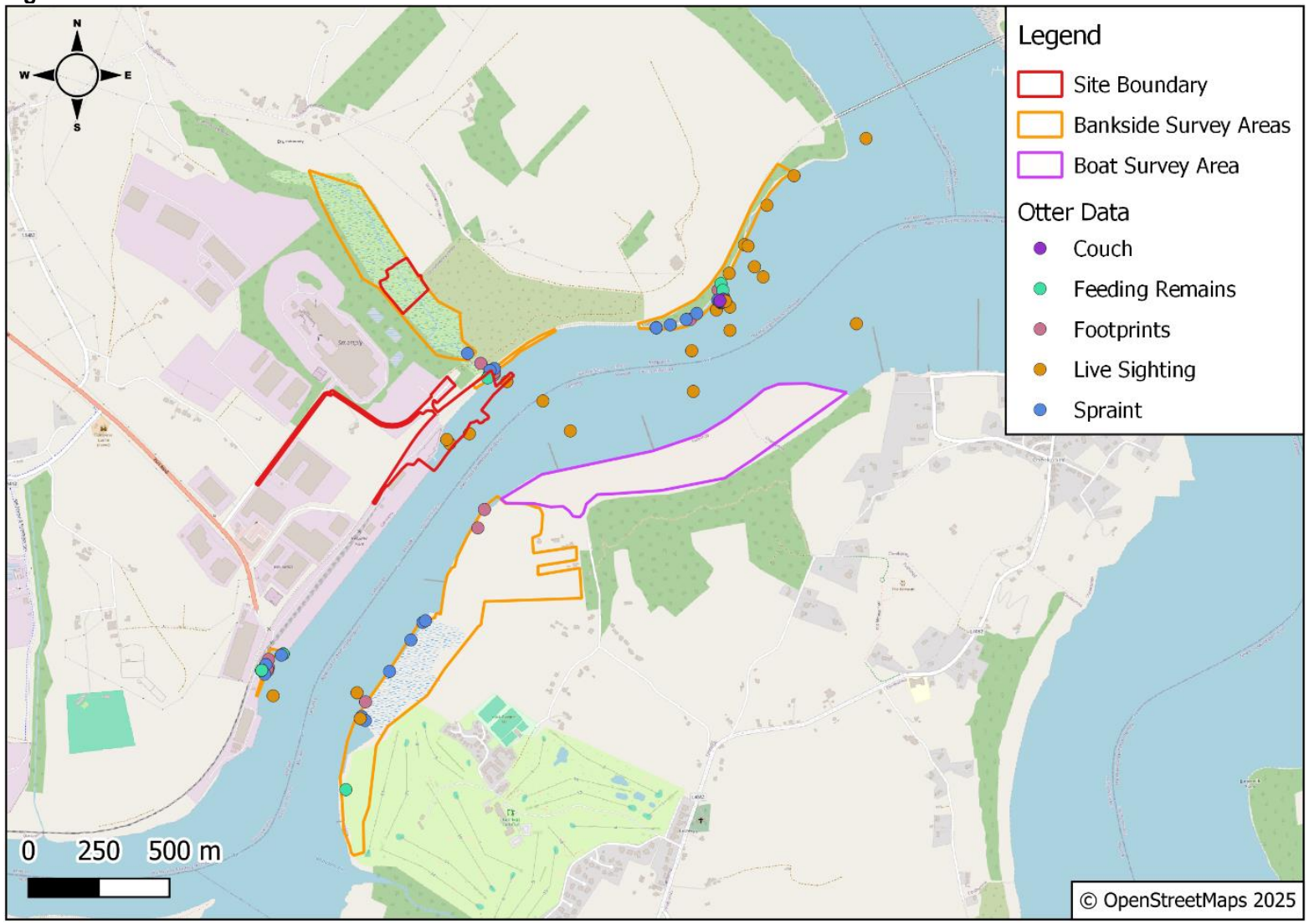
Plate 4-1: Otter Prints

Plate 4-2: Otter Spraint

Plate 4-3: Live sighting of Otter

Plate 4-4: Otter identified from camera traps

Figure 4-2: Otter Evidence



4.2.2.2 Invasive Species

No high-impact invasive species or plant species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (i.e., species of which it is an offence to disperse, spread or otherwise cause to grow in any place) were identified within the Site.

4.3 External Field Study Results

4.3.1 Benthic Assessment - Aquafact

Waterford Estuary is a Designated Shellfish Area under S.I. No.55 of 2009 (Quality of Shellfish Waters). The estuary is also a Sea-Fisheries Protection Authority ('SFPA'), classified as a Bivalve Mollusc Production Area, which is a designated location where bivalves are found, including mussels, surf clams and oysters.

The analysis of the grab samples taken by Aquafact included granulometry, the percentage organic carbon assessments and faunal analysis to determine the Joint Nature Conservation Committee ('JNCC') biotopes.

The granulometry and the percentage of organic carbon indicated that the sediment within the study area comprises slightly gravelly muddy sands and muddy sands.

The faunal analysis of the samples identified a total of 51 taxa ascribed to six phyla and comprising 1,528 individuals.

Further analysis of the faunal samples revealed three statistically significant groupings (Group A, Group B and Group C):

- Group A – Sample Q3;
- Group B – Samples Q4; and,
- Group C – Samples W1-W5, B1-B4, Q1 and Q2.

Using the JNCC biotopes, Aquafact were able to confirm that the above-mentioned groups could be classified into JNCC biotope SS.SMu.SMuVS.PolCvol *Polydora ciliate* and *Corophium volutator* in variable salinity infralittoral firm mud or clay (EUNIS Code: A5.321).

Furthermore, these stations were classified as belonging to the benthic community habitat 'muddy estuarine community complex,' which commonly occurs within the River Barrow and River Nore SAC [69]. This community complex is present intertidally and subtidally from Cheekpoint and Great Island northward to New Ross. The substrate of this community complex is predominantly of fine material, and the distinguishing species for this group are the bivalve *Scrobicularia plana* and *Macoma balthica*, the amphipod *Corophium volutator*, the polychaete *Streblospio shrubsolii* and the oligochaetes *Tubificoides pseudogaster* and *Tubificoides benedii*. These species are indicative of variable salinity community.

It should be noted that the habitat type 'muddy estuarine community complex,' recorded within the tidal river section of the Lower Suir Estuary at the Site, represents a community type that contributes to the Annex I habitat 'estuaries' and also to the Annex I habitat 'mudflats and sandflats not covered by seawater at low tide' [69]. However, these Annex I habitats are not designated for the Lower River Suir SAC, in which the Site is located.

Please refer to the Benthic Ecology Report, which has been prepared by Aquafact, for further details in Appendix B of this NIS.

4.3.2 Site Investigations

The analytical analysis of the seven sediment samples within the Site determined that the grain size ranged from very coarse silt to very fine gravel and poorly sorted to extremely poorly

sorted. The sample results indicated that the area of the Site was predominantly comprised of silt and sand (sandy mud), with one sampling location (MPSS5) comprised largely gravel (muddy gravel). The particle distribution (grain size) of the samples analysed is shown in Table 4-2 below.

Table 4-2: Physical Analysis of Soil Samples

Sample Location ID	Gravel (>2mm) %	Sand (63-2000µm) %	Silt (<63µm) %	Textural Group Classification
MPSS1	0.00	38.53	61.4	sM : Sandy Mud
MPSS2	0.00	49.79	50.21	sM : Sandy Mud
MPSS3	0.00	55.07	44.93	mS : Muddy Sand
MPSS4	13.63	45.35	41.02	gmS : Gravelly Muddy Sand
MPSS5	59.88	19.95	20.17	mG : Muddy Gravel
MPSS6	0.00	40.85	59.15	sM : Sandy Mud
MPSS7	0.00	39.58	60.42	sM : Sandy Mud

Chemical analysis of soil samples was undertaken to assess their compliance with the WAC for disposal at licensed waste facilities, in the event that reuse on-site is not feasible. The analytical results were compared against the limit values for:

- Inert Waste Landfill;
- Stable Non-Reactive Hazardous Waste disposed of in Non-Hazardous Landfill; and,
- Hazardous Waste Landfill.

The results are summarised as follows:

Chloride concentration in sample MPSS1 was reported at 806 milligrams per litre (‘mg/l’), which marginally exceeds the limit for disposal at an Inert Waste Landfill (800 mg/l), but remains below the threshold for Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill (15,000 mg/l).

All other parameters in samples MPSS1 through MPSS7 were found to be within the applicable WAC thresholds for inert landfills.

5 IDENTIFICATION OF EUROPEAN SITES

In accordance with the European Commission Methodological Guidance [11] a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment, Heritage and Local Government [12] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely significant effects of the project. The key variables determining whether or not a particular European site is likely to be significantly affected by a project are:

- The physical distance from the project to the European site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [8], few projects have a zone of influence this large; however, the identification of European sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

There are seven European sites located within 15km of the Site - these are identified in Figure 5-1 and Table 5-1

Figure 5-1: Site Location and European Sites within 15km

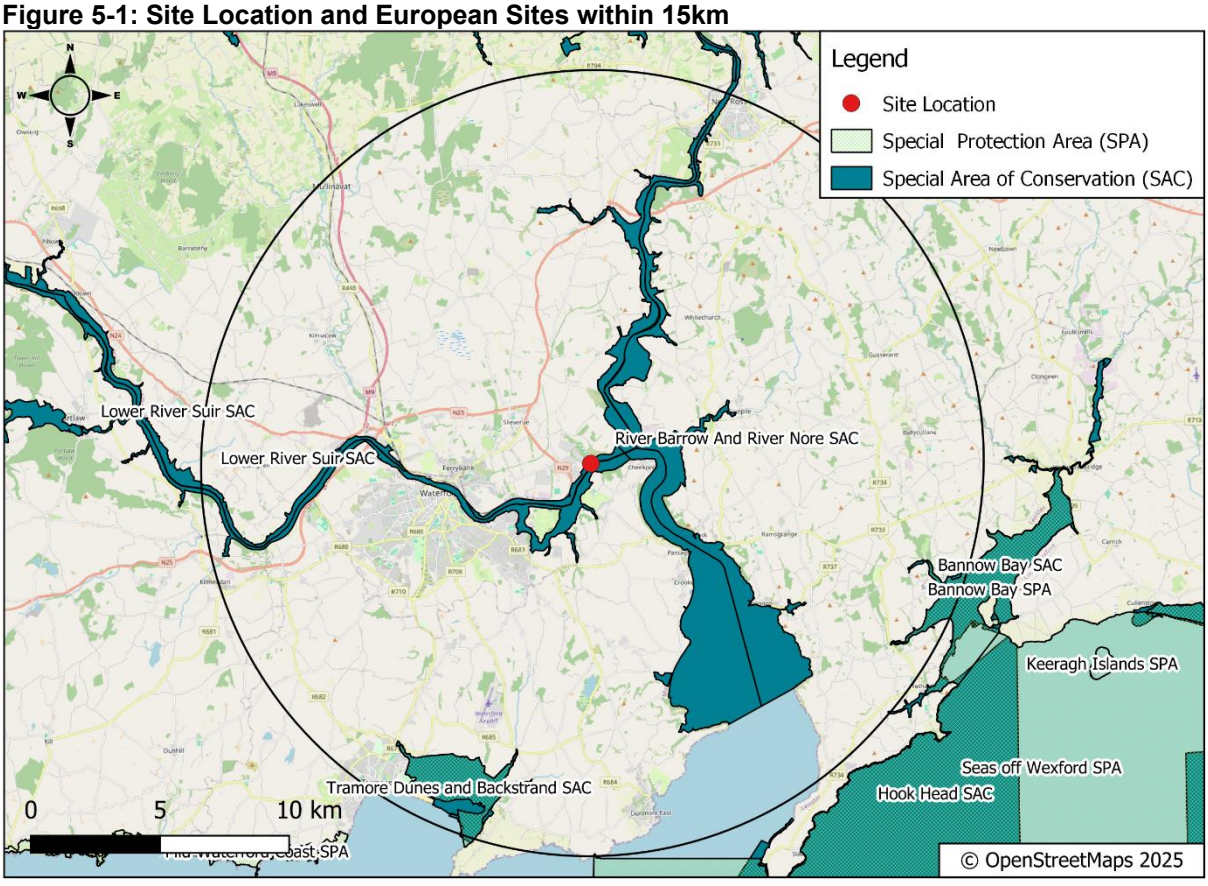


Table 5-1: European Sites within 15km of the Site

Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation ('SAC')			
Lower River Suir SAC	002137	Within	-
River Barrow and River Nore SAC	002162	ca. 1.1km	NE
Tramore Dunes and Backstrand SAC	000671	ca. 11.2km	SW
Bannow Bay SAC	000697	ca. 12.8km	SE
Special Protection Area ('SPA')			
Tramore Back Strand SPA	004027	ca. 11.2km	SW
Bannow Bay SPA	004033	ca. 13.4km	SE
Seas Off Wexford SPA	004237	ca. 14.8km	N

5.1 Identification of European Sites within ZoI

The Zone of Influence ('ZoI') comprises the area in which the Proposed Development may potentially affect the conservation objectives (or qualifying interests) of a European site. The definition of ZoI for the proposed works evaluated multiple factors as outlined in Section 2.1 and discussed below. Please note that the extent of ZoI differs for different environmental aspects, e.g. air, water, etc.

5.1.1 Habitat Loss / Degradation

As mentioned, the Site is partially located within the footprint of the operational Port of Waterford, a major working port that operates 24 hours a day, 7 days a week, year-round. In addition, the Site is partially within the Lower River Suir SAC.

During the surveys undertaken at the Site, there were no habitats designated for the Lower River Suir SAC located on-site or within the immediate surroundings of the Site. The benthic assessments undertaken by Aquafact confirmed that the benthic community habitat within the Site is classified as 'muddy estuarine community complex,' which is a community type that makes up part of the Annex I habitat - estuaries. However, the estuarine habitat within the Site does not constitute a qualifying feature of the Lower River Suir SAC.

The land reclamation works associated with the Proposed Development will require dredging, infilling and piling works within the boundary of the Lower River Suir SAC. Therefore, a total area of ca. 1.3ha of the Lower River Suir SAC will be reclaimed, which will result in a permanent loss of intertidal / benthic habitat within this area and an alteration to the tidal river. However, these habitats do not constitute qualifying features for which the Lower River Suir SAC is designated. Therefore, the qualifying habitats of the Lower River Suir SAC will not be directly lost as a result of the Proposed Development.

It should be noted that the Proposed Development has been designed to incorporate an 'open quay' design, which will allow for an influx of water to move under the wharf and allow the movement of designated species, including otter and fish species, within the tidal river and utilise the habitats under the wharf. Hence, there will not be a complete loss of tidal habitat within the Site boundary.

However, due to the nature of the proposed works, particularly dredging, infilling and piling, it was considered that there would be a potential for the works to give rise to indirect effects on

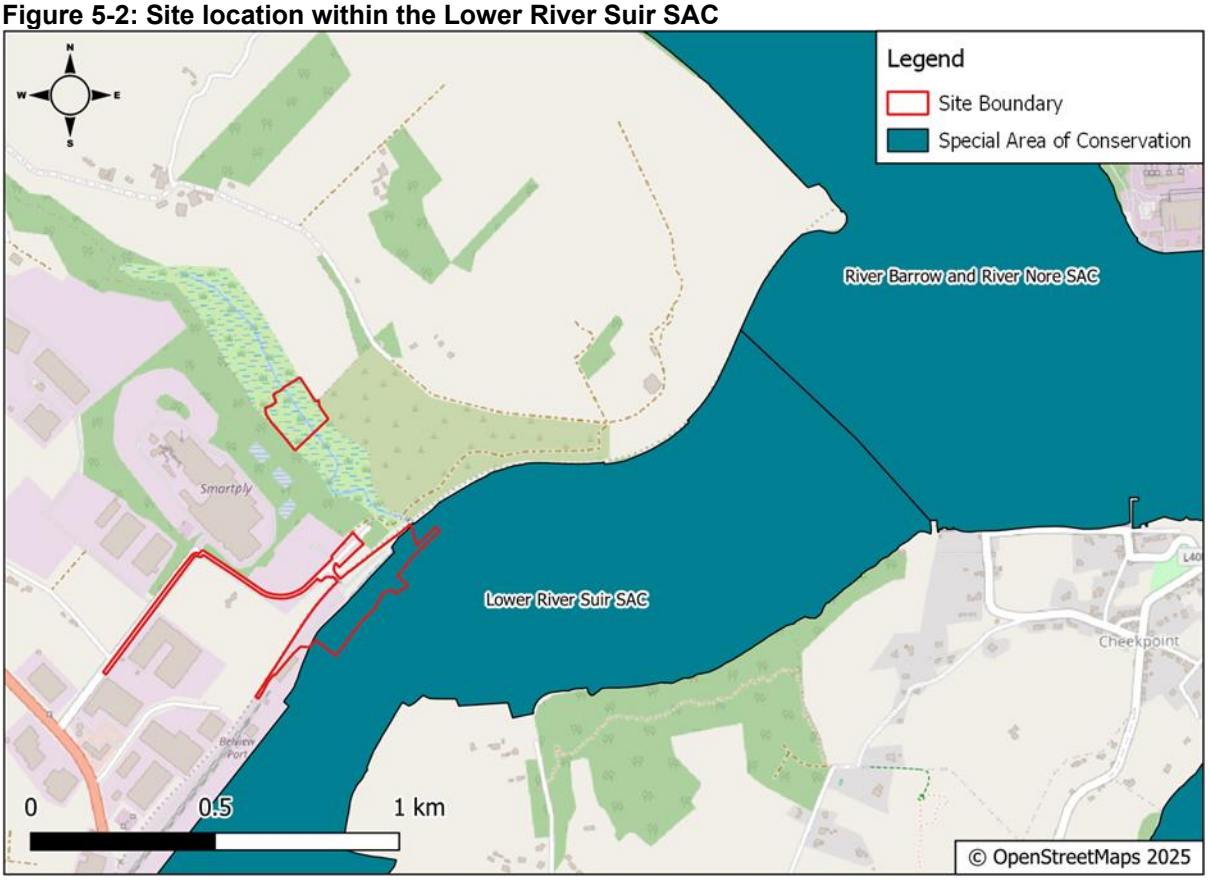
aquatic habitats through sediment disturbance, water quality impairment, and hydrodynamic changes. Therefore, potential indirect effects to habitats designated under the Lower River Suir SAC via water quality impairment will be considered further.

In addition, the River Barrow and River Nore SAC, which lies downstream of the Site, contains sensitive Annex I habitats, including estuaries and mudflats and sandflats not covered by seawater at low tide, which have the potential to be affected by changes in water quality, turbidity, and sediment deposition. Therefore, given the hydrological connectivity between the Site and the River Barrow and River Nore SAC further consideration will be required.

5.1.2 Water Quality Impairment

As mentioned, the Site is partially located within the Lower River Suir SAC as described in Section 3.2 and is hydrologically connected to the River Barrow and River Nore SAC via the Lower Suir Estuary; see Figure 5-2.

Figure 5-2: Site location within the Lower River Suir SAC



Potential water quality impacts would typically be associated with the release of sediment and other pollutants to surface water during the construction and demolition phase of the Proposed Development. Therefore, the ZoI would be considered to include the receiving waterbodies adjacent to and connected to the Site during the construction phase within 5km, which is the distance used as the starting point for the assessment of waterbodies based on accepted best practice and professional expertise.

It should be noted that the Proposed Development will alter the hydromorphology of the Lower Suir Estuary. Dredging works will temporarily deepen the existing navigation channel, while reclamation activities will result in a permanent narrowing of the channel by ca. 60m to facilitate the construction of new port infrastructure. The EPA already categorises the Lower Suir Estuary as a heavily modified waterbody, with maintenance dredging and large vessel transit already occurring within the waterbody. Whilst there will be narrowing of the channel,

flood risk assessment indicates that there will be no change to flood risk resulting from the Proposed Development, indicating a limited change in the overall flow of the waterbody. This is corroborated by the ABPmer report, which concluded that the predicted changes to flow speeds were generally small and confined to the area immediately adjacent to and upstream of the Proposed Development. Overall, in terms of hydromorphology, the Proposed Development will be in line with existing trends and activities within the waterbody, with any effects resulting from it being permanent and neutral or imperceptibly negative. Therefore, it was considered that the Proposed Development will not result in any hydrodynamic changes to the Lower River Suir SAC or any other European site.

However, given requirements for demolition works, capital dredging, land reclamation works and construction of the quay, it was considered that potential water quality impairment could occur within the Lower Suir Estuary. Within 5km of the Site is the Lower River Suir SAC and the River Barrow and River Nore SAC. Therefore, these SACs will be taken forward for further consideration.

Furthermore, given the fact that the stormwater drainage will discharge into Luffany Stream and the Lower Suir Estuary during the Operational Phase, potential water quality impairment for watercourses within 5km of the Site, the Lower River Suir SAC and the River Barrow and River Nore SAC, will be taken forward for further consideration.

Although the Site is hydrologically linked to the Hook Head SAC and the Seas off Wexford SPA via the Waterford Estuary, these sites are located over 14.8km downstream of the Site. As such, given the distance separating the Site from the Hook Head SAC and the Seas off Wexford SPA, these European sites have been screened out from further consideration.

Furthermore, given the lack of hydrological connection between the Site and Tramore Dunes and Backstrand SAC, Bannow Strand SAC, Tramore Back Strand SPA and Bannow Bay SPA these European sites have been screened out from further consideration.

5.1.3 Air Quality Impairment

According to the Institute of Air Quality Management ('IAQM') Guidelines, the potential adverse effects from dust associated with construction works occur to ecological receptors within a distance of 50m from the boundary of the Site [70].

Given that the Site is partially located within the Lower River Suir SAC, this European site will be screened in for further consideration in relation to impacts associated with dust.

5.1.4 Noise / Disturbance

Noise from the construction activity has the potential to cause disturbance to resting, foraging and commuting qualifying species of the European sites.

Baseline Ambient Noise

It should be noted that the ambient acoustic environment within the Belview Port is influenced by a mixture of sound sources, including natural sources, such as tidal movement of water and sediment and wind, and anthropogenic sources, such as commercial and recreational movements of vessels from Waterford City to the Celtic Sea. The Port of Waterford is an established Tier 2 Port and is located within a zoned port and industrial setting.

Therefore, it was considered that as the Site is located within a zoned port and industrial setting, any species utilising this section of the Lower Suir Estuary has been habituated to anthropogenic noise sources from the current shipping movements.

Construction Phase

As part of the works will be marine-based, the primary potential impacts were predicted to be underwater noise impacts beyond the immediate vicinity of the Proposed Development.

Otter, which are designated under the Lower River Suir SAC and the River Barrow and River Nore SAC, are known to utilise this section of the Lower Suir Estuary and have been observed commuting under the existing wharf. Although there were no otter holts located within 200m of the Site, the habitats on-site and within the immediate vicinity of the Site were considered suitable for commuting and foraging otters.

Otters are considered in the group *Other Marine Carnivores in Air ('OCA') and Water ('OCW') Hearing groups* [71]. The different thresholds for impulsive and non-impulsive noise are presented in Table 5-2 below for both categories. The weighted values are based on auditory weighting functions that were calculated for each hearing group to better describe relative hearing sensitivity within the audible range using the more data-derived, systematic approach of Finneran [72] based on a generic band-pass filter equation.

Table 5-2: Thresholds for Otters exposed to impulsive and non-impulsive noise

Type of noise	Marine mammal hearing group	TTS onset: SEL (weighted) dB	TTS onset: Peak SPL (unweighted) dB	PTS onset: SEL (weighted) dB	PTS onset: Peak SPL (unweighted) dB
Impulsive noise	OCA	146	161	161	167
	OCW	188	226	203	232
Non-impulsive noise	OCA	157	NA	177	NA
	OCW	199	NA	219	NA

SEL – Sound Exposure Levels

SPL – Sound Pressure Levels

TTS – Temporary Threshold Shift may result in a reduction in hearing sensitivity but is not permanent.

PTS – Permanent Threshold Shift may result in auditory injuries and in some cases can lead to death.

SEL thresholds in dB re 1 μPa^2s under water and dB re $(20\ \mu Pa)^2$ s in air (group OCA only); and peak SPL thresholds in dB re 1 µPa under water and dB re 20 µPa in air (group OCA only).

During the Construction Phase, the main potential sources for underwater and terrestrial noise emissions which could effect otter. The major underwater noise sources will include capital dredging, piling works and infilling works. The most significant underwater noise source will be piling works, in particular impact piling, which represents the worst-case event with predicted peak source levels up to 250dB re 1µPa @ 1m. Other activities such as dredging, vessel movements, support vessels, jack-up barge operation and vibratory piling will generate lower noise levels (typically 150–170dB re 1µPa @ 1m). Whereas the noise sources for terrestrial noise emissions will include the demolition works, the wharf construction works and the building works. Therefore, as otter are designated for Lower River Suir SAC and the River Barrow and River Nore SAC, further consideration for potential noise effects will be required.

In addition, designated fish species are also known to utilise the Lower Suir Estuary and the Waterford Estuary. Similar to otter, underwater noise emissions could result in effects on fish within the immediate vicinity of the Site.

Underwater noise criteria are the subject of ongoing research. In many cases, species-specific data is sparse or does not currently exist and must be extrapolated from similar species. However, for fish species, the most relevant criteria for injury was considered to be those contained in Popper *et al* (2014) *'Sound Exposure Guidelines for Fishes and Sea Turtles'* [73]. The guidelines set out criteria for injury due to different sources of noise, see Table 5-3.

Table 5-3: Underwater Noise Impact Criteria

Organism	Designated Fish	Impact Type	Threshold dB
Eggs and Larvae	All Species	Mortality of fish eggs and larvae	>210 dB re 1µPa^2/s SEL_{cum} >207 dB re: 1µPa SPL_{Peak}
Fish: swim bladder is not involved in hearing (particle motion detection).	Atlantic Salmon	Mortality/ PTS in adult fish	210 dB re 1µPa^2/s SEL_{cum} >207 dB re: 1µPa SPL_{Peak}
		Recoverable injury in adult fish	203 dB re 1µPa^2/s SEL_{cum} >207 dB re: 1µPa SPL_{Peak}
		Temporary Threshold Shift (TTS)	186 dB re 1µPa^2/s SEL_{cum}
Fish: swim bladder involved in hearing (primarily pressure detection).	Twait Shad	Mortality/ PTS in adult fish	207 dB re 1µPa^2/s SEL_{cum} >207 dB re: 1µPa SPL_{Peak}
		Recoverable injury in adult fish	203 dB re 1µPa^2/s SEL_{cum} >207 dB re: 1µPa SPL_{Peak}
		Temporary Threshold Shift (TTS)	186 dB re 1µPa^2/s SEL_{cum}
Fish: no swim bladder (particle motion detection).	River Lamprey Sea Lamprey	Mortality/ PTS in adult fish	219 dB re 1µPa^2/s SEL_{cum} >213 dB re: 1µPa SPL_{Peak}
		Recoverable injury in adult fish	216 dB re 1µPa^2/s SEL_{cum} >213 dB re: 1µPa SPL_{Peak}
		Temporary Threshold Shift (TTS)	186 dB re 1µPa^2/s SEL_{cum}

The consequences of the Proposed Development on fish assemblages will be species-specific. Given the possibility of potential for designated fish species of the Lower River Suir SAC and the River Barrow and River Nore SAC to move through the waters of the Lower Suir Estuary within the vicinity of the Site, further consideration will be given to these SACs.

Operational Phase

During the Operational Phase, noise emissions will be associated with vessels berthing, loading / unloading, and departing from the new berth. These activities will increase the frequency of short-term underwater noise events but will not raise overall sound levels, which will remain consistent with existing shipping in the estuary. Such noise may cause temporary behavioural responses in otter, fish and marine mammals; however, as these levels are already characteristic of port operations, additional impacts were predicted to be minor and localised. As mentioned, given that the Port of Waterford is a major working port that operates 24 hours a day, 7 days a week, year-round, any species utilising this section of the Lower Suir Estuary was considered to be habituated to anthropogenic noise sources from the current shipping movements.

It is therefore considered unlikely that operational noise will result in any significant effects to any designated species that may occur within the vicinity of the Site.

5.1.5 Invasives Species

No invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [35] were recorded within the Site.

However, given that the works will involve in-river works within the Lower River Suir SAC, it was considered that biosecurity measures will be required to ensure that there will be no introduction of alien invasive species as a result of the Proposed Development. Therefore, this SAC has been screened in for further consideration.

5.1.6 ZoI Conclusions

The Site is partially located within the Lower River Suir SAC and in close proximity to the River Barrow and River Nore SAC. The boundaries of the seven are located within 15km from the Site.

Given the distance separating the Site from the Tramore Dunes and Backstrand SAC, Bannow Strand SAC, Tramore Back Strand SPA, Bannow Bay SPA and Seas Off Wexford SPA, and the intervening lands separating the Site from the European sites and the lack of impact pathways, it was considered that the Proposed Development will not result in adverse effects to these European Sites and they have therefore been screened out from further consideration.

The following European sites listed in Table 5-4 have been screened in for further consideration to assess potential adverse effects resulting from the Proposed Development.

Table 5-4: European Sites within ZoI

Site Name	Code	Distance at closest point and source-pathway-receptor link
Lower River Suir SAC	002137	The Site is partially located within the Lower River Suir SAC, see Figure 5-2. Therefore, potential habitat loss / degradation, potential noise disturbance, potential air quality disturbance and potential biosecurity effects during the demolition and construction works will be taken forward for further consideration. In addition, potential water quality impairment effects during the operational phase will be taken forward for further consideration.
River Barrow and River Nore SAC	002162	The Site is located 1.4km southwest of the River Barrow and River Nore SAC, see Figure 5-2. Therefore, potential water quality impairment, degradation effects to habitats, and potential noise and disturbance effects to designated species during the demolition and construction works will be taken forward for further consideration. In addition, potential water quality impairment effects during the operational phase will be taken forward for further consideration.

The screening assessment for individual designated habitats and species for each of the screened in European sites and the potential for them to be adversely affected by the Proposed Development are presented in Section 6 below.

Further information on the screened in European sites is provided below.

5.2 Lower River Suir SAC (Site Code: 002137)

The Lower River Suir SAC, is an extensive site, which covers the freshwater stretches of the River Suir from south of Thurles, Co. Tipperary, to the Barrow-Suir confluence east of Cheekpoint, Co. Waterford.

The SAC is comprised of a number of Annex I habitats, including the priority habitats, alluvial forest and Yew woodland (Tables 5-5 and 5-6 below). Other habitats within the SAC include

wet and dry grassland, marsh, reed swamp, improved grassland, tidal river, deciduous woodland and mudflats.

The SAC is of conservation interest for the presence of a number of Annex II species including Freshwater Pearl Mussel, Otter, White-clawed Crayfish, Salmon, Twaite Shad and three species of Lampreys-Sea, Brook and River Lamprey. The site is one of only three known spawning grounds in the country for Twaite Shad. The site is also of ornithological importance for the number of Annex I bird species, E.U. Birds Directive, including Golden Plover, Whooper Swan and Kingfisher.

Intensive agriculture is the primary land use along the banks of the river. The widespread use of fertiliser and slurry poses the greatest threat to the conservation status of the SAC due to the related impairment in water quality. Furthermore, there are multiple industrial developments which border the SAC, and discharge into the river. Fishing is the primary tourism attraction along the stretches of the Suir, including both commercial and leisure fishing with numerous Angler Associations [74].

Table 5-5: Qualifying Annex I Habitats for the Lower River Suir SAC

Qualifying Habitats **(* denotes Priority Habitat)**	**Code**	**Site Specific Conservation Objective**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	1330	Restore favourable conservation condition
Mediterranean salt meadows (*Juncetalia maritimi*)	1410	Restore favourable conservation condition
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260	Maintain favourable conservation condition
Old sessile oak woods with Ilex and Blechnum in British Isles	91A0	Restore favourable conservation condition
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	91E0	Restore favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition

Table 5-6: Qualifying Annex II Species for the Lower River Suir SAC

Species	**Species Name**	**Code**
Mammals listed on Annex II of the Habitats Directive	Otter (*Lutra lutra*)	1355
Fish listed on Annex II of the Habitats Directive	Atlantic salmon (*Salmo salar*)	1106
	Sea lamprey (*Petromyzon marinus*)	1095
	Brook lamprey (*Lampetra planeri*)	1096
	River lamprey (*Lampetra fluviatilis*)	1099
	Twaite shad (*Alosa fallax*)	1103
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (*Margaritifera margaritifera*)	1029

Species	Species Name	Code
Crustaceans listed on Annex II of the Habitats Directive	White-clawed crayfish (*Austropotamobius pallipes)*	1092

5.3 River Barrow and River Nore SAC (Site Code: 002162)

The River Barrow and River Nore SAC consist of the freshwater stretches of the Barrow and Nore River catchments extending from the Slieve Bloom Mountains to the estuary and tidal elements in Creadan Head, Waterford.

Species-rich habitats (Annex I of the EU Habitats Directive), including estuaries, alluvial forests, petrifying springs, and intertidal mudflats and sandflats, can be found within this SAC.

This SAC is of considerable conservation significance for multiple reasons:

- Ornithological importance: This SAC supports Kingfisher, a nationally important bird population listed in Annex I of the EU Birds Directive. One SPA (River Nore), designated under the EU Birds Directive, is also located within the SAC; and,
- This SAC supports multiple species listed on Annex II of the EU Habitats Directive, including Otter, River Lamprey and Salmon.

Land use within the SAC is primarily agricultural, principally grazing and silage production. Fishing is also a main tourist attraction along stretches of the main rivers and their tributaries. Other recreational activities such as boating, golfing and walking also occur within the SAC. The main threats to the SAC and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and sewage plants, along with over-grazing, invasion of non-native species and land reclamation [75].

Table 5-7: Qualifying Annex I Habitats for the River Barrow and River Nore SAC

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Estuaries	1130	Maintain favourable conservation condition
Mudflats and Sandflats not covered by seawater at low tide	1140	Maintain favourable conservation condition
Salicornia and other annuals colonizing mud and sand	1310	Maintain favourable conservation condition
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)*	1330	Restore favourable conservation condition
Mediterranean salt meadows (*Juncetalia maritimi)*	1410	Restore favourable conservation condition
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	3260	Maintain favourable conservation condition
European dry heaths	4030	Maintain favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition
Petrifying springs with tufa formation (Cratoneuron)*	7220	Maintain favourable conservation condition
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	91A0	Restore favourable conservation condition

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)*	91E0	Restore favourable conservation condition

Table 5-8: Qualifying Annex II Species for the River Barrow and River Nore SAC

Qualifying Species	Species Name	Code
Mammals listed on Annex II of the Habitats Directive	Otter *(Lutra lutra)*	1355
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (*Margaritifera margaritifera*)	1029
	Nore Freshwater pearl mussel (*Margaritifera durrovensis*)	1990
	Desmoulin's whorl snail (*Vertigo moulinsiana)*	1016
Crustaceans listed on Annex II of the Habitats Directive	White-clawed crayfish (*Austropotamobius pallipes)*	1092
Fish listed on Annex II of the Habitats Directive	Salmon (*Salmo salar)*	1106
	Sea Lamprey (*Petromyzon marinus*)	1095
	Brook Lamprey (*Lampetra planeri*)	1096
	River Lamprey *(Lampetra fluviatilis)*	1099
	Twaite Shad *(Alosa fallax)*	1103
Flora listed on Annex II of the Habitats Directive	Killarney Fern (*Trichomanes speciosum)*	1421

5.4 Conservation Objectives

European and national legislation places a collective obligation on Ireland and its citizens to maintain a favourable conservation status in areas designated as candidate Special Areas of Conservation. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and,
- The conservation status of its typical species is favourable as defined below.

The favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself;
- The natural range of the species is neither being reduced or likely to be reduced for the foreseeable future; and,
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Conservation objectives for all identified Natura 2000 SAC Sites are as follows:

> *'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and the Annex II species for which the SAC has been selected.'*

The full reports for the conservation objectives for the Lower River Suir SAC[3] and River Barrow and River Nore SAC[4] can be found on the NPWS website [16].

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf
[4] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf

6 STAGE 1 SCREENING: IDENTIFICATION OF POTENTIAL SIGNIFICANT IMPACTS

6.1 Potential Significant Impacts

The potential for significant effects on the Lower River Suir SAC and River Barrow and River Nore SAC were considered further in this section. The key output of this stage of the assessment was the identification of likely significant effects of the Proposed Development alone and in combination with other plans and projects on relevant European sites without the implementation of mitigation measures.

Table 6-1, Table 6-2, Table 6-3 and Table 6-4 present further details and rationale of the screening assessment undertaken for each of the European sites identified as having the potential to be significantly affected by the Proposed Development, in light of their site conservation objectives and best scientific knowledge.

Table 6-1: Screening Assessment: Annex I Habitats – Lower River Suir SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) / Mediterranean salt meadows (*Juncetalia maritimi*)	According to the Conservation Objectives Report, salt meadows occur where the embankment of the riverbank is absent, or has been breached, and along the tidal stretches of the rivers [74]. More extensive areas are also seen along the south bank at Ballynakill, the east side of Little Island, and in three large salt meadows between Ballynakill and Cheekpoint [75]. According to the Conservation Objectives Report, the nearest known location of the habitat is ca. 3.5km downstream of the Site; however, the nearest location of 'potential' Atlantic salt meadows habitat is ca. 340m upstream of the Site [75]. Furthermore, according to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76]. However, during the surveys undertaken at the Site and the surrounding area, this habitat is not located within the Site or within the immediate vicinity of the Site.	Degradation effects associated with pollution during the demolition and construction works (i.e. decrease in water quality)	This habitat is potentially located ca. 340m from the Site; therefore, it was considered highly unlikely that the works will have any significant direct or indirect negative effects on this habitat during either the Construction or Operational Phase of the Proposed Development. This conclusion was based on the fact that there will be no works along the shoreline where this habitat is located and the fact that desk-based information indicated that this habitat has been present at this location for a number of years and appears to be unaffected by the current operations at the port. Furthermore, Atlantic salt meadows and Mediterranean salt meadows are located in an estuarine environment, which is a highly dynamic environment and are subject to diurnal tides, which result in significant varieties in levels of salinity, suspended solids, and nutrients. Demolition works undertaken as part of the Proposed Development will be confined to the Site, and therefore, there will be no overlap with the habitat, nor will the works occur within the immediate vicinity of this habitat. Although the capital dredging, piling and infilling works during construction will occur within the Lower Suir Estuary, any associated increases in suspended sediment will be temporary, localised, and within the range of existing port activities such as maintenance dredging and shipping. Furthermore, given the dispersive nature of the estuary, the resilience of salt meadows and the distance separating this habitat from the Site, it was considered that in the event of water quality impairment effects, this habitat will not be affected by the works. Regardless, in order to	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			ensure no effects will occur to any designated species (as discussed below) water quality protection measures will be implemented during the Construction Phase and, in turn, will ensure no impacts will occur to any habitat within the wider area as well. During operation, vessel movements will remain within established navigation channels, and associated activities will be consistent with the existing baseline. In addition, it was considered that, should any potential pollutants enter the Lower Suir Estuary, they will be dispersed and diluted immediately within the regular flow and large expanse of the estuary. Regardless, in order to ensure no effects will occur to any designated species (as discussed below) water quality protection measures will be implemented during the construction phase and, in turn, will ensure no impacts will occur to any habitat within the wider area as well. Therefore, there will be no potential for this habitat to be affected. Furthermore, it should be noted that the Port of Waterford have a Pollution Management Plan that will remain in place throughout the Construction and Operational Phases to minimise the risk of accidental releases or pollution events. Therefore, no further assessment was deemed to be required.	
Water courses of plain to montane levels with *the Ranunculion fluitantis* and	The habitat survey did not identify this habitat onsite or within the immediate vicinity of the Site. The distribution of this habitat throughout this SAC is currently unknown [77].	N/A	As this is a freshwater habitat, there were no impact pathways from the Site to this habitat identified as the Site is situated within estuarine section of the	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Callitricho - Batrachion vegetation	According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].		Lower Suir Estuary. Therefore, no further assessment was required.	
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	The habitat survey did not identify this habitat onsite or within the immediate vicinity of the Site. The distribution of this habitat within the SAC is currently unknown [77]. However, the lowland type communities of the habitat are considered to occur ca. 21km upstream in association with various areas of alluvial forest within the SAC, notable at Fiddown, below Carrick-on-Suir and at Tibberaghny Marshes According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	This terrestrial habitat was not located onsite or within the vicinity of the Site. It was considered that there were no impact pathways connecting the Site to this habitat, given the distance separating this habitat from the Site. Therefore, there will be no potential for adverse effects to occur on this habitat, and no further assessment was required.	**Screened Out**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	The habitat survey did not identify this habitat onsite or within the immediate vicinity of the Site. The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Site [77]. The nearest recorded location of this habitat is located ca. 53.5km upstream of the Site at its nearest point. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.	**Screened Out**
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-*	The habitat survey did not identify this habitat onsite or within the immediate vicinity of the Site. The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Site. The	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Padion, Alnion incanae, Salicion albae)	Conservation Objectives show that this habitat is present ca. 2.0km upstream of Site [77]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].			
Taxus baccata woods of the British Isles	The habitat survey did not identify this habitat onsite or within the immediate vicinity of the Site. This habitat has not been mapped in detail for the Lower River Suir SAC [77]. According to the Conservation Objectives, there are two stands of Yew woods within the SAC [77]. These stands occur on limestone ridges at Shanbally and Cahir Park, the nearest of which is over 60km northwest from the Site [77]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has not been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	**Screened Out**

Table 6-2: Screening Assessment: Annex II Species for the Lower River Suir SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Otter *(Lutra lutra)*	Large river catchments, including the River Suir catchment, are considered to be among the more important SACs for otter. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been	• Effects associated with pollution during the construction works (i.e. decrease in water quality) and,	Otters are known to occur within the Lower River Suir SAC and there are recent records of otters occurring within 2km of the Site [24]. Moreover, extensive signs of otter were identified onsite and within the surrounding area during the field surveys in the form of live sightings, prints and spraints. Therefore, if was	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	recorded within the 10km grid containing the Site (S61) [76]. The NBDC holds records for otter within a 2km boundary of the Site [24] and otter surveys completed onsite revealed the presence of otters and suitable habitat; however, no otter holts were identified within 200m of the Site.	• Indirect impacts on food chain supply and, • Disturbance during Construction and Operational Phase	concluded that otter were utilising the Lower Suir Estuary for foraging and commuting purposes. As part of the Proposed Development, there will be a loss of ca. 1.3ha of subtidal and intertidal habitats suitable for foraging and commuting otter. However, a Biodiversity Enhancement Area, ca. 1.8ha in size, has been incorporated into the design of the Proposed Development to provide suitable foraging and sheltering / resting areas for local biodiversity, including otter. Given that otter utilise the Lower Suir Estuary onsite and withing the wider area, there will be potential for impacts to occur as a result of demolition, dredging activities, infilling, including sediment resuspension, potential pollution events, and elevated noise levels during the construction phase. During the construction phase, dredging and land reclamation works may cause temporary increases in suspended sediments and turbidity within the Lower Suir Estuary, which could affect water quality and prey availability for designated species. Therefore, water mitigation measures will be required in order to ensure no adverse effects occur to this species during the demolition and construction works. It was also noted that during the operational phase, stormwater from the quayside will discharge into the Lower Suir Estuary and stormwater from the roof of the Operator 2 Facility to the north of the railway will discharge into the Luffany Stream, which is hydrologically linked to the Lower River Suir SAC. Therefore, in order to ensure no significant effects occur as a result of stormwater discharge, mitigation measures will be required.	

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			Also, given the fact that the Site is partially located within the SAC, possible dust generated during the demolition and construction works could affect this species in the absence of appropriate mitigation measures. In addition, the dredging, land reclamation works, and in-river construction works (particularly piling) have the potential to cause noise and disturbance to this species and cause prey species to move away from the area, resulting in decreased prey availability. Therefore, noise mitigation measures will be required in order to ensure no significant effects will occur to this species during the demolition and construction works. Moreover, Operational Phase activities, including vessel movements and associated underwater and airborne noise, may also contribute to disturbance pressures on sensitive species. However, such effects will be localised and not of a magnitude to give rise to significant impacts, given the fact that operational noise emissions will be in line with the current port activities. Therefore, due to the fact that otter that occur within the vicinity of the Site are considered to be habituated to the current levels of anthropogenic activities and related noise emissions, it was considered that there will be no significant noise and disturbance effects on this species during the operational phase. Furthermore, otters are highly mobile and have the ability to temporarily avoid areas of disturbance, and as such, given the fact that there are no otter holts located within 200m of the Site, it was considered that should otter be disturbed during the construction	

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			works, they will move to a more suitable area within the wider SAC. Therefore, water mitigation measures, dust mitigation measures and disturbance mitigation measures will be incorporated into the works.	
Atlantic Salmon (*Salmo salar)*	The NBDC holds no records for salmon within 2km of the Site [24]. Moreover, the distribution of this species is currently not mapped within the SAC [77]. However, the presence of salmon in the Suir catchment is well documented and this species forms an integral part of the local tourism industry [77]. Records of salmon are held within the river catchment of the Suir [77]. As discussed in Section 4.1.2, salmon were recorded within the Barrow-Nore-Suir Estuary by the IFI and Dr. Martin O'Farrell from 2016 – 2023. In addition, according to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	• Effects associated with pollution during the construction works (i.e. decrease in water quality) and, • Indirect impacts on food chain supply. • Disturbance during Construction and Operational Phases.	This species is known to be present within the Lower River Suir SAC catchment during parts of its life cycle. As part of the Proposed Development, there will be a loss of ca. 1.3ha of the Lower Suir Estuary. It was noted that this area is subject to large tidal action, and as such, a portion of this area is exposed at low tide. Furthermore, the muddy benthic habitat is not considered to be suitable spawning habitat for this species. As such, it was considered that this habitat was suboptimal for most fish species. Therefore, it was considered that the total loss of suitable habitat for fish species will not be significant, particularly in the context of the wider Lower River Suir SAC. It was considered that there would be potential for effects to occur in the event of a potential pollution events during the Construction and Operational Phases. Furthermore, during the construction phase, dredging and land reclamation works may cause temporary increases in suspended sediments and turbidity within the Lower Suir Estuary, which could affect water quality and result in direct effects to this species and to the prey availability for this species. Therefore, water mitigation measures will be required in order to ensure no adverse effects occur to this	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			species during the demolition and construction works. It was also noted that during the Operational Phase, stormwater from the quayside will discharge into the Lower Suir Estuary and stormwater from the roof of the Operator 2 Facility to the north of the railway will discharge into the Luffany Stream, which is hydrologically linked to the Lower River Suir SAC. Therefore, in order to ensure no significant effects will occur as a result of stormwater discharge, mitigation measures will be required. In addition, the dredging, land reclamation works, and in-river construction works (particularly piling) have the potential to cause noise and disturbance to this species and cause prey species to move away from the area resulting in decreased prey availability. Therefore, noise mitigation measures will be required in order to ensure no significant effects will occur to this species during the demolition and construction works. In addition, Operational Phase activities, including vessel movements and associated underwater noise, may also contribute to disturbance pressures on sensitive species. However, such effects will be localised and not of a magnitude to give rise to significant impacts, given the fact that operational noise emissions will be in line with the current port activities. Therefore, it was considered that there will be no significant noise and disturbance effects this species during the operational phase. However, it should be noted that fish are highly mobile species that have the ability to temporarily avoid areas of disturbance, and as such, given the fact that there were no suitable spawning grounds for	

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			this species onsite or within the vicinity of the Site, it was considered that this species will move to a more suitable area within the wider SAC. Therefore, water mitigation measures and disturbance mitigation measures will be incorporated into the works.	
Sea Lamprey (*Petromyzon marinus*)	The NBDC holds records for sea lamprey within the River Suir catchment [24]. Although there are no records held by NBDC for the species within 2km of the Site [24]. As discussed in Section 4.1.2, sea lamprey were recorded within the Barrow-Nore-Suir Estuary by Dr. Martin O'Farrell during the fish impingement studies at the Great Island CWS. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	As per Atlantic Salmon	As per Atlantic Salmon	**Screened In**
River Lamprey (*Lampetra planeri*)	The NBDC holds records for river lamprey within the River Suir catchment [24]. Although there are no records held by NBDC for the species within 2km of the Site [24]. As discussed in Section 4.1.2, salmon were recorded within the Barrow-Nore-Suir Estuary by the IFI and Dr. Martin O'Farrell from 2019 – 2023. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	As per Atlantic Salmon	As per Atlantic Salmon	**Screened In**
Twaite Shad *(Alosa fallax)*	The NBDC holds no records twaite shad within 2km of the Site [24]. This species was however recorded in the Lower River Suir and River Barrow and Nore estuary in 2013 by Inland Fisheries Ireland [78]. As	As per Atlantic Salmon	As per Atlantic Salmon	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	discussed in Section 4.1.2, salmon were recorded within the Barrow-Nore-Suir Estuary by the IFI and Dr. Martin O'Farrell from 2016 – 2023. However, the presence of this species within the Suir catchment is well documented. The Site synopsis also notes the catchment is one of only three spawning grounds for this species in the country According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].			
Freshwater pearl mussel (*Margaritifera margaritifera*)	Mussel habitat is widespread in the Clodiagh, with mussels almost continually present in low numbers from downstream of Clonea to above Portlaw [79]. The species was not recorded to be abundant within any area of the SAC [79]. The NBDC holds records for freshwater pearl mussel within the River Suir catchment; however, there were no recent records held by NBDC for the species within a 2km boundary of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76]. The species is known to occur within the Clodiagh catchment, which is 27km upstream of the Site at its nearest point [77]. As part of the lifecycle of freshwater pearl mussel, small larvae (glochidia) are released into the water and attach to the gills of a host fish, typically juvenile Atlantic salmon or brown trout [80].	Indirect adverse effects associated with pollution during the proposed works i.e., a decrease in water quality.	This species occurs within freshwater, and the closest record of freshwater pearl mussel is over ca. 27km upstream of the Site. Therefore, direct effects will not occur to the species. However, this species is reliant on Atlantic salmon and other salmonid species for parts of its life cycle. Therefore, should any significant effects occur to their host species as they migrate through the Waterford Estuary, indirect significant effects could occur to this species.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
White-clawed crayfish (*Austropotamobius pallipes)*	This white-clawed crayfish occurs extensively on the River Suir and its tributaries [77]. The species has been recorded on almost the entire length of the non-tidal section of the River Suir main channel [77]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76]. The NBDC holds no records for white-clawed crayfish within 2km of the Site [24]. The species is known to occur 12.5km upstream of the Site [24].	N/A	This freshwater species does not occur within the tidal sections of the Lower River Suir SAC. The nearest record of this species is located ca. 12.5km upstream of the Site. Therefore, it can be concluded that there are no potential impact pathways from the Site to habitats that support this species. Hence, this species has been scoped out from further consideration.	**Screened Out**
Brook Lamprey (Lampetra planeri)	The NBDC holds records for brook lamprey within the River Suir catchment [24]. Although there are no records held by NBDC for the species within 2km of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76]. Brook lamprey are only known to occur within freshwater habitats, and brook lamprey have not been recorded in the Barrow-Nore-Suir estuary.	N/A	As per white-clawed crayfish.	**Screened Out**

Table 6-3: Screening Assessment: Annex I Habitats – River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Estuaries	The likely area of this habitat is derived from a survey undertaken in 2010 [81]. The Conservation Objectives Report shows that this habitat is	N/A	It was considered highly unlikely that the works will have any significant direct or indirect negative effects on the estuarine habitat within the River Barrow and River Nore SAC during either the construction or operational phase of the	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	located ca. 1.1km downstream of the Site at its nearest point [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].		development. This conclusion was based on the distance separating the Site from the River Barrow and River Nore SAC (ca. 1.1km downstream), the nature of the proposed works and the receiving environment. Estuaries are extremely dynamic environments, and the waterbodies are subject to changes and elevated levels of sediment within the water column. Estuaries generally experience significant sediment deposition because they act as natural traps for sediments carried by rivers and the mixing of freshwater and saltwater currents creates conditions that favour sediment accumulation, which is evident by the sediment profile of the riverbed and extensive sand and mudflats located within the estuary. Therefore, it was considered highly unlikely that any potential pollutants could reach this habitat; the dispersive nature of the estuary waterborne contaminants would be dispersed and diluted immediately within the regular flow and large expanse of the estuary. In addition, the Port of Waterford have a Pollution Management Plan that will remain in place throughout the construction and operational phases to minimise the risk of accidental releases or pollution events No likely significant effects were considered likely during either construction or operation on habitats downstream of the Site. This habitat can therefore be screened out and no further assessment required.	

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Mudflats and Sandflats not covered by seawater at low tide	The likely area of sediment communities was derived from a combination of intertidal and subtidal surveys [82] [83]. The Conservation Objectives Report shows that this habitat is located ca. 1.5km downstream of the Site at its nearest point [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per estuaries.	**Screened Out**
Salicornia and other annuals colonizing mud and sand	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Site [75]. This habitat is limited to the lower regions of the River Barrow and River Nore SAC, and this habitat was not identified onsite. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per estuaries.	**Screened Out**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)*	The Conservation Objectives show that this habitat is present ca. 3km downstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site(S61) [76].	N/A	As per estuaries.	**Screened Out**
Mediterranean salt meadows (*Juncetalia maritimi)*	The Conservation Objectives show that this habitat is present ca. 3km downstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has	N/A	As per estuaries.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	been recorded within the 10km grid containing the Site(S61) [76].			
Reefs	According to the Conservation Objectives Report, this habitat is limited to the intertidal reaches of the River Barrow and River Nore with nearest record of this habitat located ca. 13.5km downstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per estuaries.	**Screened Out**
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	The distribution of this habitat within the SAC is currently unknown, however, this habitat was not identified onsite or within the immediate vicinity of the Site during the habitat survey [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As this is a freshwater habitat, there were no impact pathways identified from the Site to this habitat as the Site is situated within estuarine section of the Lower Suir Estuary. Therefore, no further assessment was required.	**Screened Out**
European dry heaths	The distribution of this habitat within the SAC is currently unknown, however, this habitat was not identified onsite or within the immediate vicinity of the Site during the habitat survey. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	This terrestrial habitat is not located onsite or within the vicinity of the Site. There were no impact pathways identified connecting the Site to this habitat given its terrestrial nature. Therefore, there were no potential adverse effects anticipated that could affect this habitat.	**Screened Out**
Hydrophilous tall herb fringe communities of plains and of the	The distribution of this habitat within the SAC is currently unknown, however, this habitat was not	N/A	As per European dry heaths.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
montane to alpine levels	identified onsite or within the immediate vicinity of the Site during the habitat survey. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].			
Petrifying springs with tufa formation (Cratoneuron)*	The Conservation Objectives Report show that this habitat is not present in the immediate vicinity of the Site [75]. The only known occurrence of this habitat is located along the River Nore, between Thomastown and Inistioge, which is ca. 35.5km upstream of the Site. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has not been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per European dry heaths.	**Screened Out**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Site [75]. The nearest recorded location of this habitat is located ca. 9km upstream of the Site. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has been recorded within the 10km grid containing the Site (S61) [76].	N/A	As per European dry heaths.	**Screened Out**
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)*	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Site [75]. The nearest recorded location of this habitat is located ca. 8.5km upstream of the Site. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this habitat has	N/A	As per European dry heaths.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	been recorded within the 10km grid containing the Site (S61) [76].			

Table 6-4: Screening Assessment: Annex II Species for River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Otter (*Lutra lutra*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown [75]. The NDBC holds records for otter within 2km of the Site [24]. Moreover, otter were observed utilising the Site, which is hydrologically connected to the River Barrow and River Nore SAC. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	• Effects associated with pollution during the construction and operational works - Decrease in water quality; and, • Indirect impacts on food chain supply.	Otters are known to occur within the River Barrow and River Nore SAC and have been recorded on-site and within the surrounding area during the field surveys. The Site is hydrologically linked to the River Barrow and River Nore SAC, ca. 1.1km upstream of the SAC. Therefore, given the close proximity between the Lower River Suir SAC and the River Barrow and River Nore SAC, and the functional connectivity between these sites via the Lower Suir Estuary, it was considered likely the otter utilising the area onsite and within the vicinity of the Site commutes between the two SACs. In this context, taking a precautionary approach, it was considered that potential significant effects that may occur to otter within the Lower River Suir SAC, as a result of the Proposed Development, have the potential to occur to otter designated under the River Barrow and River Nore SAC. Therefore, this species has been screened in for further assessment based on the same criteria as the Lower River Suir SAC.	**Screened In**
Atlantic Salmon (*Salmo salar*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is	• Effects associated with pollution during the	This species is known to be present within the river catchment during parts of its life cycle.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	currently unknown [75]. The NDBC holds no records for salmon within 2km of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	construction and operational works- Decrease in water quality; and, • Indirect impacts on food chain supply.	The Site is hydrologically linked to the River Barrow and River Nore SAC, ca. 1.1km upstream of the SAC. Therefore, given the close proximity between the Lower River Suir SAC and the River Barrow and River Nore SAC, and the functional connectivity between these sites via the Lower Suir Estuary, it was considered likely that individuals utilising the area onsite and within the vicinity of the Site commute between the two SACs. In this context, taking a precautionary approach, it was considered that potential significant effects that may occur to otter within the Lower River Suir SAC, as a result of the Proposed Development, have the potential to occur to this species designated under the River Barrow and River Nore SAC. Therefore, this species has been screened in for further assessment based on the same criteria as the Lower River Suir SAC.	
Sea lamprey (*Petromyzon marinus*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown [75]. The NDBC holds no records for sea lamprey within 2km of the Site [24]. As discussed in Section 4.1.2, sea lamprey were recorded within the Barrow-Nore-Suir Estuary by Dr. Martin O'Farrell during the fish impingement studies at the Great Island CWS. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	As above as per freshwater pearl mussel.	As per Atlantic Salmon	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
River lamprey (*Lampetra fluviatillisi*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown [75]. The NDBC holds no records for river lamprey within 2km of the Site [24]. As discussed in Section 4.1.2, salmon were recorded within the Barrow-Nore-Suir Estuary by the IFI and Dr. Martin O'Farrell from 2019 – 2023. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	As above as per freshwater pearl mussel.	As per Atlantic Salmon	**Screened In**
Twaite shad (*Alosa fallax fallax*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown; however, the species is known to breed within the River Barrow [75]. The NDBC holds no records for twaite shad within 2km of the Site [24]. As discussed in Section 4.1.2, salmon were recorded within the Barrow-Nore-Suir Estuary by the IFI and Dr. Martin O'Farrell from 2016 – 2023. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76].	As above as per freshwater pearl mussel.	As per Atlantic Salmon	**Screened In**
Freshwater pearl mussel (*Margaritifera margaritifera*)	The status of the freshwater pearl mussel within the River Barrow and River Nore SAC is currently under review [75]. Moreover, the NBDC holds no records of this species with 2km of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76].	Indirect adverse effects associated with pollution during the proposed works i.e., a decrease in water quality.	This species occurs within freshwater, and the closest record of freshwater pearl mussel is over ca. 27km upstream of the Site. Therefore, direct effects will not occur to the species. However, this species is reliant on Atlantic salmon and other salmonid species for parts of its life cycle. Therefore, should any significant effects occur to their host species as they migrate through the	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			Waterford Estuary, indirect significant effects could occur to this species.	
Nore pearl mussel (*Margaritifera durrovensis*)	This species is confined to 14km of the main channel of the Nore; [84] [85]. This species is a freshwater species and therefore there is no suitable habitat present within the potentially affected area of the SAC. The NBDC holds no records of this species within 2km of the Site [24] According to the Conservation Objectives Report, the nearest known location of this species within the SAC is 27.9km upstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76].	As above as per freshwater pearl mussel.	This species is refined to a ca. 14km stretch of the main channel of the River Nore [84] [85]. Therefore, it is not within the potentially affected area of the SAC. However, this species is reliant on Atlantic salmon and other salmonid species for parts of its life cycle. Therefore, should any significant effects occur to their host species as they migrate through the Waterford Estuary, indirect significant effects could occur to this species.	**Screened In**
Desmoulin's Whorl Snail (*Vertigo moulinsiana*)	This snail lives on vegetation in swamps, fens and marshes. According to the Conservation Objectives Report, this species is only known to occur in two locations within the SAC, the nearest of which is 49km upstream of the Site [75]. Moreover, the NBDC holds no records of this species with 2km of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76].	N/A	This species was not identified on-site and is not known to occur within the vicinity of the Site. This species has been screened out from further consideration.	**Screened Out**
White-clawed crayfish	The NDBC holds no records for white-clawed crayfish within 2km of the Site [24].According to the Conservation Objectives Report, the nearest	N/A	This freshwater species does not occur within the tidal sections of the River Barrow and River Nore SAC. The nearest record of this species is located ca. 42.5km upstream of the Site. Therefore, it can	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
(*Austropotamobius pallipes*)	known location of this species within the SAC is 42.5km upstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76].		be concluded that there are no potential impact pathways from the Site to habitats that support this species. Hence, this species has been scoped out from further consideration.	
Brook lamprey (*Lampetra planeri*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown [75]. The NDBC holds no records for brook lamprey within 2km of the Site [24]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has been recorded within the 10km grid containing the Site (S61) [76]	N/A	As above as per white-clawed crayfish	**Screened Out**
Killarney Fern (*Trichomanes speciosum*)	The NDBC holds no records for Killarney fern within 2km of the Site [24]. According to the Conservation Objectives Report, the nearest known location of this species within the SAC is 40km upstream of the Site [75]. According to the Status of EU Protected Habitats and Species in Ireland from 2019, this species has not been recorded within the 10km grid containing the Site (S61) [76]. There is no suitable habitat onsite for this species.	N/A	This species was not identified on-site and there were no habitats within the vicinity of the Site that are suitable to support this species. Therefore, this species has been scoped out from further consideration.	**Screened Out**

6.2 Stage 1 – Analysis of 'In-Combination' Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in combination with other plans and projects.

Due to the large size of the Lower River Suir SAC and the River Barrow and River Nore SAC, there are numerous projects and activities which have the potential to affect the conservation interests of these European sites.

The Site is located within an active port that is surrounded by numerous industrial and port-related facilities, which include:

- SmartPly Europe, which manufactures sustainably-timber construction panels and has various warehouses and facilities in the area, including Store All (SmartPly Distribution), is located ca. 170m northwest of the main operational area;
- Southeast Port Services Limited, a shipping agency and storage provider, is located ca. 180m north of the main operational area;
- Target Fertilisers, a wholesaler of grass and tillage fertilisers, is located ca. 60m northwest of the Site;
- Belview Bulk Storage is located ca. 500m southwest of the Site;
- DFDS Waterford (Container Division), a freight shipping service, is located south of the Site;
- Glanway, an Irish waste processor and producer of alternative fuels, is located ca. 550m south of the Site; and,
- O'Brien Cement is located ca. 600m south of the Site.

These facilities operate in tandem with the current Port of Waterford operations. It was considered that during the Construction and Operational Phases of the Proposed Development, these facilities will continue to operate under normal activity levels. Furthermore, it was considered that during the Construction Phase, the Port will carry out normal operations, which include shipping traffic, maintenance dredging and port-related activities.

A review was undertaken of the Kilkenny County Council ePlan [17], Waterford City and County Council ePlan [18], Wexford County Council Planning Applications website [19], the National Planning Application Database [20] and An Coimisiún Pleanála ('ACP') Mapping Search [86] to assess any plans or projects that have the potential to result in in-combination effects with the Proposed Development.

It should be noted that the Port of Waterford have previous planning applications that have been granted within the Site boundary. However, these works have already been undertaken and, as such, are not considered likely to result in any in-combination effects with the Proposed Development.

In addition, maintenance dredging is also carried out at the Port of Waterford. The operation of dredgers on silty material generates underwater noise levels comparable to those from regular shipping traffic. Accordingly, the cumulative effect of maintenance dredging noise is not considered likely to give rise to significant effects to the conservation objectives of any European site in the overall context of the Proposed Development.

Therefore, no current or previously granted plans or projects were identified in the immediate vicinity that were considered to have the potential to have any in-combination with the Proposed Development to result in significant impacts on the integrity of European sites.

Two planning applications that had recently been submitted to Kilkenny County Council were identified during the desk-based review, and, implementing a precautionary approach, these applications were assessed for potential in-combination effects with the Proposed Development:

KCC Planning Ref: 2560391

Drumdowney Solar Farm Ltd. submitted an application to Kilkenny County Council on 27th June 2025 for a solar farm with a 40 year operational lifetime that will cover a total area of ca. 189ha and will include solar panels on ground mounted frames, 27 single storey electrical inverter/transformer stations, five single storey spare parts containers, three Ring Main Units, five weather stations, underground electrical ducting, cabling within the development site, private lands and within the public road network to connect solar farm field parcels and associated ancillary works. This application is currently awaiting a decision from Kilkenny County Council. The development was subject to an Appropriate Assessment ('NIS'). The NIS concluded "*It has been objectively concluded that the proposed development will not adversely affect the integrity of Natura 2000 sites, and there is no reasonable scientific doubt in relation to this conclusion*." Therefore, should this development receive planning permission, it was considered highly unlikely that the Proposed Development will result in any in-combination effects on the conservation objectives of any European site with this project.

KCC Planning Ref: 2560254

Suir Shipping Limited submitted a planning application to Kilkenny County Council on the 12th May 2025 for an extension of the existing access service road, construct a new clear span bridge structure, ancillary service connections, landscaping and associated site works. This application is currently awaiting a decision for Kilkenny County Council; however, Kilkenny County Council issued a request for further information ('RFI') on the 4th July 2025. The development was subject to an Appropriate Assessment ('NIS'). The NIS assessed likely significant ecological effects arising from the development. This NIS stated, "*Following an examination, analysis and evaluation of the relevant information, including the nature of the predicted impacts from the Proposed Development and all associated works, it has been objectively concluded that with the implementation of the proposed mitigation measures, the Proposed Development will not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the qualifying interests of the Lower River Suir SAC and River Barrow and River Nore SAC or any other European site in light of best scientific knowledge*." Therefore, should this development receive planning permission, it was considered highly unlikely that the Proposed Development will result in any in-combination effects on the conservation objectives of any European site with this project.

It is therefore considered that the Proposed Development will be unlikely to have any significant in-combination contribution to possible significant effects on the Lower River Suir SAC, River Barrow and River Nore SAC, Tramore Dunes and Backstrand SAC, Bannow Strand SAC, Tramore Back Strand SPA, Bannow Bay SPA or any other European site.

6.3 Stage 1 – AA Screening Conclusion

A detailed assessment of the layout and nature of the Proposed Development, the construction methods to be employed and the overall activities that will occur at the Site during construction and operation has been carried out and the potential for significant effects on European sites and qualifying features of interest within the zone of influence of the Site has been examined in detail.

Five designated sites, Tramore Dunes and Backstrand SAC, Bannow Strand SAC, Tramore Back Strand SPA, Bannow Bay SPA and Seas Off Wexford SPA, were screened out given the distances separating the Site from these European sites and lack of impact pathways. It

could be objectively concluded that the Proposed Development will not, either alone or in combination with other plans or projects, be likely to have significant effects on those sites.

The Site is partially located within the Lower River Suir SAC and is hydrologically connected to the River Barrow and River Nore SAC. Therefore, the Lower River Suir SAC and River Barrow and River Nore SAC European sites were taken forward for further detailed consideration, Stage 2 Appropriate Assessment. Using professional experience, guidance and judgement, the following factors have been considered in identifying potential significant effects on the identified European site:

- Qualifying interests;
- Special conservation interests;
- Conservation objectives;
- The nature of the onsite habitats; and,
- The location of the Site.

The screening process has examined the potential for the Proposed Development to cause significant effects on European sites and the qualifying features of interest as per the screening determination in Section 4.

Lower River Suir SAC

Taking a precautionary approach, the screening exercise has identified the following designated species:

- Otter
- Salmon
- Sea Lamprey
- River Lamprey
- Twaite Shad
- Freshwater pearl mussel

River Barrow and River Nore SAC

Taking a precautionary approach, the screening exercise has identified the following designated species:

- Otter
- Salmon
- Sea Lamprey
- River Lamprey
- Twite Shad
- Freshwater pearl mussel
- Nore pearl mussel
-

Therefore, the European sites associated with these qualifying features of interest have been brought forward for further consideration.

Therefore, progression to Stage 2 of the Appropriate Assessment process was deemed to be required in the light of current case law on mitigation measures.

Section 7 below further addresses potential issues arising from the Proposed Development and the mitigation measures required to negate any potential significant likely effects on these European sites.

7 STAGE 2 NIS

7.1 Assessment of Potential Significant Effects

This section provides recommendations for measures which will mitigate against any adverse effects on the integrity of the identified European site as a result of the Proposed Development. The following effects with the potential to adversely affect the conservation objectives of the Lower River Suir SAC and the River Barrow and River Nore SAC were considered:

- Potential disturbance to designated species during Construction Phase;
- Potential impairment of water quality during the Construction Phase;
- Potential dust impacts during the Construction Phase;
- Potential impairment of water quality during the Operational Phase; and,
- Potential disturbance to designated species during the Operational Phase;

The screening exercise did not identify any other factors that will result in any likely significant effects.

7.1.1 Construction Phase

7.1.1.1 Potential Disturbance to Designated Species During Construction

Construction noise sources have the potential to result in temporary adverse effects on the noise levels in the vicinity of the Site. However, it should be noted that during the construction phase of the Proposed Development, works will be limited to 07:00 and 19:00 hours Monday to Friday inclusive and 07:00 and 14:00 hours on Saturdays, and pile installation works will be limited to 08:00 – 18:00 Monday to Friday, and 8:00 – 14:00 on Saturdays. In addition, there will be natural breaks in activity, which will provide opportunities for species such as otter and fish to move through the area.

Construction noise can impact species such as otter and fish for which the SAC is designated. Impacts can include disturbance, behavioural impacts, stress and displacement from feeding grounds and impacts on migration. Underwater noise generated from construction within the water column can travel much further distances than noise generated in air and therefore could reach off-site locations.

Otter

No holts or couches were identified on or adjacent to the Site, and the shoreline did not provide suitable habitats for otter holts or couches. The area does, however, provide suitable commuting and foraging habitat for otters. Given the presence of the existing port and the levels of human disturbance within this section of the estuary, it was considered that any otters using this part of the estuary would have become habituated to human disturbance.

Demolition and construction noise has the potential to cause disturbance to otter; however, these works will be limited to construction hours. Restricting activity to this window will ensure regular breaks in disturbance and provide opportunities for otters and other species to move through the area.

As part of the assessments undertaken for the Proposed Development, a detailed terrestrial noise impact assessment was undertaken. The noise assessment concluded that the predicted range of sound pressure levels resulting from the construction phase of the Proposed Development will be 59-67dB. These predicted values are lower than the thresholds presented Table 5-2. Therefore, it was considered that the predicted levels will not cause any harm to the otters.

However, otters using the works area will likely be displaced or disturbed during construction, particularly during piling, when the area will be temporarily unavailable to them. Alternative habitats within the wider estuary and coastal zone will remain accessible, ensuring that foraging and feeding opportunities will continue. Consequently, the works were not predicted to affect the breeding success or the overall population of otters within the area. Mitigation measures, including adherence to best-practice construction guidelines, will ensure that no direct impacts to individuals will occur. To address the potential for short-term disturbance, consultation with the NPWS will be undertaken prior to the commencement of construction to determine the need for, and secure, where required, a derogation licence for the works. Given the location of the Proposed Development within the Port of Waterford and the high levels of human activity, any species utilising the area are likely to be habituated to elevated noise levels or will avoid this area.

Furthermore, lighting will be required during the construction phase, particularly during the winter months when daylight hours will be short, and as such, mitigation measures will be implemented during the construction phase to ensure no significant adverse effects will occur to any otter foraging or commuting in the area. However, it should be noted that the existing Port of Waterford already contains extensive lighting infrastructure for safety and security purposes. As such, it was considered that otter utilising the Site are likely to be habituated to a degree of artificial lighting.

Following completion of works, otters will be expected to reoccupy the area, consistent with the high levels of activity recorded within the port in baseline surveys.

Fish

The estuarine environment supports a range of fish species, some of which may utilise the area for feeding, migration, or as nursery habitat. Piling and dredging activities have the potential to generate underwater noise and vibration that could result in temporary disturbance or displacement of fish, particularly diadromous species such as salmonids during their migration periods.

As part of the assessments undertaken for the Proposed Development, a detailed underwater noise impact assessment was undertaken. The noise assessment concluded that in a worst-case scenario, using 250dB SPLPeak, the potential injury zone fish species would be within a 180-200m range from the piling event. Therefore, in order to ensure no impacts occur as a result of underwater noise, mitigation measures will be implemented.

During the capital dredging works, it was considered that any potential disturbances to fish will be very localised and restricted to the immediate vicinity of operations. In addition, although capital dredging has the potential to increase suspended sediment levels, which could lead to short-term reductions in water quality and temporary impacts on foraging efficiency, fish are mobile animals which, depending on species, can rest on the bottom or occupy the water column at varying distances from the bottom or surface. Either way, it can be expected that fish species can swim at normal or burst speeds (typically up to seven body lengths per second) away from any sudden disturbance in their immediate vicinity. Therefore, the entrainment of fish during the capital dredging was therefore considered unlikely, as any fish that may be disturbed will move to adjacent areas to avoid the disturbance.

Furthermore, given the existing baseline conditions within the Port of Waterford, including regular vessel movements, maintenance dredging, and elevated background disturbance, fish populations within this section of the estuary were considered to be habituated to a dynamic environment. Impacts arising from the Proposed Development were therefore predicted to be localised and temporary in nature. Adherence to best practice construction methodologies and mitigation measures will further minimise potential effects. Accordingly, no significant long-term impacts on estuarine fish populations were anticipated.

Mitigation Measures

In order to ensure no impacts occur to any species that may utilise underwater habitats (fish, otter) mitigation measures to reduce and mitigate against noise disturbance, will be implemented in line with recommendations made for pile driving by the Department of Arts, Heritage and the Gaeltacht ('DAHG') in the '*Guidance to Manage the Risk to Marine Mammal from Man-made Sound Sources in Irish Waters'* [52].

During the capital dredging works, the Contractor will implement clear 'soft-start' or 'ramp up' procedures, whereby sound energy input to the marine environment will be gradually or incrementally increased from levels unlikely to cause significant behavioural impact on marine mammals, fish or otter to the full output necessary for completion of the activities.

However, during the piling works, a suitably qualified marine mammal observer ('MMO') will be appointed to monitor for marine mammals and otter and will log all relevant events using standardised data forms prepared by the DAHG.

The following measures will be implemented to mitigate against impacts on species such as marine mammals, birds and fish species utilising the estuaries:

- The MMO will assess an area of 1km radial distance of the pile driving sound source as the 'Monitored Zone';
- Pre-Start Monitoring:
    - Pile driving activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, will be achieved. Where effective visual monitoring, as determined by the MMO, will not be possible, the pile driving will be postponed until effective visual monitoring will be possible;
    - An agreed and clear onsite communication signal will be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (more information below). Works will only proceed on positive confirmation with the MMO;
    - Pile driving activity will not commence if marine mammals are detected within the Monitored Zone during the pre-start monitoring;
    - The MMO will conduct Pre-Start-Up Monitoring, which will be a constant effort monitoring at least 30 minutes before the sound-producing activities are due to commence. Pile driving shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO; and,
    - The Pre-Start Monitoring will subsequently be followed by an appropriate Ramp-Up Procedure, which will include continued monitoring by the MMO.
- Ramp-Up Procedure ('soft-start'):
    - In commencing a pile driving operation where the output peak sound pressure level (in water) from any source, including equipment testing, exceeds 170 dB re: 1µPa @1m an appropriate Ramp-up Procedure (i.e., "soft-start") will be used. The procedure for use will be informed by the risk assessment undertaken, giving due consideration to the pile specification, the driving mechanism, the receiving substrate, the duration of the activity, the receiving environment and species therein, and other information;
    - Where it is possible, according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output will

commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter will be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes;

- This controlled build-up of acoustic energy output will occur in consistent stages to provide a steady and gradual increase over the ramp-up period;
- Where the above measures will not be possible, alternatives will be examined whereby the underwater output of acoustic energy will be introduced in a consistent, sequential and gradual manner over a period of 20-40 minutes prior to commencement of the full necessary output; and,
- In all cases where a Ramp-Up Procedure will be employed, the delay between the end of ramp-up and the necessary full output will be minimised to prevent unnecessary high-level sound introduction into the environment.

- Once an appropriate and effective Ramp-Up Procedure commences, there will be no requirement to halt or discontinue the procedure if weather or visibility conditions deteriorate, nor if marine mammals occur within the Monitored Zone; and,
- If there is a break in pile driving sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) will be undertaken.

All temporary lighting used during the construction phase will be sensitive to local wildlife while still providing the necessary lighting for human usage. Where possible, the following measures will be implemented for lighting at the Site during the construction phase:

- Avoidance of excessive lighting;
- Lighting will be aimed only where it will be needed;
- Lighting will be turned down / off when not required; and,
- Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct light only where it will be needed.

Therefore, it was concluded that the implementation of the above mitigation measures during the construction works will ensure that no adverse disturbances will occur to species designated for the Lower River Suir SAC and the River Barrow and River Nore SAC as a result of the Proposed Development.

7.1.1.2 Potential Impairment of Water Quality

The Site is partially located within the Lower River Suir SAC and so hydrologically linked to the River Barrow and River Suir SAC further downstream.

Should pollutants from the Proposed Development enter the Lower Suir Estuary / Lower River Suir SAC, through the surface water run-off discharging from the Site into the Lower Suir Estuary, these pollutants could potentially adversely affect the water quality within the Lower Suir Estuary and the downstream River Barrow and River Nore SAC. This can subsequently adversely affect the Annex I/II species protected under the Lower River Suir SAC and River Barrow and River Nore SAC.

Capital Dredging

In order to achieve the required berth depth, capital dredging of the Lower Suir Estuary will be required to remove ca. 7,000m3 of fluvial sediment from the riverbed [22], occurring in the earlier half of the 3-month “Capital Dredging & Land Reclamation Works” period of the construction phase (See Table 3-1). Dredging operations have the potential to increase the

disturbance and concentration of suspended solids within the Lower Suir Estuary and down gradient surface waterbodies via fluvial pathways.

However, a report prepared by LFC Marine *"Review and analysis of the turbidity data before & during the plough dredging campaign of early 2023"* [87] discusses turbidity data (a proxy for suspended solids) from continuous monitoring from the Drumroe and Cheekpoint buoys located in the Lower Suir Estuary. The report stated, "*the vast majority of turbidity is generated by tidal movements; it is difficult to discern any difference in turbidity due to ploughing activity*." Additionally, it was noted that while some elevation in turbidity corresponds to periods of plough dredging, similar elevations occur when no plough dredging occurs, and as such, these elevations could not be attributed to dredging with any degree of confidence. Further statistical analysis was carried out between the plough dredging and non-plough dredging data, with a statistically significant rise in mean turbidity at both buoys. However, the rise in mean turbidity, over the turbidity range, was of no practical significance as it was hidden within the natural variability of the turbidity within the estuarine system, with a rise of only 1.17% in natural, background mean turbidity within the turbidity range.

Therefore, it was concluded that past dredging did not result in turbidity (a proxy for suspended solid concentrations) above the natural variability of within the estuary. Based on this, it is predicated that the capital dredging activities required will result in localised sediment plumes that will have slight, but temporary adverse effects on surface water. These effects will reduce downstream as the resulting sediment plumes disperse within the high flow of the Estuary.

Additionally, there will be the potential for chemical changes to surface water to arise from the disturbance of fluvial sediments; however, this will be dependent on the composition of the sediments mobilised. Based on the site investigations undertaken on-site, the estuarine sediments to be dredged will have no prominent contaminants beyond chloride, which is naturally elevated within estuarine environments due to the marine influence/seawater mixing into the estuarine waters; refer to Section 4.3.2. This is further supported by more than 30 years of sediment testing data carried out for the Dumping at Sea licence, issued by the EPA. All of this data was assessed on three previous occasions by the EPA, with the conclusion of no adverse environmental effects. As such, any effects arising from chemical changes to surface water were predicted to be not significant.

Therefore, it was concluded that the capital dredging works will not result in any significant effects to the conservation objectives of the Lower River Suir SAC and the River Barrow and River Nores SAC. Regardless, during the capital dredging, all works will comply with all relevant legislation and best practice to reduce potential environmental impacts of the works. Furthermore, as a precautionary principle, the following mitigation measures will be put in place, to ensure that water quality will be protected within the vicinity of the Site and further downstream. The measures that will be put in place to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below.

Land Reclamation Works

Reclamation works will consist of the deposition of clean imported material sourced from local quarries and demolition material from the ramp, as well as the reuse of dredged material from the capital dredging. Such reuse will only occur when material has been deemed suitable for this function, with unsuitable material to be handled as waste and appropriately removed offsite. As the material will be checked and screened, whether imported or reused dredge material, any resulting chemical changes have been predicted to be imperceptible.

Reclamation works will also produce sediment plumes both directly from the reclamation material itself, but also from disturbance of any estuarine bed sediments in the reclamation area. As such, any effects predicted for reclamation will be greater than dredging works. Given the estuary is an environment with high concentrations of suspended solids, a slight to

moderate adverse temporary effect was predicted to arise from reclamation activities as a result of suspended solids release / disturbance.

Therefore, in order to ensure no significant effects to the conservation objectives of the Lower River Suir SAC and the River Barrow and River Nores SAC, mitigation measures that will be put in place are outlined below.

Piling Works

The piling works undertaken as part of the Proposed Development will potentially produce sediment plumes. In addition, precast concrete will be utilised in most instances, with no concrete pours occurring in the water column, as pouring of concrete will largely be associated with the casting of the in-situ concrete pile heads.

As such, it was considered that any potential effects from piling works will not likely exceed land reclamation effects in significance; therefore, a slight to moderate adverse temporary effect was predicted to arise.

Therefore, in order to ensure no significant effects to the conservation objectives of the Lower River Suir SAC and the River Barrow and River Nores SAC, mitigation measures will be put in place as outlined below.

General Construction Activities

As outlined in Section 3, there will be limited demolition works required as part of the Proposed Development. In addition, general construction works will include the excavation of materials for the construction of substructures, pouring of concrete throughout the work zones and construction of the wharf and the ORE Operator Facilities.

Potential pollutants resulting from the construction works include suspended solids, silt and hydrocarbon leaks or spills. Should run-off of potential pollutants from these works enter the Lower River Suir SAC, which could adversely affect the water quality within the watercourse and further downstream in the River Barrow and River Nore SAC.

Sediment and silt have the potential to clog fish gills, degrade spawning habitats and cover / smother aquatic vegetation. In addition, hydrocarbons have the potential to change the chemical balance of a waterbody, which can prove toxic to wildlife.

Therefore, impairment to the water quality at these European sites could significantly affect the species for which they are designated by inducing a bottom-up trophic cascade wherein the abundance and distribution of prey species and foraging habitat could potentially be altered, conferring a negative impact upon the fauna at higher trophic levels and upon the functioning of the ecosystem processes. As such, appropriate mitigation measures will be implemented to ensure no adverse effects occur to the water quality of the Lower River Suir SAC and the River Barrow and River Nore SAC.

Mitigation Measures

During the Construction Phase, all works will comply with all relevant legislation and best practice to reduce the potential environmental impacts of the works. Furthermore, the following mitigation measures will be put in place to ensure that water quality will be protected within the vicinity of the Site and further downstream.

In order to prevent any potential significant effects associated with the land reclamation works, the following mitigation measures will be implemented:

- The imported engineering fill will be processed on-site at the source quarry, where it will be crushed and graded to achieve uniform size and washed to remove fine particles that could otherwise contribute to increased turbidity or sediment dispersion during placement;

- Analytical testing will also be conducted to confirm that the engineering fill materials will not introduce harmful elements;
- Engineering fill materials will be unloaded using controlled methods to avoid accidental spillage into the marine environment;
- Placement of the engineering fill materials will occur gradually, with continuous up- and downstream monitoring of water quality parameters, such as suspended solids (or a turbidity as its proxy) and pH, to ensure compliance with environmental thresholds; and,
- Adaptive Management [88] of these reclamation works will be implemented. This approach will be based on modelling-monitoring-adaptation. In practice, this means that if any environmental thresholds are significantly exceeded, additional mitigation measures will be considered.

The proposed measures to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below:

- All plant and machinery will be serviced before being mobilised to the Site;
- All plant, machinery and construction vehicles will be inspected regularly for oil leaks, in accordance with the measures listed in the final CEMP prepared by the Contractor;
- All oil stored on-site for construction vehicles will be kept in a locked and bund-protected area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Drip trays will be used for fixed or mobile plant, such as pumps and generators in order to retain oil leaks and spills;
- Refuelling of plant and machinery will be completed in a controlled manner using drip trays (bunded container trays). Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile containers. Bunds for the storage of hydrocarbons and chemicals will have a holding capacity of 110% of the volume to be stored. In addition, an emergency spill kit with oil boom, absorbers, etc., will be kept onsite in close proximity to any fuel storage tanks or bowsers for use in the event of an accidental spill;
- Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage;
- All deliveries to on-site oil storage tanks will be supervised. Records will be kept of delivery dates and volumes;
- Only designated trained operators will be authorised to refuel plant on-site;
- The Site manager shall ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- A procedure will be drawn up, which will be adhered to during the refuelling of on-site vehicles. This will include the following:
    - Fuel will be delivered to plant on-site by a dedicated tanker or in a delivery bowser dedicated to that purpose;

  - In the case of a bowser, the driver or supervising foreman will check the delivery bowser daily for leakage;
  - The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;
  - Where the nozzle of a fuel pump cannot be placed fully into the tank of a machine, then a funnel will be used; and,
  - Each area of work will have a designated fuelling area. Section foremen shall identify these areas to their plant operatives;
- All equipment associated with the storage of fuel on-site will be designed and installed to relevant standards;
- All valves will be of steel construction, and the open and close positions will be clearly marked;
- Items of plant unsuitable for travelling to the refuelling area (dry screening plant) will be refuelled utilising adequately sized and positioned drip trays;
- Spill kits will be available adjacent to all refuelling and fuel storage operations;
- Spill kits will be available on the barge during the piling works – if applicable;
- Fuel, chemical and oil storage areas on site will be bunded in compliance with EPA guidance (2004);
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
- Any spillage of fuels, lubricants, hydraulic oils, explosives or other chemicals will be contained as soon as practicable; and,
- The proposed design incorporates multiple protective measures, including overfill protection on tanks, full bunding of storage areas, a forecourt interceptor, continuous monitoring, and provision of an emergency holding tank.

In order to ensure no adverse effects occur as a result of stockpiling of excavated material on-site during the construction phase, the following mitigation measures will be adhered to:

- Temporary berms will be constructed around stockpiles to prevent run-off during rain events;
- Stockpiles will be dampened down during dry periods to prevent wind dispersion;
- The stockpiles will be clearly segregated, one for reuse in berms, one for reuse in soil stabilisation, and another segregated for off-site disposal; and,
- All stockpiles will be maintained at a minimum distance of 20m from the Lower River Suir Estuary.

In addition, in order to ensure no adverse impacts occur as a result of the pouring of concrete the following mitigation measures will be employed onsite:

- The production, transport and placement of all cementitious materials will be strictly planned and supervised.
- All concrete pours will be planned with risk assessment to avoid any impacts;

- Full washing out of trucks and other equipment will occur at the dedicated contained area;
- Water supply points, if required, will be agreed with the appointed Contractor in advance of the works;
- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
- Chemicals used will be biodegradable where possible;
- Any spillages will be cleaned up immediately and disposed of as per the Waste Management Act [21];
- Where concrete will be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening; and,
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete.

In addition, during the construction phase of the Proposed Development, the following mitigation measures will be implemented to ensure the protection of the water quality within the Lower River Suir SAC and the downstream River Barrow and River Nore SAC:

- Silt fences will be installed at strategically selected onshore locations during the construction phase to safeguard the receiving surface waters from elevated levels of suspended solids in stormwater runoff. These locations will be defined in the final CEMP, to be prepared by the appointed contractor, with the objective of minimising siltation into the Luffany and the Lower Suir Estuary and thereby ensuring no significant effects to water quality occur within the Lower River Suir SAC and the River Barrow and River Nore SAC further downstream;
- During the Construction Phase, continuous water quality monitoring will be conducted in the Lower Suir Estuary. Real-time sensors measuring pH and suspended solids—or a suitable proxy such as turbidity—will be deployed both upstream and downstream of the in-water works, using buoy-mounted or otherwise appropriate monitoring platforms. This system will enable immediate detection of elevated turbidity levels or anomalously high pH values, which may indicate a release of suspended solids or a potential concrete-related contamination event;
- In addition, the Contractor will provide method statements for weather and tide / storm surge forecasting and continuous monitoring of water levels in the Lower Suir Estuary. If a flood event is forecasted, the Contractor's method statements will include the removal of site materials, fuels, tools, vehicles and persons from flood zones in order to minimise the risk of input of sediment or construction materials into the Lower Suir Estuary; and,
- The proposed measures will remove the risk from potential contamination and emergency procedures will be implemented in the event of an accidental release or spill of potentially contaminating substances. These procedures will be communicated to all relevant Site staff. The contractor's emergency procedures will take into account the Port of Waterford's Pollution Plan.

Additionally, an ECoW will be appointed to the project to ensure that the mitigation and best practice measures will be fully implemented. Therefore, the mitigation measures outlined above will minimise the identified potential risks to water quality associated with the construction phase of the Proposed Development.

As such, it can be concluded that Proposed Development will not have any adverse effects on either the surface water or groundwater quality of the nearby watercourses, or on the Lower River Suir SAC and River Barrow and River Nore SAC, and their designated conservation interests.

7.1.1.3 Potential Dust Impacts during the Construction Phase

During the Construction Phase, demolition, earthworks, construction and track-out activities that will be undertaken on-site have the potential to create dust emission:

- Demolition: A total volume of ca. 3,000m^3 material, which includes concrete and metal, will be demolished as part of works to remove the downstream ramp. This will be reused for reclamation where possible. Demolition activities <6m above ground, adjacent to the waterfront. Dust emission magnitude for demolition activity has been determined as *small*;
- Earthworks: The Proposed Development has an estimated total site area of 80,600m^2. The dominant material to be excavated consists of soils, stones and concrete slab. Land reclamation will occur on-site, involving the import of approximately 160,000 tonnes of rock for deposition above and below the waterline. Dredging is planned, with dredged material to be removed offsite or incorporated into land reclamation materials. Stockpiling and drying of dredged material suitable for reuse may occur on-site. Dredged material will comprise estuarine clays, silts and sands. Between 5-10 heavy earth-moving vehicles are anticipated to be in operational at any one time. The estimated dust emission magnitude from these factors was therefore determined as *large*;
- Construction: It is estimated that the total construction volume 12,000m^3–75,000m^3 of concrete and other material. Dust emission magnitude for construction activity has been determined as *medium*; and,
- Track-out: Due to the estimated number HGVs travelling per day (87) traversing over <50m of unpaved road, the dust emission magnitude for track-out activities has been determined as *large*.

Dust deposition arising from construction activities could potentially enter the Lower River Suir SAC through wind-blown transport or surface water runoff. Dust entering the SAC could lead to increased turbidity, smothering of intertidal or subtidal habitats, and indirect effects on aquatic species through degradation of water quality. Accordingly, the implementation of appropriate dust mitigation measures will be required to ensure that potential emissions will be minimised and that no adverse effects on the integrity of the Lower River Suir SAC will occur. The mitigation measures will include:

- A wheel wash facility will be provided at each exit point for the duration of the construction works;
- All vehicles will be required to pass through the wheel wash facility before exiting the Site to the public road network;
- The wheel wash must be kept in place and used throughout the critical dirt-generating activities of the construction works;
- Where appropriate, water supplies servicing the wheel wash will be from recycled sources;
- All waters shall be drained through appropriate filter material prior to discharge or collected for off-site disposal;

- Records will be taken of any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook;
- Records will be taken of any dust complaints will be made, and the appropriate/time action will be taken when required;
- Carry out regular inspections of and/or around the boundary of the Site;
- The frequency of the site inspections will be increased during high dust-generating activities and during prolonged dry or windy conditions, particularly in the case of earthworks;
- Erect barriers around the Site, where possible;
- Keep fencing, barriers and/or scaffolding clean and free of dust;
- Remove materials that have the potential to produce dust from the Site as soon as possible unless being reused on-site. If being used on-site, they will be covered or wetted to prevent wind whipping;
- Plan Site layout so that dust-generating activities will be located away from receptors, as far as is possible;
- Cover or fence stockpiles to prevent wind whipping;
- The use of diesel- or petrol-powered generators will be avoided, where possible;
- Traffic to and from the site will be managed to avoid congestion where possible;
- Vehicle engines will be switched off when stationary - no idling;
- Use cutting, grinding, or sawing equipment fitted with suitable dust suppression techniques such as water sprays;
- Ensure there will be a water supply on-site for the suppression of dust capable of reaching all parts of the Site;
- Minimise drop heights from handling equipment will be implemented across all activities;
- Ensure equipment will be readily available to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods;
- No burning of waste will be permitted onsite;
- Utilise water suppression where possible / suitable;
- Scabbing (Roughening of concrete surfaces) will be avoided where possible;
- Sand and other aggregates will be stored in enclosed or bunded areas unless required for a particular purpose;
- Bulk cement or other dried powder material will be delivered in enclosed trucks;
- For smaller supplies of fine power materials, the bags will be sealed after use and stored appropriately to prevent dust;
- Stabilise stockpiles as soon as possible;
- Water-assisted dust sweeper(s) will be used on the access and local roads, to remove, as necessary, any material tracked out of the Site;

- Dry sweeping of large areas will be avoided; and,
- On-site haul routes will be inspected for integrity, and necessary repairs will be instigated to the surface as soon as reasonably practicable.

Therefore, following the implementation of the mitigation measures, it was concluded that there will be no adverse impacts on the conservation objectives of the Lower River Suir SAC nor the downstream River Barrow and River Nore SAC through dust generated during the construction phase.

7.1.1.4 Biosecurity Measures for Invasive Species

No high-impact or regulated invasive species were identified onsite. However, as the construction works will take place within the Lower River Suir SAC, biosecurity measures will be implemented onsite to ensure that no invasive species will be introduced, which is in line with the *Development Management Requirements for Invasive Species* in Section 9.2.10 of the Kilkenny County Development Plan, and includes:

- All vehicles, machinery and any other equipment that will be used for the works will be washed and cleaned down prior to being used on the Site to prevent the spread of invasive alien species ('IAS');
- Before machinery or equipment will be unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris have been removed;
- Any vehicles and machinery that have not been deemed to be clean will not be permitted entry to the Site;
- All materials to be imported to the Site, including additional planting for the Biodiversity Enhancement Area will be sourced from a reputable supplier, and records of all material / supplies to the Site will be maintained;
- In advance of works, all site personnel will receive an induction regarding invasive species;
- Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species;
- Where risk assessments indicate potential presence of priority IAS (e.g., Asian clam, winter heliotrope), species-specific best practice guidelines developed under EPA Research Report 368 will be applied;
- An early-detection and rapid-response framework will be established, including routine inspections at vessel wash-down areas, staff training in IAS identification, and contingency plans for rapid eradication and post-eradication monitoring; and,
- Biosecurity signage will be displayed at the Site, all personnel will receive induction on invasive species protocols, and suspected sightings will be recorded and reported to the ECoW.

7.1.2 Operational Phase

7.1.2.1 Potential Disturbance to Designated Species During Operational Phase

During the operational phase of the Proposed Development, activities will primarily involve the berthing and manoeuvring of vessels, cargo handling, and associated port operations. These activities have the potential to give rise to both underwater and airborne noise, as well as increased vessel movements within the Lower Suir Estuary.

Such disturbance could affect designated species within the Lower River Suir SAC and species commuting into the area from the River Barrow and River Nore SAC, including otter

and fish species. Operational noise and vibration could result in behavioural disturbance effects, stress and displacement from feeding grounds for various species. However, during the operational phase, it was considered unlikely that otter or fish species will be affected by the Proposed Development due to the fact that species within the area are habituated to anthropogenic noise emissions. Therefore, given that the ORE Operator facilities are considered likely to result in similar noise levels to the ongoing port-related activities, it was considered that there will be no significant change in the noise levels within the area during the operational phase.

To further reduce potential risks, the following measures will be implemented as part of the Proposed Development:

- All plant (fixed and mobile) associated with the Proposed Development will be maintained to a high standard to reduce any tonal or impulsive sounds;
- Turning off HGVs when not in use; and,
- On-site vehicles associated with the Proposed Development operations will be equipped with white noise / broadband sirens to minimise noise during reversing activities.

Similarly, underwater noise and vessel activity may cause temporary avoidance behaviour or displacement from foraging areas. Overall, the effects were expected to be short-term and localised in nature and will occur within the Lower Suir Estuary, which is already subject to ongoing vessel traffic and port operations. As such, operational activity will remain within the established baseline levels of disturbance to which designated species are already habituated. Furthermore, mobile species such as otter and fish are capable of temporarily avoiding areas of disturbance without long-term effects on their distribution or conservation status.

The Proposed Development will operate on a 24-hour basis; as such, lighting will be required for safety and security purposes. Although lighting has the potential to disturb species, the Proposed Development has been designed to include a sensitive lighting strategy that will be implemented across the entirety of the Proposed Development to minimise light spillage from the Site. The lighting plan considers both internal and external sources. This approach will ensure that the lighting installed within the Site will be sensitive for local wildlife while still providing necessary lighting for site operations. The lighting strategy involves avoiding excessive lighting and the use of 2700Kelvin light temperature bulbs, as this will reduce the blue light component. all lighting will be downward-facing and only directed where needed. There will be no light spillage outside of the Site boundary, so species within the wider area will not be impacted by on-site lighting.

7.1.2.2 Potential Impairment of Water Quality

The Proposed Development will expand the area of hardstanding utilising drainage at the Site, and there will be an increase in stormwater drainage during the Operational Phase. There will be no discharges into surface waters without any mitigation measures.

The increases in stormwater discharge could result in slight to moderate adverse effects on receiving waters. However, the proposed drainage includes design measures to manage and mitigate any increase to suspended solids or other contaminants, such as trace hydrocarbons, entering the receiving waters. The design of all drainage and bunding will be undertaken in accordance with relevant best practice guidelines.

During the Operational Phase, the Proposed Development will operate under Port of Waterford's environmental management procedures and/or those of the ORE Operators. The

Proposed Development has incorporated design measures / operational procedures to mitigate potential effects, which include:

- The fuel tanks dedicated to the ORE facilities will be located within bunded areas designed to hold 110% of the tank volume;
- Fuel loading / unloading to occur within a contained area;
- Stormwater runoff from the wharf extension and reclaimed area will be routed to a proposed settling tank on the quay before draining through a hydrocarbon bypass interceptor before discharging to the Lower Suir Estuary through the proposed new outfall pipe:
    - The settling tank will have a V-notch weir fitting, composite sampling equipment and continuous pH and conductivity probes. In the event of a major spill or a fire occurring at the Port, contaminated run-off will be diverted to an Emergency Holding Tank where the liquid will be contained for further testing; and,
    - All contaminated run-off water will be removed off-site for treatment to an appropriate waste facility in strict accordance with the requirements of the Waste Management Regulations.
- The stormwater generated in the re-fuelling zone and bunded areas will flow through an automated shut-off valve, activated on detection of hydrocarbons, and will discharge through a forecourt interceptor to the stormwater network; and,
- It is proposed to provide permeable paving to allow stormwater generated in the proposed parking areas to discharge to the ground. Stormwater runoff from the roof of the ORE office building will be collected and discharged into the proposed surface water drainage network. It will pass through an interceptor before being discharged under controlled flow into the existing surface water network.

In addition, during the Operational Phase, the following mitigation measures will be implemented:

- Interceptors will be regularly maintained;
- The Port has certified ISO14001 in place, with relevant procedures governing hydrocarbon management and spill containment procedures. The ORE facility operators will be required to implement similar procedures to those of the Port and to enact best available environmental practices relevant to their activities;
- The integrity and water-tightness of underground pipes, tanks, bunds and containers will be checked at regular intervals in accordance with relevant guidelines;
- Suitable absorbent materials will be kept on-site to deal with any spills; and,
- Loading and unloading of fuels will be carried out in an area protected against spills and runoff in accordance with relevant EMS procedures.

The existing legislation and measures in place to reduce and manage the risks associated with incoming vessels and cargo handling include:

- EU Directive on Ship-Source Pollution (2024 Revision): Aligns EU law with MARPOL standards and imposes penalties for illegal discharges;
- EU Port State Control Directive (Directive 2009/16/EC): Empowers member states to inspect and refuse access to unsafe vessels;
- Irish Legislation:

- Maritime Safety Act 2005: Allows seizure and detention of unseaworthy vessels by authorities; and,
- Sea Pollution Act 1991: Implements MARPOL provisions in Irish law for pollution control.

Moreover, Ports can refuse entry to vessels that pose safety or pollution risks, as allowed through S.I. No. 656/2010 (Port State Control Regulations). Inspectors are allowed to board, inspect, detain, and refuse access to non-compliant ships. With these controls in place, it is concluded that there will be no operational water quality impacts on the Lower River Suir SAC or the downstream River Barrow and River Nore SAC.

7.1.2.3 Potential Dust Impairment

During the Operational Phase, it was considered that there will be no significant effects for the dust emissions from loading / unloading vessels at the Site.

Regardless, in order to ensure no dust effects occur on the Lower River Suir SAC or the downstream River Barrow and River Nore SAC, the following mitigation measures will be implemented onsite to minimise dust emissions;

- Minimise drop heights where possible; and,
- Utilise hoppers for granular / pelletised materials, when practical and/or possible.

7.2 Stage 2 - Analysis of 'In-Combination' Effects

Based on the mitigation measures as described in Section 7.1, the Proposed Development alone will not have any direct or indirect adverse effects on the integrity of any European Sites.

Following a review of the Kilkenny County Council ePlan [17], Waterford City and County Council ePlan [18], Wexford County Council Planning Applications website [19], the National Planning Application Database [20] and An Coimisiún Pleanála Mapping Search [86] as listed in Section 6.2, no current or previously granted plans or projects were identified in the immediate vicinity that were considered to have the potential to have any in-combination with the Proposed Development to result in significant impacts on the integrity of European sites.

It is therefore considered that the Proposed Development will be unlikely to have any significant in-combination contribution to possible significant effects on Lower River Suir SAC and the River Barrow and River Nore SAC.

This statement is supported by:

I. The localised nature of the proposed works;
II. The industrial setting of the local environment;
III. The dilution factor between the Proposed Development and European sites;
IV. The mitigation measures that will be put in place; and,
V. The best practice guidelines which will be implemented during the Construction and Operational Phase of the Proposed Development.

Taking the above into account and given the fact that the aforementioned projects will not result in any adverse effects to European sites, it can be concluded that the Proposed Development will not result in any in-combination contribution to adverse effects on the integrity of any European sites.

8 NIS CONCLUSIONS AND STATEMENT

A detailed assessment of the layout and nature of the Proposed Development, the construction methods to be employed, and the overall activities that will occur at the Site during both the Construction and Operational Phases has been carried out. The potential for significant effects on European sites and qualifying features of interest within the zone of influence of the Site has been examined in detail.

As detailed in Section 6.3, the Stage 1 AA Screening conclusion states that five designated sites, the Tramore Dunes and Backstrand SAC, Bannow Bay SAC, Tramore Back Strand SPA, Bannow Bay SPA and Seas Off Wexford SPA were screened out. It can be concluded that the Proposed Development will not, either alone or in combination with other plans or projects, be likely to have significant effects on these European sites.

However, the Site is partially located within a section of the Lower River Suir SAC and is hydrologically connected to the River Barrow and River Nore SAC downstream of the Site. Therefore, these European sites were taken forward for further detailed consideration.

Avoidance, design requirements and mitigation measures are detailed within this NIS which will ensure that any impacts on the Lower River Suir SAC and the River Barrow and River Nore SAC or any other European site, having regard to their conservation objectives, will be avoided during all phases of the Proposed Development, such that there will be no adverse effects on the integrity of any European sites.

Following an examination, analysis and evaluation of the relevant information, including the nature of the predicted impacts from the Proposed Development and all associated works, it has been objectively concluded that with the implementation of the proposed mitigation measures, the Proposed Development will not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the qualifying interests of the Lower River Suir SAC and the River Barrow and River Nore SAC or any other European site in light of best scientific knowledge. No reasonable scientific doubt exists in relation to this conclusion.

Accordingly, progression to Stage 3 of the Appropriate Assessment process (i.e. Assessment of Alternatives Solutions) was not considered necessary.

9 REFERENCES

[1] Department of Transport, Tourism and Sport (DTTS), “National Ports Policy,” 2013.

[2] SRA, “Regional Spatial & Economic Strategy (RSES) for the Southern Region.,” Southern Regional Assembly, 2020.

[3] EcoPorts, “EcoPorts - Green your Port, Join EcoPorts,” 2025. [Online]. Available: https://www.ecoports.com/. [Accessed 2025].

[4] Port of Waterford, “Environment Report 2023,” Port of Waterford, 2024. [Online]. Available: https://www.portofwaterford.com/wp-content/uploads/2024/01/Port-of-Waterford-PERS-Environmental-Report-2023.pdf. [Accessed 2025].

[5] DiadES, “DiadES,” 2019. [Online]. Available: https://diades.eu/. [Accessed 2025].

[6] EPA, “EPA Map Viewer,” 2025. [Online]. Available: https://gis.epa.ie/EPAMaps/.

[7] OPW, “Flood Maps,” 2025. [Online]. Available: http://www.floodinfo.ie/map/floodmaps/#.

[8] OPR, “Appropriate Assessment Screening for Development Management,” 2021.

[9] European Commision, “Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC,” Brussels, 2021.

[10] CIEEM, “Guidelines for Ecological Impact Assessment in the UK and Ireland (Terrestrial, Freshwater, Coastal and Marine), Version 1.2,” 2022.

[11] EC, “Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC,” European Commision, 2018.

[12] DoEHLG, “Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities,” Department of the Environment, Heritage and Local Government, 2010.

[13] DoEHLG, “Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10,” Department of Environment,Heritage and Local Government, 2010.

[14] L. M. Cooper, “Guidelines for Cumulative Effects Assessment in SEA of plans.,” Imperial College London., 2004.

[15] OPW, “ArteriaDrainage Maintenance categories, Source » Pathway » Receptor Chains for Appropriate Assessment,” OPW, Galway, 2012.

[16] NPWS, “National Parks and Wildlife Service,” 2025. [Online]. Available: https://www.npws.ie.

[17] Kilkenny Councy Council, “Kilkenny County Council Planning Portal,” 2025. [Online]. Available: https://kilkennycoco.ie/eng/services/planning/planning-applications/.

[18] Waterford City and County Council, “Online Planning Enquiries,” 2025. [Online]. Available: https://www.waterfordcouncil.ie/departments/planning/planning-enquiries/online-planning-enquiries.htm.

[19] Wexford County Council, “Search Planning Applications,” 2025. [Online]. Available: https://www.wexfordcoco.ie/planning/search-planning-applications.

[20] Department of Housing, Local Government and Heritage, “National Planning Application Database,” 2025. [Online]. Available: https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de.

[21] Delft Hydraulics, “Dredging of Duncannon Bar: Environmental impact of dredging and spoil dumping,” 2000.

[22] ABPmer, “Waterford Estuary, Plough Assessment, ABPmer Report No. R.2899TN,” A report produced by ABPmer for Port of Waterford, 2017.

[23] ABPmer, “Port of Waterford: Dredge Disposal Numerical modelling of disposal plumes,” 2023.

[24] NBDC, “National Biodiveristy Live Maps,” June 2025. [Online]. Available: http://maps.biodiversityireland.ie/.

[25] M. O'Farrell, “Port of Waterford Maintenance Dredging Programme: Fish Report,” Aztec Management Consultants, 2024.

[26] J. A. Fossitt, A Guide to Habitats in Ireland, Dublin: The Heritage Council, 2000.

[27] G. Smith, P. O'Donoghue and K. &. D. E. O'Hara, “Best Practice and Guidance for Habitat Surveying and Mapping,” Heritage Council, 2011.

[28] Irish Ramsar Wetlands Committee, “Irish Wetland Types- an identification guide and field survey manual,” Environmental Protection Agency, 2018.

[29] European Commission, “Interpretation Manual of European Union Habitats, EUR 28,” European Commission, DG Environment, Brussels, 2013.

[30] M. F. Ú. C. E. J. M. M. D. S. S. M. &. W. M. Wyse Jackson, “Ireland Red List No. 10: Vascular Plants.,” National Parks and Wildlife Service, 2016.

[31] NatureScot, “Standing Advice for Planning Consultations – Otters,” NatureScot, 2024. [Online]. Available: https://www.nature.scot/doc/standing-advice-planning-consultations-otters. [Accessed 2025].

[32] SNH, “Technical Advice Note #2: Otter Surveys,” Scottish Natural Heritage, 2017.

[33] DoAHG, “National Otter Survey of Ireland,” *Irish Wildlife Manuals ,* no. No. 76, 2013.

[34] NRA, “Ecological Surveying Techniques for Protected Flora and Fauna”.

[35] EC, “S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024,” European Union, 26 07 2024. [Online]. Available: https://www.irishstatutebook.ie/eli/2024/si/374/made/en/print.

[36] T. Worsfold and D. Hall, “Guidelines for Processing Marine Macrobenthic Invertebrate Samples: A Processing Requirements Protocols,” National Marine Biological Analytical Quality Control Scheme, 2010.

[37] EPA, “Waste Classification List of Waste & Determining if Waste is Hazardous or Non-Hazardous,” EPA, Dublin, Ireland, 2018.

[38] E. Union, “2003/33/EC: Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC,” in *CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS*, 2002.

[39] Sustainable Energy Authority of Ireland (SEAI), “Frequently Asked Questions on Solar Photovoltaics,” SEAI, n.d., accessed July 2025.

[40] CIRIA, “C532 Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors,” Construction Industry Research and Information Association, London, 2001.

[41] CIRIA, “C584 – Coastal and Marine Environmental Site Guide for protection of water quality and in turn aquatic life, during the construction phase of the works,” 2003.

[42] CIRIA, “C648 - Control of Water Pollution from Linear Construction Projects Technical Guidance,” 2006.

[43] CIRIA, “C649 - Control of Water Pollution from Linear Construction Projects: Site Guide,” 2006.

[44] CIRIA, “C674 – The use of concrete in maritime engineering – guide to good practice,” 2010.

[45] CIRIA, “C811 Environmental Good Practice on Site (Fifth Edition),” Construction Industry Research and Information Association, 2023.

[46] CIRIA, “The SuDS Manual (C753),” CIRIA, London, 2007.

[47] CIRIA, “C774 - Coastal and Marine Environmental Site Guide (Second Edition),” 2015.

[48] Inland Fisheries Ireland, “Guidance and Protection of Fisheries during Construction Works in and adjacent to Water,” IFI, Dublin, 2016.

[49] NRA, “Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes,” National Roads Authority, 2008.

[50] NRA, “Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads,” National Roads Authority, Dublin, 2010.

[51] NRA, “Guidelines for the Treatment of Bats prior to the Construction of National Road Schemes,” National Roads Authority , Dublin, 2006.

[52] DAHG, “Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters,” Department of Arts, Heritage and the Gaeltacht, Dublin, 2014.

[53] Department of Communications,Climate Action and Environment, “Guidance on Marine Baseline Ecological Assessments and Monitoring Activities fro Offshore Renewable Energy Projects Part 1,” April 2018. [Online]. Available: https://www.gov.ie/pdf/?file=https://assets.gov.ie/76530/2caa8f12-f1e7-4d76-ab34-19174ff5b9e6.pdf#page=null.

[54] Department of Communications, Climate Action and Environment, “Guidance on Marine Baseline Ecological Assessments and Monitoring Activities fro Offshore Renewable Energy Projects Part 2,” April 2018. [Online]. Available: https://www.gov.ie/pdf/?file=https://assets.gov.ie/76531/faca0c4e-8255-419a-a518-9457ec4734e7.pdf#page=null.

[55] OSPAR Commission, “OSPAR Guidelines for the Management of Dredged Material,” in *OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic*, Paris, France, 1992.

[56] BSI, BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites. Noise, London: British Standards Institution, 2009.

[57] BSI, BS 5228-2:2009 2009 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration, London: British Standard, 2009.

[58] Statutory Instruments, “S.I. No. 299 of 2007: Safety, Health and Welfare at Work (General Application) Regulations, 2007,” European Union, 2007.

[59] Statutory Instruments, “S.I. No. 180/2019 - Safety, Health and Welfare at Work (Diving) (Amendment) Regulations 2019,” European Union, 2019.

[60] D. Ryan, J. Coyne, D. Putharee and W. Roche, “Fish Stock Survey of Transitional Waters in the Southern River Basin District – Barrow, Nore, Suir Estuary 2016,” Inland Fisheries Ireland, 2017.

[61] D. Ryan, J. Cooney, E. Leonard, K. Nolan and W. Roche, “Fish Stock Survey of Transitional Waters in the Southern River Basin District – Barrow, Nore, Suir Estuary 2019,” Inland Fisheries Ireland, 2020.

[62] N. Teague, A. Sutcliffe, L. Fullbrook, R. Phillips and A. Scorey, “Great Island Power Station - Fish Impingement Study for SSE,” APEM, 2018.

[63] Anon., “Great Island CWS Fish Impingement Study (November 2020),” Aztec Management Consultants, Dublin and Aquafact International Services Ltd., 2021.

[64] Anon., “Great Island CWS Fish Impingement Study (June 2021),” Aztec Management Consultants, Dublin and Aquafact International Services Ltd., 2021.

[65] Anon., “Great Island CWS Fish Impingement Study (November 2022),” Aztec Management Consultants, Dublin and Triturus Environmental Ltd., 2023.

[66] Anon., “Great Island CWS Fish Impingement Study (June 2023),” Aztec Management Consultants, Dublin and Triturus Environmental Ltd., 2023.

[67] T. Harrison and F. Kelly, “Development of an estuarine multi-metric fish index and its application to Irish transitional waters,” *Ecological Indicators,* vol. 34, pp. 494-506, 2013.

[68] W. Corcoran, R. Matson, P. McLoone, A. Bateman, D. Cierpial, A. Gavin, P. Gordon, E. McCarthy, K. Kelly, S. Robson, G. Wightman, W. Roche and F. Kelly, “Sampling Fish for the Water Framework Directive - Summary Report 2022,” Inland Fisheries Ireland, 2023.

[69] NPWS, “River Barrow and River Nore SAC (site code: 2162): Conservation objectives supporting document - marine habitats (Version 1),” 2011.

[70] IAQM, “Guidelines on the assessment of dust from demolition and construction,” 2014.

[71] Southall et al, “Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects and Interim Thresholds for Non-auditory Impacts,” 2019.

[72] J. J. Finneran, “Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts.,” U.S. National Marine Fisheries Service. NOAA Technical Memorandum NMFS-OPR-55, 2016.

[73] A. Popper, A. Hawkins, R. Fay, D. Mann, S. Bartol, T. Carlson, S. Commbs, W. Ellison, R. Gentry, M. Halvorsen, S. Lokkeborg, P. Rogers, B. Southall, D. Zeddies and W. Tavolga, “ASA S3/SC1.4 TR-2014, Sound Exposure Guidelines for Fishes and Sea Turtles,” 2014.

[74] NPWS, “Lower River Suir SAC; Site Synopsis,” National Parks and Wildlife Service, 2013.

[75] NPWS, “Conservation Objectives Report - River Barrow and River Nore SAC,” National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht., 2011.

[76] NPWS, “The Status of EU Protected Habitats and Species in Ireland,” Unpublished NPWS report, 2019.

[77] NPWS, “Conservation Objectives Report Lower River Suir SAC 002137,” National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht., 2022.

[78] DEHLG, “A survey of juvenile lamprey populations in the Corrib and Suir catchments.,” Department of Environment, Heritage and Local Government , 2007.

[79] E. Ross, “Initiation of a monitoring program for the freshwater pearl mussel, Margaritifera margaritifera, in the Clodiagh River (Suir),” 2006.

[80] Pearl Mussel Project Ltd., “Freshwater Pearl Mussel,” 2018. [Online]. Available: https://www.pearlmusselproject.ie/freshwater-pearl-mussel.html#:~:text=The%20freshwater%20pearl%20mussel%20has,been%20released%20by%20male%20mussels.. [Accessed 2025].

[81] NPWS, “Site investigations for Sabellaria alveolata (Honey-comb worm) biogenic reefs in Ireland,” National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht., 2010.

[82] ARMS, “Benthic Biotope classification of subtidal sedimentary habitats in the Lower River Suir candidate,” 2008.

[83] ASU, “A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of Waterford,” 2008.

[84] Moorkens, E.A., “The freshwater pearl mussel,” Trinity College, Dublin, 1991.

[85] Moorkens, E.A., “Mapping of proposed SAC rivers for Margaritifera margaritifera. Volume 1 & 2,” NWPS, 1995.

[86] An Coimisiun Pleanala, “Map Viewer,” 2025. [Online]. Available: https://www.pleanala.ie/en-ie/Map-search. [Accessed 2025].

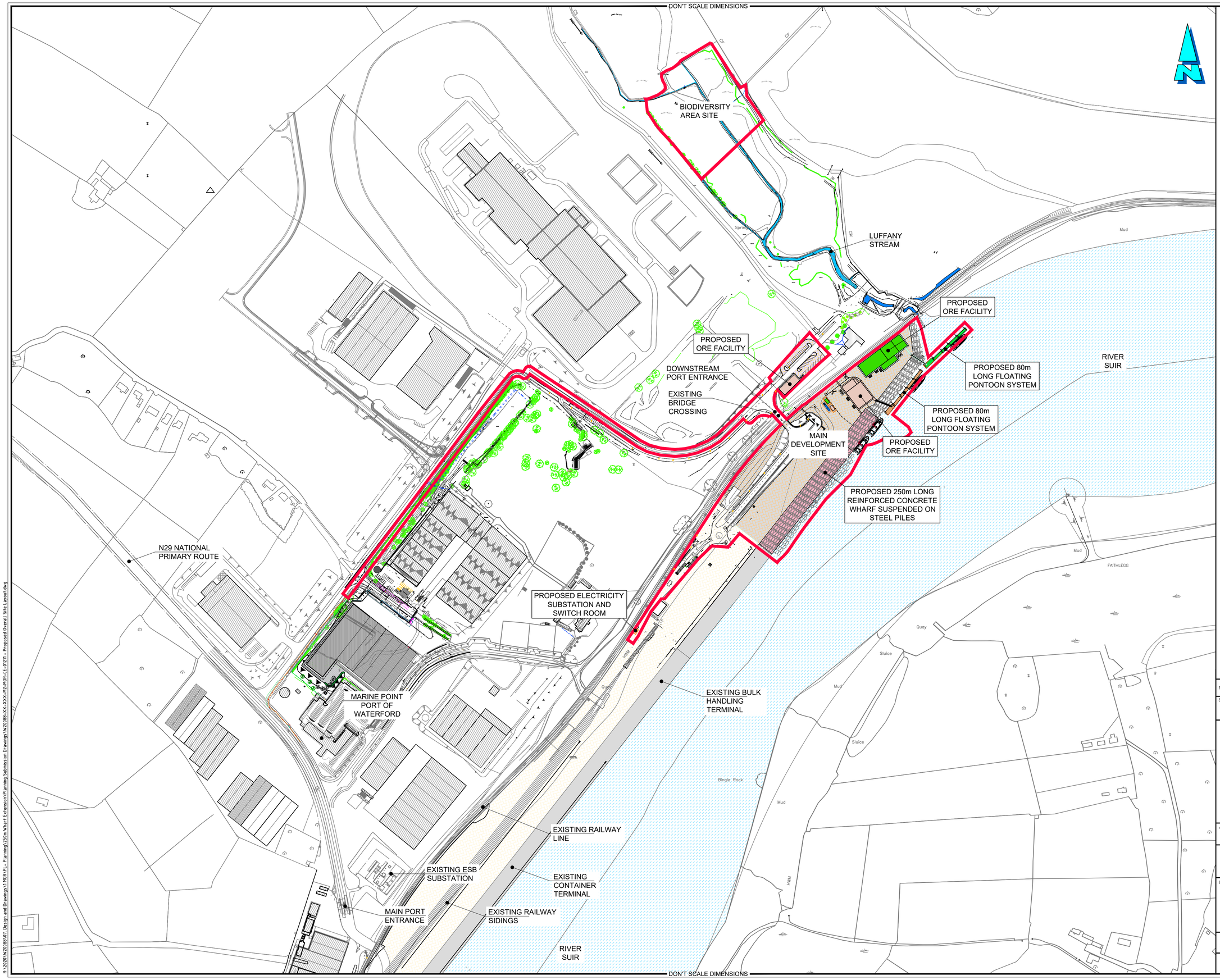
[87] M. Cunningham, “Review and analysis of the turbidity data before & during the plough dredging campaign of early 2023,” LCF Marine, Bere Island, Co. Cork, 2023.

[88] Central Dredging Association, ADAPTIVE MANAGEMENT FOR ENVIRONMENTAL ASPECTS OF DREDGING AND RECLAMATION PROJECTS: REACTIVE AND, https://dredging.org/media/ceda/org/documents/resources/cedaonline/adaptivemanagement.pdf, 2024.

APPENDICES

APPENDIX A

DON'T SCALE DIMENSIONS



Health and Safety:

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, THE SPECIFICATION AND THE SAFETY AND HEALTH PLAN.

Note:

1. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR STORED IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF MALONE O'REGAN CONSULTING ENGINEERS AS COPYRIGHT HOLDER EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DRAWING WAS ORIGINALLY ISSUED.
2. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE TO POOLBEG DATUM

LEGEND:

PROPOSED AREA OF MAIN DEVELOPMENT SITE 6.1102ha (15.099 acres)

DENOTED THUS:

PROPOSED AREA OF BIODIVERSITY AREA SITE 1.8212ha (4.50 acres)

DENOTED THUS: BIODIVERSITY AREA

TOTAL AREA OF SITE = 7.9314ha (19.599 acres)

Rev.	Description	Date	Drawn	Chkd
0	PLANNING ISSUE	05.09.2025	JD	ES

Status: P3 - ISSUED FOR PLANNING

MALONE O'REGAN CONSULTING ENGINEERS
3-4 Canada Street
Waterford
Co. Waterford.
X91 V52K
Tel: +353 51 876 855
Email: waterford@morce.ie
Web: www.maloneoregan.com

Offices also in:
DUBLIN : Tel: +353 1 260 2655 Email: dublin@morce.ie
GALWAY: Tel: +353 91 531 069 Email: galway@morce.ie
LONDON: Tel: +44 208 5281685 Email: london@morce.ie

Client: PORT OF WATERFORD COMPANY

Job: PROPOSED OFFSHORE RENEWABLE ENERGY CAPABLE TERMINAL ON A 250m WHARF EXTENSION & ANCILLARY OPERATIONAL SUPPORT INFRASTRUCTURE

Drawing: PROPOSED OVERALL SITE LAYOUT

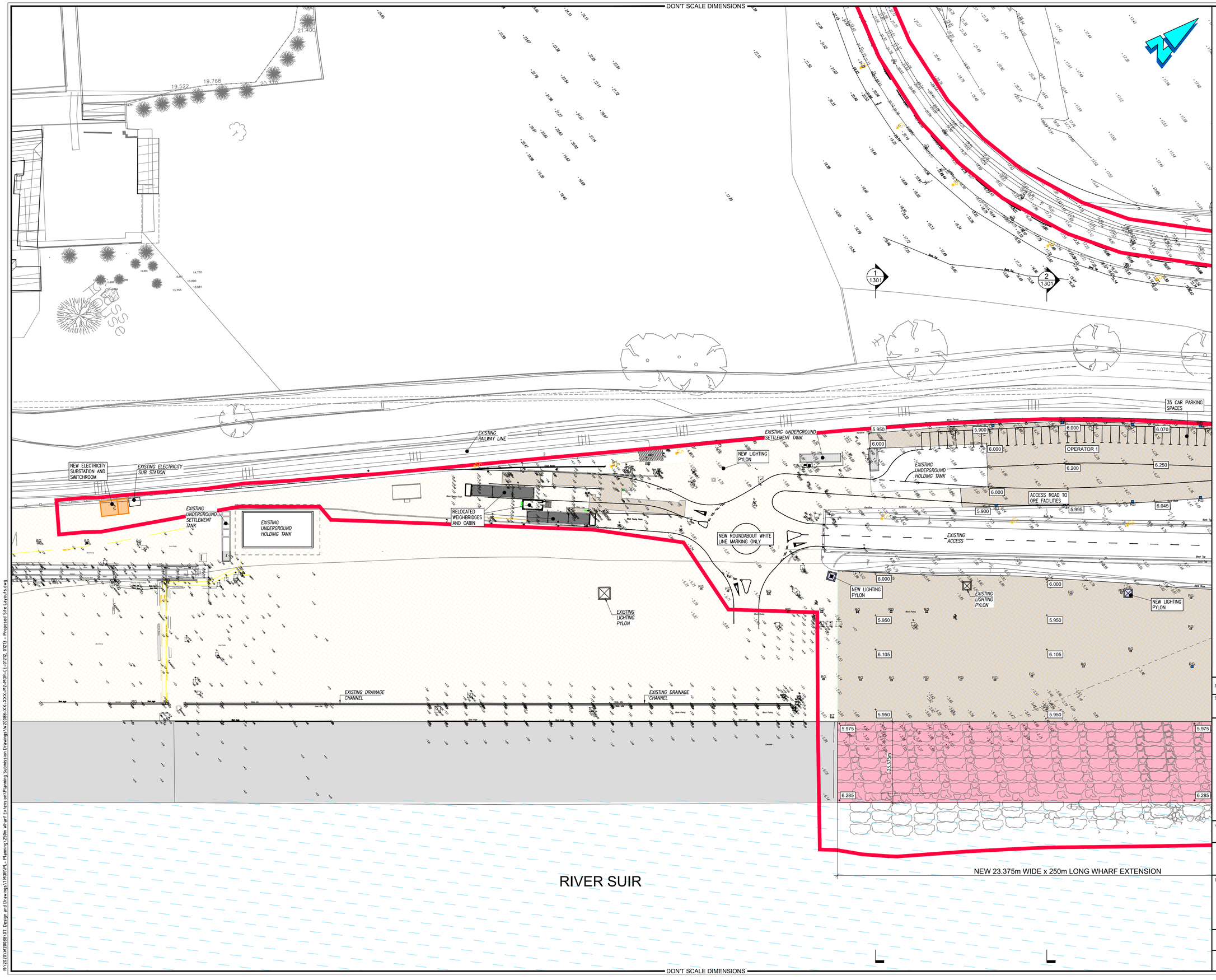
Job No	Revision	Approver	Scale	Sheet
W20088	0	ES	A1 1:2,500 A3 1:5,000	A1

Drg No: W20088-XX-XXX-DR-MOR-CE-01211

DON'T SCALE DIMENSIONS

R:\2020\w20088\07 Design and Drawings\1 MOR\PL - Planning\250m Wharf Extension\Planning Submission Drawings\W20088-XX-XXX-M2-MOR-CE-01211 - Proposed Overall Site Layout.dwg

DON'T SCALE DIMENSIONS



Health and Safety:

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, THE SPECIFICATION AND THE SAFETY AND HEALTH PLAN.

Note:

1.
2. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE TO POOLBEG DATUM

LEGEND:

PROPOSED PLANNING OUTLINE
DENOTED THUS:

EXISTING COBLOC PAVING
DENOTED THUS:

EXISTING WHARF (CONCRETE DECK)
DENOTED THUS:

NEW WHARF EXTENSION
DENOTED THUS:

WHARF CONSISTING OF CONCRETE DECK AND BEAMS WITH DRIVEN STEEL PILES

NEW COBLOC PAVING
DENOTED THUS:

COBLOC PAVING ON SAND BED ON COMPACTED CLAUSE 804 ON QUARRY RUNROCK FILL

NEW PERMEABILE PAVING
DENOTED THUS:

PERMEABLE PAVING ON BEDDING LAYER ON MODIFIED OPEN GRADED SUBBASE ON CLAUSE 804 ON PREPARED FORMATION

AREA OF ROCK ARMOUR REVETMENT
DENOTED THUS:

Rev.	Description	Date	Drawn	Chkd
0	PLANNING ISSUE	05.09.2025	JD	ES

Status: P3 - ISSUED FOR PLANNING

MALONE O'REGAN CONSULTING ENGINEERS
3-4 Canada Street
Waterford
Co. Waterford.
X91 V52K
Tel: +353 51 876 855
Email: waterford@morce.ie
Web: www.maloneoregan.com

Offices also in:
DUBLIN : Tel: +353 1 260 2655 Email: dublin@morce.ie
GALWAY: Tel: +353 91 531 069 Email: galway@morce.ie
LONDON: Tel: +44 208 5281685 Email: london@morce.ie

Client: Cuideachtaí Phort Láirge Port of Waterford Companies
PORT OF WATERFORD COMPANY

Job: PROPOSED OFFSHORE RENEWABLE ENERGY CAPABLE TERMINAL ON A 250m WHARF EXTENSION & ANCILLARY OPERATIONAL SUPPORT INFRASTRUCTURE

Drawing: PROPOSED SITE LAYOUT SHEET 1

Job No	Revision	Approver	Scale	Sheet
W20088	0	ES	A1 1:500 A3 1:1,000	A1

Drg No: W20088-XX-XXX-DR-MOR-CE-01212

R:\2020\W20088\07. Design and Drawings\1\MOR\PL - Planning\250m Wharf Extension\Planning Submission Drawings\W20088-XX-XXX-M2-MOR-CE-01212_01213 - Proposed Site Layouts.dwg

DON'T SCALE DIMENSIONS

DON'T SCALE DIMENSIONS

PROPOSED PUMPING STATION & VALVE CHAMBER

18 CAR PARKING SPACES

OFFICE FACILITY
OPERATOR 2
F.F.L. 12.250
30500

OPERATOR 2

17 CAR PARKING SPACES

35 CAR PARKING SPACES

EXISTING DOWNSTREAM ENTRANCE TO PORT

EXISTING RAIL CROSSING

EXISTING RAILWAY LINE

ACCESS ROAD TO CORE FACILITIES

NEW PEDESTRIAN ACCESS STEPS

NEW SECURITY GATES

EXISTING ACCESS

PROPOSED PUMPING STATION & VALVE CHAMBER

FUEL 1

FUEL 2

NEW SECURITY FENCE

NEW KERB AND CRASH BARRIER TO MATCH EXISTING

PROPOSED SETTLEMENT TANK

NEW LIGHTING PYLON

PROPOSED UNDERGROUND EMERGENCY HOLDING TANK

VEHICLE FILLING LOCATION WITH DISHED CONCRETE FOR CONTAINMENT

NEW CRASH BARRIER

BELOW GROUND FUEL SUPPLY LINES

WAREHOUSE
F.F.L. 6.350

OPERATOR 1

OFFICES
F.F.L. 6.350

OPERATOR 2
WAREHOUSE & WORKSHOP
F.F.L. 6.350

NEW SECURITY FENCE

KENNEDY'S MILL

LUFFANY STREAM

LUFFANY STREAM DISCHARGE PIPES

EXISTING RAILWAY LINE

FIXED QUAY SIDE CRANE

FIXED QUAY SIDE CRANE

CTV EQUIPMENT LOADING/UNLOADING BERTH

NEW ACCESS GANGWAY

CTV LOADING/UNLOADING PONTOON (80m LONG)

NEW ACCESS GANGWAY

CTV LOADING/UNLOADING PONTOON (80m LONG)

NEW 23.375m WIDE x 250m LONG WHARF EXTENSION

RIVER SUIR

DON'T SCALE DIMENSIONS

R:\2020\W20088\07. Design and Drawings\1 MOR\PL - Planning\250m Wharf Extension\Planning Submission Drawings\W20088-XX-XXX-M2-MOR-CE-01202, 01213 - Proposed Site Layouts.dwg

Health and Safety:

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, THE SPECIFICATION AND THE SAFETY AND HEALTH PLAN.

Note:

1. NO PART OF THIS DRAWING MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR STORED IN ANY RETRIEVAL SYSTEM OF ANY NATURE WITHOUT THE WRITTEN PERMISSION OF MALONE O'REGAN CONSULTING ENGINEERS AS COPYRIGHT HOLDER EXCEPT AS AGREED FOR USE ON THE PROJECT FOR WHICH THE DRAWING WAS ORIGINALLY ISSUED.
2. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE TO POOLBEG DATUM

LEGEND:

PROPOSED PLANNING OUTLINE

DENOTED THUS:

EXISTING COBLOC PAVING

DENOTED THUS:

EXISTING WHARF (CONCRETE DECK)

DENOTED THUS:

NEW WHARF EXTENSION

DENOTED THUS:

WHARF CONSISTING OF CONCRETE DECK AND BEAMS WITH DRIVEN STEEL PILES

NEW COBLOC PAVING

DENOTED THUS:

COBLOC PAVING ON SAND BED ON COMPACTED CLAUSE 804 ON QUARRY RUNROCK FILL

NEW PERMEABLE PAVING

DENOTED THUS:

PERMEABLE PAVING ON BEDDING LAYER ON MODIFIED OPEN GRADED SUBBASE ON CLAUSE 804 ON PREPARED FORMATION

AREA OF ROCK ARMOUR REVETMENT

DENOTED THUS:

Rev.	Description	Date	Drawn	Chkd
0	PLANNING ISSUE	05.09.2025	JD	ES

Status: P3 - ISSUED FOR PLANNING

MALONE O'REGAN CONSULTING ENGINEERS
3-4 Canada Street
Waterford
Co. Waterford.
X91 V52K
Tel: +353 51 876 855
Email: waterford@morce.ie
Web: www.maloneoregan.com

Offices also in:
DUBLIN : Tel: +353 1 260 2655 Email: dublin@morce.ie
GALWAY: Tel: +353 91 531 069 Email: galway@morce.ie
LONDON: Tel: +44 208 5281685 Email: london@morce.ie

Client: PORT OF WATERFORD COMPANY

Job: PROPOSED OFFSHORE RENEWABLE ENERGY CAPABLE TERMINAL ON A 250m WHARF EXTENSION & ANCILLARY OPERATIONAL SUPPORT INFRASTRUCTURE

Drawing: PROPOSED SITE LAYOUT SHEET 2

Job No	Revision	Approver	Scale	Sheet
W20088	0	ES	A1 1:500 A3 1:1,000	A1

Drg No: W20088-XX-XXX-DR-MOR-CE-01213

APPENDIX B

Port of Waterford

Benthic Survey of Belview Port

Eoin Moorhouse, Eddie McCormack, Daniel Dunleavy

AQUAFACT Ref: JN1655

July 2024

Report Approval Sheet

Client	Port of Waterford
Report Title	Benthic Survey of Belview Port
Job Number	JN1655
Report Status	Final
Issue Date	30.07.24

Rev	Status	Issue Date	Document File Name	Author (s)	Approved by:
1	Draft	03.02.21	JN1655 Benthic Survey of Belview Portv1	Eoin Moorhouse	B.O'Connor
2	Draft	12.08.21	JN1655 Benthic Survey of Belview Portv2	Eddie McCormack	B.O'Connor
3	Final	30.07.24	JN1655 Benthic Survey of Belview Port Final	Daniel Dunleavy	Eddie McCormack

AQUAFACT

Table of Contents

List of Figures

List of Tables

List of Appendices

1. Introduction

AQUAFACT International Services Ltd. was commissioned by the Client Port of Waterford to carry out a benthic survey at the location of Proposed Development at Belview Port. Three separate areas were sampled. One at the site of the Proposed Development, one upstream of the proposed the Site and one downstream of the site as shown below in Figure 1.1.

Figure 1.1: Location of study area.

2. Materials & Methods

2.1. Sampling Procedure

To carry out the subtidal benthic assessment of Belview Port, AQUAFACT sampled a total of 13 stations. Sampling took place on the 1st June 2021 from the Keltoi Warrior. Sea state was

calm with a light (5kt) southerly breeze. Figure 2.1 shows the location of the grab stations sampled on the 1st of June and Table 2.1 shows the station coordinates and depths.

AQUAFACT has in-house standard operational procedures for benthic intertidal sampling and these were followed for this project. Additionally, the NMBAQC report "Guidelines for processing marine macrobenthic invertebrate samples: a processing requirements protocols" (Worsfold and Hall, 2010) was adhered to.

A 0.025m^2 van Veen grab was used to sample the grab sites. On arrival at each sampling station, the vessel location was recorded using DGPS (latitude/longitude). Additional information such as date, time, site name, sample code and depth were recorded in a data sheet.

Three grab samples were taken at each of the thirteen stations for faunal analysis and a fourth sample was collected for sediment grain size and organic carbon analysis. The grab deployment and recovery rates did not exceed 1 metre/sec. This was to ensure minimal interference with the sediment surface as the grab descended. Upon retrieval of the grab a description of the sediment type was noted in the sample data sheet. Notes were also made on colour, texture, smell and presence of animals.

The grab sampler was cleaned between stations to prevent cross contamination.

The samples collected for faunal analysis were carefully and gently sieved on a 1mm mesh sieve as a sediment water suspension for the retention of fauna. Great care was taken during the sieving process in order to minimise damage to taxa such as spionids, scale worms, phyllodocids and amphipods. The sample residue was carefully flushed into a pre-labelled (internally and externally) container from below. Each label contained the sample code and date. The samples were stained with Eosin-briebrich scarlet and fixed in 4% w/v buffered formaldehyde solution upon returning to the laboratory. These samples were ultimately preserved in 70% alcohol prior to processing.

Figure 2.1: Location of the grab stations sampled on the 1st June 2021.

Table 2.1: Station coordinates and depths at the grab stations.

Station	Latitude	Longitude	Depth (m)
W 1	52.2756342	-7.0087152	6
W 2	52.2758877	-7.0073548	7
W 3	52.2763827	-7.0048165	7
W 4	52.2770475	-7.0016356	6
W 5	52.2773569	-7.0036584	6
B 1	52.2695155	-7.0272737	15
B 2	52.2701497	-7.0269006	8
B 3	52.2706634	-7.0261855	7
B 4	52.271342	-7.0252424	4
Q 1	52.2612827	-7.0368706	11
Q 2	52.2617901	-7.0369225	9
Q 3	52.2621644	-7.0365701	7
Q 4	52.2628558	-7.0361866	5

2.2. Sample Processing

All faunal samples were placed in an illuminated shallow white tray and sorted first by eye to remove large specimens and then sorted under a stereo microscope (x 10 magnification). Following the removal of larger specimens, the samples were placed into Petri dishes, approximately one half teaspoon at a time and sorted using a binocular microscope at x25 magnification.

The fauna was sorted into four main groups: Polychaeta, Mollusca, Crustacea and others. The 'others' group consisted of echinoderms, nematodes, nemerteans, cnidarians and other lesser phyla. The fauna were maintained in stabilised 70% industrial methylated spirit (IMS) following retrieval and identified to species level where practical using a binocular microscope, a compound microscope and all relevant taxonomic keys. After identification and enumeration, specimens were separated and stored to species level.

The sediment granulometric analysis was carried out by AQUAFACT using the traditional granulometric approach. Traditional analysis involved the dry sieving of approximately 100g of sediment using a series of Wentworth graded sieves. The process involved the separation of the sediment fractions by passing them through a series of sieves. Each sieve retained a fraction of the sediment, which were later weighed, and a percentage of the total was calculated. Table 2.2 shows the classification of sediment particle size ranges into size classes. Sieves, which corresponded to the range of particle sizes, were used in the analysis. Appendix 1 provides the detailed granulometric methodology.

Table 2.2: The classification of sediment particle size ranges into size classes (adapted from Buchanan, 1984).

Range of Particle Size	Classification	Phi Unit
<63µm	Silt/Clay	>4 Ø
63-125 µm	Very Fine Sand	4 Ø, 3.5 Ø
125-250 µm	Fine Sand	3 Ø, 2.5 Ø
250-500 µm	Medium Sand	2 Ø, 1.5 Ø
500-1000 µm	Coarse Sand	1 Ø, 1.5 Ø
1000-2000 µm (1 – 2mm)	Very Coarse Sand	0 Ø, -0.5 Ø
2000 – 4000 µm (2 – 4mm)	Very Fine Gravel	-1 Ø, -1.5 Ø
4000 -8000 µm (4 – 8mm)	Fine Gravel	-2 Ø, -2.5 Ø
8 -64 mm	Medium, Coarse & Very Coarse Gravel	-3 Ø to -5.5 Ø
64 – 256 mm	Cobble	-6 Ø to -7.5 Ø
>256 mm	Boulder	< -8 Ø

The additional sediment samples collected from the faunal stations had their organic carbon analysis performed by ALS Laboratories in Loughrea using the Loss on Ignition method. Appendix 1 provides the methodology.

2.3. Data Analysis

Uni- and multi-variate statistical analyses of the faunal data were undertaken using PRIMER v.6 (Plymouth Routines in Ecological Research).

2.3.1. Univariate Indices

Using PRIMER the faunal data were used to produce a range of univariate indices. Univariate indices are designed to condense species data in a sample into a single coefficient that provides quantitative estimates of biological variability (Heip *et al*., 1998; Clarke and Warwick, 2001). Univariate indices can be categorised as primary or derived indices.

Primary biological indices used in the current study include:

number of taxa (S) in the samples and

number of individuals (N) in the samples.

Derived biological indices, which are calculated based on the relative abundance of species in samples, used in the study include:

- Margalef's species richness index (d) (Margalef, 1958),

$$D = \frac{S - 1}{\log_2 N}$$

where: N is the number of individuals and S is the number of species

Margalef's species richness is a measure of the total number of species present for a given number of individuals.

- Pielou's Evenness index (J) (Pielou, 1977)

$$J = \frac{H'(observed)}{H'_{max}}$$

where: H'_{max} is the maximum possible diversity, which could be achieved if all species were equally abundant (= $\log_2 S$)

Pielou's evenness is a measure of how evenly the individuals are distributed among different species.

- Shannon-Wiener diversity index (H') (Pielou, 1977)

$$H' = -\sum_{i=1}^{S} p_i (\log_2 p_i)$$

where: p_l is the proportion of the total count accounted for by the i^{th} taxa

Shannon-Wiener diversity index takes both species abundance and species richness into account quantify diversity (Shannon & Wiener, 1949).

- The Shannon-Wiener based Effective Number of Species (ENS) (Hill, 1973; Jost, 2006)

$$H = \exp(H')$$

where H' is the Shannon-Wiener diversity index.

The Shannon-Wiener index diversity index is converted to ENS to reflect 'true diversities' (Hill, 1973, Jost, 2006) that can then be compared across communities (MacArthur, 1965; Jost, 2006). The ENS is equivalent to the number of equally abundant species that would be needed in each sample to give the same value of a diversity index, *i.e.* Shannon-Wiener Diversity index. The ENS behaves as one would intuitively expect when diversity is doubled or halved, while other standard indices of diversity do not (Jost, 2006). If the ENS of one community is twice that of another then it can be said that the community is twice as diverse as the other.

2.3.2. Multivariate Analysis

The PRIMER programme (Clarke & Warwick, 2001) was used to carry out multivariate analyses on the station-by-station faunal data. All species abundance data from the grab surveys were fourth root transformed and used to prepare a Bray-Curtis similarity matrix in PRIMER. The fourth root transformation allows some of the less abundant species to play a part in the

similarity calculation. Various ordination and clustering techniques can then be applied to the similarity matrix to determine the relationship between the samples.

Multidimensional scaling (MDS) is a technique that ordinates samples as points in 2D or 3D space based on similarity in species distribution data. MDS performed on the Bray-Curtis similarity matrix produce ordination maps whereby the placement of samples reflects the similarity of their biological communities, rather than their simple geographical location (Clarke & Warwick, 2001).

An indication of how well the similarity matrix is represented by the ordination is given by stress values calculated by comparing the interpoint distances in the similarity matrix with the corresponding interpoint distances on the ordinations. Perfect or near perfect matches are rare in field data, especially in the absence of a single overriding forcing factor such as an organic enrichment gradient. Stress values increase, not only with the reducing dimensionality (lack of clear forcing structure), but also with increasing quantity of data (it is a sum of the squares type regression coefficient). Clarke & Warwick (2001) have provided a classification of the reliability of MDS plots based on stress values, having compiled simulation studies of stress value behaviour and archived empirical data. This classification generally holds well for ordinations of the type used in this study. Their classification is given below:

- Stress value < 0.05: Excellent representation of the data with no prospect of misinterpretation.
- Stress value < 0.10: Good representation, no real prospect of misinterpretation of overall structure, but very fine detail may be misleading in compact subgroups.
- Stress value < 0.20: This provides a useful picture, but detail may be misinterpreted particularly nearing 0.20.
- Stress value 0.20 to 0.30: This should be viewed with scepticism, particularly in the upper part of the range, and discarded for a small to moderate number of points such as < 50.
- Stress values > 0.30: The data points are close to being randomly distributed in the ordination and not representative of the underlying similarity matrix.

Each stress value must be interpreted both in terms of its absolute value and the number of data points. In the case of this study, the moderate number of data points indicates that the

stress value can be interpreted more or less directly. While the above classification is arbitrary, it does provide a framework that has proved effective in this type of analysis.

Hierarchical Agglomerative Clustering (HAC) is used to cluster samples based on between-sample similarities into groups in dendrograms. Similarity Profiling (SIMPROF) is used to test if differences between HAC derived similarity-based clusters are significant. Similarity Percentages (SIMPER) analysis can be used to determine the characterising species of each cluster of stations identified either arbitrarily (by eye) from HAC dendrograms or statistically using SIMPROF testing (Clarke and Warwick, 2001; Clarke and Gorley, 2006; Anderson *et al*., 2008).

The species, which are responsible for the grouping of samples in CLUSTER analyses, were identified using the PRIMER programme SIMPER (Clarke & Warwick, 1994). This programme determined the percentage contribution of each species to the dissimilarity/similarity within and between each sample group.

3. Results

3.1. Fauna

The taxonomic identification of the benthic infauna across all 13 subtidal stations sampled in the vicinity of Belview Port yielded a total count of 51 taxa ascribed to 6 phyla and comprising 1,528 individuals. Of the 51 taxa identified, 35 were identified to species level. The remaining 16 could not be identified to species level due to the fact that they were juveniles, damaged or indeterminate. The full faunal abundance species list can be seen in Appendix 2.

Of the 51 taxa recorded, 22 were annelids (segmented worms), 15 were arthropods (crabs, shrimps, insects *etc*.), 11 were molluscs (mussels, cockles, snails etc.), 1 was an echinoderm (brittlestar), 1 was a nemertean (ribbon worm) and 1 was a nematode (round worm).

3.1.1. Univariate Analysis

In order to carry out the univariate analyses all replicate data were combined to give a total for each station prior to statistical analysis. Univariate statistical analyses were carried out on the station-by-station faunal data. The following parameters were calculated and can be seen in Table 3.1; species numbers, number of individuals, richness, evenness, Shannon-Wiener diversity, and Effective Species Number (ENS). Species numbers ranged from 5 (Q3) to 22 (Q3). Number of individuals ranged from 23 (Q3) to 336 (W2). Richness ranged from 1.28 (Q3) to 4.23 (Q1). Evenness ranged from 0.42 (W2) to 0.85 (W5). Shannon-Wiener diversity ranged from 0.7 (Q3) to 2.23 (Q1). Effective number of species ranged from 2.02 (Q3) to 9.34 (Q1) indicating that station Q1 is over 4.6 times more diverse than Q3. Figure 3.1 shows these community indices in graphical form.

Table 3.1: Univariate measures of community structure.

Station	No. Taxa	No. Individuals	Richness	Evenness	Shannon-Wiener Diversity	Effective Number of Species
	S	N	d	J'	H'(loge)	EXP(H')
W1	13	244	2.18	0.57	1.45	4.28
W2	18	336	2.92	0.42	1.22	3.38
W3	11	43	2.66	0.74	1.77	5.86
W4	13	88	2.68	0.81	2.09	8.07
W5	13	56	2.98	0.85	2.17	8.77
B1	6	26	1.53	0.80	1.43	4.17
B2	13	103	2.59	0.65	1.66	5.24
B3	19	213	3.36	0.66	1.95	7.04
B4	11	55	2.50	0.59	1.41	4.10
Q1	20	89	4.23	0.75	2.23	9.34
Q2	13	54	3.01	0.75	1.93	6.92
Q3	5	23	1.28	0.44	0.70	2.02
Q4	22	198	3.97	0.49	1.50	4.49

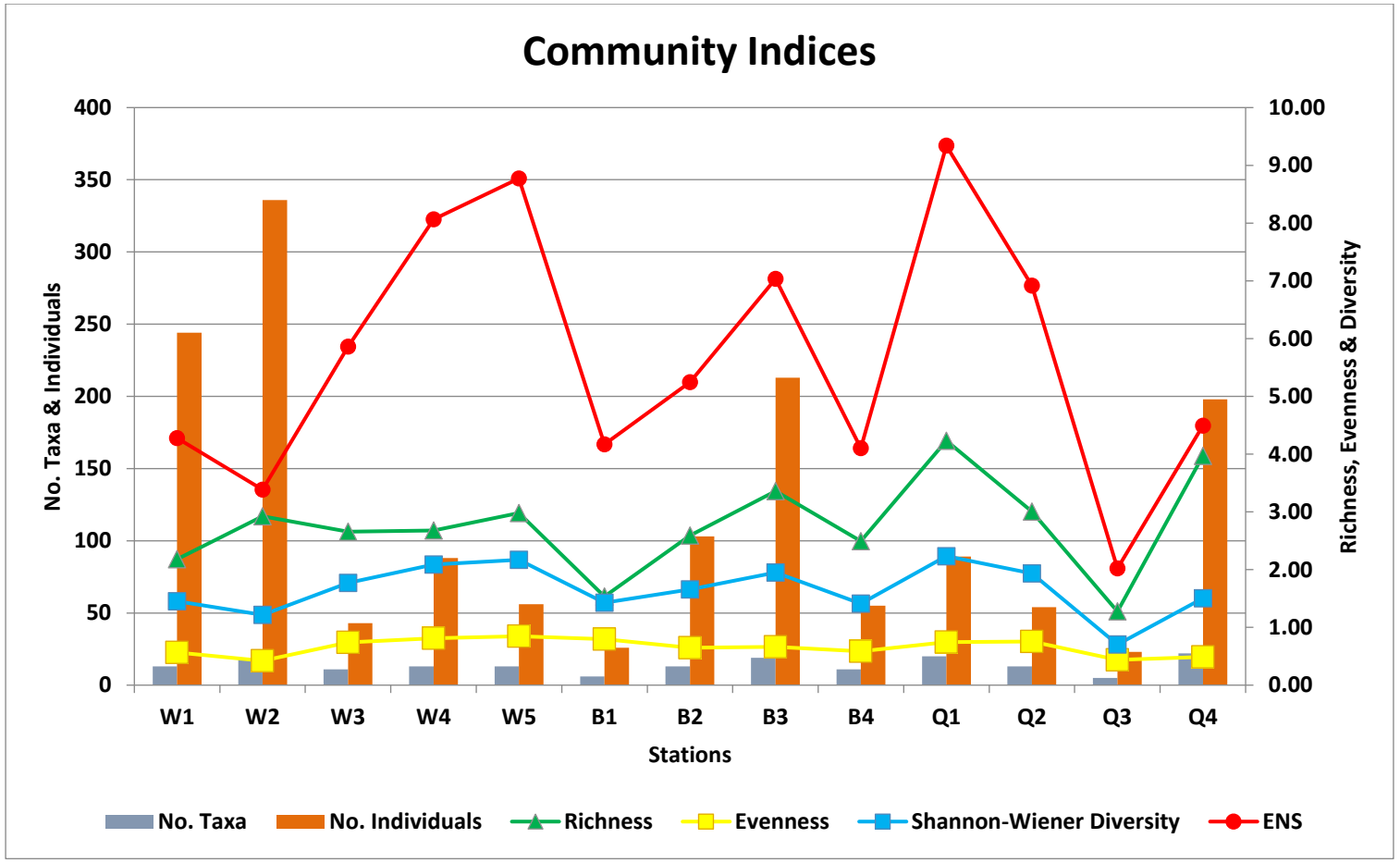


Figure 3.1: Subtidal community diversity indices. Diversity is expressed in Effective Number of Species (ENS) and Shannon-Wiener Diversity.

3.1.2. Multivariate Analysis

The same data set used above for the univariate analyses was also used for the multivariate analyses. The dendrogram and the MDS plot can be seen in Figures 3.2 and 3.3, respectively. SIMPROF analysis revealed 3 statistically significant groupings between the 13 stations (the samples connected by red lines cannot be significantly differentiated). The stress level on the MDS plot indicates that this provides a useful picture representation of the data but very fine detail may be misleading in compact subgroups.

A clear divide (25.01% similarity) can be seen between **Group a** and all other groups. A similarly clear divide (30.57% similarity) can be seen between **Group b** and **Group c**.

Group a consisted of station Q3. This group separated from all other groups at a 74.99% dissimilarity level. Group a contained 5 taxa comprising 23 individuals. 4 taxa were present twice or less. SIMPER analysis could not be carried out on this group as it only contained one station. One species accounted for over 82% of the faunal abundance: the amphipod *Corophium volutator* (19 individuals, 82.6% abundance). *C. volutator* is tolerant of disturbance, occurring under normal conditions, but their populations are stimulated by organic enrichment. This station had the lowest number of taxa, lowest number of individuals, lowest richness and lowest diversity.

Group b consisted of station Q4. This group separated from Group c at a 69.43% dissimilarity level. Group b contained 22 taxa comprising 198 individuals. Of the 22 taxa, 17 were present twice or less. Four taxa accounted for almost 89% of the faunal abundance: Nematoda (118 individuals, 59.6% abundance), the oligochaete *Tubificoides benedii* (34 individuals, 17.17% abundance), the gastropod *Peringia ulvae* (13 individuals, 6.57% abundance), and the amphipod *Corophium volutator* (11 individuals, 5.56% abundance). SIMPER analysis could not be carried out on this group as it only contained one station. Nematoda, *Corophium volutator* and *Peringia ulvae* are tolerant of disturbance, occurring under normal conditions, but their populations are stimulated by organic enrichment. *Tubificoides benedii* is a first order opportunistic species which proliferates in reduced sediments with high organic content. Q4 had the highest number of taxa and the highest richness.

Group c consisted of stations W1-W5, B1-B4, Q1 and Q2. This group separated from Group b at a 69.43% dissimilarity level. This group had a within-group similarity level of 51.83%. Group c contained 39 taxa comprising 1,307 individuals. Of the 39 taxa, 17 were present twice or less. Six taxa accounted for over 79% of the faunal abundance: the amphipod *Corophium volutator* (440 individuals, 33.66% abundance), Nematoda (97 individuals, 7.42% abundance), and the polychaetes *Tharyx killariensis* (245 individuals, 18.75% abundance), *Pygospio elegans* (83 individuals, 6.35% abundance) and *Streblospio shrubsolii* (55 individuals, 4.21% abundance). SIMPER analysis further revealed *Tubificoides benedii* and the bivalve *Macoma balthica* as characterising species of this group. *Macoma balthica, Corophium volutator*, Nematoda, *Streblospio shrubsolii* and *Pygospio elegans* are tolerant of disturbance, occurring under normal conditions, but their populations are stimulated by organic enrichment. *Tubificoides benedii* is a first order opportunistic species that proliferates in reduced sediments with high organic content. *Tharyx killariensis* is a second order opportunistic species that is present in slight to pronounced unbalanced conditions.

All of the groups can be seen as belonging to the JNCC biotope SS.SMu.SMuVS.PolCvol *Polydora ciliata* and *Corophium volutator* in variable salinity infralittoral firm mud or clay (EUNIS code A5.321). SS.SMu.SMuVS.PolCvol is a sublittoral biotope occurring in sheltered, very sheltered and extremely sheltered areas with weak tidal streams (Connor *et al.,* 2004). The biotope occurs in variable salinity and exclusively in clay and very firm mud, and is characterized by a turf of the polychaete *Polydora* along with the amphipod *Corophium volutator.* The resilience and resistance of the biotope to impacts is considered high (De-Bastos & Hill, 2016).

Additionally, these stations can be classified as belonging to one of the four common benthic community habitat types occurring in the River Barrow and River Nore SAC (Figure 4.4) (NPWS, 2011) namely the habitat 'Muddy estuarine community complex'. This community is present intertidally and subtidally from Cheek Point and Great Island northward to New Ross. The substrate of this community complex is predominantly of fine material. The distinguishing species for this group are the bivalve *Scrobicularia plana* and *Macoma balthica,* the amphipod *Corophium volutator,* the polychaete *Streblospio shrubsolii,* and the oligochaetes *Tubificoides pseudogaster* and *Tubificoides benedii.* These species are indicative of variable salinity community (NPWS, 2011).

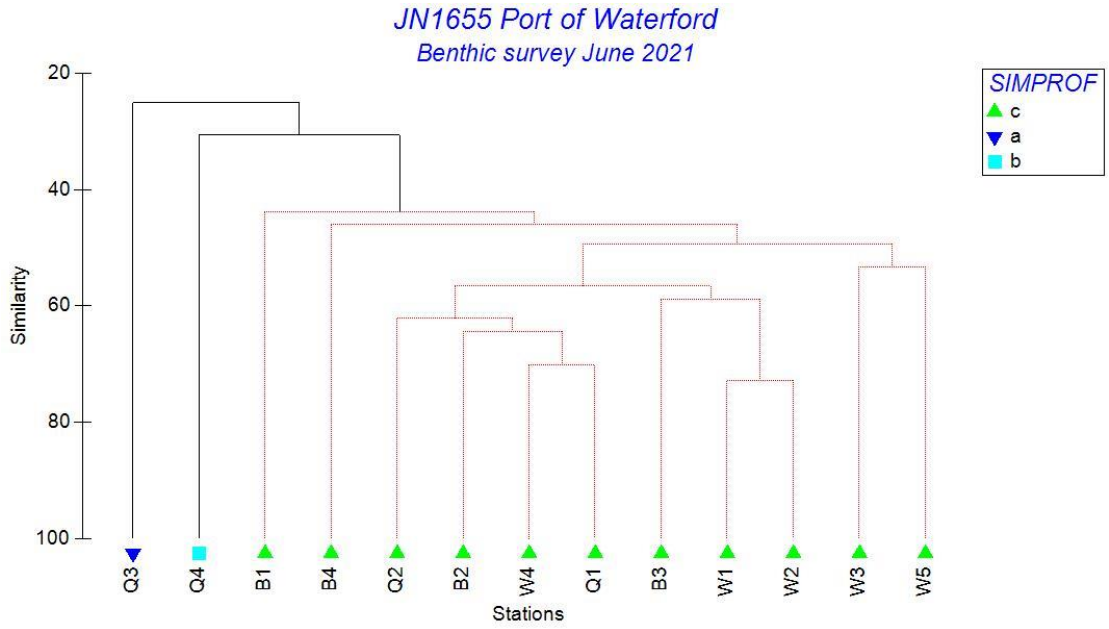


Figure 3.2: Dendrogram produced from Cluster analysis.

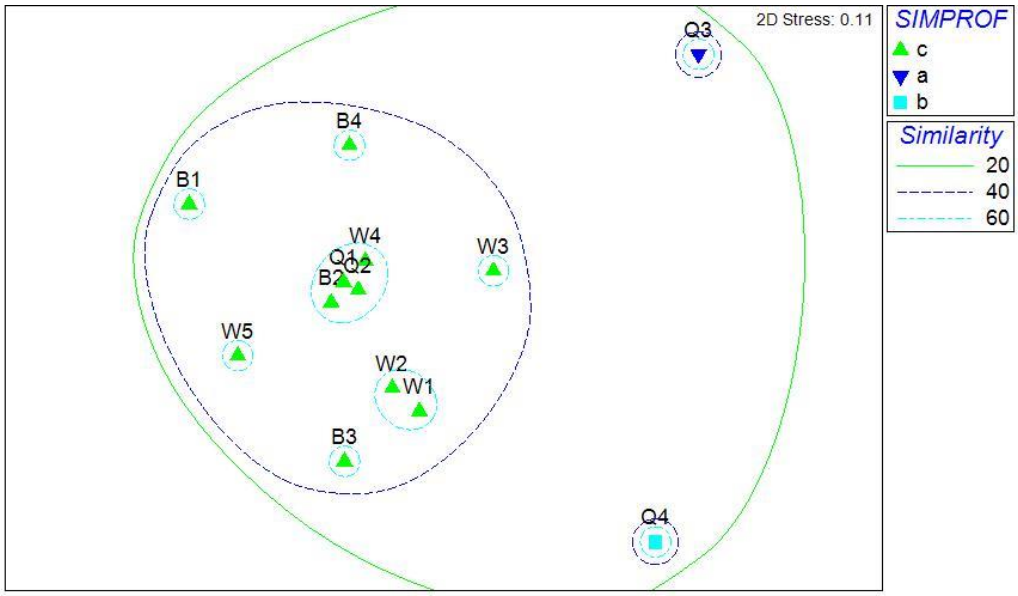


Figure 3.3: MDS plot.

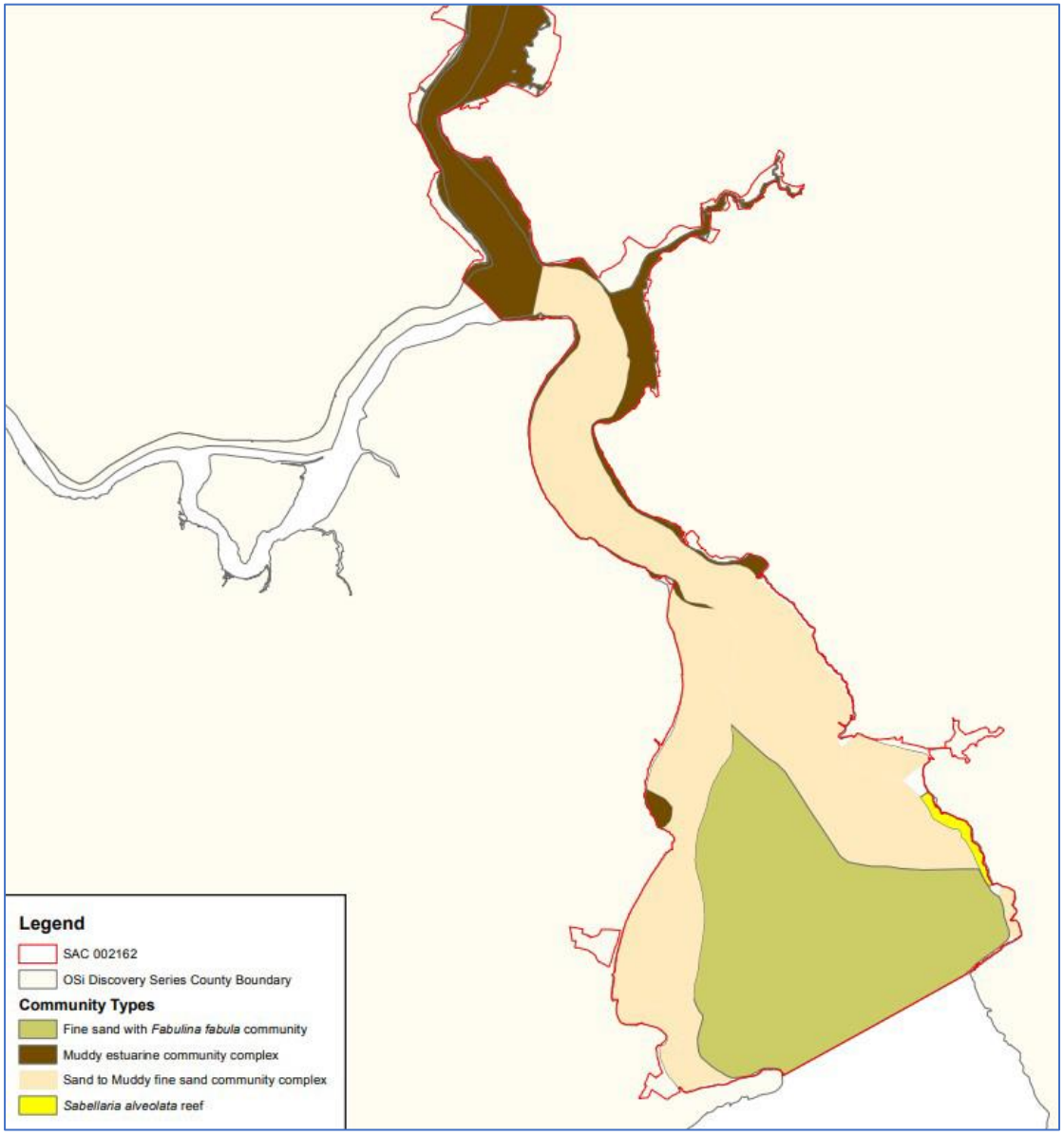


Figure 3.4: River Barrow and River Nore conservation objectives marine community types (NPWS, 2011).

3.2. Sediment

Table 3.2 shows the sediment characteristics of the subtidal and intertidal stations surveyed including the granulometry and the percentage organic carbon.

The sediment sampled within the study area was classified as slightly gravelly muddy sand, and muddy sand according to Folk (1954). No medium gravel-boulders were recorded. Highest levels of fine gravel were observed at Q1 (0.8%). Highest levels of very fine gravel, very coarse sand, coarse sand, medium sand and fine sand were found at B1 (1.3%, 4.8%, 7.8%, 8.6% and 8.9% respectively). Highest levels of very fine sand were found at W3 (75.2%) and highest levels of silt-clay were found at Q4 (36.7%). Figure 3.5 illustrates the sediment type according to Folk (1954). Figure 3.6, 3.7 and 3.8 illustrate the sediment fractions of stations W1-5, B1-4 and Q1-4 respectively. Organic matter values ranged from 4.88% (B4) to 8.04% (B1).

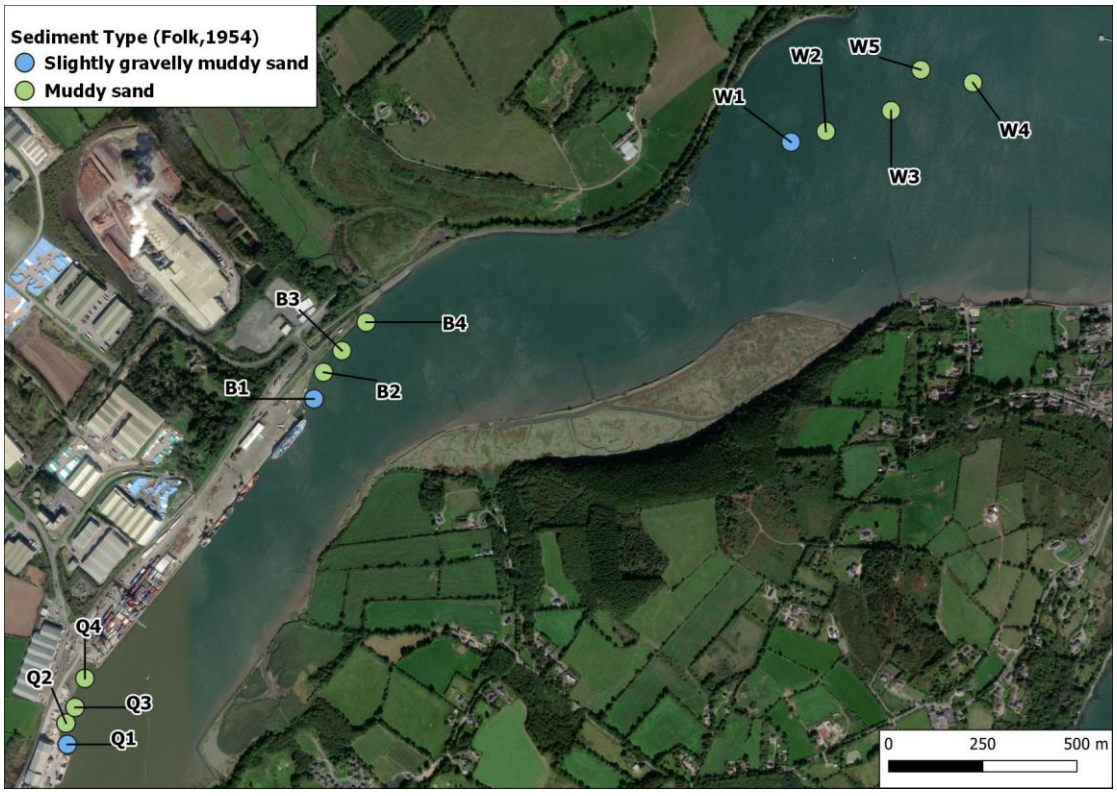


Figure 3.5: Sediment type at each stations according to Folk (1954).

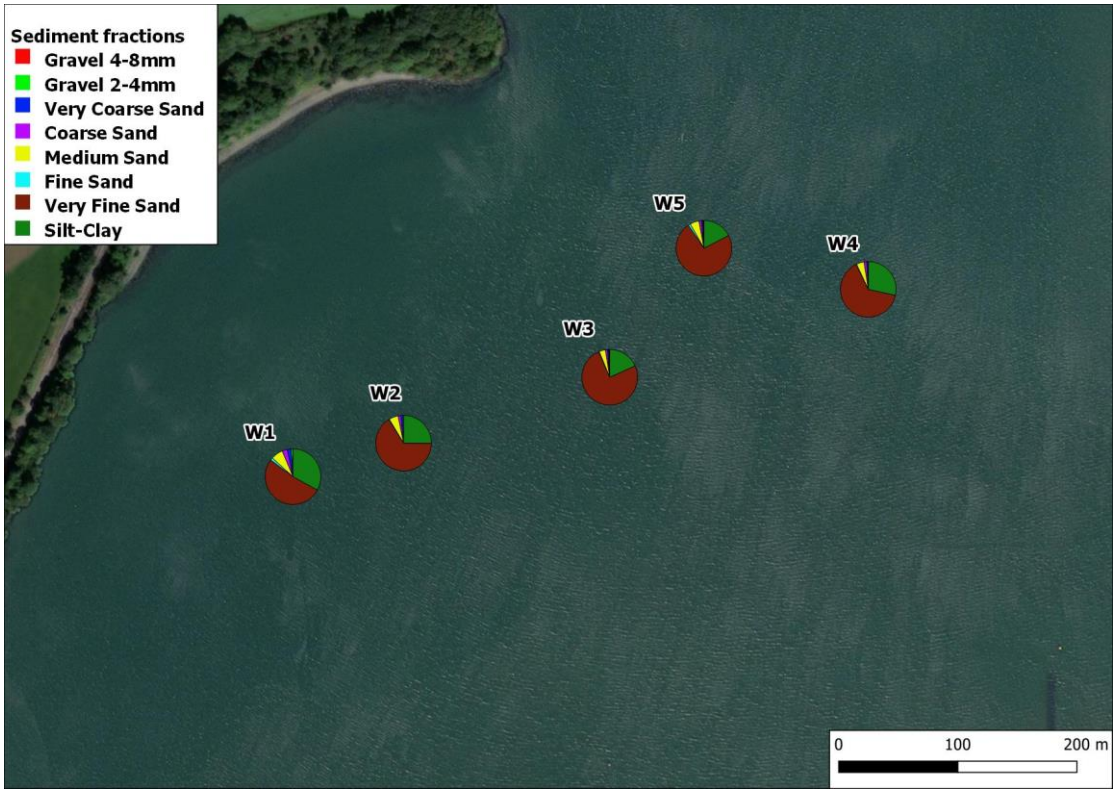


Figure 3.6: Sediment fractions of stations W1-5.

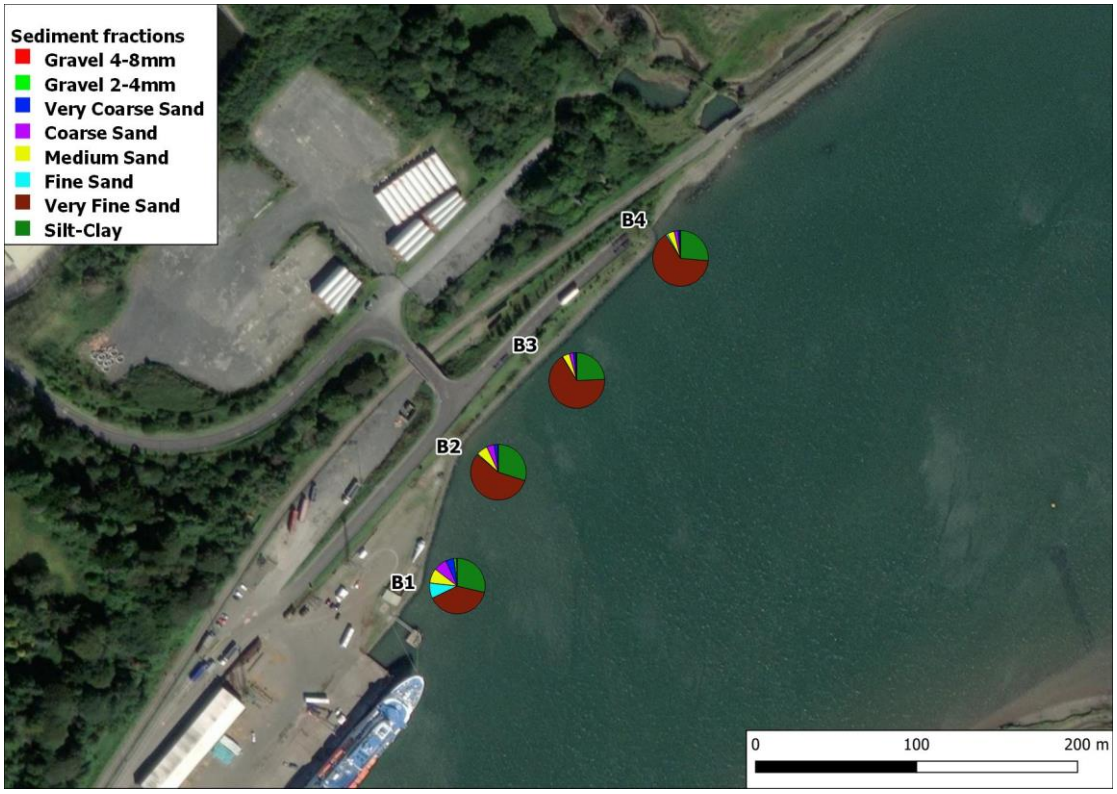


Figure 3.7: Sediment fractions of B1-4.

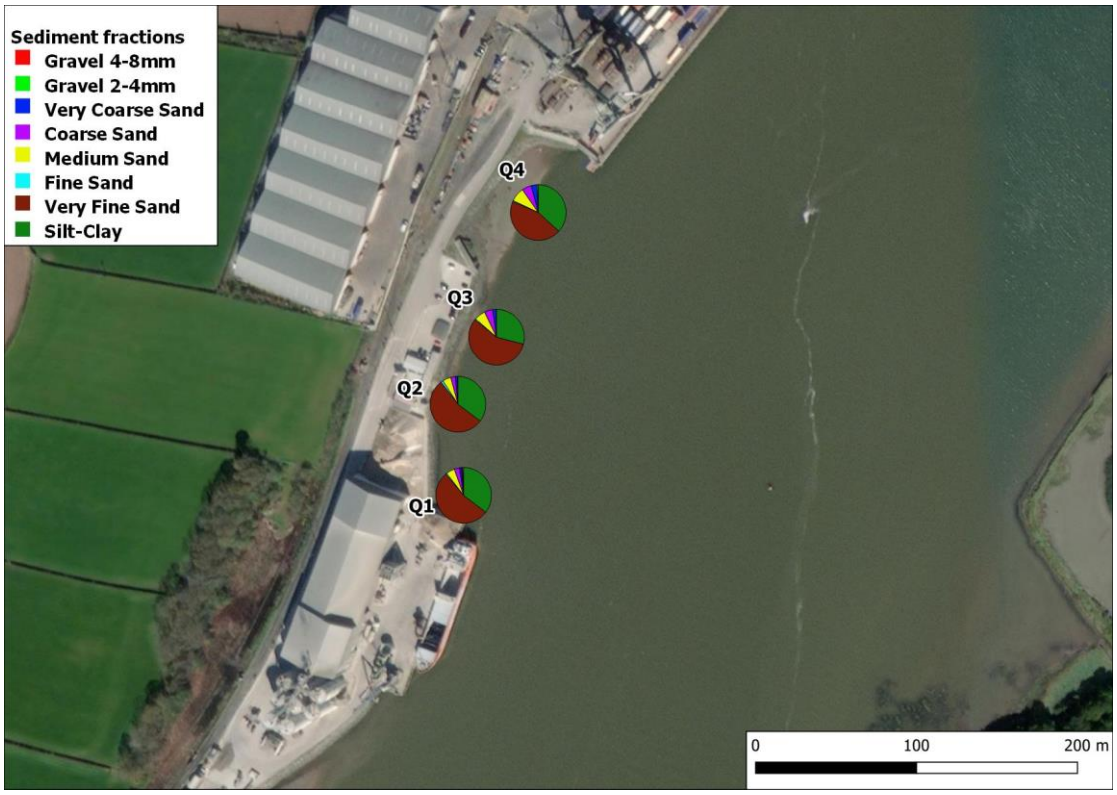


Figure 3.8: Sediment fractions of Q1-4.

Table 3.2: Sediment characteristics of the benthic faunal stations sampled. LOI refers to the % organic carbon loss on ignition.

Station	>8mm	Fine Gravel (4-8mm)	Very Fine Gravel (2-4mm)	Very Coarse Sand (1-2mm)	Coarse Sand (0.5-1mm)	Medium Sand (0.25-0.5mm)	Fine Sand (125-250mm)	Very Fine Sand (62.5-125mm)	Silt-Clay (<63mm)	Folk (1954)	LOI
W1	0	0	1	2.3	3	7	1.5	52.2	33	Slightly Gravelly Muddy Sand	6.18
W2	0	0	0.3	1.3	1.6	5.4	0.5	65.8	25.1	Muddy Sand	5.77
W3	0	0.4	0.2	0.7	1.2	3.7	0.4	75.2	18.2	Muddy Sand	6.62
W4	0	0.3	0.3	0.8	1.5	5.3	1.3	73.1	17.4	Muddy Sand	6.43
W5	0	0.1	0	0.8	1.6	4.5	0.3	64.2	28.4	Muddy Sand	5.77
B1	0	0.7	1.3	4.8	7.8	8.6	8.9	39.2	28.6	Slightly Gravelly Muddy Sand	8.04
B2	0	0	0.4	2.1	4.4	6.5	0.6	56.1	29.9	Muddy Sand	6.36
B3	0	0.5	0.2	1.3	2.4	4.2	0.3	66.8	24.4	Muddy Sand	4.93
B4	0	0.4	0.1	1	2.2	4.3	1	64.8	26.4	Muddy Sand	4.88
Q1	0	0.8	0.4	1.3	3	5	0.6	53.5	35.4	Slightly Gravelly Muddy Sand	5.62
Q2	0	0	0.3	1.3	2.6	4.9	1.3	54.2	35.2	Muddy Sand	5.47
Q3	0	0	0.3	2	4.8	6.5	0.6	56.7	29	Muddy Sand	7.32
Q4	0	0.1	0.7	3.3	5.6	8.3	0.6	44.7	36.7	Muddy Sand	7.22

4. Discussion

Estuarine communities in the Suir estuary were generally characterised by low numbers of species and individuals. Analysis of the benthic communities present at the 13 stations reveal that all stations can be classified as belonging to one of the four common benthic community habitat types occurring in the River Barrow and River Nore SAC namely the habitat 'Muddy estuarine community complex'. This community is present intertidally and subtidally from Cheek Point and Great Island northward to New Ross and extends up the Suir estuary. The substrate of this community complex is predominantly of fine material. The distinguishing species for this group are the bivalve *Scrobicularia plana* and *Macoma balthica,* the amphipod *Corophium volutator,* the polychaete *Streblospio shrubsolii* and the oligochaetes *Tubificoides pseudogaster* and *Tubificoides benedii.* These species are indicative of variable salinity community (NPWS, 2011).

The 13 stations can be classified as belonging to the JNCC biotope SS.SMu.SMuVS.PolCvol *Polydora ciliata* and *Corophium volutator* in variable salinity infralittoral firm mud or clay (EUNIS code A5.321). SS.SMu.SMuVS.PolCvol is a sublittoral biotope occurring in sheltered, very sheltered and extremely sheltered areas with weak tidal streams (Connor *et al.,* 2004). The biotope occurs in variable salinity and exclusively in clay, very firm mud and muddy sand and is characterized by a turf of the polychaete *Polydora* along with the amphipod *Corophium volutator.* The often-abundant *Corophium volutator* forms an important food source for several species of birds and mobile predators such as fish and crabs. Because of their high numbers, the tube contracted by *Corophium* and *Polydora* are thought to stabilize the intertidal sediments in which they reside. Removal of these characterising species would result in the biotope being lost or re-classified. However, both species are known to have long reproductive seasons and short life spans and where perturbation removes a portion if the populations or even causes local extinction resilience is likely to be high for as long as recruitment from neighbouring areas and/or adult migration is possible (De-Bastos & Hill, 2016). Within the Suir estuary and adjacent Barrow and Nore estuaries this biotope is extensive.

5. References

Anderson, M. J. (2008). PERMANOVA+ for PRIMER: guide to software and statistical methods. *PRIMER-E, Plymouth Marine Laboratory*, *214*.

Clarke, K. R., & Warwick, R. M. (1994). Similarity-based testing for community pattern: the two-way layout with no replication. *Marine biology*, *118*, 167-176.

Clarke, K.R. & R.M. Warwick. 2001. Changes in marine communities: An approach to statistical analysis and interpretation. 2nd Edition. *Primer-E Ltd.*

Clarke, K. R., & Gorley, R. N. (2006). Primer. *PRIMER-e, Plymouth, 866.*

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. ISBN 1 861 07561 8. In JNCC (2015), The Marine Habitat Classification for Britain and Ireland Version 15.03. [2019-07-24]. Joint Nature Conservation Committee, Peterborough. Available from https://mhc.jncc.gov.uk/

De-Bastos, E.S.R. & Hill, J., 2016. [Polydora ciliata] and [Corophium volutator] in variable salinity infralittoral firm mud or clay. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. DOI https://dx.doi.org/10.17031/marlinhab.193.1

Folk, R.L. 1954. The distinction between grain size and mineral composition in sedimentary rock nomenclature. *Journal of Geology* **62 (4):** 344-359.

Heip, C.H.R., Herman, P.M.J., Soetaert, K., 1998. Indices of diversity and evenness. *Océanis* 24, 61–87.

Hill, M. 1973. Diversity and evenness: a unifying notation and its consequences. *Ecology* 54: 427–432.

Jost, L. 2006. Entropy and diversity. *Oikos* 113: 363–375.

MacArthur, R.H. 1965. Patterns of species diversity. Biological Reviews 40: 510–533.

Kruskal, J.B. & M. Wish. 1978. Multidimensional scaling. *Sage Publications, Beverly Hills, California.*

Margalef, D.R. 1958. Information theory in ecology. *General Systems* **3:** 36-71.

NPWS. 2011. River Barrow and River Nore SAC (sire code: 2162). Conservation objectives supporting document – marine habitats.

https://www.npws.ie/sites/default/files/publications/pdf/002162_Barrow%20Nore%20SAC%20Marine%20Supporting%20Doc_V1.pdf

Pielou, E.C. 1977. Mathematical ecology. Wiley-Water science Publication, John Wiley and Sons. pp.385.

Shannon, C.E. & W. Weaver. 1949. The mathematical theory of communication. University of Illinois Press, Urbana.

Worsfold, T. M., Hall, D. J., & O'Reilly, M. (2010). Guidelines for processing marine macrobenthic invertebrate samples: a Processing Requirements Protocol: Version 1.0, June 2010. *Unicomarine Report NMBAQCMbPRP to the NMBAQC Committee*, *33*.

Appendix 1
Sediment Analysis Methodology

Sediment Analysis

AQUAFACT will carry out the granulometric analysis using the traditional granulometric technique. We have all of the necessary equipment required *e.g.* Wentworth graded sieves, Easysize and GRADISTAT computer software, hydrogen peroxide, sodium hexametaphosphate, drying oven, beakers, mixers, electronic scales. We have carried out sediment analysis for all subtidal sampling programmes that we have been involved in.

AQUAFACT will employ the following methodology for the granulometric analysis:

1. Approximately 100g of dried sediment (previously washed in distilled water and dried) is weighed out and placed in a labelled 1L glass beaker to which 100ml of a 6 percent hydrogen peroxide solution is then added. This is allowed to stand overnight in a fume hood.
2. The beaker is placed on a hot plate and heated gently. Small quantities of hydrogen peroxide are added to the beaker until there is no further reaction. This peroxide treatment removes any organic material from the sediment which can interfere with grain size determination.
3. The beaker is then emptied of sediment and rinsed into a 63µm sieve. This is then washed with distilled water to remove any residual hydrogen peroxide. The sample retained on the sieve is then carefully washed back into the glass beaker up to a volume of approximately 250ml of distilled water.
4. 10ml of sodium hexametaphosphate solution is added to the beaker and this solution is stirred for ten minutes and then allowed to stand overnight. This treatment helps to dissociate the clay particles from one another.
5. The beaker with the sediment and sodium hexametaphosphate solution is washed and rinsed into a 63µm sieve. The retained sampled is carefully washed from the sieve into a labelled aluminium tray and placed in an oven for drying at 100ºC for 24 hours.
6. The dried sediment should then be passed through a Wentworth series of analytical sieves (>8,000 to 63µm; single phi units). The weight of material retained in each sieve is weighed and recorded. The material passing through the 63µm sieve is also weighed and the value added to the value measured in Point 5 above.
7. The total silt/clay fraction is determined by subtracting all weighed fractions from the initial starting weight of sediment as the less than 63µm fraction was lost during the various washing stages.

8. The reporting of sediment samples will be as percentages within the following range of particle sizes:
    - PSA % <63
    - PSA % 63<125
    - PSA % 125<250
    - PSA % 250<500
    - PSA % 500<1000
    - PSA % 1000<2000
    - PSA % 2000<4000
    - PSA % 4000<8000
    - PSA % ≥8000

The grain size data will be used to determine Folk (1954) classification, which is standard in all AQUAFACT's reports.

The organic matter (Loss on Ignition) will be carried out by ALS Labs in Loughrea using the following methodology:

1. The collected sediments are transferred to aluminium trays, homogenised by hand and dried in an oven at 100º C for 24 hours.
2. A sample of dried sediment is placed in a mortar and pestle and ground down to a fine powder.
3. 1g of this ground sediment is weighed into a pre-weighed crucible and placed in a muffle furnace at 450ºC for a period of 6 hours.
4. The sediment samples are then allowed to cool in a dessicator for 1 hour before being weighed again.
5. The organic content of the sample is determined by expressing as a percentage the weight of the sediment after ignition over the initial weight of the sediment.

Appendix 2
Species List

JN1655 Port of Waterford Benthic Survey														
Station	**AphiaID**	**W1**	**W2**	**W3**	**W4**	**W5**	**B1**	**B2**	**B3**	**B4**	**Q1**	**Q2**	**Q3**	**Q4**
NEMATODA	799	0	0	0	0	0	0	0	0	0	0	0	0	0
Nematoda	799	4	4	0	1	0	2	5	55	0	1	25	0	118
NEMERTEA	152391	0	0	0	0	0	0	0	0	0	0	0	0	0
Nemertea (indet)	152391	0	1	0	0	0	0	0	0	0	1	0	0	0
ANNELIDA	882	0	0	0	0	0	0	0	0	0	0	0	0	0
POLYCHAETA	883	0	0	0	0	0	0	0	0	0	0	0	0	0
PHYLLODOCIDA	892	0	0	0	0	0	0	0	0	0	0	0	0	0
Polynoidae	939	0	0	0	0	0	0	0	0	0	0	0	0	0
Pholoidae	941	0	0	0	0	0	0	0	0	0	0	0	0	0
Pholoe inornata	130601	0	1	0	0	0	0	0	0	0	0	0	0	0
Pholoe baltica (sensu Petersen)	130599	0	0	0	0	0	0	0	0	0	0	0	0	1
Nephtyidae	956	0	0	0	0	0	0	0	0	0	0	0	0	0
Nephtys sp. (juv)	129370	0	0	0	0	1	0	0	0	1	0	0	0	0
Nephtys hombergii	130359	0	2	4	4	10	7	2	0	2	1	0	0	0
ORBINIIDA	884	0	0	0	0	0	0	0	0	0	0	0	0	0
Orbiniidae	902	0	0	0	0	0	0	0	0	0	0	0	0	0
Scoloplos armiger	130537	0	0	0	0	0	0	0	0	0	0	0	0	1
SPIONIDA	889	0	0	0	0	0	0	0	0	0	0	0	0	0
Spionidae	913	0	0	0	0	0	0	0	0	0	0	0	0	0
Spionidae (damaged)	913	0	0	0	0	0	0	1	0	0	0	0	0	0
Polydora sp. (damaged)	129619	3	1	0	0	0	0	0	0	0	0	0	0	0
Polydora cornuta	131143	0	2	0	0	0	0	0	0	0	0	0	0	0
Pygospio elegans	131170	9	29	2	0	13	0	5	14	0	11	0	0	1
Streblospio shrubsolii	131193	0	1	0	2	0	2	10	25	6	5	4	0	0

JN1655 Port of Waterford Benthic Survey														
Station	**AphiaID**	**W1**	**W2**	**W3**	**W4**	**W5**	**B1**	**B2**	**B3**	**B4**	**Q1**	**Q2**	**Q3**	**Q4**
CAPITELLIDA	890	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitellidae	921	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitella sp. complex	129211	0	0	0	1	0	0	3	0	0	7	0	1	0
Arenicolidae	922	0	0	0	0	0	0	0	0	0	0	0	0	0
Arenicola marina	129868	0	0	0	0	0	0	0	0	1	1	1	0	0
Maldanidae	923	0	0	0	0	0	0	0	0	0	0	0	0	0
Euclymene oerstedii	157376	0	0	0	0	0	0	0	1	0	0	0	0	0
OPHELIIDA	891	0	0	0	0	0	0	0	0	0	0	0	0	0
Opheliidae	924	0	0	0	0	0	0	0	0	0	0	0	0	0
Polyophthalmus pictus	130510	0	0	0	0	0	0	0	1	0	0	0	0	0
TEREBELLIDA	900	0	0	0	0	0	0	0	0	0	0	0	0	0
Cirratulidae	919	0	0	0	0	0	0	0	0	0	0	0	0	0
Cirratulidae (partial/damaged)	919	10	0	0	1	0	0	0	4	0	1	0	0	0
Tharyx killariensis	152269	38	32	2	10	7	0	57	74	0	22	3	1	0
SABELLIDA	901	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabellidae	985	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabricia stellaris	130913	0	0	0	0	0	0	0	0	0	1	0	0	0
OLIGOCHAETA	2036	0	0	0	0	0	0	0	0	0	0	0	0	0
HAPLOTAXIDA	2118	0	0	0	0	0	0	0	0	0	0	0	0	0
Naididae	2039	0	0	0	0	0	0	0	0	0	0	0	0	0
Baltidrilus costatus	743898	0	0	0	0	0	0	0	0	0	0	0	1	1
Tubificoides sp. (damaged)	137393	2	3	0	26	1	1	1	1	0	1	1	0	0
Tubificoides diazi	137574	0	0	0	0	5	0	0	0	0	0	0	0	0
Tubificoides pseudogaster aggregate	137582	2	0	2	13	0	0	0	0	0	1	1	0	0

JN1655 Port of Waterford Benthic Survey														
Station	**AphiaID**	**W1**	**W2**	**W3**	**W4**	**W5**	**B1**	**B2**	**B3**	**B4**	**Q1**	**Q2**	**Q3**	**Q4**
Tubificoides benedii	137571	19	6	1	12	6	12	11	16	6	24	5	0	34
ARTHROPODA	1065	0	0	0	0	0	0	0	0	0	0	0	0	0
CRUSTACEA	1066	0	0	0	0	0	0	0	0	0	0	0	0	0
AMPHIPODA	1135	0	0	0	0	0	0	0	0	0	0	0	0	0
Phoxocephalidae	101403	0	0	0	0	0	0	0	0	0	0	0	0	0
Metaphoxus simplex	102983	0	0	0	0	0	0	0	2	0	0	0	0	0
Gammaridae	101383	0	0	0	0	0	0	0	0	0	0	0	0	0
Gammarus sp. (damaged)	101537	0	0	0	0	0	0	0	0	0	0	0	0	1
Gammarus locusta	102281	0	0	0	0	0	0	0	5	0	0	0	0	1
Melitidae	101397	0	0	0	0	0	0	0	0	0	0	0	0	0
Melitidae (damaged)	101397	0	0	0	0	0	0	0	0	1	0	0	0	0
Isaeidae	101388	0	0	0	0	0	0	0	0	0	0	0	0	0
Microprotopus maculatus	102380	0	0	0	0	0	0	0	0	0	0	1	0	1
Aoridae	101368	0	0	0	0	0	0	0	0	0	0	0	0	0
Microdeutopus sp. (damaged)	101471	0	0	0	0	0	0	0	0	0	0	0	0	4
Microdeutopus gryllotalpa	102048	0	0	0	0	0	0	0	0	0	0	0	0	1
Corophiidae	101376	0	0	0	0	0	0	0	0	0	0	0	0	0
Monocorophium insidiosum	148592	0	0	0	0	0	0	0	1	0	0	0	0	0
Corophium volutator	102101	145	235	3	10	0	0	2	2	34	4	5	19	11
Caprellidae	101361	0	0	0	0	0	0	0	0	0	0	0	0	0
Caprella acanthifera	101822	0	0	0	0	0	0	0	0	0	0	0	0	1
ISOPODA	1131	0	0	0	0	0	0	0	0	0	0	0	0	0
Anthuridae	118244	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyathura carinata	118474	0	0	0	0	0	0	0	0	0	1	0	0	0

JN1655 Port of Waterford Benthic Survey														
Station	**AphiaID**	**W1**	**W2**	**W3**	**W4**	**W5**	**B1**	**B2**	**B3**	**B4**	**Q1**	**Q2**	**Q3**	**Q4**
Janiridae	118258	0	0	0	0	0	0	0	0	0	0	0	0	0
*Jaer*a sp. (damaged)	118364	0	0	0	0	0	0	0	0	0	1	0	0	0
Idoteidae	118283	0	0	0	0	0	0	0	0	0	0	0	0	0
Idotea chelipes	119042	0	0	0	0	0	0	0	1	0	0	0	0	0
DECAPODA	1130	0	0	0	0	0	0	0	0	0	0	0	0	0
Caridea	106674	0	0	0	0	0	0	0	0	0	0	0	0	0
Crangonidae	106782	0	0	0	0	0	0	0	0	0	0	0	0	0
Crangon crangon	107552	0	1	0	0	1	0	0	1	0	0	0	0	0
INSECTA	1307	0	0	0	0	0	0	0	0	0	0	0	0	0
Elmidae larvae	?	0	0	0	0	1	0	0	0	0	0	0	0	0
MOLLUSCA	51	0	0	0	0	0	0	0	0	0	0	0	0	0
GASTROPODA	101	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerithiidae	128	0	0	0	0	0	0	0	0	0	0	0	0	0
Bittium reticulatum	139054	0	0	0	0	0	0	0	0	0	0	0	0	1
Rissoidae	123	0	0	0	0	0	0	0	0	0	0	0	0	0
Rissoa parva	141365	0	0	1	0	0	0	0	0	0	0	0	0	1
Hydrobiidae	120	0	0	0	0	0	0	0	0	0	0	0	0	0
Peringia ulvae	151628	7	11	22	1	2	0	0	3	1	1	2	1	13
Iravadiidae	122	0	0	0	0	0	0	0	0	0	0	0	0	0
Pyramidellidae	162	0	0	0	0	0	0	0	0	0	0	0	0	0
Turbonilla lactea	141072	0	0	0	0	0	0	0	0	0	0	0	0	2
BIVALVIA	105	0	0	0	0	0	0	0	0	0	0	0	0	0
MYTILIDA	210	0	0	0	0	0	0	0	0	0	0	0	0	0
Mytilidae	211	0	0	0	0	0	0	0	0	0	0	0	0	0

JN1655 Port of Waterford Benthic Survey														
Station	**AphiaID**	**W1**	**W2**	**W3**	**W4**	**W5**	**B1**	**B2**	**B3**	**B4**	**Q1**	**Q2**	**Q3**	**Q4**
Mytilidae (juv)	211	0	1	1	2	1	0	0	3	1	1	0	0	1
CARDIIDA	869602	0	0	0	0	0	0	0	0	0	0	0	0	0
Cardiidae	229	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerastoderma edule	138998	2	2	2	0	0	0	0	0	0	0	0	0	0
Tellinidae	235	0	0	0	0	0	0	0	0	0	0	0	0	0
Macomangulus tenuis	878470	0	0	0	0	0	0	0	0	0	0	0	0	1
Macoma balthica	141579	1	3	3	5	7	2	2	2	1	2	2	0	0
Semelidae	1781	0	0	0	0	0	0	0	0	0	0	0	0	0
Semelidae (juv)	1781	2	1	0	0	1	0	1	2	0	0	2	0	1
Scrobicularia plana	141424	0	0	0	0	0	0	3	0	1	2	2	0	0
MYIDA	245	0	0	0	0	0	0	0	0	0	0	0	0	0
Corbulidae	248	0	0	0	0	0	0	0	0	0	0	0	0	0
Varicorbula gibba	378492	0	0	0	0	0	0	0	0	0	0	0	0	1
ECHINODERMATA	1806	0	0	0	0	0	0	0	0	0	0	0	0	0
OPHIUROIDEA	123084	0	0	0	0	0	0	0	0	0	0	0	0	0
OPHIURIDA	123117	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphiuridae	123206	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphiuridae (juv)	123206	0	0	0	0	0	0	0	0	0	0	0	0	1

APPENDIX C

SOCOTEC

Environmental Chemistry

Certificate of Analysis

Client: Port of Waterford Company

Project: 23051381

Quote: BEC230128507 V1.2

Project Ref: Port of Watford

Site: Soil Analysis

Contact: Ian Moriarty

Address: Third Floor
Marine Point, Belview Port
Waterford
Eire
X91 W0XW

E-Mail: im@portofwaterford.com

Phone: 1

No. Samples Received: 7

Date Received: 15/05/2023

Analysis Date: 26/05/2023

Date Issued: 26/05/2023

Report Type: Final Version 01

This report supersedes any versions previously issued by the laboratory

Reported by Customer Service Specialist
Aniko Gondolne-Mantler
01283 554434

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Samples Analysed

Text ID	Sample Reference	Sampling Date	Sample Type	Sample Description
23051381-001	MPSS1	21/04/2023 00:00:00	SOLID	Soil Sample
23051381-002	MPSS2	21/04/2023 00:00:00	SOLID	Soil Sample
23051381-003	MPSS3	21/04/2023 00:00:00	SOLID	Soil Sample
23051381-004	MPSS4	20/04/2023 00:00:00	SOLID	Soil Sample
23051381-005	MPSS5	20/04/2023 00:00:00	SOLID	Soil Sample
23051381-006	MPSS6	20/04/2023 00:00:00	SOLID	Soil Sample
23051381-007	MPSS7	20/04/2023 00:00:00	SOLID	Soil Sample

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

1252

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	MPSS1		MPSS2		MPSS3		MPSS4
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	20/04/2023
Antimony as Sb	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Arsenic as As	ICPMSW (Dissolved)	0.01	mg/kg^	N		0.04		0.03		0.02		0.03
Barium as Ba	ICPWATVAR (Dissolved)	0.1	mg/kg^	N		<1.0 D		<0.1		<0.1		<0.1
Cadmium as Cd	ICPMSW (Dissolved)	0.0002	mg/kg^	N		<0.0002		<0.0002		0.0003		<0.0002
Chloride as Cl	KONENS	10	mg/kg^	N		7780		5810		5360		4300
Total Chromium as Cr	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Copper as Cu	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Lead as Pb	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Mercury as Hg	ICPMSW (Dissolved)	0.0003	mg/kg^	N		<0.0003		<0.0003		<0.0003		<0.0003
Molybdenum as Mo	ICPMSW (Dissolved)	0.01	mg/kg^	N		0.06		0.05		0.05		0.03
Nickel as Ni	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Phenol Index	SFAPI	0.5	mg/kg^	N		<0.5		<0.5		<0.5		<0.5
Selenium as Se	ICPMSW (Dissolved)	0.01	mg/kg^	N		<0.01		<0.01		<0.01		<0.01
Total Sulphur as SO4	ICPWATVAR (Dissolved)	30	mg/kg^	N		975		1140		1260		1080
TDS as mg/kg	PHCONDW	700	mg/kg^	N		20100		15200		14500		11900
Leached Organic Carbon	WSLM13	2	mg/kg^	N		75.0		62.1		48.8		51.5
Fluoride as F	ISEF	1	mg/kg^	N		4		4		4		3
Zinc as Zn	ICPMSW (Dissolved)	0.02	mg/kg^	N		<0.02		<0.02		<0.02		<0.02
Conductivity at 25°C	PHCONDW	100	µS/cm	N		3060		2290		2190		1780

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

1252

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005		006		007	
					Customer ID	MPSS4	MPSS5		MPSS6		MPSS7	
					Sample Type	SOLID	LPL	SOLID	LPL	SOLID	LPL	SOLID
					Sampling Date	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
Antimony as Sb	ICPMSW (Dissolved)	0.01	mg/kg^	N			<0.01		<0.01		<0.01	
Arsenic as As	ICPMSW (Dissolved)	0.01	mg/kg^	N			0.03		0.04		0.03	
Barium as Ba	ICPWATVAR (Dissolved)	0.1	mg/kg^	N			<0.1		<0.1		<0.1	
Cadmium as Cd	ICPMSW (Dissolved)	0.0002	mg/kg^	N			0.0003		<0.0002		<0.0002	
Chloride as Cl	KONENS	10	mg/kg^	N			4530		5680		4330	
Total Chromium as Cr	ICPMSW (Dissolved)	0.01	mg/kg^	N			<0.01		<0.01		<0.01	
Copper as Cu	ICPMSW (Dissolved)	0.01	mg/kg^	N			0.02		<0.01		<0.01	
Lead as Pb	ICPMSW (Dissolved)	0.01	mg/kg^	N			<0.01		<0.01		<0.01	
Mercury as Hg	ICPMSW (Dissolved)	0.0003	mg/kg^	N			<0.0003		<0.0003		<0.0003	
Molybdenum as Mo	ICPMSW (Dissolved)	0.01	mg/kg^	N			0.02		0.06		0.05	
Nickel as Ni	ICPMSW (Dissolved)	0.01	mg/kg^	N			<0.01		<0.01		<0.01	
Phenol Index	SFAPI	0.5	mg/kg^	N			<0.5		<0.5		<0.5	
Selenium as Se	ICPMSW (Dissolved)	0.01	mg/kg^	N			<0.01		<0.01		<0.01	
Total Sulphur as SO4	ICPWATVAR (Dissolved)	30	mg/kg^	N			816		954		802	
TDS as mg/kg	PHCONDW	700	mg/kg^	N			12500		15000		11800	
Leached Organic Carbon	WSLM13	2	mg/kg^	N			64.7		66.1		61.1	
Fluoride as F	ISEF	1	mg/kg^	N			3		3		3	
Zinc as Zn	ICPMSW (Dissolved)	0.02	mg/kg^	N			0.04		0.03		<0.02	
Conductivity at 25°C	PHCONDW	100	µS/cm	N			1870		2300		1780	

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

UKAS TESTING 1252

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	MPSS1		MPSS2		MPSS3		MPSS4
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	20/04/2023
pH	PHCONDW	1	pH units	N		8.1		8.0		7.9		8.0
TDS as mg/l	PHCONDW	70	mg/l	N		2080		1560		1490		1210
ANC	ANC	0.04	mol/kg^	N			3.04		3.12		2.72	
pH (2.5:1 extraction)	PHSOIL	1	pH units	UM			7.8		7.7		7.7	
Chloride as Cl	KONENS	1	mg/l	U		806		595		549		437
Phenol Index	SFAPI	0.05	mg/l	U		<0.05		<0.05		<0.05		<0.05
Fluoride as F	ISEF	0.1	mg/l	U		0.4		0.4		0.4		0.3
Total Organic Carbon	WSLM59	0.02	% m/m^	U			1.00		0.83		0.60	
LOI @ 450°C	LOI(%MM)	0.2	% m/m^	N			5.5		4.6		4.1	
Leached Organic Carbon	TOCW	0.4	mg/l	U		7.77		6.36		5.00		5.23
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U		0.001		<0.001		<0.001		<0.001
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U		0.004		0.003		0.002		0.003
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U		0.00002		0.00002		0.00003		<0.00002
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U		<0.00003		<0.00003		<0.00003		<0.00003
Molybdenum as Mo	ICPMSW (Dissolved)	0.001	mg/l	U		0.006		0.005		0.005		0.003
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

1252

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005		006		007	
					Customer ID	MPSS4	MPSS5		MPSS6		MPSS7	
					Sample Type	SOLID	LPL	SOLID	LPL	SOLID	LPL	SOLID
					Sampling Date	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
pH	PHCONDW	1	pH units	N			8.1		8.0		7.8	
TDS as mg/l	PHCONDW	70	mg/l	N			1270		1560		1210	
ANC	ANC	0.04	mol/kg^	N		4.80		5.84		2.56		2.64
pH (2.5:1 extraction)	PHSOIL	1	pH units	UM		7.7		7.7		7.4		7.5
Chloride as Cl	KONENS	1	mg/l	U			461		589		443	
Phenol Index	SFAPI	0.05	mg/l	U			<0.05		<0.05		<0.05	
Fluoride as F	ISEF	0.1	mg/l	U			0.3		0.3		0.3	
Total Organic Carbon	WSLM59	0.02	% m/m^	U		1.16		1.17		1.21		0.98
LOI @ 450°C	LOI(%MM)	0.2	% m/m^	N		3.3		3.1		5.7		5.1
Leached Organic Carbon	TOCW	0.4	mg/l	U			6.58		6.86		6.25	
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U			<0.001		<0.001		<0.001	
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U			0.003		0.004		0.003	
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U			0.00003		<0.00002		0.00002	
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U			<0.001		<0.001		<0.001	
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U			0.002		<0.001		<0.001	
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U			<0.001		<0.001		<0.001	
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U			<0.00003		<0.00003		<0.00003	
Molybdenum as Mo	ICPMSW (Dissolved)	0.001	mg/l	U			0.002		0.006		0.005	
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U			0.001		<0.001		<0.001	

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

UKAS TESTING 1252

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	MPSS1		MPSS2		MPSS3		MPSS4
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	20/04/2023
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U		<0.002		<0.002		0.002		0.002
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U		<0.10 D		<0.01		<0.01		<0.01
Total Sulphur as SO4	ICPWATVAR (Dissolved)	3	mg/l	U		101		117		129		110
Benzene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM			<0.017		<0.016		<0.016	
Ethylbenzene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM			<0.017		<0.016		<0.016	
m/p-Xylene HS_1D_AR	BTEXHSA	0.02	mg/kg^	UM			<0.034		<0.032		<0.031	
o-Xylene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM			<0.017		<0.016		<0.016	
Toluene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM			<0.017		<0.016		<0.016	
Total BTEX HS_1D_AR	BTEXHSA	0.06	mg/kg^	UM			<0.102		<0.096		<0.094	
Acenaphthene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Acenaphthylene	PAHMSUS	0.08	mg/kg^	U			<0.14		<0.13		<0.13	
Anthracene	PAHMSUS	0.08	mg/kg^	U			<0.14		<0.13		<0.13	
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Benzo[a]pyrene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Benzo[b]fluoranthene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Benzo[g,h,i]perylene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Chrysene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005		006		007	
					Customer ID	MPSS4	MPSS5		MPSS6		MPSS7	
					Sample Type	SOLID	LPL	SOLID	LPL	SOLID	LPL	SOLID
					Sampling Date	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U			<0.001		<0.001		<0.001	
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U			0.004		0.003		0.002	
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U			<0.01		<0.01		<0.01	
Total Sulphur as SO4	ICPWATVAR (Dissolved)	3	mg/l	U			83		99		82	
Benzene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM		<0.014		<0.014		<0.018		<0.017
Ethylbenzene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM		<0.014		<0.014		<0.018		<0.017
m/p-Xylene HS_1D_AR	BTEXHSA	0.02	mg/kg^	UM		<0.029		<0.027		<0.036		<0.034
o-Xylene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM		<0.014		<0.014		<0.018		<0.017
Toluene HS_1D_AR	BTEXHSA	0.01	mg/kg^	UM		<0.014		<0.014		<0.018		<0.017
Total BTEX HS_1D_AR	BTEXHSA	0.06	mg/kg^	UM		<0.086		<0.082		<0.106		<0.101
Acenaphthene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Acenaphthylene	PAHMSUS	0.08	mg/kg^	U		<0.11		<0.11		<0.14		<0.14
Anthracene	PAHMSUS	0.08	mg/kg^	U		<0.11		<0.11		<0.14		<0.14
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Benzo[a]pyrene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Benzo[b]fluoranthene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Benzo[g,h,i]perylene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Chrysene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

UKAS TESTING 1252

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	MPSS1		MPSS2		MPSS3		MPSS4
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	20/04/2023
Coronene	PAHMSUS	0.08	mg/kg^	N			<0.14		<0.13		<0.13	
Dibenzo[a,h]anthracene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Fluoranthene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Fluorene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Naphthalene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Phenanthrene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Pyrene	PAHMSUS	0.08	mg/kg^	UM			<0.14		<0.13		<0.13	
Total PAH 16	PAHMSUS	1.28	mg/kg^	U			<2.17		<2.05		<2.00	
Total PAH 17	PAHMSUS	1.36	mg/kg^	N			<2.31		<2.18		<2.13	
PCB 101	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 118	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 138	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 153	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 180	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 28	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
PCB 52	PCBECD	0.005	mg/kg^	UM			<0.008		<0.008		<0.008	
Total PCB 7 Congeners	PCBECD	0.035	mg/kg^	UM			<0.059		<0.056		<0.055	
>C10-C40 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	20	mg/kg^	U			42.6		39.5		47.3	

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

UKAS TESTING 1252

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005		006		007	
					Customer ID	MPSS4	MPSS5		MPSS6		MPSS7	
					Sample Type	SOLID	LPL	SOLID	LPL	SOLID	LPL	SOLID
					Sampling Date	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
Coronene	PAHMSUS	0.08	mg/kg^	N		<0.11		<0.11		<0.14		<0.14
Dibenzo[a,h]anthracene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Fluoranthene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Fluorene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Naphthalene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Phenanthrene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Pyrene	PAHMSUS	0.08	mg/kg^	UM		<0.11		<0.11		<0.14		<0.14
Total PAH 16	PAHMSUS	1.28	mg/kg^	U		<1.83		<1.75		<2.27		<2.15
Total PAH 17	PAHMSUS	1.36	mg/kg^	N		<1.94		<1.86		<2.41		<2.29
PCB 101	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 118	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 138	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 153	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 180	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 28	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
PCB 52	PCBECD	0.005	mg/kg^	UM		<0.007		<0.007		<0.009		<0.008
Total PCB 7 Congeners	PCBECD	0.035	mg/kg^	UM		<0.050		<0.048		<0.062		<0.059
>C10-C40 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	20	mg/kg^	U		<28.6		32.4		<35.5		<33.7

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

1252

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	MPSS1		MPSS2		MPSS3		MPSS4
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	21/04/2023	20/04/2023
Total TPH >C8-C40 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	20	mg/kg^	U			43.6		40.3		48.4	
Total Moisture at 35°C	CLANDPREP	0.1	%	N			41.1		37.5		36.1	
Description of Solid Material	CLANDPREP		-	N			SILT		SILT		SILT	
Equivalent Weight of Dry Material (kg)	Leachate Prep CEN 10:1		kg	N			0.090		0.090		0.090	
Fraction above 4mm (%)	Leachate Prep CEN 10:1		%	N			0		0		0	
Fraction of non-crushable material (%)	Leachate Prep CEN 10:1		%	N			0		0		0	
Volume of Water for 10:1 Leach (ltr)	Leachate Prep CEN 10:1		l	N			0.829		0.844		0.843	
Weight of Sample Leached (kg)	Leachate Prep CEN 10:1		kg	N			0.161		0.146		0.147	
WAC Report	WAC		-	N			See Attached		See Attached		See Attached	

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005		006		007	
					Customer ID	MPSS4	MPSS5		MPSS6		MPSS7	
					Sample Type	SOLID	LPL	SOLID	LPL	SOLID	LPL	SOLID
					Sampling Date	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
Total TPH >C8-C40 (Aliphatic) EH_CU_1D_AL	TPHFIDUS (Aliphatic)	20	mg/kg^	U		<28.6		33.4		<35.5		<33.7
Total Moisture at 35°C	CLANDPREP	0.1	%	N		30.0		26.9		43.6		40.6
Description of Solid Material	CLANDPREP		-	N		SILT		SILT		SILT		SILT
Equivalent Weight of Dry Material (kg)	Leachate Prep CEN 10:1		kg	N		0.090		0.090		0.090		0.090
Fraction above 4mm (%)	Leachate Prep CEN 10:1		%	N		0		0		0		0
Fraction of non-crushable material (%)	Leachate Prep CEN 10:1		%	N		0		0		0		0
Volume of Water for 10:1 Leach (ltr)	Leachate Prep CEN 10:1		l	N		0.857		0.854		0.827		0.846
Weight of Sample Leached (kg)	Leachate Prep CEN 10:1		kg	N		0.133		0.136		0.163		0.144
WAC Report	WAC		-	N		See Attached		See Attached		See Attached		See Attached

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-001	MPSS1	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.161
Moisture content @ 105°C (% Wet Weight)	43.9
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.829
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.00	3	5	6
N	LOI450	Loss on Ignition (%)	5.5			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.102	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.059	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	42.6	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<2.31	100		
UM	PHSOIL	pH (pH Units)	7.8		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	3.04		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	8.1				
N	WSLM2**	Conductivity (µS/cm)	3060				
U	ICPMSW	Arsenic	0.004	0.04	0.5	2	25
U	ICPWATVAR	Barium	<0.10	<1.0	20	100	300
U	ICPMSW	Cadmium	0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.006	0.06	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.02	4	50	200
U	KONENS	Chloride	806	7780	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	101	975	1000	20000	50000
N	WSLM27	Total Dissolved Solids	2080	20100	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	7.77	75.0	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-002	MPSS2	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.146
Moisture content @ 105°C (% Wet Weight)	38.3
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.844
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.83	3	5	6
N	LOI450	Loss on Ignition (%)	4.6			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.096	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.056	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	39.5	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<2.18	100		
UM	PHSOIL	pH (pH Units)	7.7		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	3.12		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	8.0				
N	WSLM2**	Conductivity (µS/cm)	2290				
U	ICPMSW	Arsenic	0.003	0.03	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.02	4	50	200
U	KONENS	Chloride	595	5810	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	117	1140	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1560	15200	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	6.36	62.1	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-003	MPSS3	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.147
Moisture content @ 105°C (% Wet Weight)	38.8
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.843
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.60	3	5	6
N	LOI450	Loss on Ignition (%)	4.1			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.094	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.055	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	47.3	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<2.13	100		
UM	PHSOIL	pH (pH Units)	7.7		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	2.72		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	7.9				
N	WSLM2**	Conductivity (µS/cm)	2190				
U	ICPMSW	Arsenic	0.002	0.02	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.00003	0.0003	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	<0.02	4	50	200
U	KONENS	Chloride	549	5360	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	129	1260	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1490	14500	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	5.00	48.8	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-004	MPSS4	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.133
Moisture content @ 105°C (% Wet Weight)	32.3
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.857
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.16	3	5	6
N	LOI450	Loss on Ignition (%)	3.3			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.086	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.050	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	<28.6	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<1.94	100		
UM	PHSOIL	pH (pH Units)	7.7		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	4.80		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	8.0				
N	WSLM2**	Conductivity (µS/cm)	1780				
U	ICPMSW	Arsenic	0.003	0.03	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.003	0.03	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	<0.02	4	50	200
U	KONENS	Chloride	437	4300	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	110	1080	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1210	11900	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	5.23	51.5	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-005	MPSS5	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.136
Moisture content @ 105°C (% Wet Weight)	33.8
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.854
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.17	3	5	6
N	LOI450	Loss on Ignition (%)	3.1			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.082	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.048	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	32.4	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<1.86	100		
UM	PHSOIL	pH (pH Units)	7.7		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	5.84		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	8.1				
N	WSLM2**	Conductivity (µS/cm)	1870				
U	ICPMSW	Arsenic	0.003	0.03	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.00003	0.0003	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	0.002	0.02	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.002	0.02	0.5	10	30
U	ICPMSW	Nickel	0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.004	0.04	4	50	200
U	KONENS	Chloride	461	4530	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	83	816	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1270	12500	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	6.58	64.7	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-006	MPSS6	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.163
Moisture content @ 105°C (% Wet Weight)	44.8
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.827
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.21	3	5	6
N	LOI450	Loss on Ignition (%)	5.7			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.106	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.062	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	<35.5	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<2.41	100		
UM	PHSOIL	pH (pH Units)	7.4		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	2.56		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	8.0				
N	WSLM2**	Conductivity (µS/cm)	2300				
U	ICPMSW	Arsenic	0.004	0.04	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.006	0.06	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.003	0.03	4	50	200
U	KONENS	Chloride	589	5680	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	99	954	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1560	15000	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	6.86	66.1	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Port of Waterford Company	
Site	Soil Analysis	
Project	23051381	
Sample No	Sample Description	Issue Date
23051381-007	MPSS7	26/05/2023

Leaching Data	
Weight of Sample (kg)	0.144
Moisture content @ 105°C (% Wet Weight)	37.5
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (ltres)	0.846
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.98	3	5	6
N	LOI450	Loss on Ignition (%)	5.1			10
UM	BTEXHSA	Sum of BTEX (mg/kg)	<0.101	6		
UM	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)	<0.059	1		
U	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL	<33.7	500		
N	PAHMSUS	Sum of 17 PAHs (mg/kg)	<2.29	100		
UM	PHSOIL	pH (pH Units)	7.5		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg)	2.64		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
					Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
			mg/l except **	mg/kg (dry wt)			
N	WSLM3**	pH (pH Units)	7.8				
N	WSLM2**	Conductivity (µS/cm)	1780				
U	ICPMSW	Arsenic	0.003	0.03	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	<0.02	4	50	200
U	KONENS	Chloride	443	4330	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	82	802	1000	20000	50000
N	WSLM27	Total Dissolved Solids	1210	11800	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	6.25	61.1	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.
Calculated data is not UKAS accredited
Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

SOCOTEC

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Deviating Sample Report

Sample Reference	Text ID	Method Code	Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
MPSS1	23051381-001	**BTEXHSA**						✓
MPSS1	23051381-001	**PAHMSUS**						✓
MPSS1	23051381-001	**PHSOIL**						✓
MPSS1	23051381-001	**TPHFIDUS (Aliphatic)**						✓
MPSS1	23051381-001	**WSLM59**						✓
MPSS2	23051381-002	**BTEXHSA**						✓
MPSS2	23051381-002	**PAHMSUS**						✓
MPSS2	23051381-002	**PHSOIL**						✓
MPSS2	23051381-002	**TPHFIDUS (Aliphatic)**						✓
MPSS2	23051381-002	**WSLM59**						✓
MPSS3	23051381-003	**BTEXHSA**						✓
MPSS3	23051381-003	**PAHMSUS**						✓
MPSS3	23051381-003	**PHSOIL**						✓
MPSS3	23051381-003	**TPHFIDUS (Aliphatic)**						✓
MPSS3	23051381-003	**WSLM59**						✓
MPSS4	23051381-004	**BTEXHSA**						✓
MPSS4	23051381-004	**PAHMSUS**						✓
MPSS4	23051381-004	**PHSOIL**						✓
MPSS4	23051381-004	**TPHFIDUS (Aliphatic)**						✓
MPSS4	23051381-004	**WSLM59**						✓
MPSS5	23051381-005	**BTEXHSA**						✓
MPSS5	23051381-005	**PAHMSUS**						✓
MPSS5	23051381-005	**PHSOIL**						✓
MPSS5	23051381-005	**TPHFIDUS (Aliphatic)**						✓
MPSS5	23051381-005	**WSLM59**						✓
MPSS6	23051381-006	**BTEXHSA**						✓
MPSS6	23051381-006	**PAHMSUS**						✓
MPSS6	23051381-006	**PCBECD**						✓
MPSS6	23051381-006	**PHSOIL**						✓
MPSS6	23051381-006	**TPHFIDUS (Aliphatic)**						✓
MPSS6	23051381-006	**WSLM59**						✓
MPSS7	23051381-007	**BTEXHSA**						✓
MPSS7	23051381-007	**PAHMSUS**						✓

MPSS7	23051381-007	**PCBECD**						✓
MPSS7	23051381-007	**PHSOIL**						✓
MPSS7	23051381-007	**TPHFIDUS (Aliphatic)**						✓
MPSS7	23051381-007	**WSLM59**						✓

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Analysis Method

Method Code	Method Description	Analysis Method
ANC	ANC: Acid Neutralisation Capacity (mol/kg)	Air Dried & Ground
BTEXHSA	BTEX for WAC by GCFID	As Received
CLANDPREP	Basic Solid Description	As Received
CLANDPREP	DW35 - CLand Prep and Dry Weight Correction to 35°C	As Received
ICPMSW (Dissolved)	Antimony (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Antimony in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Arsenic (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Arsenic in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Cadmium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Cadmium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Chromium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Chromium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Copper (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Copper in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Lead (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Lead in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Mercury (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Mercury in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Molybdenum (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Molybdenum in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Nickel (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Nickel in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Selenium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Selenium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Zinc (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Zinc in Solids (BSEN 12457-2)	Filtered
ICPWATVAR (Dissolved)	Barium (Diss.) in Lab Leachate by ICPOES	Filtered
ICPWATVAR (Dissolved)	Barium in Solids (BSEN 12457-2)	Filtered
ICPWATVAR (Dissolved)	Total Sulphur as SO4 (Diss.) in Lab Leachate	Filtered
ICPWATVAR (Dissolved)	Total Sulphur as SO4 in Solids (BSEN 12457-2)	Filtered
ISEF	Fluoride by ISE	Filtered
ISEF	Fluoride in Solids (BSEN 12457-2)	Filtered
KONENS	Chloride by Colorimetry	Filtered
KONENS	Chloride in Solids (BSEN 12457-2)	Filtered
Leachate Prep CEN 10:1	WAC Leachate Prep, 1-Stage 10:1 (BSEN 12457-2)	As Received
LOI(%MM)	LOI: Loss on Ignition @ 450°C	Air Dried & Ground
PAHMSUS	17 PAHs (inc. Coronene) for WAC by GCMS	As Received
PCBECD	PCBs, ICES 7 Congeners inc. Total Calculation	As Received
PHCONDW	Electrical Conductivity @ 25°C	Filtered
PHCONDW	pH	Filtered
PHCONDW	TDS: Total Dissolved Solids (Calc)	Filtered
PHCONDW	Total Dissolved Solids in Solids (BSEN 12457-2)	Filtered
PHSOIL	pH (2.5:1)	As Received
SFAPI	Phenol Index (Total) by SFA	Filtered
SFAPI	Phenol Index in Solids (BSEN 12457-2)	Filtered
TOCW	LOC: Leached Organic Carbon	Filtered
TPHFIDUS (Aliphatic)	TPH (>C8-C40) Aliphatic and Carbon Band (>C10-C40)	As Received
WAC	WAC Report	
WSLM13	Leached Organic Carbon in Solids (BSEN 12457-2)	Filtered
WSLM59	TOC: Total Organic Carbon	Air Dried & Ground

Client:	Port of Waterford Company
Project Name:	Port of Watford-Soil Analysis
Project No:	23051381
Date Issued:	26/05/2023

Result Report Notes

Letters alongside results signify that the result has associated report notes.
The report notes are as follows:

Letter	Note
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing . Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total

Client: Port of Waterford Company
Project Name: Port of Watford-Soil Analysis
Project No: 23051381
Date Issued: 26/05/2023

Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

U = UKAS accredited analysis
M = MCERT accredited analysis
N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 35°C.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35°C.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis
NA = Sample is not amenable for the required analysis
ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by an external subcontracted laboratory.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID MAR01869

Issue Version: 1

Customer: Port of Waterford, Gorteens, Waterford, Ireland, X91 W0XW

Customer Reference: Port of Waterford - MPSS PSA

Date Sampled: 20-Apr-23

Date Samples Received: 04-May-23

Test Report Date: 26-May-23

Condition of samples: Ambient Satisfactory

Opinions and Interpretations expressed herein are outside the scope of our UKAS accreditaion
The results reported relate only to the sample tested
The results apply to the sample as received

JMColbourne

Authorised by: Jane Colbourne

Position: Customer Service Specialist

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID MAR01869
Issue Version 1
Customer Reference Port of Waterford - MPSS PSA

		Units	%	%	%
		Method No	SUB_01*	SUB_01*	SUB_01*
		Limit of Detection	N/A	N/A	N/A
		Accreditation	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**
MPSS1	MAR01869.001	Sediment	0.00	38.53	61.47
MPSS2	MAR01869.002	Sediment	0.00	49.79	50.21
MPSS3	MAR01869.003	Sediment	0.00	55.07	44.93
MPSS4	MAR01869.004	Sediment	13.63	45.35	41.02
MPSS5	MAR01869.005	Sediment	59.88	19.95	20.17
MPSS6	MAR01869.006	Sediment	0.00	40.85	59.15
MPSS7	MAR01869.007	Sediment	0.00	39.58	60.42

* See Report Notes

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID MAR01869
Issue Version 1
Customer Reference Port of Waterford - MPSS PSA

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SUB_01*	MAR01869.001-007	Analysis was conducted by an approved subcontract laboratory.

DEVIATING SAMPLE STATEMENT

Deviation Code	Devation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Sample Contaminated through Damaged Packaging	N/A	N/A
D3	Sample Contaminated through Sampling	N/A	N/A
D4	Inappropriate Container/Packaging	N/A	N/A
D5	Damaged in Transit	N/A	N/A
D6	Insufficient Quantity of Sample	N/A	N/A
D7	Inappropriate Headspace	N/A	N/A
D8	Retained at Incorrect Temperature	N/A	N/A
D9	Lack of Date & Time of Sampling	N/A	N/A
D10	Insufficient Sample Details	N/A	N/A
D11	Sample integrity compromised or not suitable for analysis	N/A	N/A

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Advanced Chemistry and Research, Etwall House, Bretby Business Park, Ashby Road, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR01869
Issue Version	1
Customer Reference	Port of Waterford - MPSS PSA

Method	Sample and Fraction Size	Method Summary
Particle Size Analysis	Wet Sediment	Wet and dry sieving followed by laser diffraction analysis.