MP2 PROJECT

SCREENING FOR APPROPRIATE ASSESSMENT & NATURA IMPACT STATEMENT

MAIN DOCUMENT

COMHLACHT CHALAFORT ÁTHA CLIATH
DUBLIN PORT COMPANY

rps MAKING COMPLEX EASY

Approval for issue

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1 INTRODUCTION

With the introduction of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) came the obligation to establish the Natura 2000 network of Sites of Community Interest (SCIs), comprising a network of areas of highest biodiversity importance for rare and threatened habitats and species across the European Union (EU).

In Ireland, the Natura 2000 network of sites comprises Special Areas of Conservation (SACs, including candidate SACs) designated under legislation transposing the obligations under Directive 92/43/EEC, and Special Protection Areas (SPAs, including proposed SPAs) classified under the Birds Directive (Directive 2009/147/EC on the conservation of wild birds) and designated under Irish legislation.

SACs are designated for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are designated for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is designated correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

SACs and SPAs make up the pan-European network of Natura 2000 sites.

1.1 APPROPRIATE ASSESSMENT

1.1.1 The Habitats Directive

Article 6(3) of the Habitats Directive requires that–

> *Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications 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.*

Thus, Article 6(3) provides a two-stage process:

a) The first stage involves a screening for appropriate assessment; and

b) The second stage arises where, having screened the proposed development, the competent authority determines that an appropriate assessment is required, in which case it must then carry out that appropriate assessment.

1.1.2 Irish Legislation

For the purposes of applications for permission, Part XAB of the 2000 Act implemented the obligations under Article 6(3) into Irish law. In relation to other applications, the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended ("the 2011 Regulations"), transpose those obligations.

1.1.2.1 Screening

Section 177U of the 2000 Act requires *inter alia* that a screening for appropriate assessment of an application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site. While the provisions of section 177U adopt the terminology used in Article 6(3) of the Habitats Directive in terms of the test for screening, section 177U expands on this, in light if the interpretation given in decisions of the Court of Justice of the European Union. Thus, section 177U give effect to the requirement to screen an application for development consent for appropriate assessment by assessing whether the proposed development is likely to have a significant effect on a European site by considering whether such a significant effect can or cannot be excluded.

Regulation 42 of the 2011 Regulations requires *inter alia* that screening for appropriate assessment of a project for which an application for consent is received, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.

1.1.2.2 Appropriate Assessment

Section 177V of the 2000 Act requires *inter alia* that an appropriate assessment carried out by the competent authority shall include a determination under Article 6(3) of the Habitats Directive as to whether or not a proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority where it has made a determination under section 177U(4) that an appropriate assessment is required, before consent is given for the proposed development.

Regulation 42 of the 2011 Regulations requires *inter alia* that a public authority shall determine that an appropriate assessment of a project is required where the project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening that the project, individually or in combination with other plans or projects, will have a significant effect on a European site.

1.1.3 The Appropriate Assessment Process

According to European Commission guidance documents '*Assessment of plans and projects significantly affecting Natura 2000 sites'* (EC, 2001) and the '*Managing Natura 2000 sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC'* (EC, 2019), the obligations arising under Article 6 establish a step-wise procedure as follows, and as illustrated in Figure 1.1 overleaf:

- The first part of this procedure consists of a pre-assessment stage ('screening') to determine whether, firstly, the plan or project is directly connected with or necessary to the management of the site, and

secondly, whether it is likely to have a significant effect on the site; it is governed by Article 6(3), first sentence.

- The second part of the procedure, governed by Article 6(3), second sentence, relates to the appropriate assessment and the decision of the competent national authorities.
- A third part of the procedure (governed by Article 6(4)) comes into play if, despite a negative assessment, it is proposed not to reject a plan or project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

The applicability of the procedure, and the extent to which it applies, depend on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of Stage 1 is that significant effects on European sites can be excluded, there is no requirement to proceed further.

1.2 OBJECTIVE OF THE DOCUMENT

The purpose of the screening appraisal for appropriate assessment and NIS is to provide an appraisal for the competent authorities to enable each respective competent authority to carry out a screening for appropriate assessment in the first instance and, thereafter, an appropriate assessment of the implications of the MP2 Project ('the proposed development') on European sites in view of their conservation objectives.

This exercise has been conducted on behalf of Dublin Port Company (DPC) in support of an application for Planning Permission to An Bord Pleanála; an application to the Marine Planning and Foreshore Section of the Department of Housing, Planning and Local Government for a Foreshore Lease, Licence and Consent; and an application to the Office of Environmental Sustainability of the Environmental Protection Agency for a Dumping at Sea Permit.

This document seeks to assist An Bord Pleanála as a competent authority under the 2000 Act and the Department and the EPA as public authorities under the 2011 Regulations, in fulfilling their respective obligations to conduct a Stage One screening for appropriate assessment, and Stage Two appropriate assessment.

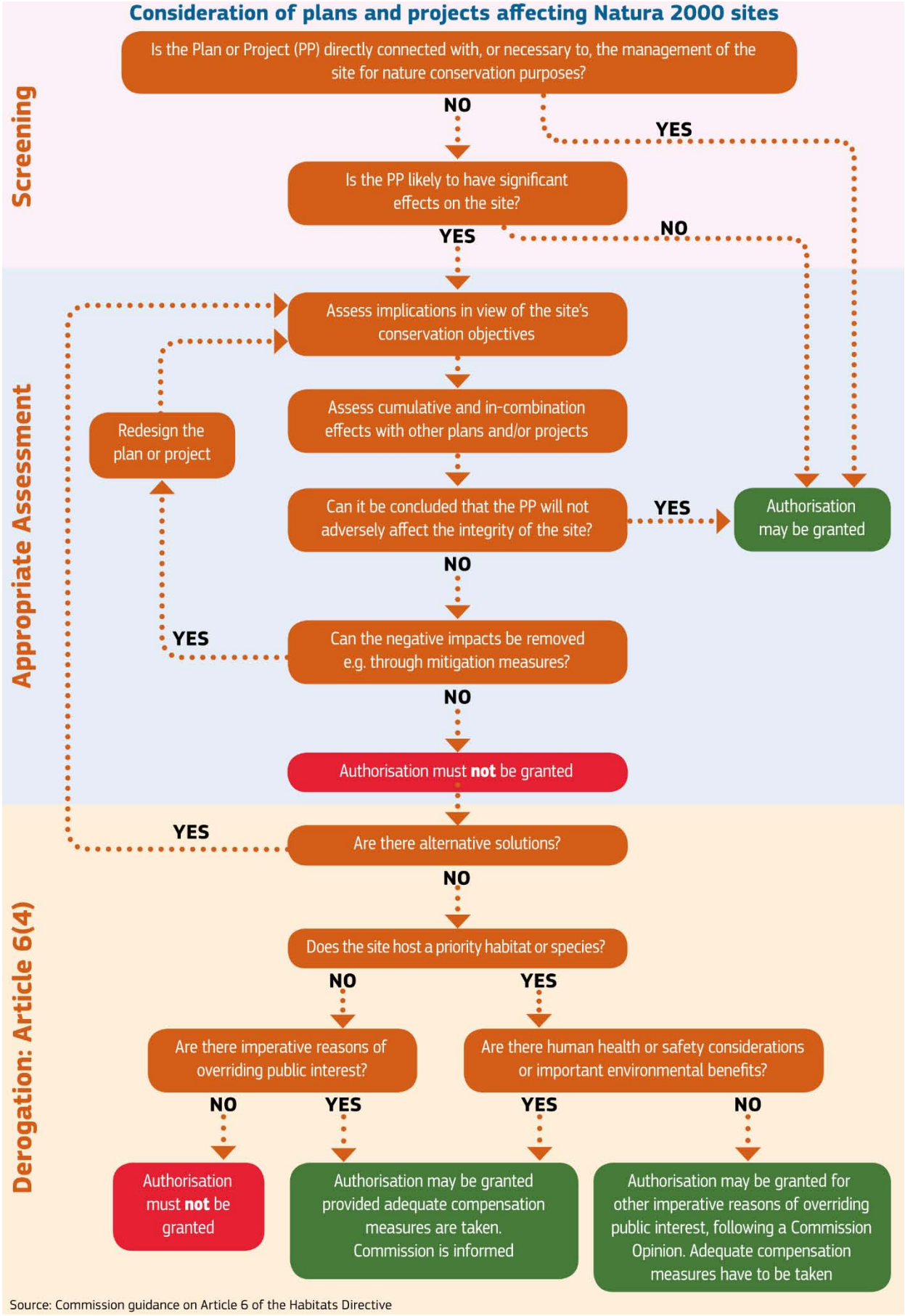

Figure 1.1 Step-wise procedure of Article 6 of the Habitats Directive (from EC, 2019)

1.3 DOCUMENT STRUCTURE

1.3.1 Methodology and Guidance

Section 2 of the document, report sets out the methodology followed and guidance documents used in conducting a screening appraisal for appropriate assessment and subsequent appraisal for appropriate assessment of the implications of the proposed development on European sites.

1.3.2 Proposed Development

Section 3 of the report describes the MP2 Project or proposed development, the general construction sequence and construction activities to be undertaken, and the manner in which the development, if permitted, will be used during the operational phase. For the avoidance of doubt, Section 3 of this report contains exactly the same information as Chapter 3 '*Project Description'* of the MP2 Project EIA Report prepared in respect of obligations arising under the EIA Directive (Directive 2011/92/EU as amended by 2014/52/EU on the assessment of the effects of certain public and private projects on the environment).

1.3.3 Stage 1 Screening Appraisal

Section 4 of the report contains a preliminary examination and analysis to understand whether or not the proposed development is likely to have a significant effect on any European site. This is the screening appraisal for appropriate assessment. It has been undertaken in view of best scientific knowledge, in light of the Conservation Objectives of the sites concerned and considers the proposed development individually or in combination with other plans and projects. Measures intended to avoid or reduce the harmful effects of the proposed development on European sites, (i.e. "mitigation measures") or best practice measures have not been taken into account in the screening stage appraisal (and should not be taken into account by the competent authorities in conducting their respective screening exercises).

1.3.4 Stage 2 Appraisal for Appropriate Assessment

Section 5 of the report contains a more detailed examination and analysis of the implications of the proposed development on the Conservation Objectives of those European sites where the possibility of Likely Significant Effects (LSEs) could not be excluded at the screening stage in the absence of further evaluation and analysis, including mitigation measures.

1.4 DIRECTLY CONNECTED WITH OR NECESSARY TO THE MANAGEMENT OF THE SITE

The MP2 Project is the second Strategic Infrastructure Development (SID) at Dublin Port to be brought forward to planning stage from the Dublin Port Masterplan 2040, reviewed 2018. The purpose of the proposed development is to provide for the redevelopment of existing port lands and complement the previously permitted ABR Project in providing capacity for growth in the Ro-Ro and Lo-Lo modes on the north side of the Port in accordance with the Port Masterplan.

The proposed development is not directly connected with or necessary to the management of any site as a European Site.

2 METHODOLOGY

2.1.1 Published guidance on Appropriate Assessment

Appropriate Assessment Guidelines for Planning Authorities have been published by the Department of the Environment Heritage and Local Government (DEHLG, 2010a). In addition to the advice available from the Department, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of Appropriate Assessment, most notably including, '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' (EC, 2001), which sets out the principles of how to approach decision making during the process. These principal national and European guidelines have been followed in the preparation this report. The following list identifies these and other pertinent guidance documents:

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; (EC, 2007);
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. European Commission (EC, 2009);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging. European Commission (EC, 2011a);
- European Commission Staff Working Document 'Integrating biodiversity and nature protection into port development' (EC, 2011b);
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.0)' (IAQM, 2019); and
- European Commission Notice C(2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2019).

2.1.2 Likely Significant Effect

The Commission's 2018 Notice (EC, 2019) advises that the appropriate assessment procedure under Article 6(3) is triggered not by the certainty but by the likelihood of significant effects, arising from plans or projects regardless of their location inside or outside a protected site. Such likelihood exists if significant effects on the site cannot be excluded. The significance of effects should be determined in relation to the specific features and environmental conditions of the site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

The requirement that the effect in question be 'significant' exists in order to lay down a *de minimis* threshold – thus, plans or projects that have no appreciable effect on the site are thereby excluded.

A significant effect is triggered when:

- there is a probability or a risk of a plan or project having a significant effect on a European site;
- the plan is likely to undermine the site's conservation objectives; and
- a significant effect cannot be excluded on the basis of objective information.

2.1.3 Mitigation Measures

In determining the likelihood of significant impacts, and hence the need for an appropriate assessment, mitigation measures (i.e. measures that are intended to avoid or reduce harmful effects) cannot be taken into account.

Accordingly, mitigation measures have not been taken into account in the screening stage appraisal.

However, as is appropriate, mitigation measures may be proposed by the project proponent and/or required by the competent authorities in order to avoid the potential impacts identified in the appropriate assessment or reduce them to a level where they will no longer adversely affect the integrity of a European site.

2.1.4 Conservation Objectives

The conservation objectives for each European site are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the site has been selected.

The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are 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.

The favourable conservation status (or condition, at a site level) of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is 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.

2.1.4.1 Site-Specific Conservation Objectives

NPWS began preparing detailed Site-Specific Conservation Objectives (SSCOs) for European sites in 2011. The European sites in Dublin Bay in closest proximity to the proposed development which are considered in some detail in this report have all had SSCOs set. The published SSCO documents are as described in Section 4.1 of this document and appended at Appendix 1 hereto.

The published SSCO documents note that an appropriate assessment based on the most up to date conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out.

The most up-to-date Conservation Objectives for the European sites being considered, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites is based on publicly available data on these European Sites, sourced from the NPWS website in June 2019 have been used in this assessment.

2.1.5 In-combination Effects

Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are also considered. As set out in the Commission's 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, cumulative effects and the vulnerability of the habitats and species concerned.

In that context, plans or projects which are completed, approved but uncompleted, or proposed have been considered. EC (2019) specifically advises that "as regards other proposed plans or projects, on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced".

3 THE PROPOSED DEVELOPMENT

This Section sets out a description of the proposed development and contains information on the project site, design, size and other relevant features in order to establish the characteristics of the project for the purposes of environmental assessment.

3.1 LOCATION OF THE PROJECT

3.1.1 Site Location

The proposed development is located mainly within the Northern Lands of Dublin Port, Dublin City. Dublin Port is the largest Port in Ireland, situated on Ireland's Eastern Coastline, as shown in Figure 3-1. The project also includes capital dredging works within Dublin Port Harbour.

The Northern Lands of Dublin Port (referred to as the Dublin Port Estate) comprise 207 ha of land entirely within the ownership of Dublin Port Company. The entire Port Estate comprises 309 ha, including the lands at the Dublin Inland Port.

The main road transportation route between the Dublin Port Estate and the national road network is via the Dublin Port Tunnel. The site is also connected to the national rail network as shown in Figure 3-2.

Dublin Port's navigation channel and fairway are currently maintained to a standard depth of -7.8m CD. The main navigation channel and fairway are currently being deepened to -10.0m CD under the permitted Alexandra Basin Redevelopment (ABR) Project (ABP Ref. 29N.PA0034) to enable the safe passage of larger vessels bringing freight and passengers to and from the Port.

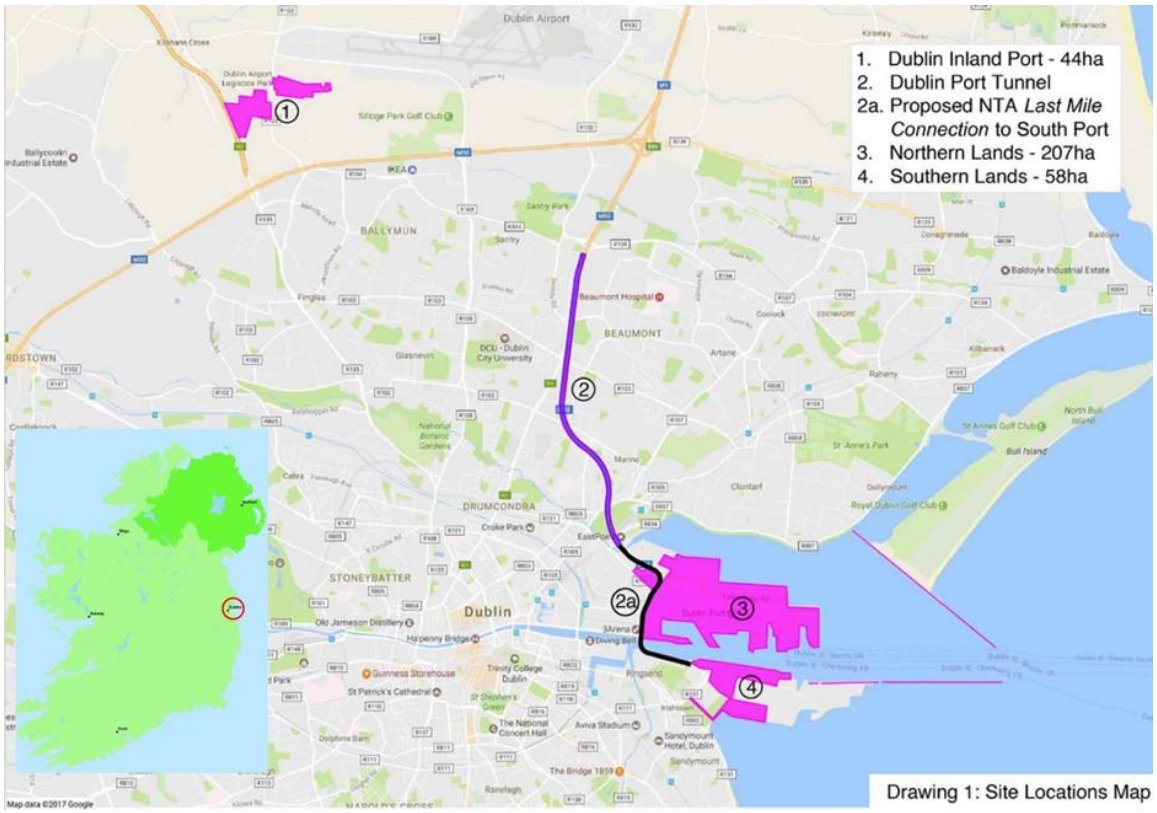

Figure 3-1 Site Location Map (reproduced from the Dublin Port Masterplan 2040, reviewed 2018

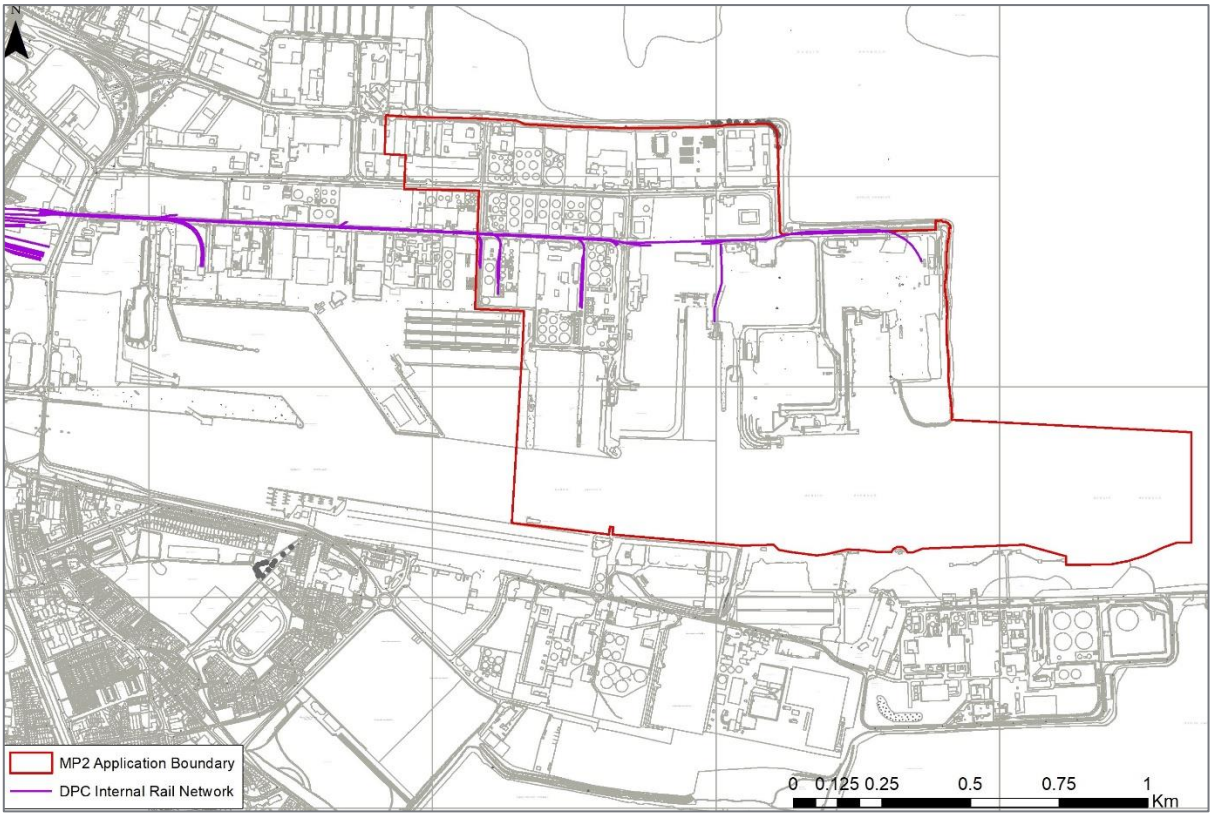

Figure 3-2 Rail network within the Dublin Port Estate

3.1.2 Development Area

The area of the proposed development for which permission is sought, and in respect of which this NIS has been prepared, is defined by the application boundary as illustrated on the application drawings. The project application boundary, overlain on the existing Port layout is presented in Chapter 1, Figure 1-2. The site is located at the eastern end of the Dublin Port Estate including an area to be dredged to the south of the site, as shown on Plate 3-1. The Application Boundary area is 165.2 ha.

Plate 3-1 Existing Land Uses within the development area

3.1.2.1 Oil Berths

Dublin Port handles many different bulk liquid products including petrol, diesel and kerosene, but also non-petroleum liquids such as molasses. 65% of oil imported into Ireland comes through Dublin Port.

The liquid petroleum products are discharged from tanker ships at four dedicated berths within the Dublin Port Estate and then pumped through a pipeline system, shared by different operators, to their storage tanks within the Port. Storage capacity in excess of 300,000 tonnes of oil products is available within the Port. Oil products are delivered by road from the Port to distribution centres and filling stations outside the Port.

There are two Oil Jetties in operation within the Dublin Port Estate supporting a range of above ground pipework.

The Western Oil Jetty has two berths (Oil Berth 1 and Oil Berth 2). These berths facilitate the majority of petroleum product imports at Dublin Port. In 2017 Oil Berth 1 had 181 ship arrivals and Oil Berth 2 had 190 ship arrivals.

The Eastern Oil Jetty also has two berths (Oil Berth 3 and Oil Berth 4). These berths facilitate the majority of bitumen products and all of the Liquid Petroleum Gas (LPG) imports at Dublin Port. In 2017 Oil Berth 3 had 59 ship arrivals: Oil Berth 4 is rarely used and had only 5 ship arrivals.

Plate 3-2 Oil Berth 4

3.1.2.2 Lo-Lo (Lift-On Lift-Off) Container Freight Terminal

There is one major Lo-Lo Container Freight Terminal within the application boundary of the MP2 Project.

There are two main groups of cargo handling equipment used for containers: primary handling equipment and secondary handling equipment.

Primary handling equipment refers to cranes of different types used to load and unload containers on and off the ship. There are two main types of crane in use in Dublin Port, rail mounted gantry cranes and dock mobile cranes. Containers are moved between the stacks and the quay side cranes by special heavy duty truck and trailer combinations or by reach stackers. Secondary handling equipment refers to the equipment (usually gantry cranes of one type or another) used to store containers in back areas in large stacks.

In Dublin, there are rubber-tyred gantries (RTGs) and rail mounted gantries. The largest RTGs can store containers in stacks up to six containers high and seven wide. These stacks occupy large areas of port land and DPC has a utilisation target of 40,000 TEU (twenty-foot equivalent units) per hectare per annum for the port's container freight terminals.

Plate 3-3 Lo Lo Container Freight Terminal

3.1.2.3 Ro-Ro (Roll-On Roll-Off) Terminals

There are a currently five Berths within the development area with ramps for Ro-Ro freight and passengers. Ro-Ro refers to shipping services and activities where vehicles are driven on and off ferries or other specialised ships (such as car carriers). Some services are freight only; others carry a combination of freight and passengers.

Ro-Ro freight is transported either “accompanied” or “unaccompanied”. “Accompanied” refers to trailer units to which the cab is attached at all times and the driver accompanies the vehicle on the Ro-Ro ferry. “Unaccompanied” refers to freight trailers that are delivered and collected from the compound adjacent to the vessel. These trailers are driven on and off ships by dock workers.

The main difference in the two operations is the amount of land needed to service the units. In the case of accompanied freight, the units drive off the vessel and leave the port immediately. Unaccompanied freight requires larger areas of parking.

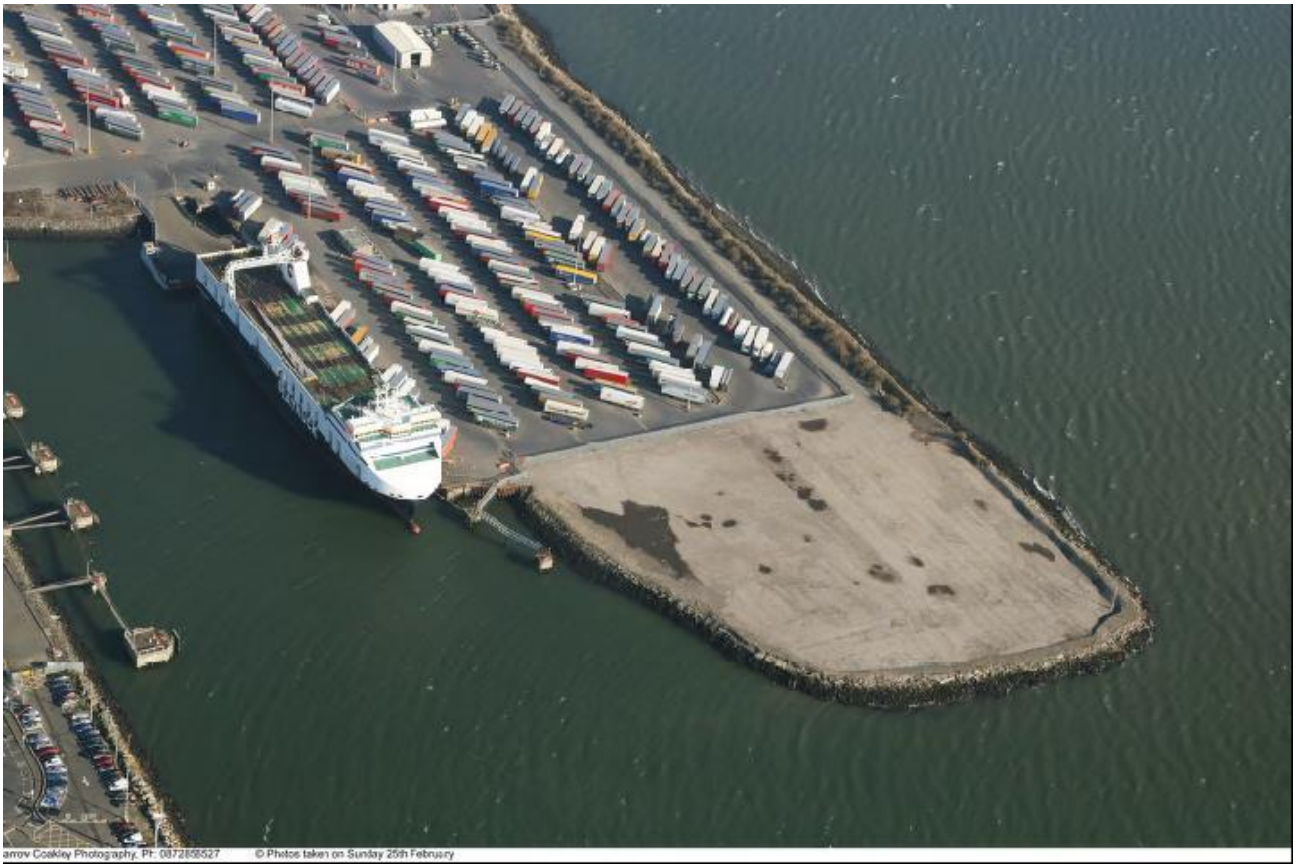

Plate 3-4 Ro-Ro activity within the development area

3.1.2.4 Ferry Terminal Buildings

There are three ferry terminal buildings located within the MP2 Project application boundary. Terminal 2 is used by Stena Line, Terminal 5 is used by Seatruck and Terminal 1 is used by Irish Ferries, with seasonal use by Isle of Man Steam Packet Company. Terminal 2 and Terminal 5 will be demolished as part of the works, with the existing Terminal 1 Building being used as a unified terminal building thereafter. The Seatruck operation at Terminal 5 will be relocated to the west of the Dublin Port Estate to a facility permitted under the ABR Project consent.

Plate 3-5 Terminal 1 Building used by Ferries

3.1.2.5 Permitted Development under the Alexandra Basin Redevelopment (ABR) Project

The ABR Project is currently at construction stage having been granted permission by ABP in July 2015 (ABP Ref. 29N.PA0034). The ABR Project includes the infilling of Basin 52/53 which currently hosts two Ro-Ro Ramps operated by Seatruck. The permission also allows for the construction of a new riverside berth at the entrance to Basin 52/53 (Berth 52).

3.1.2.6 Adjacent Land Uses

The site is bounded to the north and east by the Tolka estuary. The Tolka estuary is used for recreational purposes mostly by small sailing craft based at Clontarf. Swimming also takes place from the North Bull Wall throughout the year, including the winter season. There are no licenced aquaculture sites within the estuary. The Tolka Estuary is also of international importance due to its large populations of waterbirds.

The site is bounded to the south by the lower River Liffey (Dublin Harbour) which is the main navigation channel for Dublin Port. The Great South Wall lies outside, but in close proximity to, the boundary of the site. DPC is the authority with responsibility for the safe passage of all shipping entering and leaving the Port. No other commercial activities are permitted within the navigation channel for safety reasons. A number of events are hosted by DPC including the annual 'Riverfest'. Accommodation is also made for sailing and boating activity based at the Poolbeg Yacht, Boat Club and Marina and Stella Maris Rowing Club.

The site is bounded to the west by Port lands with similar land uses to that within the development area.

3.1.2.7 Amenity Designations

There are a number of Natura 2000 sites designated as Special Protection Areas (SPAs) or candidate Special Areas of Conservation (cSACs) which could have connectivity with the proposed development area.

There are no archaeological or industrial heritage features designated within the development area. However the Pier Head at the terminus of Breakwater Road which currently supports the Port's Operations Building, shown in Plate 3-6, is of built heritage interest. This structure formed the end of the 19th Century Eastern Breakwater which marked the end of eastern extremity of Dublin Port during that era. This Pier Head is proposed to be demolished as part of the MP2 Project. The Great South Wall which lies outside, but in close proximity, to the development area is a protected structure and National Monument and is not affected by the MP2 Project.

Plate 3-6 Pier Head at the terminus of Breakwater Road and the Port's Operations Building

3.2 PROPOSED DEVELOPMENT WORKS

This section of the NIS describes both the proposed marine and landside structural works, and the associated dredging and infill works required to achieve the MP2 Project's objectives. A site plan of the proposed works is presented in Figure 3-3. The MP2 Project application area is delineated by a red line and the marine and landside works individually identified. The works proposed as part of the MP2 Project are summarised as follows:

- Construction of a new Ro-Ro jetty (Berth 53) for ferries up to 240m in length on an alignment north of the Port's fairway and south and parallel to the boundary of the South Dublin Bay & River Tolka SPA (004024).
- A reorientation of the already consented Berth 52 (ABP Ref. 29N.PA0034). Berth 52 is also designed to accommodate ferries up to 240m in length. The works will also comprise an amendment to the consented open dolphin structure (ABP Ref. 29N.PA0034) to create a closed berthing face at the eastern end of Berth 49.

[Elsewhere within the ABR Project, the extension of the existing Berth 49 is already consented to also make this berth capable of accommodating ferries up to 240m in length. The combination of the ABR Project with the MP2 Project will therefore deliver three river berths all capable of accommodating ferries up to 240m in length].

- A lengthening of an existing river berth (50A) to provide the Container Freight Terminal with additional capacity to handle larger container ships. These works will include the infilling of the basin east of the now virtually redundant Oil Berth 4 on the Eastern Oil Jetty. These works will also include dredging to a standard depth of -11.0m CD which is a proposed amendment to the channel dredging as permitted under the ABR Project (ABP Ref. 29N.PA0034).
- As part of the infilling of Oil Berth 4, it is proposed to redevelop Oil Berth 3 as a future deep-water container berth (standard depth of -13.0m CD) for the Container Freight Terminal. This will facilitate the change of use of the berth from petroleum importation to container handling when the throughput of petroleum products through Dublin Port declines as a result of national policies to decarbonise the economy.
- The dredging of a berthing pocket to a standard depth of -13.0m CD at Oil Berth 3 will require stabilisation of the existing quay wall at Jetty Road. It is not proposed to use this quay wall for the berthing of vessels.
- Dredging at the proposed Berth 53 and channel widening to a standard depth of -10.0m CD which is a proposed amendment to the channel dredging as permitted under the ABR Project (ABP Ref. 29N.PA0034).
- Consolidation of passenger terminal buildings, demolition of redundant structures and buildings, and removal of connecting roads to increase the area of land for the transit storage of Ro-Ro freight units as a Unified Ferry Terminal (UFT). Works include reorganisation of access roads; two proposed check in areas comprising a total of 14 check lanes; proposed set down and parking area for the existing Terminal 1 building; proposed pedestrian underpass to access the existing Terminal 1 building; three proposed toilet blocks and a proposed ESB Substation. These works will comprise amendments to consented developments with planning reference numbers 3084/16 & 3638/18, and the ABR Project (ABP Ref. 29N.PA0034).
- A heritage zone adjacent to Berth 53 and the Unified Ferry Terminal set down area. This will comprise an alteration to consented development planning reference 3084/16.

3.2.1 Construction Design Considerations

The following design elements have been considered when carrying out the design of the various elements of the project:

- Maximise the potential of the existing port property in the context of the Dublin Port Masterplan 2040, reviewed 2018, through redesign of the Ferry Terminal Yards;
- Upgrade of the Eastern Oil Jetty (Oil Berths 3 and 4) and allow for the future use as a Lo-Lo berth;
- Provide sufficient water depth at each berth for the design vessels proposed;
- Minimise the impact of construction on the operation of existing berths;

- Provide a sufficiently wide channel to accommodate the piloting of vessels;
- Minimise the impact of proposed structures on existing port navigation;
- Take full cognisance of environmental constraints and where feasible provide mitigation through engineering design;
- Ensure the integrity and stability of the Great South Wall is maintained.

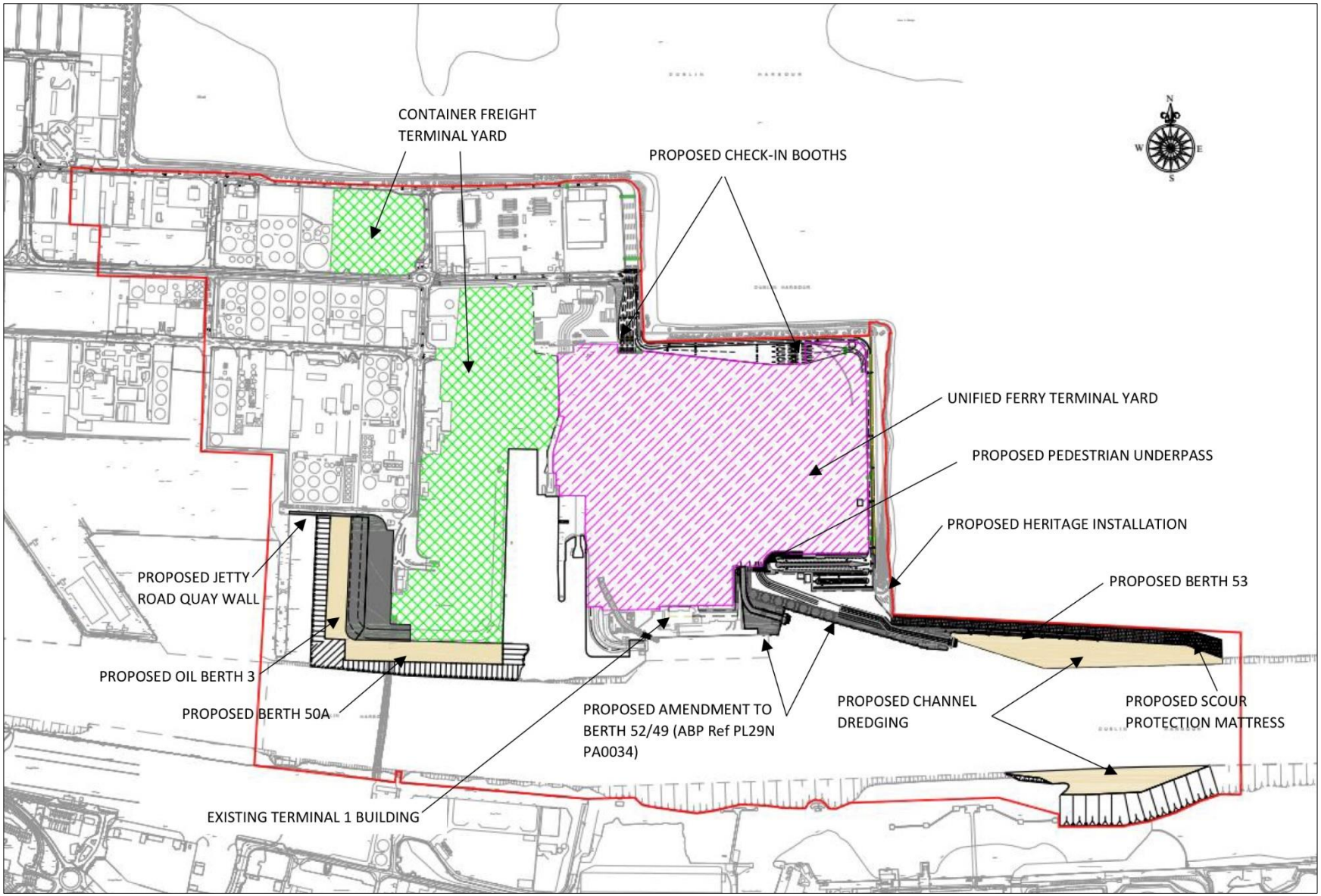

Figure 3-3 Site plan of the proposed works

3.2.2 Berth 52 /49

Berth 52 will be used predominantly for the berthing of Ro-Ro ferries. The berth will accommodate the bow-to and stern-to berthing of a wide range of ferries up to 240m in length.

Berth 52 was granted permission under An Bord Pleanála Ref. PL29N.PA0034. As a result of the proposed development of Berth 53, permitted Berth 52 requires repositioning.

Proposed amendments to Berth 52, presented in Figure 3-4, comprise the following:

- Rotation of Berth 52 and all associated elements including a Ro-Ro jetty structure (circa 288m in length), by approximately 9 degrees (clockwise). This relatively minor reorientation allows Berth 53 connectivity with the Port lands, minimises its length and maximises the buffer between Berth 53 and the boundary of the South Dublin Bay and River Tolka SPA. The structure comprises a combination of a steel cellular wall, steel sheet pile combi wall, and an open piled structure (at the commencement of Berth 53). The proposed combi wall will be comprised of circular piles of circa 1.6m diameter with sheet pile infill panels. These piles will be driven to a depth of circa -30m CD.
- Rotation of the proposed linkspan to Berth 52 to allow two-tier access to the Ro-Ro ferries: and, reinforced concrete bankseat to support the linkspan.
- Rotation of the proposed ramp structure to access the upper linkspan tier.
- Installation of jetty furniture including fenders, mooring bollards, handrails and an automated mooring system.
- Installation of a new power outlet for Ship to Shore Power which will be fed from the proposed substation adjacent to the proposed parking and set down area.
- Construction of a new piled quay wall structure approximately 52m in length to accommodate the linkspan structure and to provide additional operational quayside space at Berth 49. The 52m long walls will be back filled with granular fill material.

Berth 49 was granted permission under An Bord Pleanála Ref PL29N.PA0034. As a result of the proposed repositioning of Berth 52 permitted Berth 49 requires minor amendments.

Proposed amendments to Berth 49 comprise:

- Encompassing the eastern dolphins associated with Berth 49 within a new piled quay wall structure approximately 40m in length at the eastern end of Berth 49. The 40m long walls will be back filled with granular fill material.
- The overall length of Berth 49, or functionality of the berth will not be altered. Berth 49 will accommodate vessels up to 240m in length.

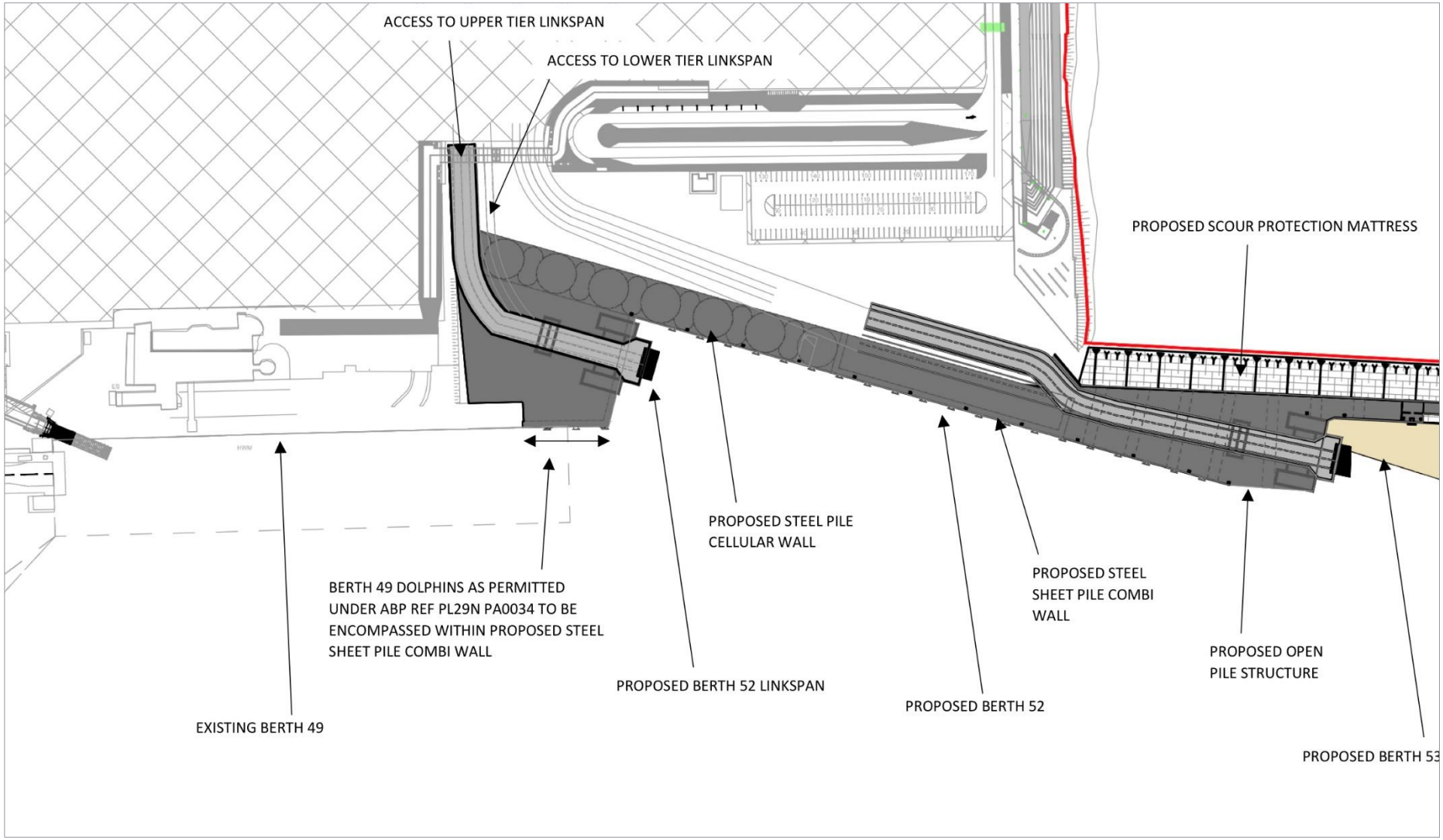

Figure 3-4 Plan View of Amendments to Proposed Berth 52 and Berth 49

3.2.3 Berth 53

Berth 53 will be used predominantly for the berthing of Ro-Ro ferries. The berth will accommodate the bow-to and stern-to berthing of a wide range of ferries up to 240m in length.

The design of Berth 53 has been developed by an iterative process considering, *inter alia*, its functional requirements, navigational safety, impact on views (particularly from Clontarf) and its potential impact on the conservation objectives of the South Dublin Bay and River Tolka SPA.

The proposed works at Berth 53 are presented in Figure 3-5, and will comprise:

- The construction of a new Ro-Ro jetty structure approximately 406m in length overall.
- The construction of 8 No. reinforced concrete mooring dolphins on tubular steel piles of circa 1.0m – 1.2m diameter to provide a new berthing face approximately 284m in length;
- Construction of a new linkspan structure to allow two tier access to the Ro-Ro ferries;
- Construction of a new ramp structure to access the upper linkspan tier;
- Construction of a new deck structure to allow access to the lower linkspan tier and dolphins;
- Construction of a reinforced concrete access/maintenance route to the dolphins;
- Construction of a reinforced concrete bankseat for the linkspan;
- Dredging of a berthing pocket to a standard depth of -10.0m CD;
- Installation of scour protection mattresses to provide slope stabilisation and scour protection to the dredged berthing pocket;
- Installation of a wash protection structure to the north line of the 406m jetty structure;
- Installation of jetty furniture including visual screening barriers, fenders mooring bollards, handrails and an automated mooring system.
- Installation of a power outlet for Ship to Shore Power which will be fed from the proposed substation adjacent to the proposed parking and set down area.

The mooring dolphins will be supported on a system of tubular steel piles constructed in a vertical and raking alignment. The access structures to the linkspan will be constructed of tubular steel vertical piles.

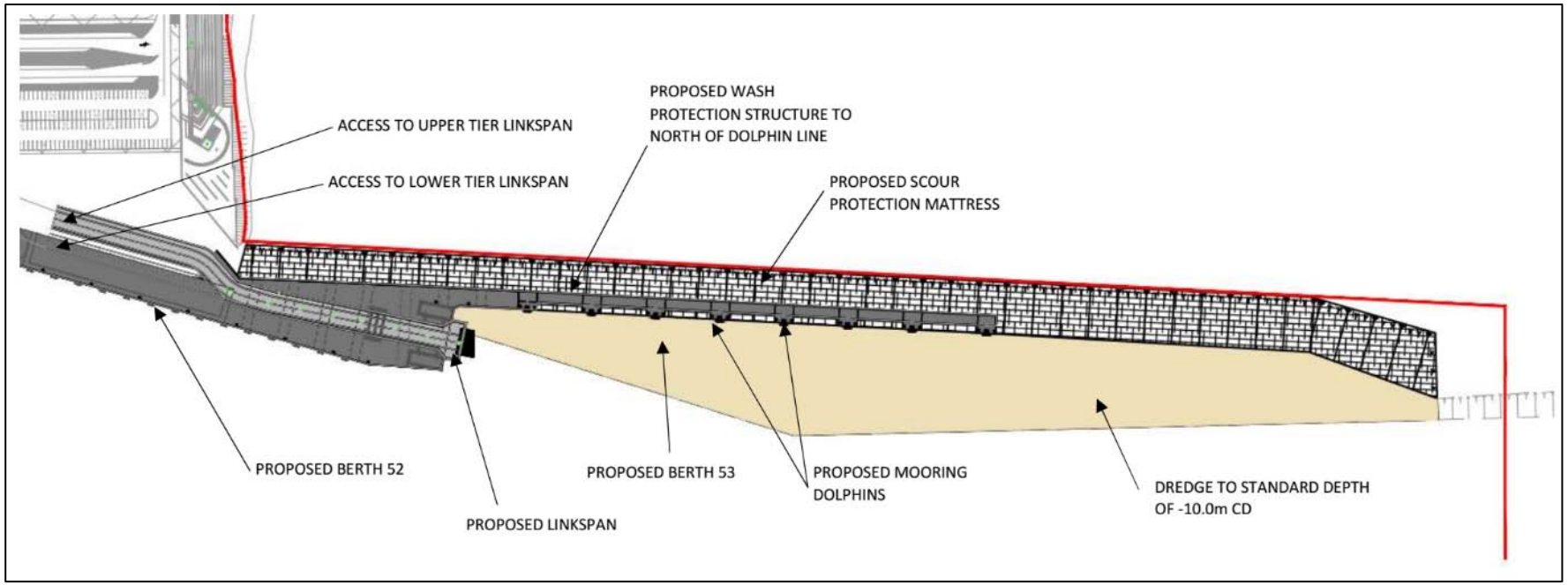

Figure 3-5 Plan view of proposed Berth 53

A schematic of the proposed wash protection structure is indicated Figure 3-6.

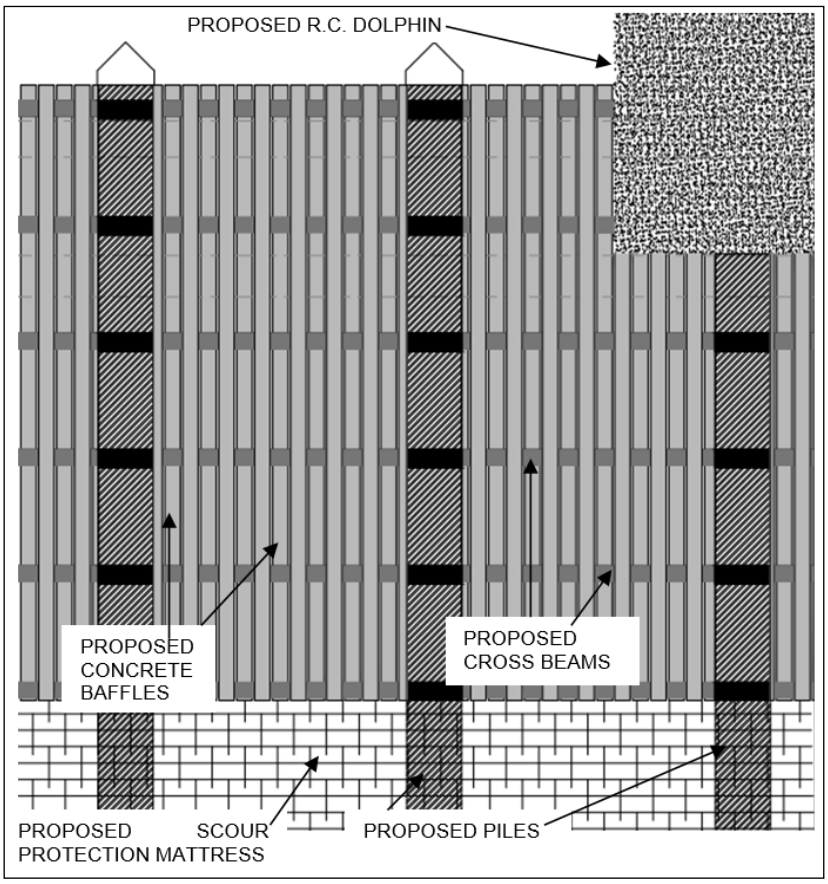

Figure 3-6 Proposed wash protection structure

A cross section through the proposed scour protection mattresses is indicated in Figure 3-7.

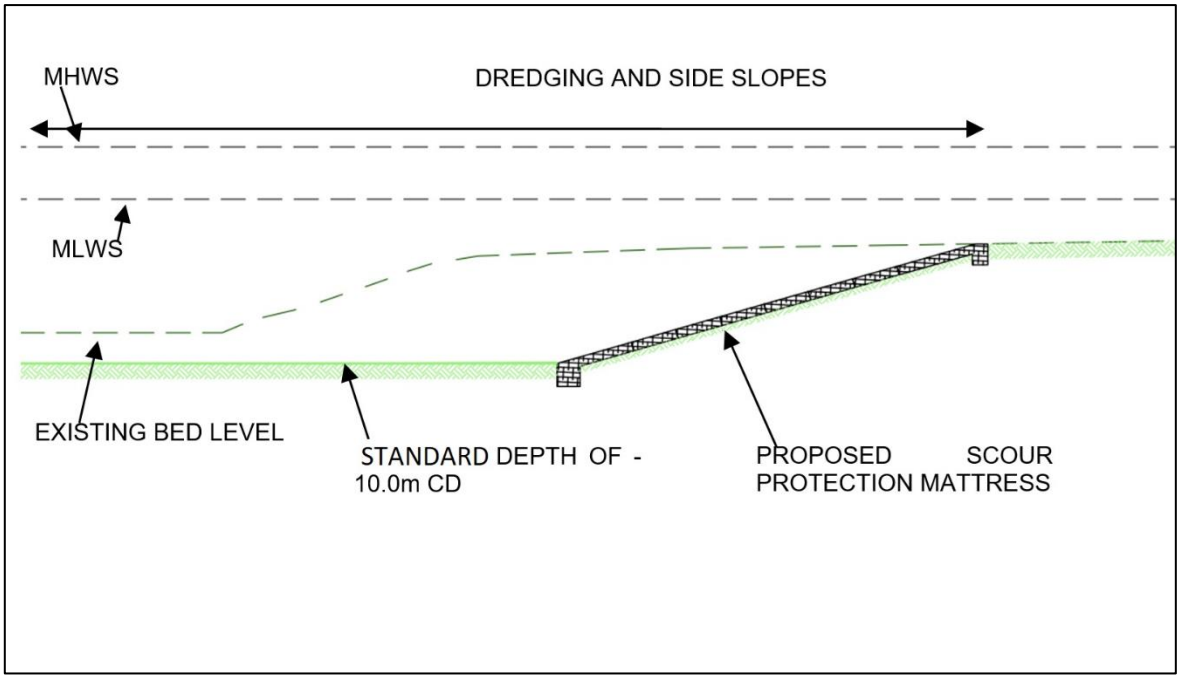

Figure 3-7 Cross section through proposed scour protection mattress

3.2.4 Berth 50A

It is proposed to extend the existing Berth 50A to provide a multi-purpose predominately Lo-Lo Container Vessel berth.

The proposed works at Berth 50A are presented in Figure 3-8 and will comprise the following:

- Demolition of the Port Operations Building and ancillary structures;
- Demolition of the Pier Head at the terminus of the 19th Century Eastern Breakwater including the salvage and storage of masonry units for future use in heritage gain projects;
- Demolition of the southern end of the Eastern Oil Jetty;
- Construction of a new steel sheet pile combi-wall which will act as the berthing face. The proposed combi wall will be comprised of circular piles of circa 1.4m diameter with sheet pile infill panels. The new section of quay wall will be approximately 125m in length, providing an overall quay length of approximately 305m;
- Installation of a sheet pile anchor wall and ties to support the combi-wall;
- Construction of a bridging structure to avoid disruption to existing 220KV High Voltage ESB Cables which run through the site, to include for temporary protection works;
- Backfilling of structure with engineering fill material and Construction & Demolition (C&D) Waste (as part of Oil Berth 3 works);
- Installation of new tubular steel piles to support the extension of the existing crane rails;
- Construction of a new reinforced concrete deck;
- Dredging of a berthing pocket to a standard depth of -11.0m CD;
- Installation of jetty furniture including crane rails, fenders, mooring bollards and emergency ladders.

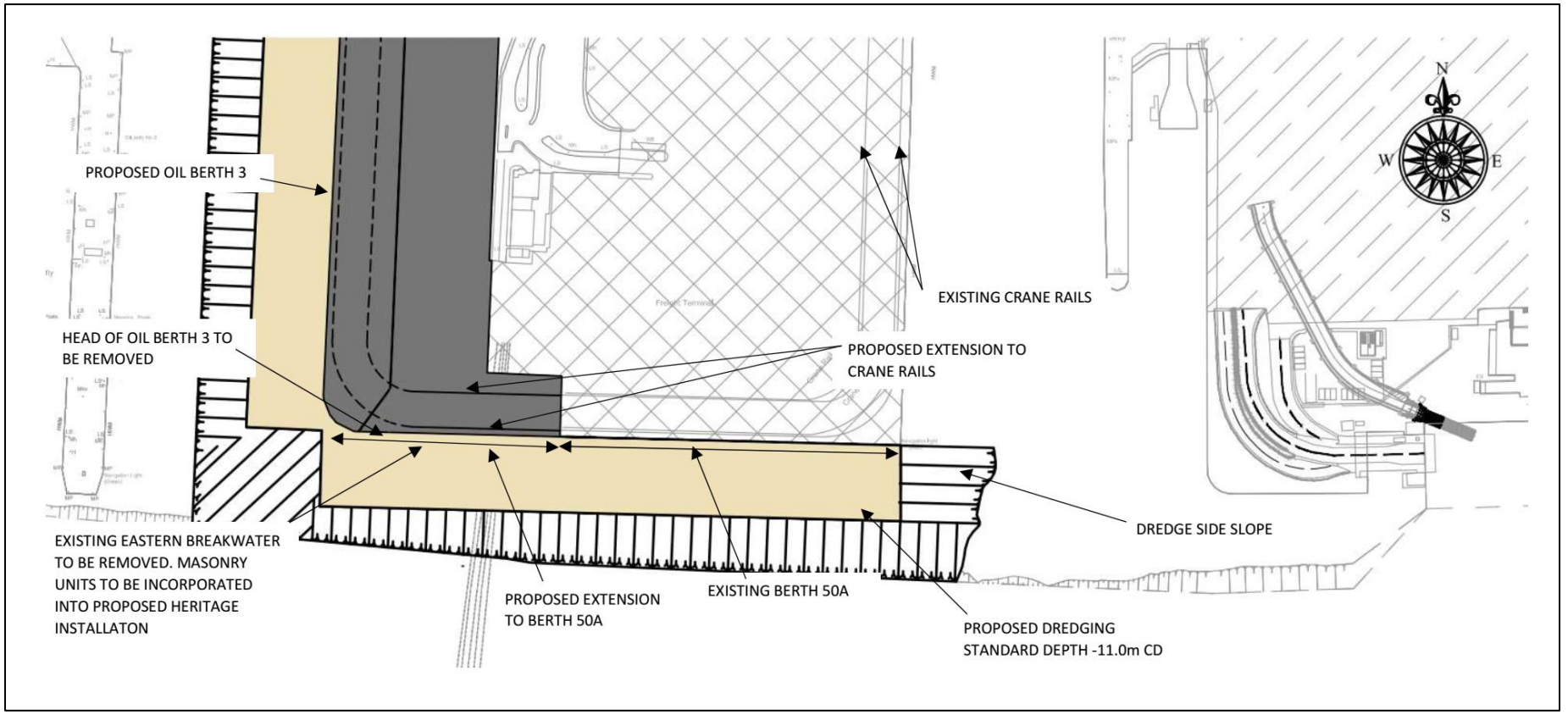

Figure 3-8 Plan view of proposed berth 50A

3.2.5 Oil Berth 3

The Eastern Oil Jetty comprises Oil Berth 3 to the west and Oil Berth 4 to the east. The proposed development will involve the removal of Oil Berth 4 and consolidating operations to Oil Berth 3. The berth will be designed as a multi-purpose structure, initially for oil tanker berthing, with a future potential use as a container vessel berth. The basin at Oil Berth 4 will be infilled to provide an additional container freight terminal storage area. The proposed layout and typical cross section are presented in Figure 3-9 and Figure 3-10.

The works will comprise the following elements:

- Temporary support of the oil berth gantry (framework) and equipment;
- Demolition of the southern end of the Eastern Oil Jetty (as per description of Berth 50A);
- Demolition of the existing pilot boat pontoon and gangway;
- Construction of a new steel sheet pile combi-wall at a minimum of 5m distance from the face of the existing. The proposed combi wall will be comprised of circular piles of circa 1.4m diameter with sheet pile infill panels Oil Berth 3. It is proposed to retain the existing structure in position throughout the works. The new quay wall will be approximately 239m long;
- Infilling of the basin at Oil Berth 4 with engineered fill material and suitable recycled Construction and Demolition (C&D) waste arising from proposed demolition works within the footprint of the MP2 Project development area. The void between the existing Oil Berth 3 and the proposed new sheet pile wall will also be filled with engineered fill material. The quantity of fill material required is approximately 145,000m^3;
- Installation of a sheet pile anchor wall and ties to support the combi-wall;
- Installation of new tubular steel piles to support the potential future extension of the crane rails;
- Construction of a new reinforced concrete deck. The new deck will have a plan area of 20,000m^2 which is an increase of 17,500m^2 over the existing deck area.;
- Construction of a circa 2m high wall as a separation boundary between the Container Freight Terminal Yard and the Oil Berth;
- Dredging of a berthing pocket to a standard depth of -13.0m CD;
- Installation of jetty furniture including Fenders (panel and corner roller fenders), mooring bollards and emergency ladders.

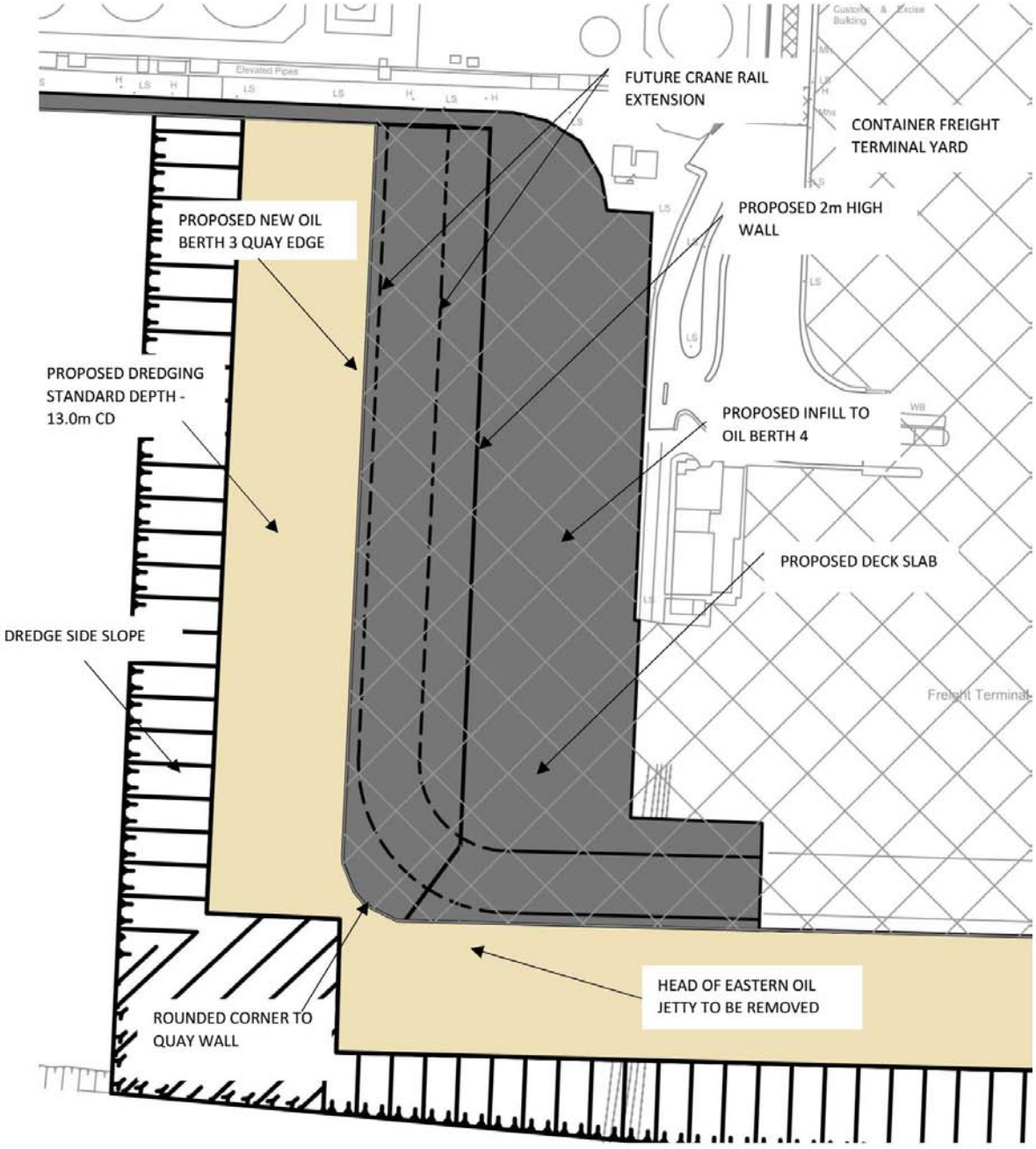

Figure 3-9 Plan view of proposed Oil Berth 3

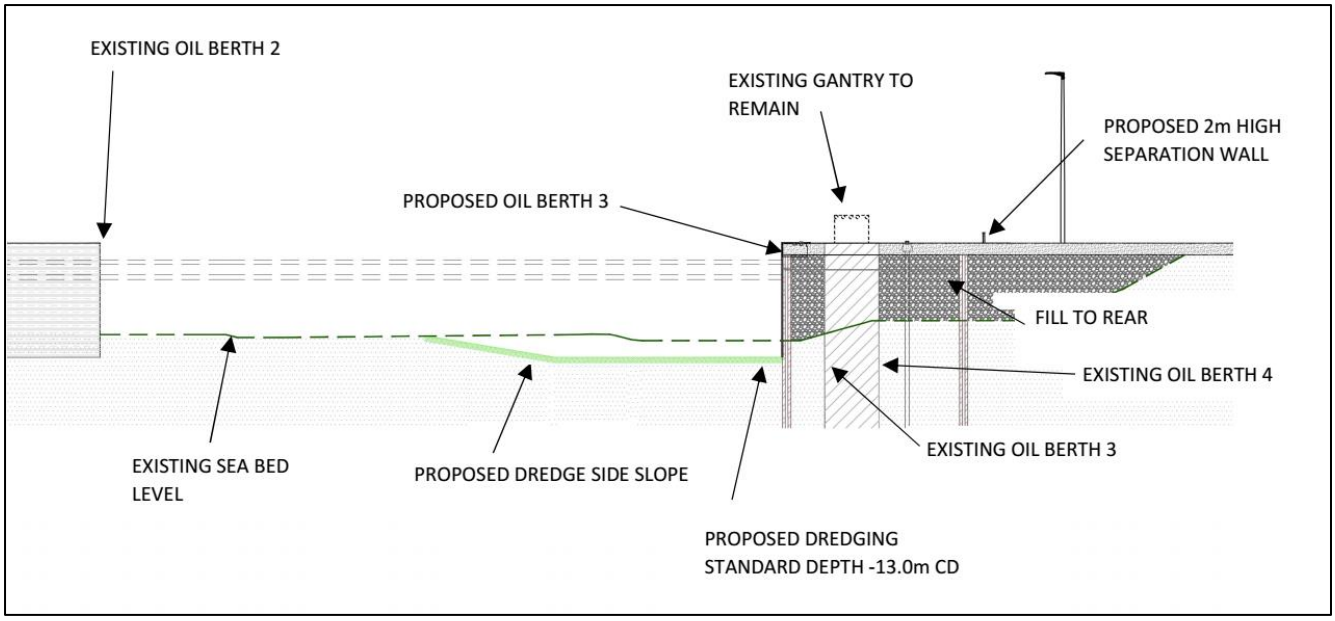

Figure 3-10 Cross section at proposed Oil Berth 3

The dredging of a berthing pocket to a standard depth of -13.0m CD at Oil Berth 3 will require stabilisation of the existing quay wall at Jetty Road. It is not proposed to use this quay wall for the berthing of vessels. The proposed layout is presented in Figure 3-11.

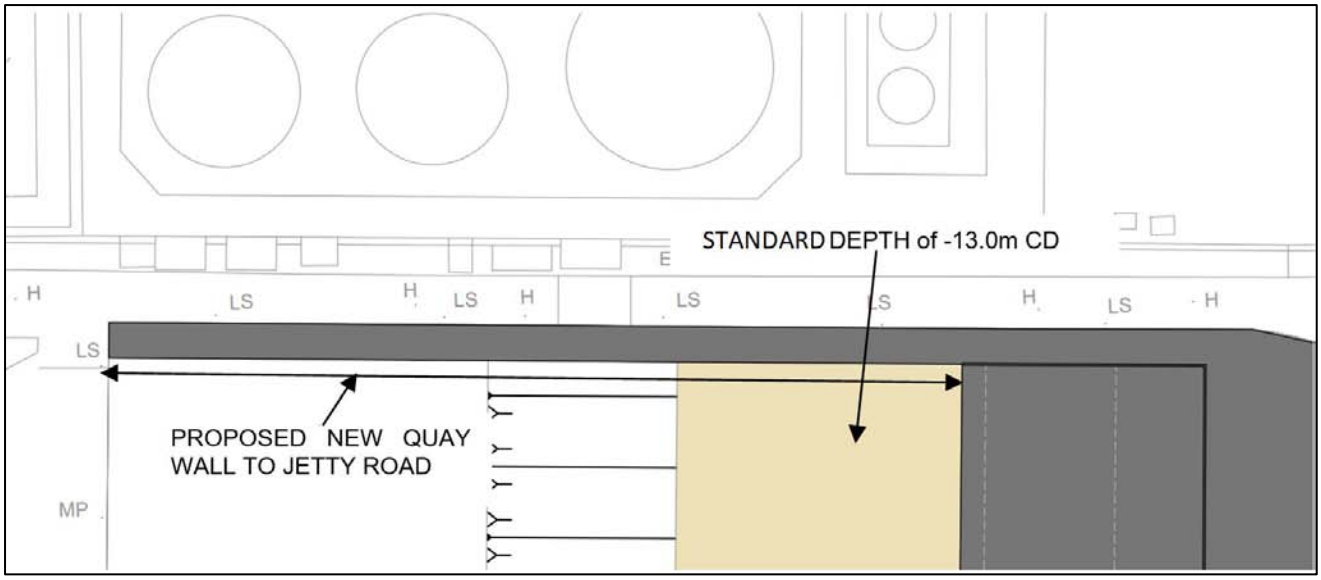

Figure 3-11 Plan of proposed Jetty Road Quay Wall

The works will comprise the following elements:

- Construction of a new steel sheet pile combi-wall 5m in front of the face of the existing Jetty Road quay wall. The proposed combi wall will be comprised of circular piles of circa 1.4m diameter with sheet pile infill panels. It is proposed to retain the existing structure in position throughout the works. The new quay wall will be approximately 120m long;
- Installation of ground anchors to stabilise the new sheet pile combi-wall. These anchors will be fixed into bedrock. This system negates the need for a sheet pile anchor wall;

- Installation of fill material behind the new wall;
- Construction of a new reinforced concrete capping beam;
- Re-decking the existing Jetty Road;
- Installation of furniture including emergency ladders and handrails.

3.2.6 Channel Widening Works

To facilitate the safe navigation and turning of vessels of up to 240m in length, and the expected increased frequency of sailings, channel widening works will be required to the south of the existing navigation channel. Widening will be carried out via dredging works. The standard depth of the channel will be -10.0m CD.

The layout design of the dredging works has been developed via an iterative process considering, amongst others, its navigational safety, proximity to proposed berths, its potential impact on the Great South Wall and its potential impact on the conservation objectives of the South Dublin Bay and River Tolka SPA.

The navigation channel has permission to be deepened from -7.8m CD to -10.0m CD under the ABR Project (ABP Ref. 29N.PA0034). The capital dredging scheme for the ABR Project commenced in October 2017 with dredging activity taking place within the navigation channel and fairway within Dublin Bay. The ABR Project capital dredging of the section of navigation channel adjacent to the MP2 Project channel widening is scheduled for the winter season October 2020 – March 2021.

A layout of the proposed channel widening works is indicated in Figure 3-12. A typical cross section of the proposed works is indicated in Figure 3-13.

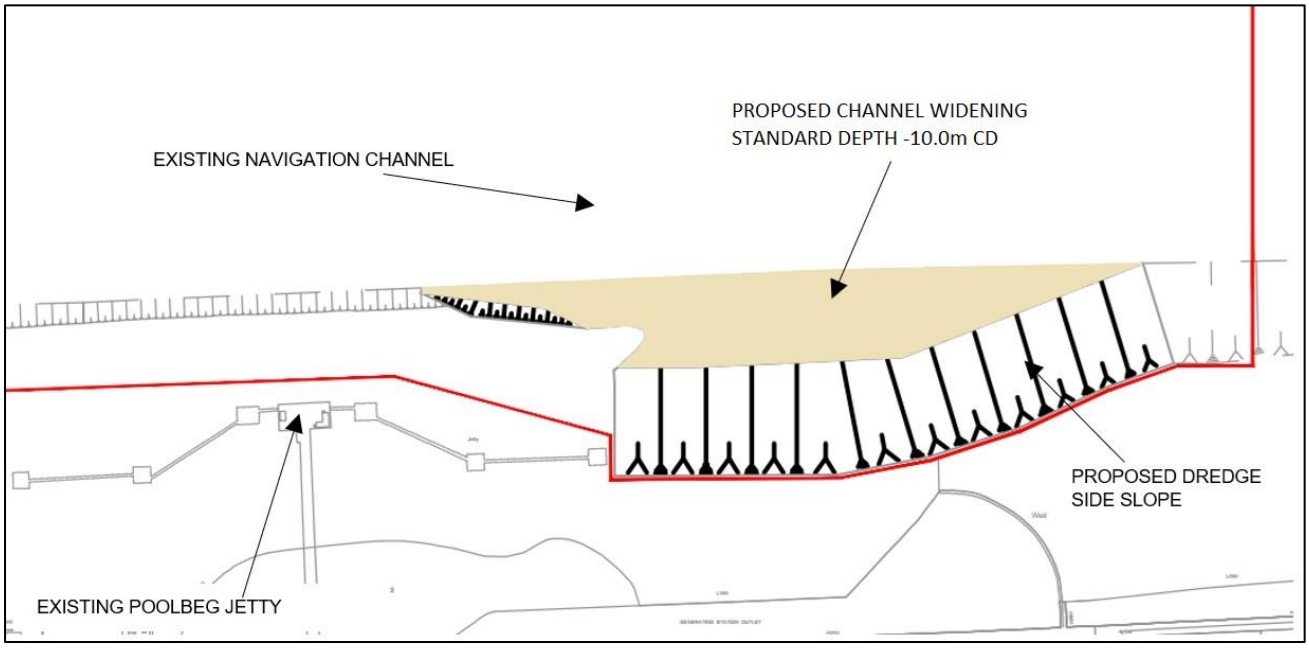

Figure 3-12 Plan view of proposed channel widening works

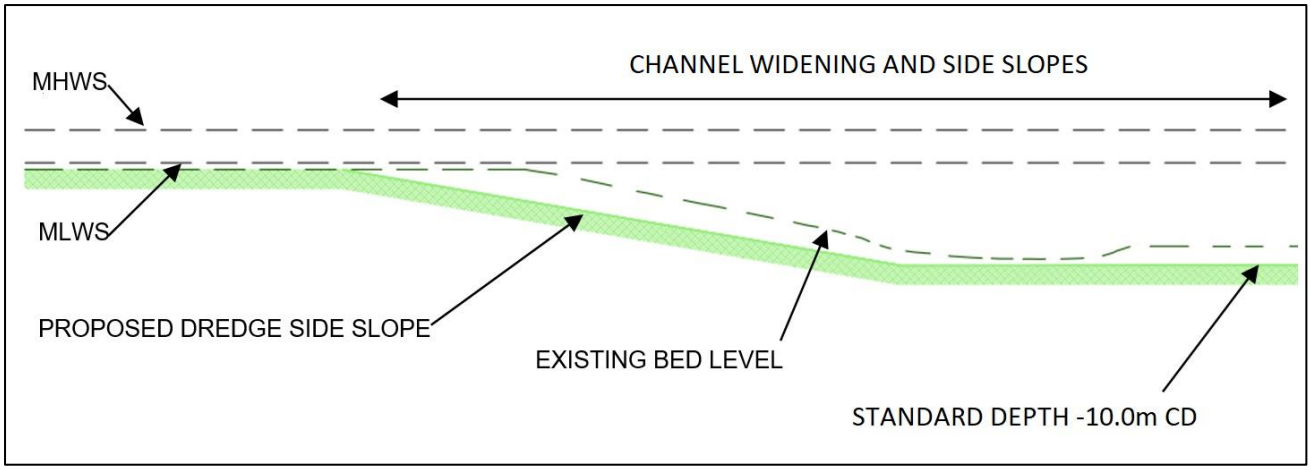

Figure 3-13 Cross section through proposed channel widening works

3.2.7 Dredging & Disposal Works

The volume of capital dredging required for each element of the works, as described in the previous sections, is tabulated in Table 3-1.

Table 3-1 Dredging Summary

Element of Work	Reference within Section 3 '*Proposed Development*'	Standard depth	Volume
Berth 53	Section 3.2.3	-10.0m CD	159,595m^3
Channel Widening	Section 3.2.6	-10.0m CD	111,995m^3
Oil Berth 3	Section 3.2.5	-13.0m CD	83,414m^3
Berth 50A	Section 3.2.4	-11.0m CD	69,640m^3
Total Volume to be dredged			**424,644m^3**

The capital dredging works will be carried out using a trailing suction hopper dredger and/or a backhoe dredger. Other ancillary equipment will include a survey vessel and bed-leveller to remove peaks and troughs created by the dredger.

It is proposed to dispose of the dredged material at the licenced dump site at the entrance to Dublin Bay located to the west of the Burford Bank, presented in Figure 3-14.

The loading and dumping of the dredged material will be subject to separate consents; a Foreshore Licence is required from the Department of Housing, Planning and Local Government (DHPLG) and a Dumping at Sea Permit is required from the Environmental Protection Agency (EPA).

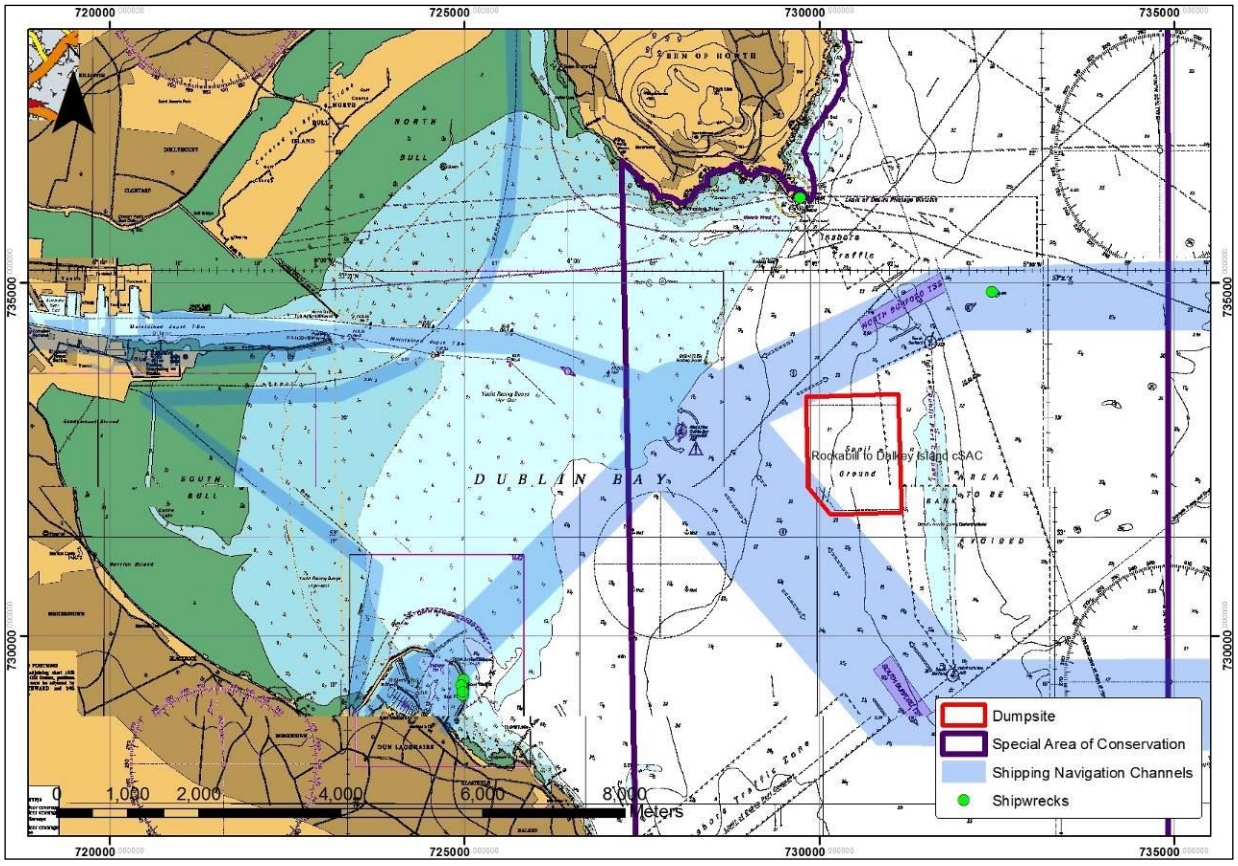

Figure 3-14 Location of licensed offshore disposal site

3.2.8 Unified Ferry Terminal

3.2.8.1 Overview

It is proposed to provide a Unified Ferry Terminal at the eastern end of the port to facilitate Irish Ferries, Stena Line, P&O and the seasonal Isle of Man service. The existing Seatruck operation in this area will be relocated to the western end of the port.

The area at the eastern end of the port currently includes facilities for traffic and passengers both within the International Ship and Port Facility Security Code (ISPS) restricted area and areas outside the restricted area where public access is possible. In order to improve efficiency and optimise the Ro-Ro yard area it is proposed to relocate all public access to the perimeter of the site leaving the internal area free for unified port operations. Upon the completion of the MP2 Project this area will comprise approximately 34.4 hectares of hardstanding space (35.8ha inclusive of State Services Yard which was constructed under the Dublin Port Interim Unified Passenger Terminal [IUPT] - Project Reg. Ref. 3638/18).

The area will be flexible as the usage of the port evolves and will generally be split into staging areas for accompanied heavy goods vehicles (HGVs), accompanied cars and unaccompanied trailers. Circulation routes will be provided to route vehicles from the check in area to each staging area and from each staging area to the berths. Routes will also be provided to route vehicles from the berths back to the unaccompanied staging area and to the exit via the state services yard.

A site plan of the proposed land elements of the works is presented in Figure 3-15. A site plan indicating the operational layout of the Unified Ferry Terminal is presented in Figure 3-16

The proposed land elements of the works will not impede on the existing railway lines present within the site boundary.

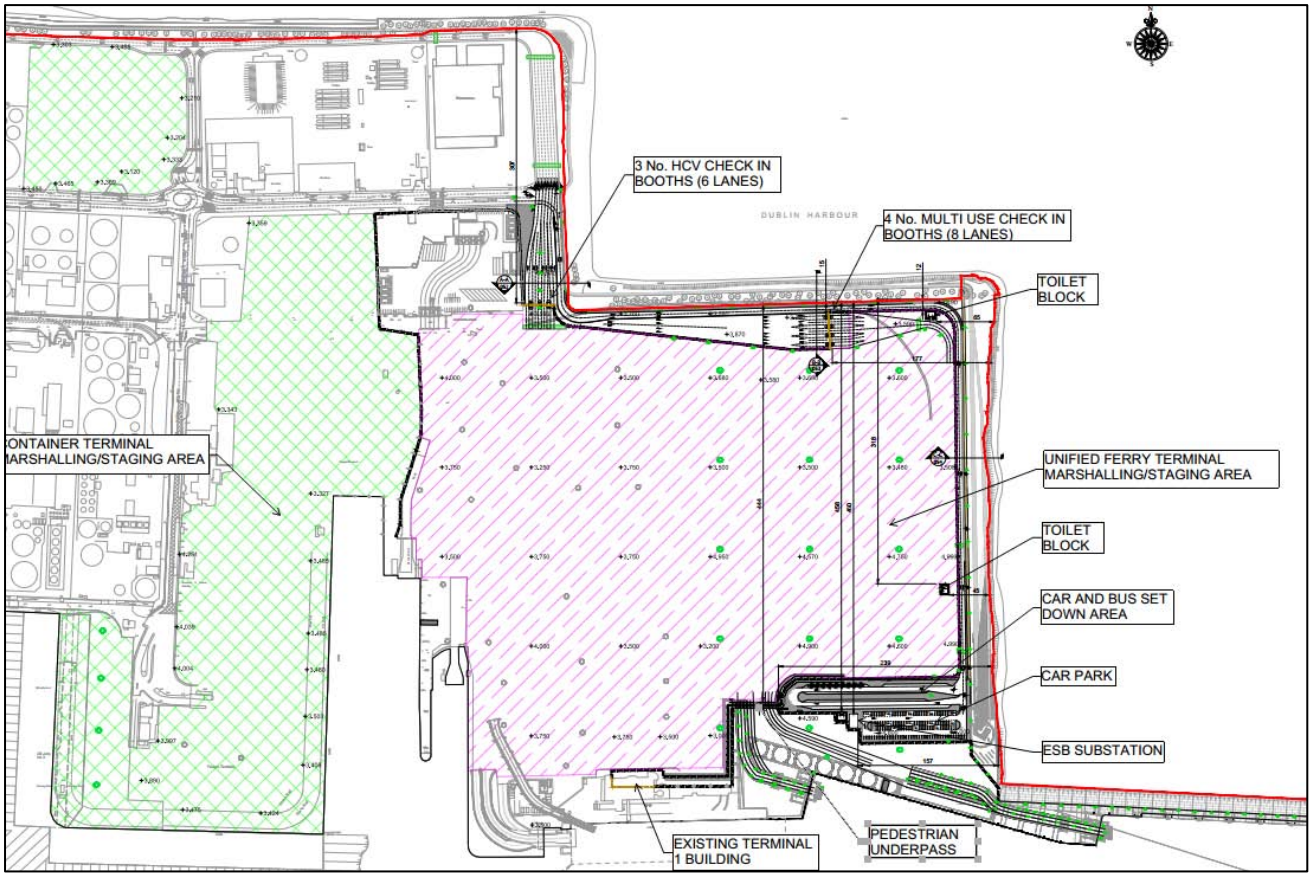

Figure 3-15 Site Plan of the proposed landside elements of the works

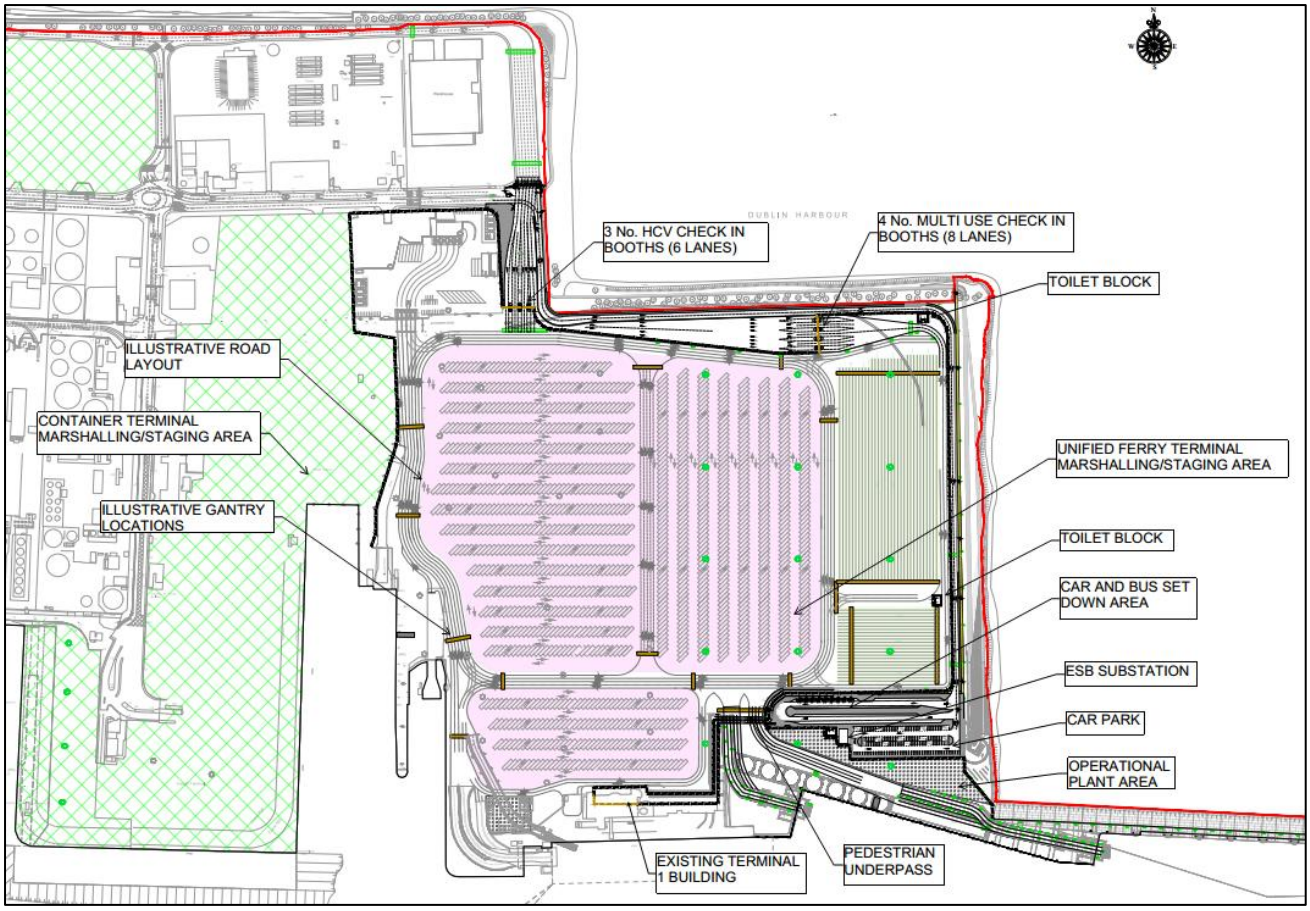

Figure 3-16 Operational Layout of the proposed Unified Ferry Terminal

3.2.8.2 Demolitions

In order to facilitate the proposed Unified Ferry Terminal [UFT] it is a requirement to demolish existing structures within the site. A number of structures are to be demolished in advance of the MP2 Project as part of other permissions.

The demolitions proposed as part of the MP2 Project are outlined below. The gross floor area of each element is provided.

- Terminal 2 Building – steel framed clad structure (1,058m^2)
- Terminal 2 Check In – prefabricated cabin units with steel frame canopy above (603m^2)
- Terminal 5 Building / Offices – modular lightweight structure (796m^2)
- Terminal 5 Check In – prefabricated cabin units, (97m^2)
- Terminal 5 Sheds (3 no.) – Steel framed clad structure with masonry walls (Shed 1 - 325m^2, Shed 2 - 162m^2, Shed 3 - 316m^2
- Terminal 5 Substations (2 no.) – masonry and concrete structure (Substation 1 - 47m^2, Substation 2 - 100m^2)
- Terminal 1 Car Check In - prefabricated cabin units (72m^2)
- Oil Berth 4 basin pontoon – steel frame (198m^2)

- Pier Head – (Overall Area 2,950m^2) Masonry blocks with material infill. Demolition includes modular lightweight port operations building (600m^2) and steel framed mast.
- Head of Oil Berth 3 – concrete / masonry jetty (275m^2)

The Proposed Demolition Plan is presented in Figure 3-17.

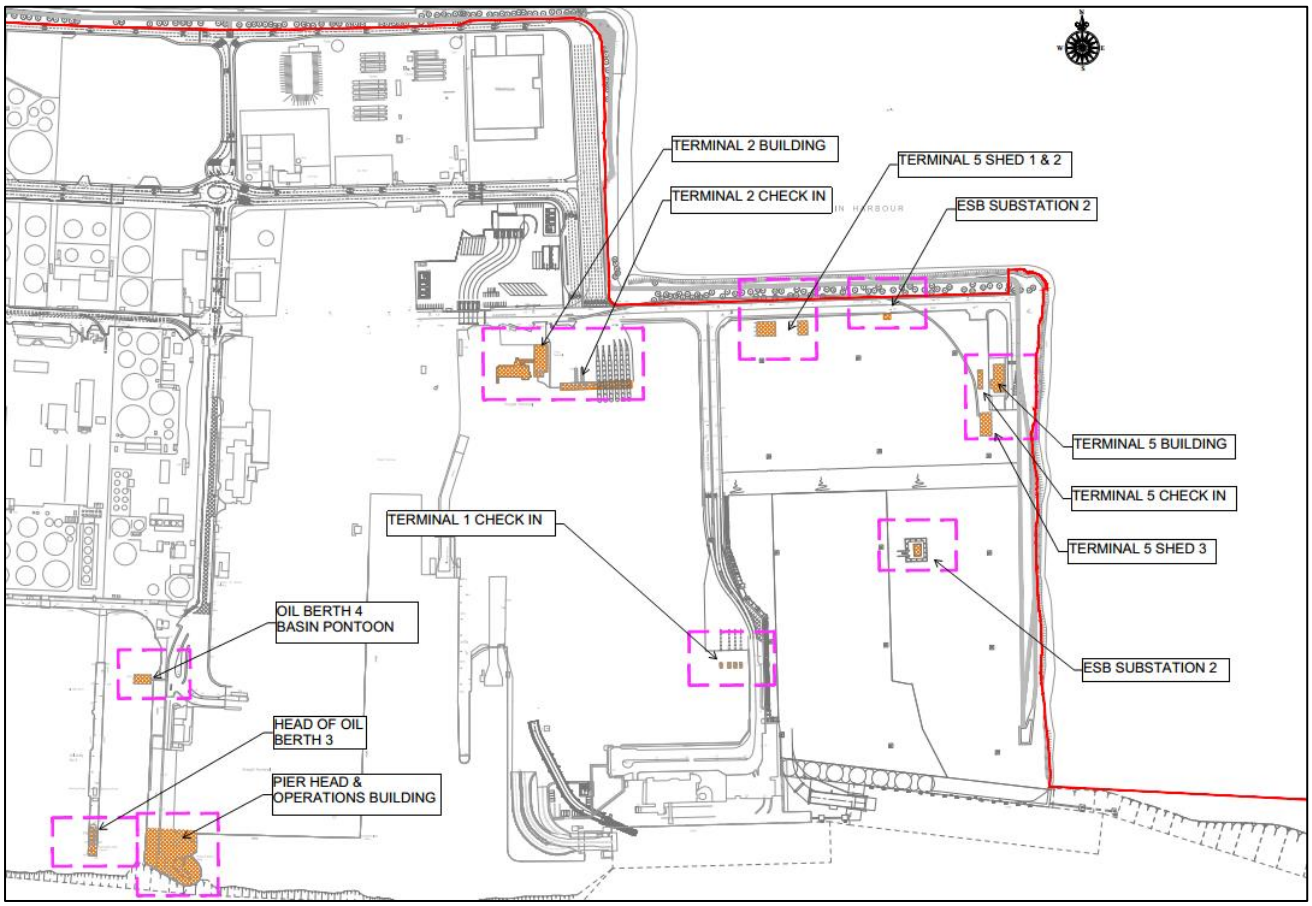

Figure 3-17 Demolition Plan

3.2.8.3 Departures

It is proposed that departing vehicles will arrive to the new Unified Ferry Terminal (UFT) via Promenade Road and the Promenade Road Extension which will be constructed as part of the Dublin Port Internal Roads Project (consented under Reg. Ref. 3084/16). A diagram of the proposed departure route is presented in Figure 3-18. As part of the Dublin Port Internal Roads Project (consented under Reg. Ref. 3084/16), there are seven southbound lanes proposed to link the Promenade Road Extension to the entrance to the UFT at Alexandra Road. There are also four north bound lanes to link arrivals from UFT to Tolka Quay Road.

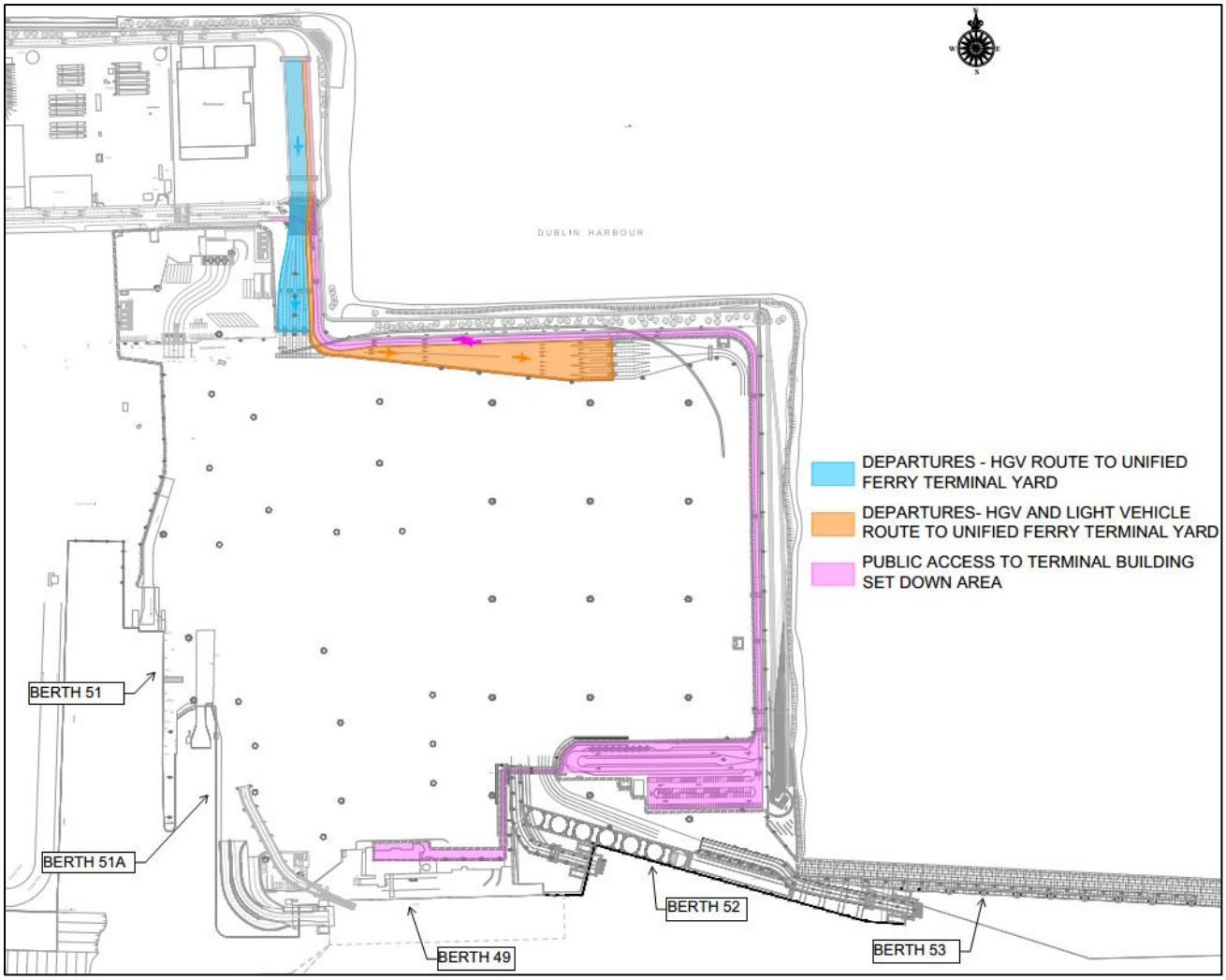

Figure 3-18 Departure Routes

At the end of Promenade Road Extension, the seven departure lanes will be separated through gantry signage with lane designations as indicated below:

- Lane 1 (eastern lane) public access to Terminal 1
- Lane 2 Access to dual use check in booths (HGV/ Light Vehicle)
- Lane 3 to 7 HGV access to check in, which will subsequently split to six check-in lanes.

In order to facilitate infrastructure for departures and public access to Terminal 1 the full width available in this area from the edge of the State Services yard to the west to the edge of the greenway to the east, is required. This will prevent installation of the four northbound arrival lanes as consented under the Internal Roads Project with traffic diverted through the State Services Yard. Arrivals is discussed further below.

3.2.8.3.1 Heavy Goods Vehicles

HGV check in will be facilitated at the proposed six lane HGV check-in facility at Alexandra Road and the proposed dual use eight lane check in facility towards the North East corner of the site. The queue lengths have been estimated based on target check in times to ensure adequate space is available in advance of the check-in booths to prevent pre-check in HGV queues from impacting on the public access to the Terminal building or

light vehicle access to the dual use check in booths. As the port traffic increases, evolving technology will reduce the target check-in times to reduce the queue. Additional pre-check-in staging areas for HGVs will be provided elsewhere within the port if required. The proposed check-in areas include new double-sided check-in booths with a canopy provided above for cover. It is proposed to provide three new booths to service the six dedicated HGV check in lanes and an additional four booths to service the eight dual use lanes.

Following check-in, accompanied HGVs will be routed through internal circulation roads to a dedicated HGV pre-boarding holding area to await departure. Toilet facilities will be provided in this area and a pedestrian route to the terminal building will also be available via the proposed pedestrian underpass which will maintain all accompanied passengers within the ISPS restricted area. Once called from the holding area by the operator the HGVs will be routed through the internal circulation roads to the relevant berth for departure.

Unaccompanied HGVs will be directed through internal circulation routes to the relevant unaccompanied HGV staging area. Each HGV will be routed to the relevant set down space and drop off the HGV trailer before the HGV tractor unit will leave the port. The trailers will be collected by port tractor units and moved onto the relevant ship for departure.

3.2.8.3.2 Car / Tourism Vehicles

It is proposed that check-in for car / tourism vehicles will be facilitated at the new 8 lane dual use (HGV and light vehicle) check in facility at the north eastern corner of the site. The check in area will include four new booths to facilitate eight check-in lanes as discussed in HGV check-in section above. Gantry signage will be used to designate lanes and separate cars and HGVs queuing in this area. The queue lengths have been estimated for various scenarios, based on anticipated traffic, booth numbers and check in times. The design ensures that adequate space is available to facilitate the car/tourism pre-check in queue in line with the guidance on the COMAH Land Use Planning Assessment prepared for the project and discussed in Chapter 6. This requires that only a small portion of this queue (up to 10%) extends into the 'middle risk zone'.

Following check-in, accompanied cars will be routed through the internal circulation routes to the dedicated car staging area to await departure. Toilet facilities will be provided in this area and a pedestrian route to the terminal building will also be available via the proposed pedestrian underpass which will maintain all accompanied passengers within the ISPS restricted area. Once called from the holding area by the operator the vehicles will be routed through the internal circulation roads to the relevant berth for departure.

3.2.8.3.3 Foot Passengers

The existing Terminal 1 will facilitate foot passengers for all berths and operators. Access to the Terminal building will be via the proposed public road which runs around the northern and eastern perimeter of the UFT outside of the ISPS Restricted Area. A cycle track is also provided in this area which links with the cycle facilities proposed under the Dublin Port Internal Roads Project (consented under Reg. Ref. 3084/16), A set down area for both cars and buses and parking facilities is provided outside the south-east corner of the UFT. Access from this point to the terminal building will be on foot with a pedestrian underpass provided to cross pedestrians beneath vehicle movements associated with Berth 52 and 53. Foot passengers will use the existing check-in facilities to cross into the ISPS restricted area within the building. Access to ships on Berth 49 will be available directly from Terminal 1 with access to vessels on other berths by bus from the building. For Berths 51 and 53

the bus will drop passengers off within the vessel and the busses will drop off at passenger walkway structures for Berths 51 and 52.

3.2.8.4 Arrivals

A new State Services facility has been constructed as part of the Interim Unified Passenger Terminal (IUPT) Project (Project Reg. Ref. 3638/18) to the north of the UFT. All vehicles using the port will continue to depart via this area where checkpoint and inspection facilities are provided for An Garda Síochána, Revenue and the Department of Agriculture, Food & Marine.

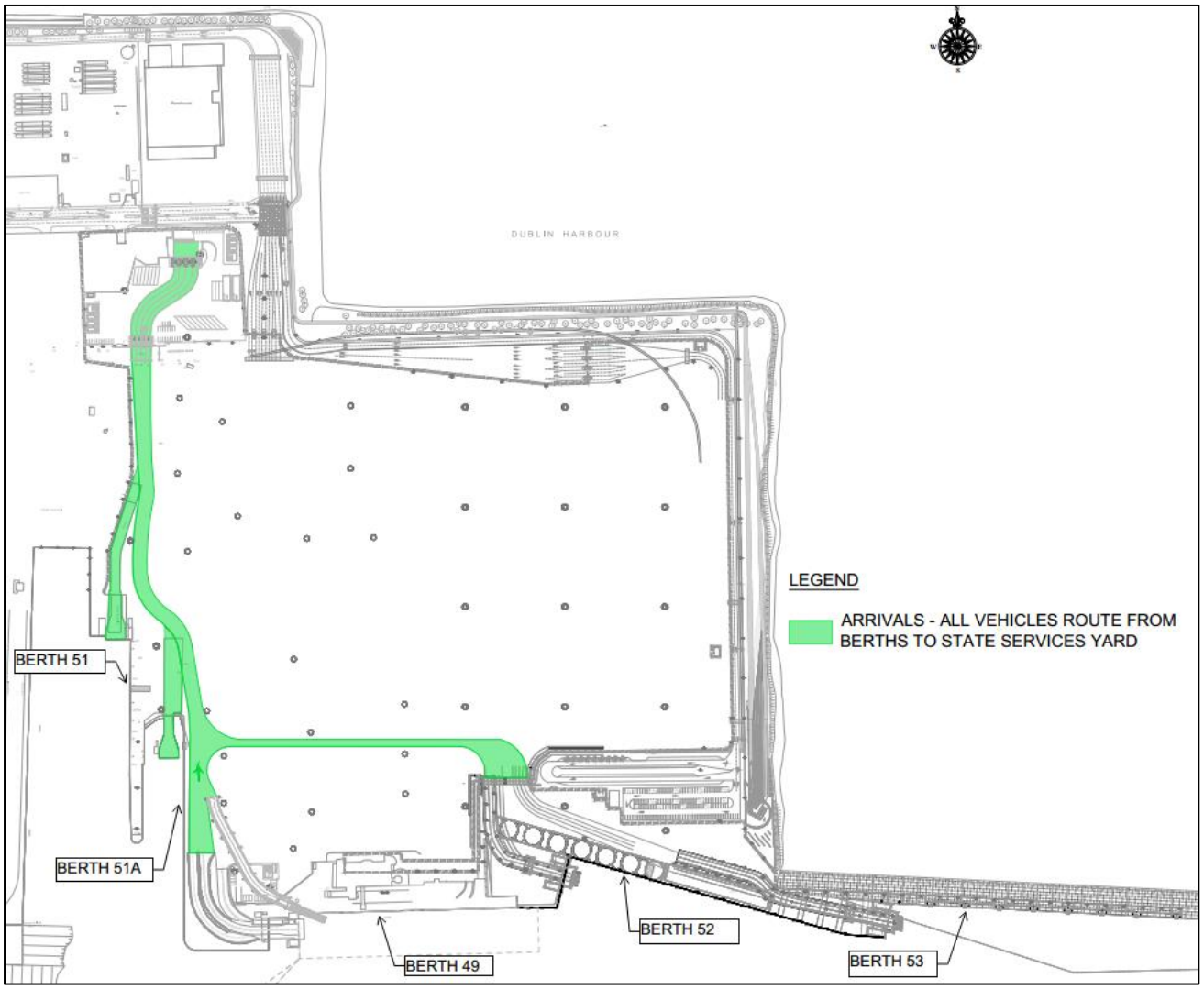

Figure 3-19 Arrival Routes

3.2.8.4.1 Accompanied Vehicles

Accompanied vehicles will be unloaded from the ships and directed through internal circulation routes to the state services yard. The operational layout of the UFT is provided which indicates how internal circulation could be provided with flexibility in mind to ensure it is possible to re-route vehicles arriving on the ships through the UFT to reach the back of any arrivals queue in the event of a delay in the state services yard. Lanes within the pre-boarding staging areas may also be used to hold arrival vehicles if required in the event of a significant delay.

3.2.8.4.2 Unaccompanied Units

The unaccompanied units will be unloaded by port tractors to a designated unaccompanied trailer holding area. The articulated tractors collecting the vehicles will enter the port through the HGV check in lanes and route to the relevant unaccompanied staging area and collect the relevant trailer. The HGV tractor and trailer unit will then exit via the state services yard.

3.2.8.5 Foot Passengers

Arriving foot passengers will be transported back to the terminal by bus (and walkway from Berth 49). They will exit the ISPS Restricted Area through the check point for An Garda Síochána; Revenue and the Department of Agriculture, Food & Marine using the facilities already in place in Terminal 1. They will then walk through the public side of the pedestrian underpass to access the pick-up and public transport facilities available at the set down and parking area. Vehicles departing this area will then pass along the public perimeter road on the north and east boundary of the UFT and cross the HGVs queuing pre-check-in using the proposed signalised junction before joining the main port exit route on Tolka Quay Road.

3.2.8.6 Structures

The proposed primary landside structures are as follows:

- **Heritage Installation**

  The MP2 Project includes a proposal to create a Heritage Zone, commemorating the industrial and cultural heritage of Dublin Port in the following ways:

  - The original location of Pier Head (which will be removed as part of the MP2 Project) will be recorded in inscribed text on the new quay at Berth 50A.
  - A new structure or 'Marker' will be created to denote the final entrance and exit point to the port as envisaged by the Dublin Port Masterplan 2040, reviewed 2018. The Marker will incorporate the original bell and lantern which have been salvaged for conservation from the lighthouse that once stood at the end of Breakwater Road, which demarcated the end of the port in the Victorian era. A view of the Marker is presented in Figure 3-20.
  - Accessible to the public by bridge, the Marker includes a viewing and interpretative deck to communicate the history of Pier Head, the legacy of Port Engineer Bindon Blood Stoney and the significance of the surrounding environment, providing views over the port and Dublin Bay.
  - Beneath the Marker, an informal performance space in the shape of the Breakwater 'roundel' will create a small amphitheatre defined by retained granite from Pier Head.
  - The proposal includes for a Sea Organ and Aeolian Harp, natural musical instruments which 'play' when water laps against a series of pipes and wind blows against a series of strings.
  - The Heritage Zone will converge with the end of the new 4km Greenway already planned at Dublin Port (Dublin Port Internal Road Network – Reg. Ref. 3084/16), providing newly accessible public realm for leisure and recreation purposes.

Figure 3-20 View of the Marker looking South

A full description of the proposed Heritage Installation is presented in the following reports (under separate cover) which form part of the application for permission.

- Industrial Heritage Impacts and Compensation Planning and Design Report (MOLA Architecture)
- Conservation Strategy and Industrial Heritage Appraisal (Southgate Associates).

- **Pedestrian Underpass:** A pedestrian underpass is proposed to facilitate pedestrian links to the existing Terminal Building. It is proposed that the structure will have two independent corridors to separate passengers within the ISPS restricted area, accessing the Terminal Building from the Accompanied Staging Area, from members of the public, accessing the Terminal Building from the set down and parking area. On each approach on each side of the ISPS line it is proposed to install Part M Compliant ramps and ambulant disabled stairs. The proposed pedestrian underpass plan is presented in Figure 3-21. A section through the underpass as indicated on plan is present in Figure 3-22.

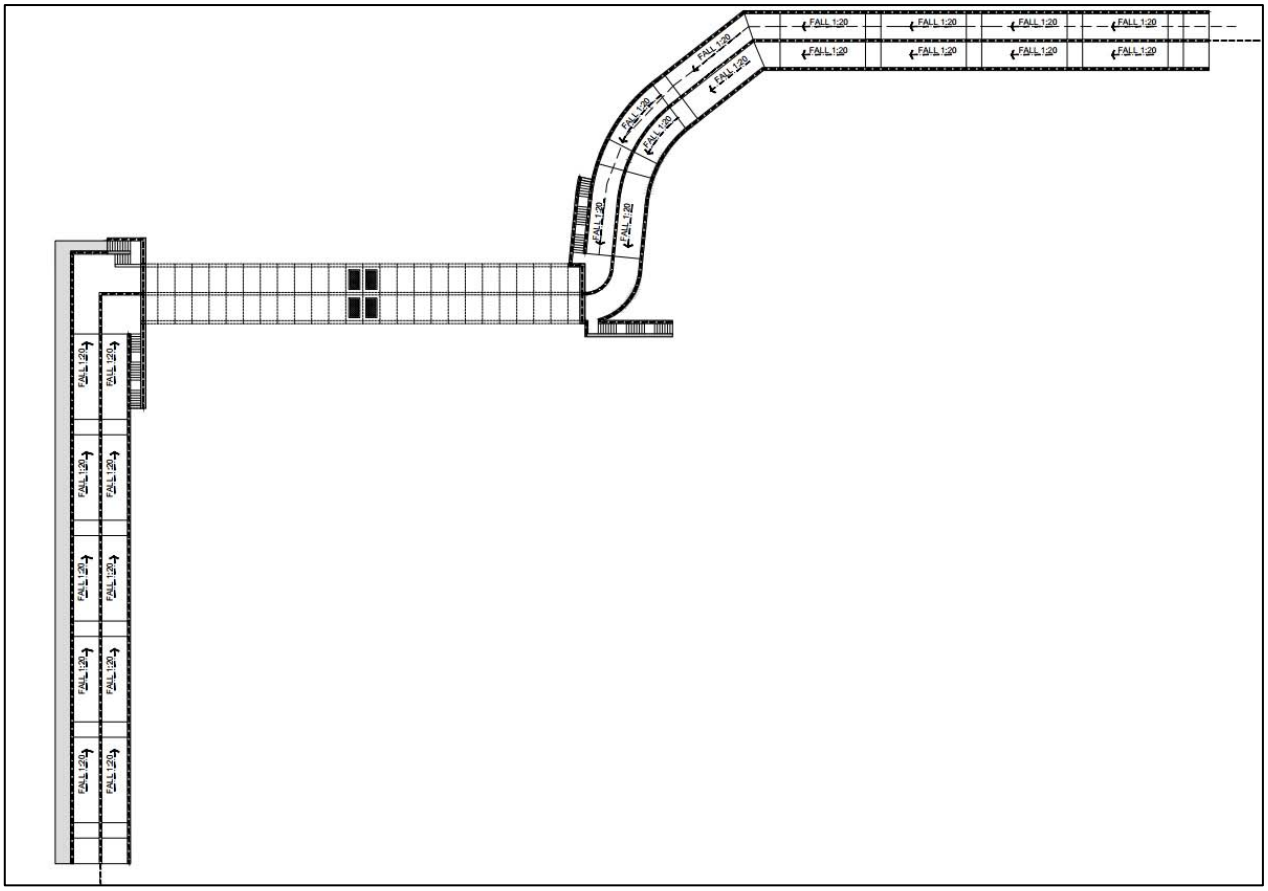

Figure 3-21 Proposed Pedestrian Underpass Plan

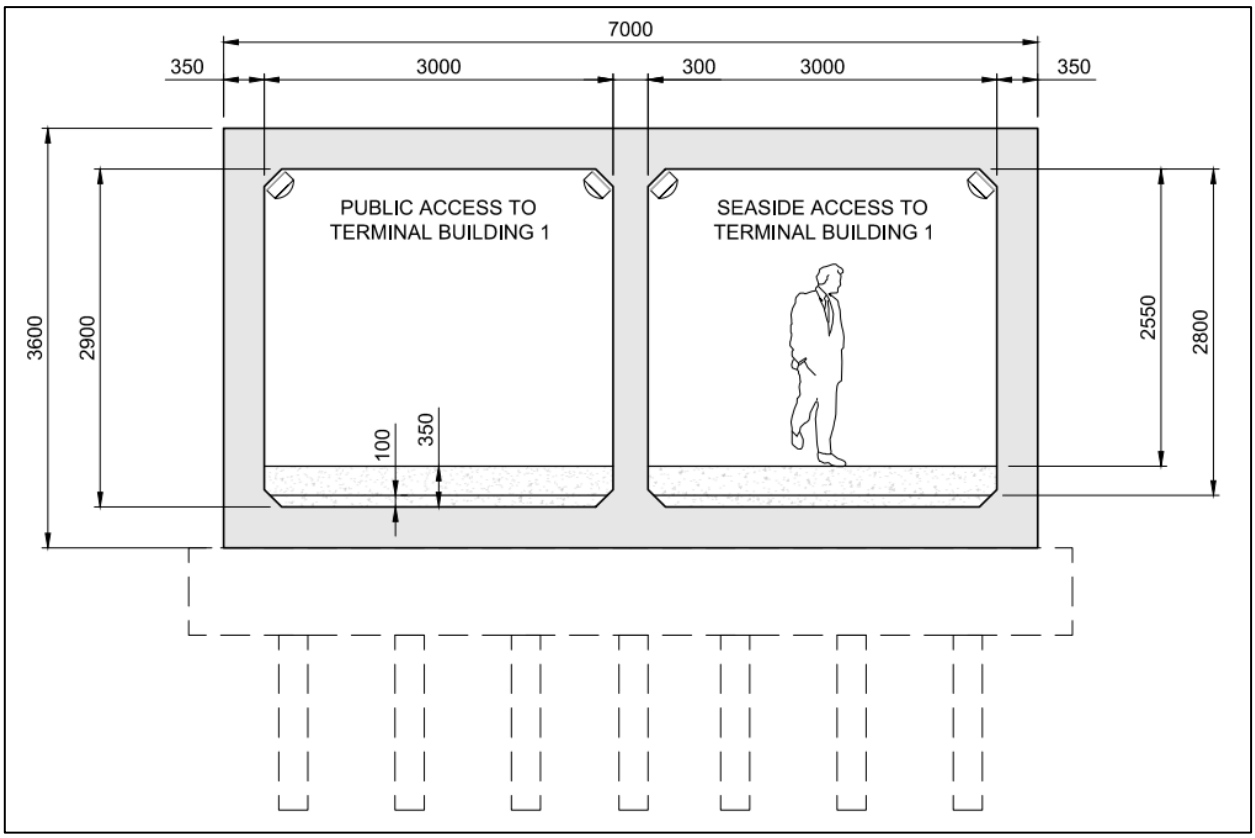

Figure 3-22: Proposed Pedestrian Underpass Section

- **Passenger Walkways:** It is proposed to provide passenger walkway plant to access Berth 51 and Berth 52. Each unit will include an ambulant disabled stairs and an enclosed high-level walkway to facilitate access to the ship. Structures are steel framed lightweight construction. The units will be rubber wheeled mobile port plan of steel framed lightweight construction.
- **Existing Passenger Terminal 1 Building:** It is proposed to retain the existing Terminal 1 Building as the Unified Ferry Terminal Building. An assessment of the building has been undertaken to consider the ability of the building to provide for the peak number of departing and arriving foot passengers. The assessment concluded that adequate capacity is available for the predicted building use. Routes to access and exits points at the building will also be adjusted to maintain separation of passengers and the public using the pedestrian underpass.
- **Toilet Blocks: –** It is proposed to install two toilet blocks within the Unified Ferry Terminal Yard to provide facilities for staff and passengers of accompanied vehicles. A third toilet block which will be accessible by the public is proposed adjacent to the Terminal Building set down and parking area.
- **Gantries:** Gantry structures are proposed to direct traffic both to and within the UFT. The structures will be steel framed construction supported on piled foundations in line with existing gantry signage located within the port. Both static and variable message signage will be installed on the gantries.
- **Lighting:** The street lighting within the UFT has been designed in accordance with CIE 140 and EN 13201-2015. It is proposed to utilise the existing and consented lighting where possible with additional High Mast Lighting (HML) and Street Lighting where required to provide required luminance and uniformity. The locations of HML poles consented under the ABR Project have been adjusted slightly to take account of the design layout. Proposed street lighting for the development is indicated within the project drawings.
- **Security Fence:** It is proposed to install a new security fence to define the edge of the ISPS Restricted Area at the perimeter of the UFT. The boundary proposed is a 4m high steel bar railing as indicated in the project drawings.
- **Utilities:** It is not proposed to make significant adjustments to existing utilities as part of this project with individual changes required discussed below.
  - Watermain: The existing watermain network will be extended to serve Berth 52 and Berth 53. Facilities will be provided for freshwater bunkering at these berths. It has been confirmed by Irish Water through the pre-connection enquiry process that it is feasible to provide the required additional water demand to facilitate this. Refer to Appendix 5 for the Irish Water pre-connection enquiry and confirmation of feasibility letter.
  - Wastewater Drainage: A gravity sewer is proposed to link the proposed toilet blocks to the existing gravity sewer serving Terminal 5 (which is to be demolished). The existing toilet provision at Terminal 1 Building is considered adequate for the proposed use. It is not anticipated that there will be any increase in the peak wastewater discharge to the public sewer as a result of the development.
  - Stormwater Drainage: There is limited additional hardstanding area proposed within the UFT to that already in place and that consented under the ABR Project. The additional hardstanding is due to the proposed Berth 53. It is proposed to collect storm water on the new hardstanding areas in a closed

system and discharge via a new silt trap and oil interceptor/separator to the outfall at Berth 52 as consented as part of the ABR Project. This approach has been agreed in principal with Dublin City Council. Refer to Appendix 5 for a record of correspondence on same.

- Electrical: It is proposed to provide a new substation to the South East corner of the UFT to facilitate the additional power demand of the proposed UFT and to replace the loads provided by two existing substations within Terminal 5 which are proposed to be demolished. The new substation will also facilitate Shore to Ship Power (SSP) for Berth 52 and 53 to provide required hoteling power demand of berthed vessels. Each berth will be equipped with the required transformer within the new substation building which will serve as galvanic separation between harbours electric grid and the vessels electric system. The substation will link to a power outlet at Berth 52 and Berth 53 to facilitate a connection to berthed vessels. Preliminary consultations with ESB have indicated that they can provide the required level of capacity to feed this sub-station from their existing network, with MV cables uprated locally where required.
- Communication Network: It is proposed to install ducting to link the proposed development areas back to the existing communications network within the port.

3.3 CONSTRUCTION PHASE

3.3.1 Construction Elements

The elements of the construction phase of the MP2 Project are:

Modification of the permitted Berth 52 and Berth 49 layout (ABP Ref. 29N.PA0034).to accommodate the proposed new Berth 53. Filling of the existing Berth 52/53 Basin This will include encompassing the consented Berth 49 eastern dolphins within a new quay wall structure.

- Construction of a new Ro-Ro berth – Berth 53, with dredging, scour protection mattresses and wash protection structure;
- Extension of Berth 50A by the removal of the existing Port Operations Building and Pier Head at the terminus of the 19th Century Eastern Breakwater. The proposed development will comprise an extension to Berth 50A to accommodate Lo-Lo vessels;
- Construction of new quay at Oil Berth 3 and infilling of the basin at Oil Berth 4;
- Channel dredging works;
- Dredging at Oil Berth 3 and Berth 50A to accommodate future vessels;
- Heritage Installation;
- Redevelopment and optimisation of the ferry terminal yard to include:
  - Demolition of existing buildings as indicated;
  - Construction of roads and access routes to check in areas and Terminal 1 Building;

- Construction of two new vehicle check in areas including double sided dual booths with canopies above;
- Construction of new car parking area and set down area for Terminal 1 Building;
- Construction of new pedestrian underpass to access the existing Terminal 1 Building;
- Construction of three new toilet blocks
- Adjustment to existing utilities and drainage;
- Construction of new substation building;
- Installation of new ISPS security fence;
- Installation of overhead gantries with static and variable message signage;
- Installation of new High Mast Lighting and Street Lighting;
- Regrading of levels from western edge of consented ABR Project infill;

3.3.2 Construction Sequence Summary

The following construction sequence summary has been separated into two elements: land phases and marine phases. The proposed project phasing plan is presented in Figure 3-23. The sequencing programme is presented in Figure 3-24.

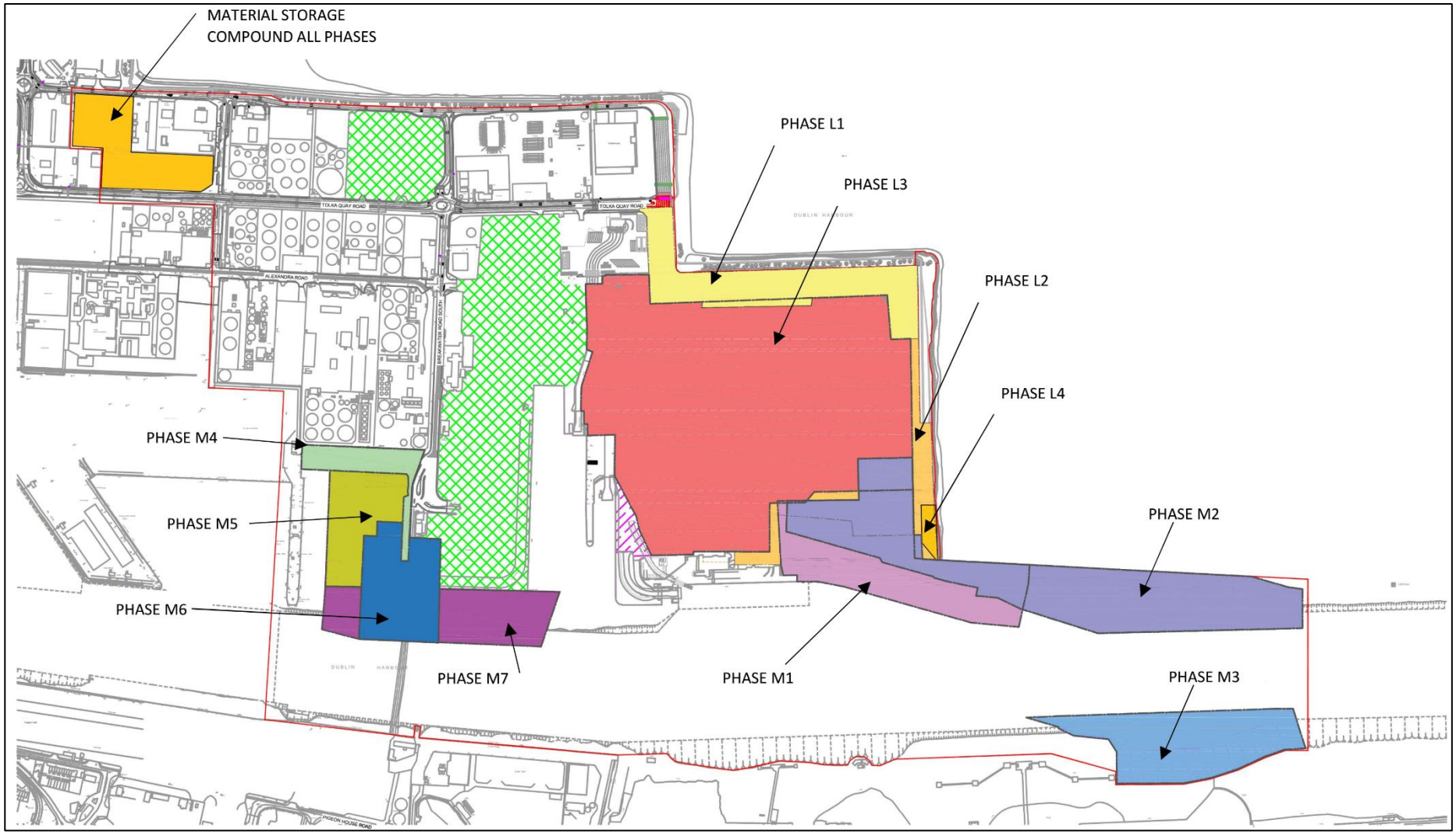

Figure 3-23 Plan of general project phasing

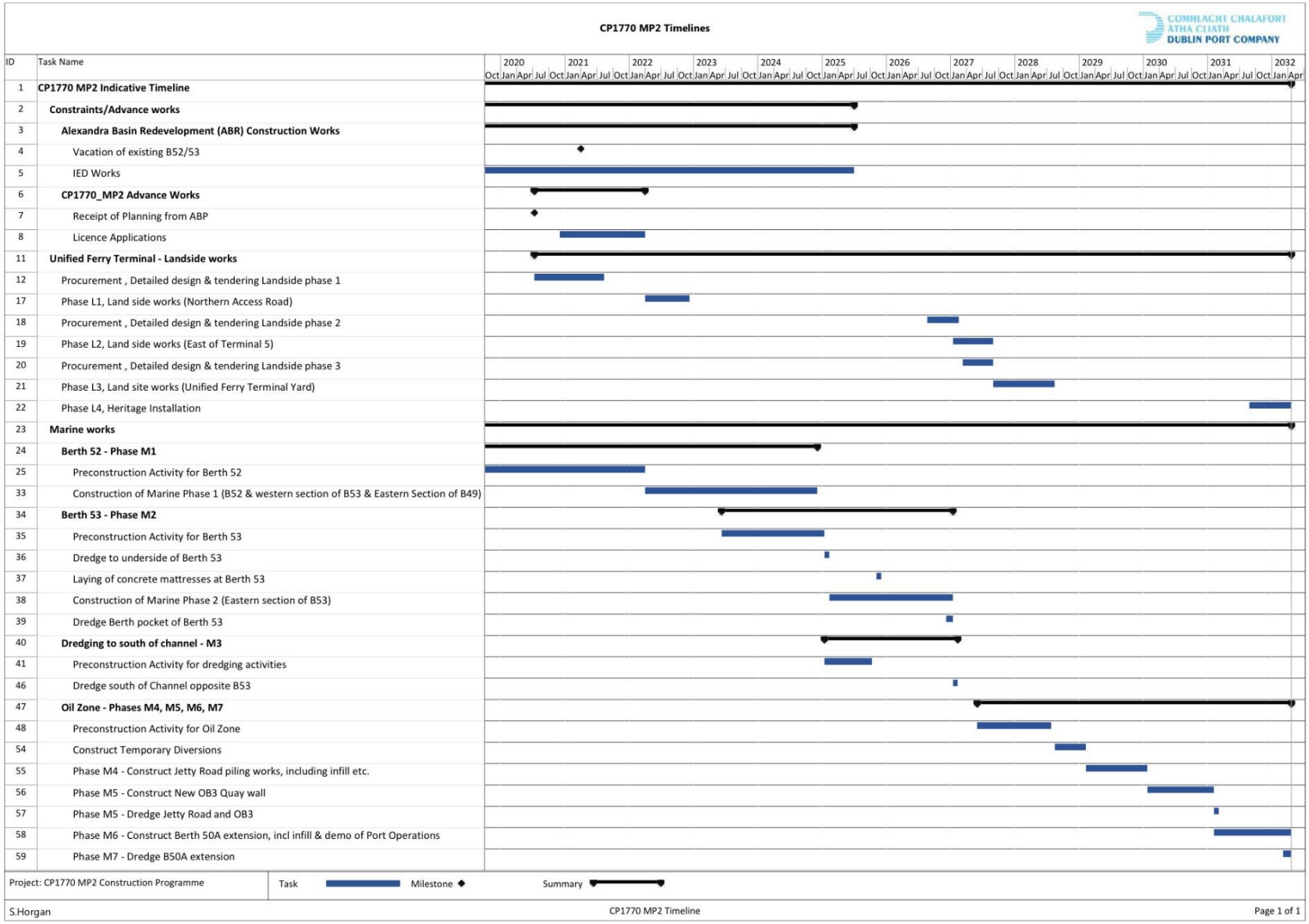

Figure 3-24 Sequencing Programme

3.3.2.1 Phase L1 – Northern Access Road

Phase L1 comprises the following:

- Demolition of: Terminal 5 Shed 1, Terminal 5 Shed 2, ESB Substation 1;
- Installation of underground services and drainage;
- Construction of new access routes, including gantry signage and street lighting, to the north side of the site and tie in with the DPC internal road network;
- Construction of Toilet Block 3
- Installation of both check-in areas for future commissioning;
- Installation of gated access to the greenway at the north east corner of the site.

The works will take approximately 6 months to complete, commencing in Q1 2022.

3.3.2.2 Phase M1 – Berth 52

Phase M1 will commence at the same time as Phase L1 (Q1 2022). It is proposed to complete the filling of the basin (ABP Ref. 29N.PA0034), by the construction of a temporary rock armour causeway to the south of the basin. The rock armour causeway will seal the basin from the main navigation channel. The causeway will then be used as the construction platform for the commencement of Phase M1.

The following works in the water are proposed:

- Construction of cellular sheet pile wall (modification from ABP permission 29N.PA0034);
- Construction of steel pile combi-walls;
- Commencement of the installation of the piles and lower deck level to Berth 53.

The following works out of the water are proposed:

- Installation of linkspan structure;
- Installation of reinforced concrete deck;
- Installation of access structure to upper tier linkspan;
- Installation of services and jetty furniture.

The works programme will be 33 months commencing in Q1 2022. Piling in the River Liffey Channel will not take place between March and May in order to avoid the main salmon smolt run. Piling on the land for the deadman walls and rear of the cellular sheet pile structures may occur in this period.

3.3.2.3 Phase M2 – Berth 53

Phase M2 will commence in Q1 2025 after Phase M1 is completed (Q1 2024). The new deck constructed for Berth 53/Phase M1 will allow construction access to Berth 53.

The following works in the water are proposed:

- Dredging of berth pocket (to a standard depth of -10.0mCD) and side slopes and disposal at sea;

- Installation of slope stabilisation mattresses;
- Installation of vertical and raking piles for the jetty deck and dolphins;
- Installation of vertical piles for wash protection structure.

The following works out of the water are proposed:

- Construction of reinforced concrete decks;
- Construction of reinforced concrete dolphins;
- Installation of steel beams and precast concrete baffles for the wash protection structure;
- Installation of reinforced concrete maintenance access road;
- Installation of linkspan structure;
- Installation of access structure to upper tier linkspan;
- Installation of services and jetty furniture.

The works programme will be 24 months, commencing in Q1 2025.

Construction works will temporarily cease at Berth 53 during extreme low Spring Tides when bird feeding habitat becomes available within the SPA immediately northward of the works.

3.3.2.4 Phase L2 – Eastern Access Road

Works at Phase L2 will commence after the filling the basin under ABP permission 29N.PA0034 and after Phase M2, i.e. Q1 2027. It will comprise the following:

- Demolition of: Terminal 5 Check In, Terminal 5 Building, Terminal 5 Shed 3;
- Installation of underground services and drainage;
- Construction of new access routes, including gantry signage and street lighting, to the east side of the site;
- Construction of an at-grade car park with designated spaces and bus and car set down area;
- Construction of Toilet Block 1
- Construction of ESB Substation;
- Installation of pedestrian underpass with ramp and stair access;

The works will take approximately 6 months to complete, commencing in Q1 2027.

3.3.2.5 Phase L3 – Unified Ferry Terminal Yard

Phase L3 will be the final phase of works at the Unified Ferry Terminal Yard. Works to the State Services Yard will have been completed as part of the Interim Unified Ferry Terminal project before the commencement of Phase L3.

It will comprise the following:

- Demolition of ESB Substation 2, Terminal 1 Check In, Terminal 2 Building, Terminal 2 Check In;
- Construction of Toilet Block 2;
- Installation of pavements in required areas (demolished buildings etc.);
- Regrading of levels at western edge of consented ABR infill;
- Installation of underground services and drainage;
- Installation of ISPS fencing;
- Installation of road markings;
- Installation of High Mast Lighting;
- Connection to the L1 and L2 road networks;
- Internal upgrade works to the existing Terminal 1 Building;

The works will take approximately 12 months to complete, commencing in Q3 2027.

3.3.2.6 Phase M3 – Channel Widening Works

Phase M3 will comprise the dredging and disposal at sea of seabed from the Liffey Channel. The dredging works will be carried out over one dumping at sea season with a programme of 1 month, commencing in Q1 2027. The works will be carried out after the dredging of Phase M2, but during the M2 primary jetty construction works. All capital dredging works will take place within the period October and March. These works will take place post Phase L1 but pre-Phases L2, L3 and L4.

3.3.2.7 Phase M4 – Jetty Road

Phase M4 will commence after the completion of Phase M3 which will have been completed in Q1 2027.

In advance of Phase M4 commencing, the bitumen importation pipelines shall be relocated to Oil Berth 01 & 02. The gas importation pipelines will remain in operation. No works will be permitted when vessels are berthed.

Phase M4 will comprise the construction of a new sheet pile combi wall at the jetty road. This element of the works will take approximately 12 months to construct, commencing in Q1 2029. The following works in the water are proposed:

- Installation of sheet pile combi-walls;
- Filling of the void between the existing wall at the Jetty Road and the proposed new wall with engineering fill;
- Filling of void between Oil Berth 4 and revetment with engineering fill;

The following works out of the water are proposed:

- Temporary diversion of the existing bitumen importation pipes;

- Installation of a temporary frame to support the existing gantry;
- Installation of sheet pile anchor walls;
- Installation of ground anchors;
- Construction of reinforced concrete decks;
- Installation of services and jetty furniture.

3.3.2.8 Phase M5 – Oil Berth 3

Phase M5 will occur after Phase M4 is completed.

Phase M5 will comprise the construction of a new steel combi sheet pile wall at Oil Berth 3. The construction works will commence in Q1 2030 and last approximately 12 months and the dredging work a further one month commencing in Q1 2031.

The following works in the water are proposed:

- Installation of sheet pile combi-walls;
- Filling of void between existing wall at Oil Berth 3 and the proposed new wall with engineering fill;
- Filling of void between Oil Berth 4 and revetment with engineering fill;
- Dredging to a standard depth of -13.0m CD and side slope and disposal at sea;

The following works out of the water are proposed:

- Temporary diversion of the existing bitumen importation pipes;
- Installation of a temporary frame to support the existing gantry;
- Removal of existing deck beams which span the concrete caissons;
- Installation of sheet pile anchor walls;
- Installation of steel bearing piles for the future crane rails;
- Construction of reinforced concrete decks;
- Installation of services and jetty furniture.

3.3.2.9 Phase M6 – Berth 50A

Phase M6 will commence after Phase M5 is completed.

Phase M6 will comprise the construction of a new sheet pile to the west end of Berth 50A. The primary construction works will last approximately 15 months, commencing in Q1 2031.

The following works in the water are proposed:

- Excavation of Pier Head at the Eastern Breakwater. All masonry units will be recorded and re-used as part of a heritage installation at the port (Phase L4). The made ground will be excavated and disposed of at a suitably licenced site;
- Excavation of the south end of the existing Oil Berth 3/4 jetty;
- Installation of sheet pile combi-walls walls;
- Fill of void between existing wall at Oil Berth 3 and the proposed new wall with engineering fill;
- Filling of void between Oil Berth 4 and revetment with engineering fill;
- Installation of ESB 220kV feeder cable bridging structure;

The following works out of the water are proposed:

- Demolition of the Port Operations Building;
- Installation of a temporary frame to support the existing gantry;
- Installation of sheet pile anchor walls;
- Installation of steel bearing piles for the future crane rails;
- Construction of reinforced concrete decks;
- Installation of services and jetty furniture;

Piling in the River Liffey Channel will not take place between March and May in order to avoid the main salmon smolt run. Piling on the land for the deadman walls and piling through the existing Eastern Breakwater may occur in this period.

3.3.2.10 Phase L4 – Heritage Installation

Phase L4 will commence mid-way through Phase M6, i.e. in Q3 2031. The works will comprise the construction of the heritage zone incorporating the masonry blocks recovered during Phase M6 and the installation of the heritage structures. The works will take 9 months to complete.

3.3.2.11 Phase M7 – Dredging of Berth 50A

Phase M7 will commence upon completion of Phase M6.

Phase M7 will comprise the dredging in front of the existing Berth 50A to a standard depth of -11.0m CD and disposal at sea of the material. This phase will commence in Q1 2032. The works will take one month to complete.

3.3.3 Construction Methodology

The following sections outline the proposed construction methodology:

3.3.3.1 Landside Structures (Phases L1 – L4)

- **Heritage Installation:** The main components of the heritage installation, comprising the 'Marker' and access bridge, will be fabricated off-site. These components will be transported and assembled on site. These elements will require precast concrete piled foundations which will be installed using the same construction techniques as the landside structures (High Mast Lighting). The other public realm elements will be built using conventional construction techniques.
- **Pedestrian Underpass:** The pedestrian underpass will be of precast concrete construction with the approach ramps and vertical circulation structures constructed of reinforced concrete. Piles will be installed, and existing material and piles will be excavated to a suitable formation level. A concrete slab / pile cap will be installed on the piles and the precast concrete underpass sections will be dropped into place above. The ground at the proposed approach ramps and stairs will be excavated with a stone base and concrete retaining walls and slabs installed to form the structure. Areas will be backfilled to finished level as the installation progresses. Note the works area is located in the vicinity of the proposed infilling works which are permitted under ABP Reg. Ref. PL29N.PA0034. Any fill material installed in the proposed underpass location to infill this area will be inert in nature to avoid excavation of contaminated material.
- **Check in Booths and Canopies:** The check in area is to be constructed of steel framed lightweight construction. The ground below will be excavated, and a stone base installed below a concrete raft foundation.
- **Passenger Walkways:** It is proposed to install passenger walkway plant to access Berth 51 and Berth 52. Each walkway will include an ambulant disabled stairs, and an enclosed high-level walkway to facilitate access to the ship. The units will be rubber wheeled mobile port plan of steel framed lightweight construction.
- **Existing Passenger Terminal Building:** The existing Passenger Terminal 1 Building will be utilised as the Unified Ferry Terminal Building to facilitate foot passenger check in and provide facilities for those in accompanied units awaiting departure. The building already has facilities for State Services to inspect foot passengers. Routes to access and exits at the building will be adjusted to maintain separation of passengers and the public using the pedestrian underpass.
- **Gantries:** Gantry structures are proposed to direct traffic both to and within the UFT. The structures will be in line with existing galvanised steel gantry signage located within the port. Gantries will be supported on piled foundations.
- **Lighting:** Additional High Mast and Street Lighting are proposed as part of the works. High Mast Lighting proposed for the new development is indicated within the project drawings. A piled foundation is proposed for High Mast Lighting with standard concrete gravity foundations proposed for regular street lighting.
- **Security Fence:** It is proposed to install a new security fence to define the edge of the ISPS Restricted Area at the perimeter of the UFT. The typical boundary proposed is a 4m high steel bar

railing as indicated in the project drawings. The vertical steel posts are to be installed at regular centres in a concrete gravity foundation.

- **Utilities:** Works will involve the installation of below ground watermain, storm sewer, cabling and ducting for communication and electrical infrastructure. Works will involve excavation of relevant areas, installation of infrastructure and reinstatement of ground to required level and surface material.
- **Substation:** A new substation is proposed as part of the works. This will be of masonry construction with a concrete roof and concrete floor slab and trenches below. It will be installed on a piled foundation.
- **Toilet blocks:** Three toilet blocks are proposed as part of the development. Toilet blocks will be of traditional masonry construction with a lightweight timber roof. The ground below will be excavated, and a suitable stone base installed below a concrete raft foundation.
- **Demolitions:** In order to facilitate the proposed Unified Ferry Terminal, it is a requirement to demolish a number of existing structures within the site. Demolitions proposed to be undertaken as part of MP2 Project are indicated in Figure 3-17. The construction of each structure is discussed in 3.2.8.2. All proposed demolitions will involve the dismantling in situ of all existing above ground elements and breaking out of existing bases at ground or below ground level. Waste will be segregated at source into suitable waste streams. Material will be reused on site where possible and removed off site to suitable waste facility where required.

The proposed construction areas (site compound, storage and site) are indicated in Figure 3-25, Figure 3-26, Figure 3-27 and Figure 3-28.

Figure 3-25 Phase L1 Construction Area

Figure 3-26 Phase L2 Construction Area

Figure 3-27 Phase L3 Construction Area

Figure 3-28 Phase L4 Construction Area

3.3.3.2 Berth 52 (Phase M1)

The construction of Berth 52 will commence after the filling of the basin (permission reference 29N.PA0034). It is proposed that a causeway constructed from clean, inert, rock will be used to seal the basin during the filling works. The causeway will then be used as a platform to commence the construction of Berth 52.

The construction of the steel sheet pile cellular wall will be the first section of the wall to be constructed. Plant will be positioned on the causeway and allow the craneage and piling of sheet piles. The cellular wall will not require a sheet pile anchor wall to be installed. The sheet piles will be driven to circa -30.0mCD. The cells will be filled with suitable granular material.

When the sheet pile cellular wall has been completed, works will commence on the sheet pile combi wall to the east. This wall will require the installation of a deadman anchor wall to restrain the berthing wall in position. The anchor wall will be driven through the existing land. The combi wall will comprise tubular steel piles with steel sheet piles driven between the piles.

When the sheet piles have been installed, reinforced concrete panels will be installed as the berthing face to the sheet piles. These panels will be precast and lowered into position by crane.

The completion of the works to the east end of Berth 52 will facilitate the commencement of the works to Berth 53. Berth 52 will effectively act as a working platform.

The proposed construction areas is indicated in Figure 3-29.

Figure 3-29 Phase M1 Construction Area

3.3.3.3 Berth 53 (Phase M2)

The dredging works to Berth 53 will take place in advance of the main construction works to the berth. The materials to be dredged will comprise of clay predominantly. This material will be dredged using a trailer suction hopper dredge or equivalent. The dredge material will be loaded into barges and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank. Ancillary dredging vessels such as a survey vessel and a bed leveller will be required throughout the dredging activities. All capital dredging works will take place within the period October to March.

As the dredging progresses in an eastward direction, concrete mattresses will be installed on the dredge side slopes to stabilise the slopes. The mattresses will be manufactured off site and comprise articulated concrete blocks which will adapt to the shape of the dredge side slope. Spaces will be left in the mattresses to accommodate the installation of piles for the jetty structure.

The dredging and mattress installation works will take approximately 2.5 months to complete and will be completed before the piling commences.

Piling works for the jetty structure at Berth 53 will commence at the west end, after the completion of Berth 52. The first number of piles will be installed from Berth 52. The majority of piles will require installation from barges. Three barges will be required to install the piles comprising:

1. A jack-up barge is a mobile buoyant barge/platform which is fitted with a number of moveable legs, and is capable of lifting itself above the water. For Berth 53 construction works, a jack-up barge will be fitted with a pile gate which will be used as a template to position the piles;
2. A spud leg barge is similar to a jack-up barge; however, it is not capable of lifting itself above the water. The moveable legs on this type of barge keep the barge in position, while the barge remains afloat. For Berth 53 construction works, a spud leg barge will be positioned beside the jack up barge. A crane will be positioned on the spud leg barge which will be used for installing the piles. The spud leg barge will be positioned on the south, east and north of the jack up barge;
3. A smaller support barge will be used to service the jack-up and spud-leg barges (e.g. deliver piles to the site). This will be a floating barge which will not have legs and will moor to the other barges.

Other ancillary craft (safety boat, transport vessel etc.) will also be located on site. These vessels will be similar to vessels currently operating day-to-day at the port.

Each dolphin will take approximately 1 week to pile. Piles will be driven via an impact hammer, which will operate for approximately 10-minute intervals. Each pile may take approximately 1 hour to pile. The vertical piles at the east end approach to the berth will have an approximate diameter of 1.0m, the vertical and raking piles to the dolphins will have an approximate diameter of 1.2m.

The spud leg barge will be used to crane the hollow precast dolphin superstructures on the piles. When positioned on the piles, the precast superstructures will be filled with reinforced concrete.

Precast concrete bridge beams will be installed by the crane on the spud leg barge. These will span between the dolphins. The precast bridge beams will also be filled with reinforced concrete, with voids

being maintained for services. The spud leg barge will also be used for the installation of fenders and ladders.

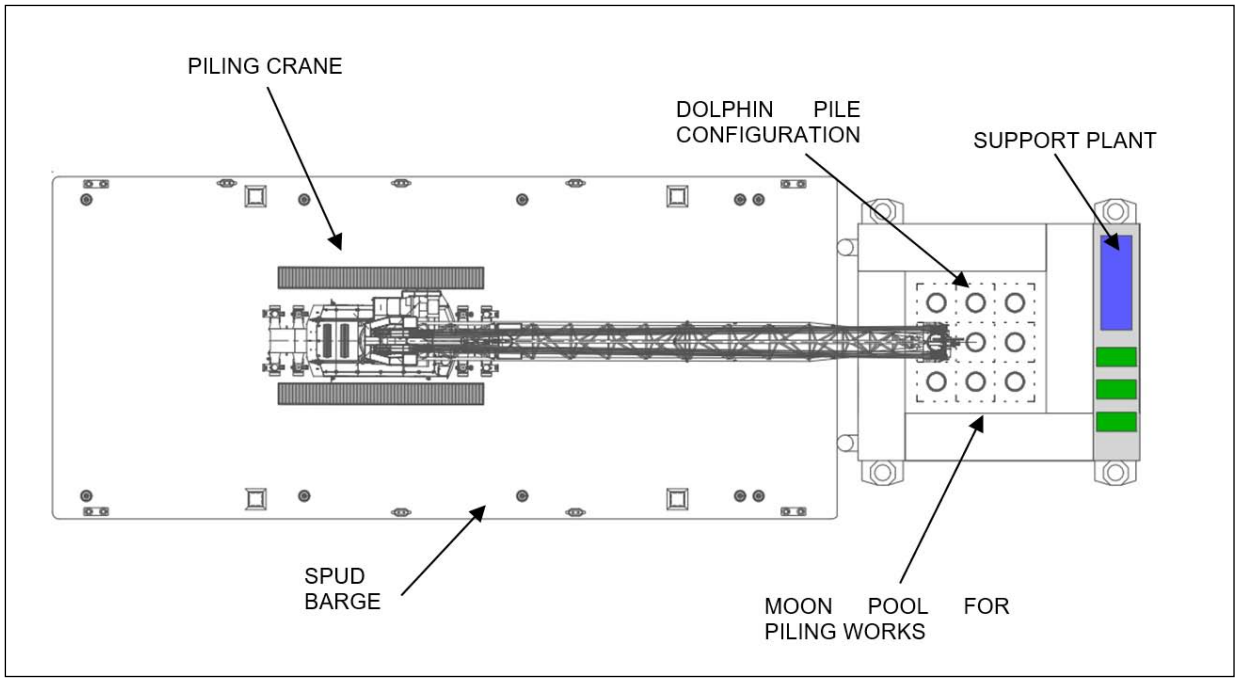

Figure 3-30 Plan of jack-up and spud-leg barge arrangement

The proposed construction area is indicated in Figure 3-31.

Figure 3-31 Phase M2 Construction Area

3.3.3.4 Channel Widening (Phase M3)

Channel widening via dredging will take place to the south of the Liffey Channel.

The materials to be dredged will comprise clays, sands and gravels. The majority of the material will be dredged using a trailer suction hopper dredge. The dredge material will be loaded into barges and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank. There will also be a requirement for a back-hoe dredger on site to carry out the finer elements of the dredging works. This material will be loaded into a hopper barge and disposed of at the licenced sea disposal site. The dredging will proceed from north to south, with the dredger working in a west to east direction

Ancillary dredging vessels such as a survey vessel, work boats and a bed leveller shall be required throughout the dredging activities. These vessels will be similar to vessels currently operating day-to-day at the port.

All capital dredging works will take place within the period October to March.

The proposed construction area are indicated in Figure 3-32.

Figure 3-32 Phase M3 Construction Area

3.3.3.5 Jetty Road, Oil Berth 3 and Berth 50A

3.3.3.5.1 Jetty Road (Phase M4)

In advance of the construction works at Oil Berth 3 and Jetty Road, the existing bitumen and gas importation pipelines will be removed from the berth and repositioned on the Western Oli Jetty.

A jack-up barge and spud leg barge will be mobilised to site for the installation of the steel sheet pile combi wall at the Jetty Road. The works will commence on the west end of Jetty Road and work in an easterly direction, dependent on the expected landing of gas. The jack-up barge will be fitted with a pile gate to ensure the accuracy of the tubular steel pile locations. The piles will be pitched and driven from the spud leg barge. The piles will be driven using a vibro hammer and impact hammer. The tubular steel piles will have a diameter of 1.4m. The piles will be driven to approximately -30m CD. Steel sheet piles will be driven between adjacent tubular steel piles. The spud barge will be used for the installation of ground anchors to retain the steel combi-wall in position. When the ground anchors are installed, the rear to the new wall will be filled with engineering fill material sourced from local quarries (refer to Section 3.3.4.) The engineering fill material will comprise crushed rock transported by road from the quarries.

3.3.3.5.2 Oil Berth 3 (Phase M5)

Oil Berth 3 comprises a gantry with pipelines on top of a concrete deck which spans upon concrete caissons.

The steel sheet pile combi-wall will be installed at Oil Berth 3 in the same manner as the Jetty Road. The piles will be driven using a vibro hammer and impact hammer. The tubular steel piles will have a diameter of circa 1.4m. Steel sheet piles will be driven between adjacent tubular steel piles. When the combi-wall is constructed, a frame will be installed to support the existing pipeline gantry. The deck which spans between the concrete caissons will then be removed to allow the infill behind the new wall structure, and the existing basin, with engineering fill material. When mid tide level is reached with the fill material, tubular steel piles will be installed which will support the future potential crane rail installation. The deadman anchor wall will also be installed. The deadman will be connected via tie rods to the combi-wall. Trenches will be cut in the existing deck to facilitate this. Precast concrete panels will be installed on the front of the combi-wall as a berthing face. The filling will then continue to the deck formation level, where provision will be made for the installation of services. The reinforced concrete deck will then be cast on the fill material. Quay furniture and services will then be installed.

When all the piles are installed, a back-hoe dredger will mobilise to site to dredge the berth pocket to -13.0m CD. The material will be loaded into a hopper barge and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank. All capital dredging works will take place within the period October to March.

A new in-situ reinforced concrete wall will be constructed on the deck to separate the Oil Berth Zone from the Container Freight Terminal yard.

The proposed construction areas are indicated in Figure 3-34.

Figure 3-33 Phase M4 Construction Area

Figure 3-34 Phase M5 Construction Area

3.3.3.5.3 Berth 50A (Phase M6)

The demolition of the Port Operations building, and existing mast will take place at the outset of construction works in this area.

To limit the works in the water, it is proposed to install the steel sheet pile combi wall from the existing eastern breakwater. The fill material to Oil Berth 3 will also be used as a working platform. Piles will be driven through the existing overburden and into the sea bed to an approximate level of -30m CD. The combi-wall will comprise circa 1.4m diameter tubular steel piles, with sheet piles driven between adjacent tubular piles. The driving of the deadman anchor wall will also be possible from the land.

When the piles are driven, excavation of the existing eastern breakwater can commence. The existing granite structure will be recorded and moved to the proposed heritage installation location. The existing fill material will be excavated and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank. This is addressed in Chapter 12.

5 No. ESB 220kV feeder cable ducts pass under the existing Eastern Breakwater. It is proposed to keep these cables in position during the works. Before the Eastern Breakwater is removed, a steel sheet pile cofferdam (approximately 50m long x 15m wide) will be constructed in the proximity of the ducts. Temporary works will be employed to brace the cofferdam and support excavations. When the cofferdam is installed, the overburden above the ducts will be excavated, exposing the ducts. They will then be encased in concrete at the location of the proposed new quay wall. The cofferdam will remain part of the permanent works where it intersects the proposed new quay wall. The void between the cofferdam, at the intersection of the new quay wall will be filled with reinforced concrete to deck level. A concrete mattress will be placed over the southern side of the ducts to act as protection from future dredging campaigns.

All works in the vicinity of the ESB 220Kv cables shall be by agreement with ESB.

The proposed construction areas are indicated in Figure 3-35.

Figure 3-35 Phase M6 Construction Area

3.3.3.5.4 Berth 50A Dredging (Phase M7)

Phase M7 will comprise the dredging in front of the existing and proposed Berth 50A to a standard depth of -11.0m CD and disposal at sea of the material. This phase will commence after the works at Phase M6. The dredging works will take one month to complete. All capital dredging works will take place within the period October to March.

The dredging will be carried out using a back-hoe dredger. This material will be loaded into a hopper barge and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank.

Ancillary dredging vessels such as a survey vessel, work boats and a bed leveller shall be required throughout the dredging activities. These vessels will be similar to vessels currently operating day-to-day at the port.

The proposed construction areas are indicated in Figure 3-36.

Figure 3-36 Phase M7 Construction Area

3.3.4 Source of Fill Material

Suitable infill material (crushed rock) will be sourced from authorised quarries and will be imported by road to fill the void at Oil Berth 4, and to fill the voids behind the proposed structures at Jetty Road and Berth 52. This material will be sourced locally within the region. Figure 3-37 shows the proximity of active crushed rock quarries in the vicinity of the Dublin Port and the proposed haul routes. Quarry facilities from which this material will be sourced will have been registered with the local authority and will have the necessary planning permission and other consents in place for the winning and haul of such material. The traffic associated with these movements is considered in Section 3.3.6.

The anticipated volumes and type of fill material required to meet the design ground levels for Dublin Port lands are set out as follows:

- Phase M1 (Berth 52)

Circa 143,357m^3 of imported material will be required. Of this, 121,374m^3 has been consented via the ABR Project (ABP Ref. 29N.PA0034). A net increase of 21,982m^3 of imported fill material will be required (equating to circa 39,567T based on a conversion of 1.8T/m^3).

- Phase M4 (Jetty Road)

Circa 3,600m^3 of imported fill material (equating to circa 6,480T based on a conversion of 1.8T/m^3)

- Phase M5 (Oil Berth 3)

Circa 145,000m^3 of imported fill material (equating to circa 261,000T based on a conversion of 1.8T/m^3).

Table 3-2 Potential List of Quarries

Quarry Name	Location	Council Licensed / Registered	Availability to Provide Required Engineering Fill	Figure 3-37 Reference	Distance to Site	Haul Route
Feltrim Quarry	Swords, Co. Dublin.	✓	✓	Feltrim	15.5km	▪ Feltrim Rd ▪ M1 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Huntstown Quarry	North Road, Finglas, Dublin 11.	✓	✓	Huntstown	19.1km	▪ R135 ▪ N2 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Rathcore Quarry	Kilsaran Build, Rathcore, Enfield, Meath.	✓	✓	Rathcore	61.0km	▪ L6226 ▪ R148 ▪ M4/N4 ▪ M50 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Allen Quarry	Kilmeague, Naas, Kildare.	✓	✓	Allen	65.8km	▪ R145 ▪ M7/N7 ▪ M50 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Shillelagh Quarries	Aghfarrell, Brittas, South County Dublin.	✓	✓	Aghfarrell	43.7km	▪ R114 ▪ N81 ▪ N82 ▪ N7 ▪ M50 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Ballinascorney Quarry	Kilsaran Build, Ballinascorney, South County Dublin.	✓	✓	Ballinascorney	43.5km	▪ R114 ▪ N81 ▪ N82 ▪ N7 ▪ M50 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd
Belgard Quarry	Fortunestown, Tallagh, Dublin.	✓	✓	Belgard	32.2km	▪ R113 ▪ R838 ▪ M50 ▪ Dublin Port Tunnel ▪ Promenade Rd ▪ Tolka Quay Rd

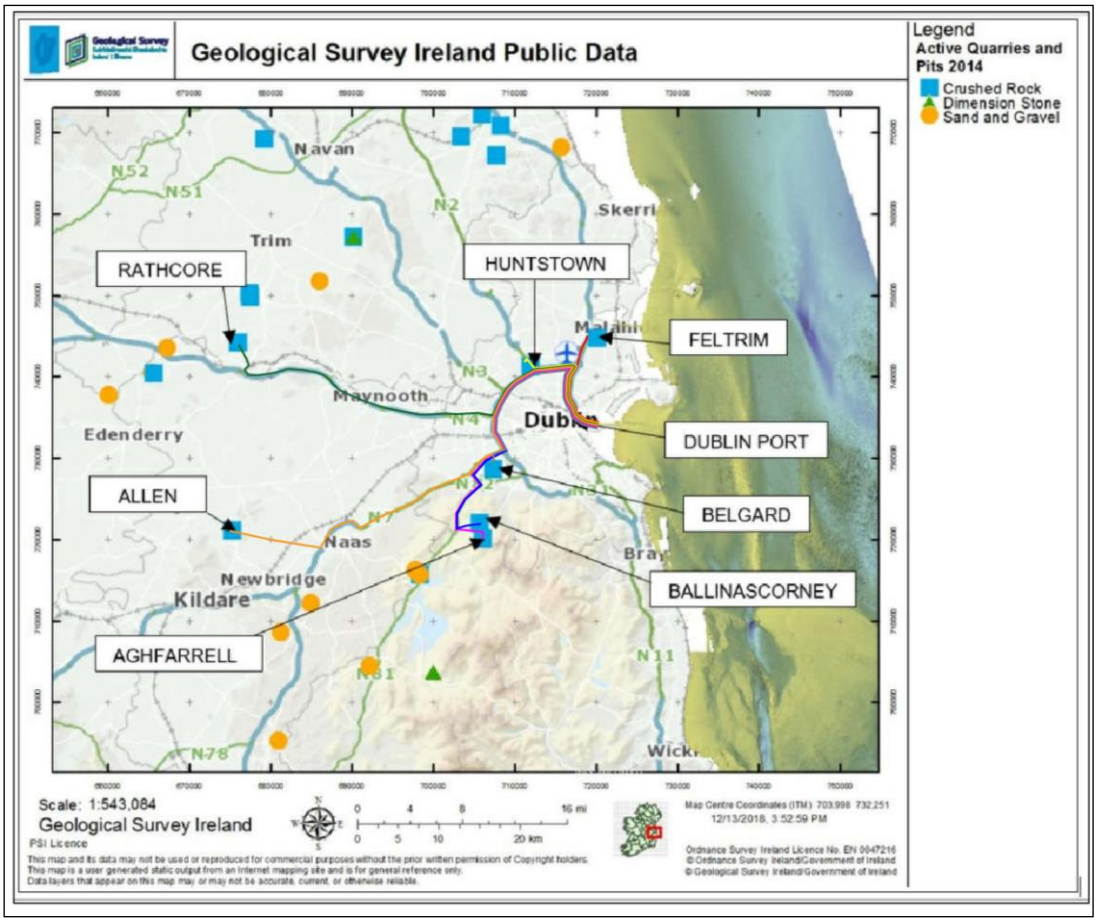

Figure 3-37 Map of active quarries in vicinity of Dublin Port (Source: GSI)

3.3.5 Working Hours

Where construction activity takes place for the redevelopment in the vicinity of residential properties, the activities will operate between the hours of 08:00 and 18:00 on Monday to Fridays, between 08:00 and 13:00 on Saturdays and there will be no activity on Sundays or Bank Holidays. Where additional or alternative working hours are required, these will be agreed in advance with Dublin City Council. Capital Dredging works are remote from residential properties and will be undertaken on 24 hour / 7 days per week basis.

3.3.6 Construction Traffic

Construction traffic will arrive and depart the port via the national road network. All HGV movements will be in compliance with the Dublin City Council HGV Management Strategy. Within the Dublin Port Estate, traffic will be routed through the existing road network to reach the MP2 Project site boundary. Traffic within the proposed site will be diverted in a phased manner to ensure the existing facilities at Terminal 1 and Terminal 2 remain operational with minimal impact.

The Sequencing Programme for the MP2 Project (Figure 3-24) has been used to determine the future construction traffic on the road network. Staffing levels are also presented. The predicted daily flows split per quarter over the duration of the project are presented in Table 3-3.

Table 3-3 Predicted construction daily traffic flows

	2021				2022				2023			
Average Daily	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Staff	0	0	0	0	29	43	43	41	28	28	28	54
HGV movement (1 way)	0	0	0	0	15	21	28	29	29	41	32	31
Internal HGV movement (1 way)	0	0	0	0	2	1	8	10	14	1	0	1
	2024				**2025**				**2026**			
Average Daily	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Staff	54	54	12	0	28	54	54	52	54	46	70	70
HGV movement (1 way)	29	21	3	0	6	5	5	4	5	4	4	6
Internal HGV movement (1 way)	1	2	1	0	1	1	1	1	0	1	1	0
	2027				**2028**				**2029**			
Average Daily	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Staff	57	35	21	13	13	13	6	0	28	28	32	54
HGV movement (1 way)	13	13	8	5	5	5	3	0	0	0	3	2
Internal HGV movement (1 way)	0	0	0	0	0	0	0	0	1	1	0	0
	2030				**2031**				**2032**			
Average Daily	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Staff	28	28	28	52	49	28	28	50	36	0	0	0
HGV movement (1 way)	9	0	57	40	22	2	0	7	6	0	0	0
Internal HGV movement (1 way)	2	3	1	0	0	2	1	0	0	0	0	0

The table represents a single movement (in and out) and therefore figures below should be doubled if considering how many trips to or from the port. The peak HGV traffic volume will occur Q3 2030. There will be an average daily traffic over this period of 57 HGV movements per day, based on a 5-day working week. The peak week within the proposed construction stage will be Q4 2030 where on average there will be 81 HGV movements per day. This would incorporate a peak of 17 HGV movements (in and out) per hour between 7am and 8 am.

3.3.7 Site Compounds

Site compounds are indicated in Figure 3-38. Separate compounds will be used for different phases of the works. The compounds have been sized to accommodate welfare facilities, site offices and parking, construction plant storage, and materials storage. Each compound is located in or immediately adjacent to the relevant works phase, such as to cause minimal interference to general port operations. Compounds are not required for Phase M3 & M7 as works will be carried out by dredging plant.

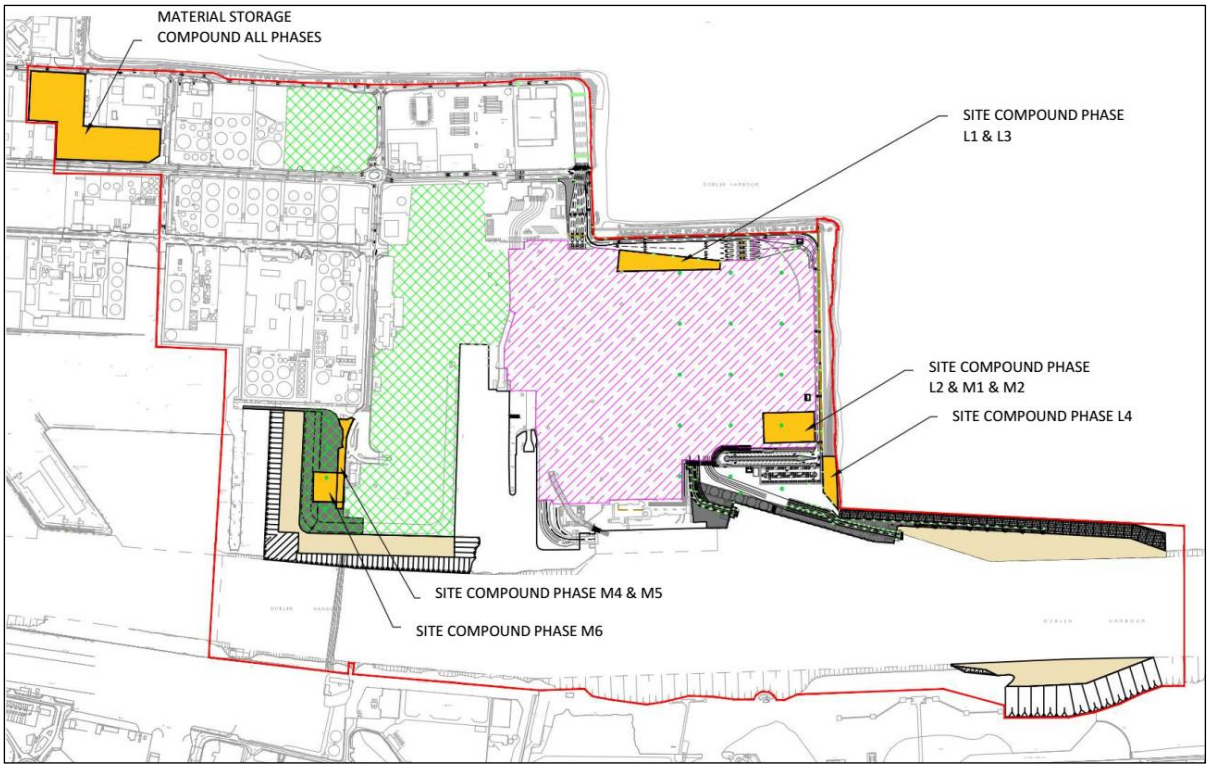

Figure 3-38 Site Compounds

3.4 OPERATIONAL PHASE

The key objective of the MP2 Project is to increase the throughput of cargo and passengers by providing the infrastructure required to maximise the efficient use of existing port lands. A description of the existing port operations forms part of the application for permission (under separate cover). There are no significant changes to the existing types of operations, processes and activities (regular and occasional) proposed by the MP2 Project.

The following maintenance, pollution control and navigational measures will be implemented.

3.4.1 Maintenance

During the operational stage, maintenance of the quay/jetty structures will be minimal. Some maintenance of fenders, bollards, link spans and service infrastructure may be required. Maintenance access will be carried out from the deck of the structure.

There will be a requirement for maintenance dredging to be carried out within the berthing pockets and channel area. Future maintenance dredging will be subject to consents required by the Environmental Protection Agency (EPA) and the Department of Housing, Planning and Local Government (DHPLG).

3.4.2 Pollution Control

3.4.2.1 Storm Water

There is limited additional hardstanding area proposed as part of the project. At Berth 53 it is proposed to collect storm water from the new hardstanding areas in a closed system and discharge via a new silt

trap and oil interceptor/separator to the local storm water drainage network (which is consented under the ABR Project). The consented ABR Project storm drainage network ultimately discharges to the sea at Berth 52 via a flap vale (or similar) in the quay wall. Minor modifications will be made to the drainage consented under the ABR Project to facilitate the Berth 52 realignment.

Rainfall on the new hardstanding at the infilled basin at Oil Berth 4 will be collected by a series of gullies and drains. The new network will be routed through new silt traps and oil interceptors/separators before discharge to the sea at the new the quay wall.

The methodology above was discussed and agreed in principal with Dublin City Council Drainage Department. A copy of the email correspondence is provided in Appendix 5.

3.4.2.2 Wastewater

A gravity sewer is proposed to link the proposed toilet blocks to the existing gravity sewer serving Terminal 5 (which is to be demolished). The existing toilet provision at Terminal 1 Building is considered adequate for the proposed use. The existing network servicing the unified ferry terminal discharges via a series of gravity sewers and pumping stations to the main public foul network outside the Dublin Port Estate.

It is not anticipated that there will be any increase in the peak wastewater discharge to the public sewer as a result of the development.

3.4.2.3 Waste Disposal from Vessels

All waste from berthed vessels will be disposed of in accordance with the Dublin Port Ship's Waste Management Plan contained in Appendix 17-1. The storage of waste at the berth will not be permitted. Waste will be collected directly by a licensed waste disposal contractor.

Disposal from vessels directly into the water at the berth, Liffey Channel, or Dublin Bay is strictly prohibited.

3.4.2.4 Ship to Shore Power

Ship to Shore Power facilities are provided for vessels on Berth 52 and Berth 53 to provide required hoteling load for vessels. This will allow engines to be turned off when vessels are berthed.

3.4.3 Navigation

3.4.3.1 Vessel Speed Limit

The development will not impact upon the navigation speed limit enforceable within the harbour.

3.4.3.2 Navigation Charts

The proposed development will require updating of the appropriate navigation charts for the area. This will be done through consultation with the United Kingdom Hydrographic Office.

3.4.3.3 Radar and GPS

Impacts on radar are not envisaged. Global Positioning System navigation charts will be updated based on updates to Navigation Charts.

3.4.3.4 VHF & Communication

Impacts on VHF radio and other communication systems are not envisaged.

3.4.3.5 Marine Notices

Marine Notices will be issued to alert the general public of the proposed changes to the port.

3.4.3.6 Vessel Manoeuvring

The dredging works will improve navigability on the approach to Dublin Port.

3.5 DESCRIPTION OF THE RISK OF ACCIDENTS HAVING REGARD TO SUBSTANCES AND TECHNOLOGIES USED

The risk of accidents can arise during both the construction and operational stages of the MP2 Project. There are no substances or technologies being proposed that are not considered 'normal' either by the construction industry or by Port operations.

The development is within the vicinity of several establishments that fall within the scope of the *Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations*, 2015 (the COMAH Regulations), in particular the Calor establishment and the Indaver establishment, to the west of the development on the northern side of Tolka Quay Road. In light of the nature of the activities that will take place at the MP2 Project site, and the nature of the surrounding environment, the most significant risks of major accidents and disasters are associated with the COMAH establishments.

From a COMAH perspective, the potential direct and indirect risks arising from the MP2 Project satisfy the Health and Safety Authority's COMAH land use planning guidance. It also concludes that other, non-COMAH direct and indirect major accident and disaster risks arising from the MP2 Project are not significantly different from the current risks.

DPC has developed a comprehensive emergency management plan that caters for the range of accident and emergency events that may occur within its estate (or that may occur outside the estate and that have a direct, knock-on effect), and this plan is provided to the other relevant stakeholders, including An Garda Síochána, Dublin City Council, Transport Infrastructure Ireland, and the Principal Response Agencies. In the event of an incident at a COMAH establishment that could impact on people at other facilities in the Port, or on road traffic entering or exiting the Port, DPC will activate its Emergency Management Plan, in which case people would be directed away from the source of the hazard.

3.6 PROJECT CHANGE AND DECOMMISSIONING

Following completion of the construction phase of the works, temporary works required to facilitate the construction of the permanent works will be removed from site. The temporary works include the use of large items such as marine jack-up barges and pile guides which will be dismantled and removed from site by sea and road respectively. Temporary works requiring the use of temporary piles have been designed to be incorporated into the permanent works, negating the need to remove them.

There are no plans proposed for the decommissioning of the permanent marine elements of the MP2 Project given the nature of the Port development which can be considered as 'permanent works'.

The landside elements of the unified ferry terminal aspect of the MP2 Project have been designed to allow maximum flexibility because its use will be a function of customer requirements which may change over time (accompanied Ro-Ro versus unaccompanied Ro-Ro versus passenger vehicles). Flexibility is also required as a result of the uncertainty of land requirements by the State Agencies as a result of Brexit. To provide this flexibility the proposed landside structures have been limited to entrance booths, signage gantries, lighting, toilet blocks, pedestrian underpass, substation, fencing and other works required for the safe movement of freight and passengers. Any changes to the landside layout which may be required, including the decommissioning of signage gantries, will be the subject of subsequent planning consent and appropriate mitigation can be applied to those consents.

4 SCREENING FOR APPROPRIATE ASSESSMENT

4.1 EUROPEAN SITES

A screening exercise must be undertaken by the competent authorities to determine whether, firstly, the plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; EC 2018.

In addition, the provisions of national legislation, such as section 177U make clear that screening for appropriate assessment of an application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.

There is a significant aggregation of designated sites in and around Dublin Bay, including European sites (SACs, candidate SACs [cSACs] and SPAs), NHAs and pNHAs, Ramsar sites and Nature Reserves. It is a coastal wetland complex of considerable nature conservation value in a European and international context and the UNESCO designated Dublin Bay Biosphere extends to over 300km^2, containing or overlapping with 14 European sites.

This screening assessment considers European sites designated under Directives 92/43/EEC and 2009/147/EC. Of the sites considered, only Rogerstown Estuary SAC, Malahide Estuary SAC and Rockabill to Dalkey Island SAC have been the subject of a Statutory Instrument [S.I. Nos. 286 of 2018 and 91 & 94 of 2019]. Accordingly, only Rogerstown Estuary SAC, Malahide Estuary SAC and Rockabill to Dalkey Island are referred to as an “SAC”. All other sites are referenced as being cSACs (or SPAs as the case may be). Note that the level of protection afforded to a European site is precisely the same, regardless as to whether the European site is a cSAC or SAC and no further distinction is drawn between candidate sites and designated sites in this document.

The proposed development will be screened against those European sites in order to appraise whether, firstly, the project is directly connected with or necessary to the management of the European sites and, secondly, whether it is likely to have a significant effect on any European site.

The most up-to-date Conservation Objectives (all of which are appended to this document) for the European sites under consideration, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites are provided in Table 4.1. The information contained in these tables is based on publicly available data on these European Sites, sourced from NPWS in June 2019, and appended to this document as a series of Conservation Objectives. SACs and cSACs described in Table 4.1 are illustrated in Figure 4.1. SPAs described in Table 4.1 are illustrated in Figure 4.2.

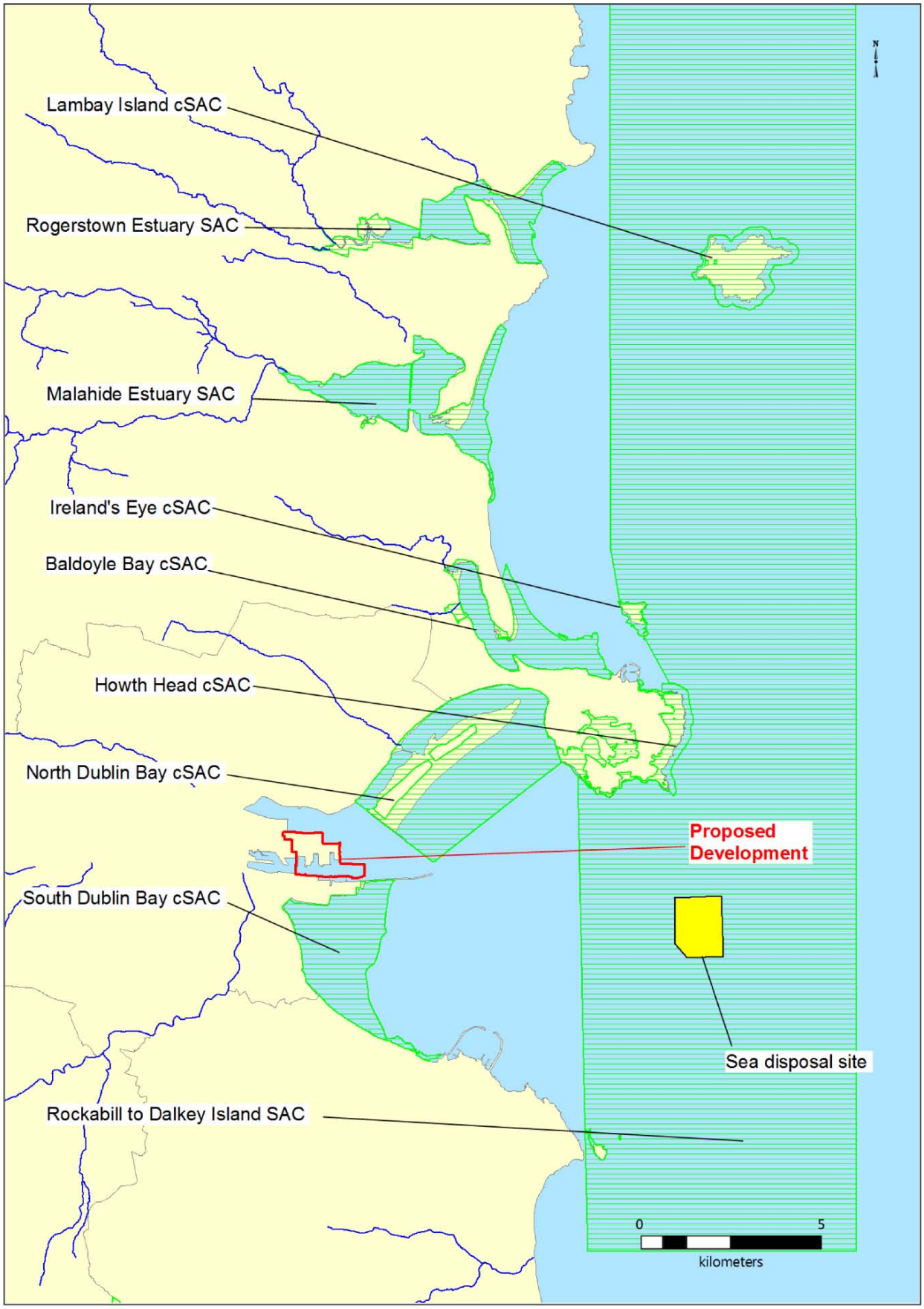

Figure 4.1 SACs and cSACs considered in the Habitats Directive appraisal

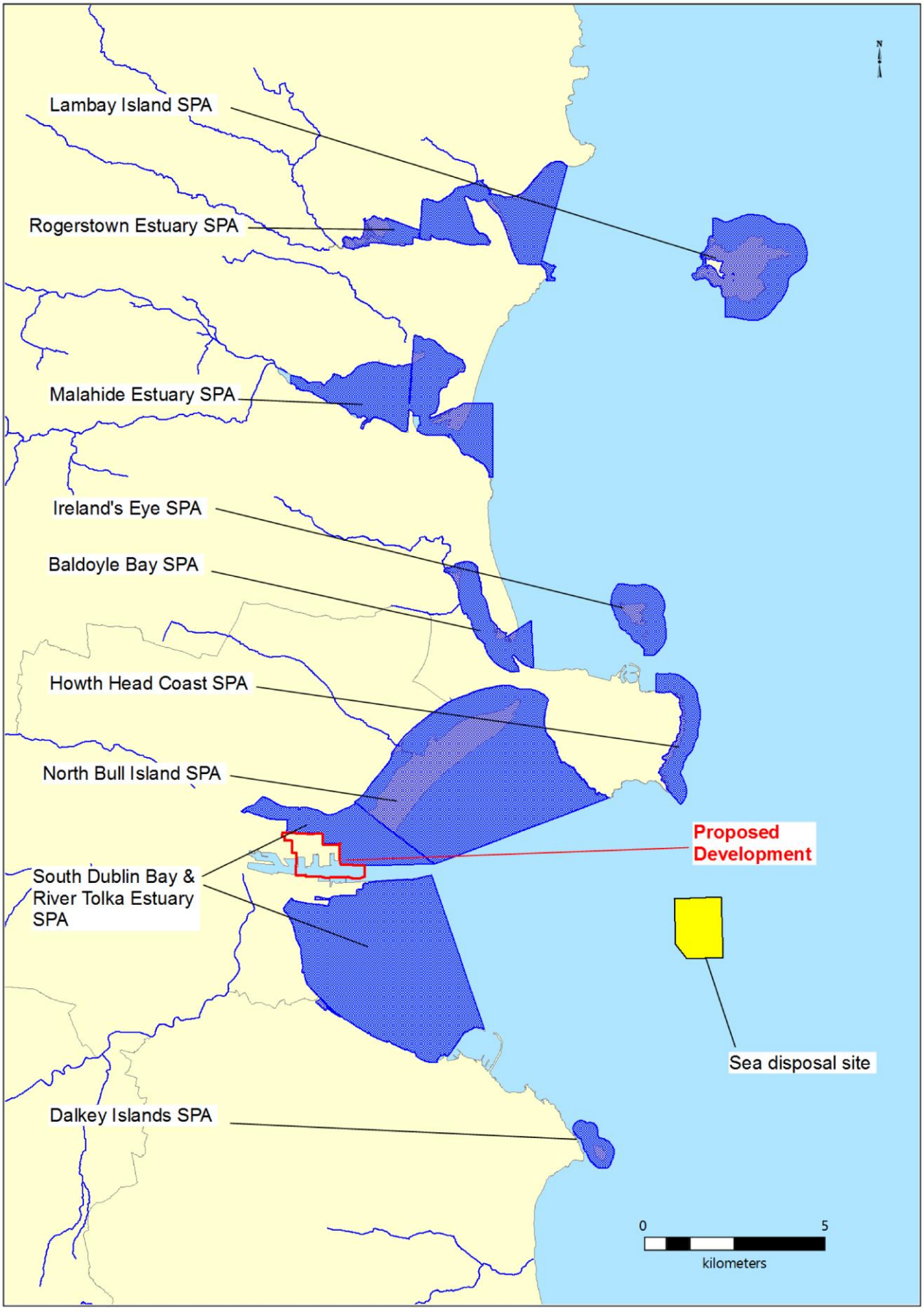

Figure 4.2 SPAs considered in the Habitats Directive appraisal

Table 4.1 Qualifying Interests and Conservation objectives of European sites considered

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td>IE000204</td><td>Lambay Island cSAC</td><td>
Conservation Objectives Specific Version 1.0 (22/07/13)
To maintain the favourable conservation condition of 2 no. Annex 1 habitat type in the cSAC, as defined by a range of attributes and targets; and of 2 no. Annex II species in the cSAC, as defined by 5 no. attributes and targets.

Annex I Habitats

• Reefs [1170]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Distribution</td><td>Occurrence</td><td>The distribution of reefs is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community structure</td><td>Biological composition</td><td>Conserve the following community types in a natural condition: Intertidal reef community complex; Laminaria-dominated community complex.</td></tr>
</table>
• Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat length</td><td>Kilometres</td><td>Area stable, subject to natural processes, including erosion. Total length of cliff section mapped: 7.27km.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and hydrological regime</td><td>Occurrence of artificial barriers</td><td>No alteration to natural functioning of geomorphological and hydrological processes due to artificial structures</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: bracken and woody species</td><td>Percentage</td><td>Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%</td></tr>
</table>
</td><td>21.6km by sea from proposed development

16km by sea from disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
Annex II Species
• Grey seal (Halichoerus grypus) [1364]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Access to suitable habitat</td><td>Number of artificial barriers</td><td>Species range within the site should not be restricted by artificial barriers to site use.</td></tr>
<tr><td>Breeding behaviour</td><td>Breeding sites</td><td>The breeding sites should be maintained in a natural condition.</td></tr>
<tr><td>Moulting behaviour</td><td>Moult haul-out sites</td><td>The moult haul-out sites should be maintained in a natural condition.</td></tr>
<tr><td>Resting behaviour</td><td>Resting haul-out sites</td><td>The resting haul-out sites should be maintained in a natural condition.</td></tr>
<tr><td>Disturbance</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the grey seal population at the site</td></tr>
</table>
• Harbour seal (Phoca vitulina) [1365]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Access to suitable habitat</td><td>Number of artificial barriers</td><td>Species range within the site should not be restricted by artificial barriers to site use.</td></tr>
<tr><td>Breeding behaviour</td><td>Breeding sites</td><td>The breeding sites should be maintained in a natural condition.</td></tr>
<tr><td>Moulting behaviour</td><td>Moult haul-out sites</td><td>The moult haul-out sites should be maintained in a natural condition.</td></tr>
<tr><td>Resting behaviour</td><td>Resting haul-out sites</td><td>The resting haul-out sites should be maintained in a natural condition.</td></tr>
<tr><td>Disturbance</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the harbour seal population at the site</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE000208</td><td>Rogerstown Estuary SAC</td><td>
Conservation Objectives Specific Version 1.0 (14/08/13)
To maintain the favourable conservation condition of 7 no. Annex 1 habitat type in the SAC, as defined by a range of attributes and targets.

Annex I Habitats

• Estuaries [1130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community extent</td><td>Hectares</td><td>Maintain the extent of the Zostera-dominated community and the Mytilus edulis-dominated community, subject to natural processes.</td></tr>
<tr><td>Community structure: Zostera density</td><td>Shoots/m²</td><td>Conserve the high quality of the Zostera-dominated community, subject to natural processes</td></tr>
</table>
</td><td>23.5km by sea from proposed development

19km by sea from the disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Community structure: Mytilus edulis density</td><td>Individuals/m²</td><td>Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Sand to coarse sediment with Nephtys cirrosa and Scolelepis squamata community complex; Estuarine sandy mud to mixed sediment with Tubificoides benedii, Hediste diversicolor and Peringia ulvae community complex.</td></tr>
</table>
Mudflats and sandflats not covered by seawater at low tide [1140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community extent</td><td>Hectares</td><td>Maintain the extent of the Zostera-dominated community and the
Mytilus edulis-dominated community, subject to natural processes.</td></tr>
<tr><td>Community structure: Zostera density</td><td>Shoots/m²</td><td>Conserve the high quality of the Zostera-dominated community, subject to natural processes</td></tr>
<tr><td>Community structure: Mytilus edulis density</td><td>Individuals/m²</td><td>Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Sand to coarse sediment with Nephtys cirrosa and Scolelepis squamata community complex; Estuarine sandy mud to mixed sediment with Tubificoides benedii, Hediste diversicolor and Peringia ulvae community complex.</td></tr>
</table>
Salicornia and other annuals colonising mud and sand [1310]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession. For sub-site mapped: Rogerstown Estuary 0.90ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
</table>
</td><td></td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed development
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
		Vegetation composition: typical species and subcommunities	Percentage cover	Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)	
		Vegetation structure: negative indicator species – Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica). No new sites for this species and an annual spread of less than 1% where it is already known to occur	
		• Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Rogerstown Estuary-37.2ha.	
		Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	
		Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	
		Physical structure: creeks and pans	Occurrence	Allow creek and pan structure to develop, subject to natural processes, including erosion and succession	
		Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	
		Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% area outside creeks vegetated	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	
		Vegetation structure: negative indicator species – Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is known to occur	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
Mediterranean salt meadows (Juncetalia maritimi) [1410]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession. For sub-site mapped: Rogerstown Estuary-2.18ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/absence of physical barriers</td><td>Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession.</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation in the sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain more than 90% of area outside creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with characteristic species listed in SMP (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species – Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is already known to occur</td></tr>
</table>
Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush - 1.25ha, Portrane -
1.31ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Vegetation composition: plant health of dune grasses</td><td>Percentage cover</td><td>95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present)</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
</table>
Fixed coastal dunes with herbaceous vegetation (grey dunes)* [2130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush - 3.24ha; Portrane - 5.13ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: bare ground</td><td>Percentage cover</td><td>Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes</td></tr>
<tr><td>Vegetation structure: sward height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in Ryle et al. (2009)</td></tr>
<tr><td>Vegetation composition: negative indicator species (including Hippophae rhamnoides)</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: scrub/trees</td><td>Percentage cover</td><td>No more than 5% cover or under control</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td>IE000205</td><td>Malahide Estuary SAC</td><td>
Conservation Objectives Specific Version 1.0 (27/05/13)
To maintain the favourable conservation condition of 7 no. Annex 1 habitat type in the SAC, as defined by a range of attributes and targets.

Annex I Habitats

• Mudflats and sandflats not covered by seawater at low tide [1140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community extent</td><td>Hectares</td><td>Maintain the extent of the Zostera-dominated community and the
Mytilus edulis-dominated community complex, subject to natural processes.</td></tr>
<tr><td>Community structure: Zostera density</td><td>Shoots/m²</td><td>Conserve the high quality of the Zostera-dominated community, subject to natural processes</td></tr>
<tr><td>Community structure: Mytilus edulis density</td><td>Individuals/m²</td><td>Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Fine sand with oligochaetes, amphipods, bivalves and olychaetes community complex; Estuarine sandy mud with Chironomidae and Hediste diversicolor community complex; and
Sand to muddy sand with Peringia ulvae, Tubificoides benedii and Cerastoderma edule community complex.</td></tr>
</table>
• Salicornia and other annuals colonizing mud and sand [1310]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Malahide Estuary- 1.93ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
</table>
</td><td>18.8km by sea from proposed development

16km by sea from the disposal site</td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and subcommunities	Percentage cover	Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)
Vegetation structure: negative indicator species - Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica). No new sites for this species and an annual spread of less than 1% where it is already known to occur

- *Spartina* swards (*Spartinion maritimae*)

The Conservation Objectives document published by NPWS stateas that " *Spartina swards (Spartinion maritimae) was originally listed as a qualifying Annex I habitat for Malahide Estuary SAC due to historical records of two rare forms of cordgrass–small cordgrass (Spartina maritima) and Townsend's cordgrass (S . x townsendii.). However, Preston et al. (2002) considers both forms to be alien. In addition, all stands of cordgrass in Ireland are now regarded as common cordgrass (S. anglica) (McCorry et al., 2003; McCorry and Ryle, 2009). As a consequence, a conservation objective has* ***not*** *been prepared for this habitat. It will therefore* ***not be necessary to assess*** *the likely effects of plans or projects against this Annex I habitat at this site*." (authors emphasis).

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Malahide Estuary - 25.33ha.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: creeks and pans	Occurrence	Allow creek and pan structure to develop, subject to natural processes, including erosion and succession
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample	Maintain more than 90% area outside creeks vegetated

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed development
			of monitoring stops		
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	
		Vegetation structure: negative indicator species – Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is known to occur	
		• Mediterranean salt meadows (*Juncetalia maritimi*) [1410]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Malahide Estuary - 0.64ha.	
		Habitat distribution	Occurrence	No decline, subject to natural processes.	
		Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	
		Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	
		Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	
		Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation in the sward	
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with characteristic species listed in SMP (McCorry and Ryle, 2009)	
		Vegetation structure: negative indicator species - Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is already known to occur	
		• Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") [2120]			
		Attribute	**Measure**	**Target**	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes including erosion and succession. Total area mapped: 1.80ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: plant health of dune grasses</td><td>Percentage cover</td><td>95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present)</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
</table>
*Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes including erosion and succession. Total area mapped: 21.42ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: bare ground</td><td>Percentage cover</td><td>Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes</td></tr>
<tr><td>Vegetation structure: sward height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in Ryle et al. (2009)</td></tr>
<tr><td>Vegetation composition: negative indicator species (including Hippophae rhamnoides)</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Vegetation composition: scrub/trees</td><td>Percentage cover</td><td>No more than 5% cover or under control</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE000199</td><td>Baldoyle Bay cSAC</td><td>
Conservation Objectives Specific Version 1.0 (19/11/12)
To maintain the favourable conservation condition of 4 no. Annex 1 habitat type in the cSAC, as defined by a range of attributes and targets.

Annex I Habitats
• Mudflats and sandflats not covered by seawater at low tide [1140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Fine sand dominated by Angulus tenuis community complex; and Estuarine sandy mud with Pygospio elegans and Tubificoides benedii community complex.</td></tr>
</table>
• Salicornia and other annuals colonizing mud and sand [1310]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 0.383ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimeters</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain more than 90% of area outside creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and sub-communities</td><td>Percentage cover</td><td>Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina</td></tr>
</table>
</td><td>13.8km by sea from proposed development

8.4km by sea from the disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>indicator species- Spartina anglica</td><td></td><td>anglica), with an annual spread of less than 1%</td></tr>
</table>
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 11.98ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Occurrence</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain more than 90% of the area outside of the creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and sub-communities</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species-Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%</td></tr>
</table>
Mediterranean salt meadows (Juncetalia maritimi) [1410]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 2.64ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Occurrence</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain more than 90% of the area outside of the creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species</td><td>Percentage cover at a representative sample of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species- Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE002193</td><td>Ireland’s Eye cSAC</td><td>
Conservation Objectives Specific Version 1.0 (27/01/17)
To maintain the favourable conservation condition of 2 no. Annex 1 habitat type in the cSAC, as defined by a range of attributes and targets.

Annex I Habitats
• Perennial vegetation of stony banks [1220]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes including erosion and succession.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the typical vegetated shingle flora including the range of subcommunities within the different zones</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
</table>
</td><td>12.9km by sea from proposed development

7.6km by sea from the disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat length</td><td>Kilometres</td><td>Area stable, subject to natural processes, including erosion. Total
length of cliff mapped: 2.57km.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes</td></tr>
<tr><td>Physical structure: functionality and Hydrological regime</td><td>Occurrence of artificial barriers</td><td>No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: bracken and woody species</td><td>Percentage</td><td>Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE000202</td><td>Howth Head cSAC</td><td>
Conservation Objectives Specific Version 1.0 (06/12/16)
To maintain the favourable conservation condition of 2 no. Annex 1 habitat type in the cSAC, as defined by a range of attributes and targets.

Annex I Habitats

Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat length</td><td>Kilometres</td><td>Area stable, subject to natural processes, including erosion. Total
length of cliff: 8.22km.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and hydrological regime</td><td>Occurrence of artificial barriers</td><td>No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures</td></tr>
</table>
</td><td>5.6km by sea from proposed development

3.0km by sea from the disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: bracken and woody species</td><td>Percentage</td><td>Cover of bracken (Pteridium aquilinum) on grassland and/or heath less than 10%. Cover of woody species on grassland and/or heath less than 20%</td></tr>
</table>
European dry heaths [4030]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes</td></tr>
<tr><td>Ecosystem function: soil nutrients</td><td>Soil pH and appropriate nutrient levels at a representative number of monitoring stops</td><td>Maintain soil nutrient status within natural range</td></tr>
<tr><td>Community diversity</td><td>Abundance of variety of vegetation communities</td><td>Maintain variety of vegetation communities, subject to natural processes</td></tr>
<tr><td>Vegetation composition: lichens and bryophytes</td><td>Number of species at a representative number of 2m x 2m monitoring stops</td><td>Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding Campylopus and Polytrichum mosses</td></tr>
<tr><td>Vegetation composition: number of positive indicator species</td><td>Number of species at a representative number of 2m x 2m monitoring stops</td><td>Number of positive indicator species present at each monitoring stop is at least two</td></tr>
<tr><td>Vegetation composition: cover of positive indicator species</td><td>Percentage cover at a representative number of 2m x 2m monitoring stops</td><td>Cover of positive indicator species at least 50% for siliceous dry heath and 50- 75% for calcareous dry heath</td></tr>
</table>
</td><td></td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed development
		Vegetation composition: dwarf shrub composition	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle (Myrica gale), creeping willow (Salix repens) and western gorse (Ulex gallii) is less than 50%	
		Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	
		Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	
		Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	
		Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (Pteridium aquilinum) less than 10%	
		Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (Juncus effusus) less than 10%	
		Vegetation structure: senescent ling	Percentage cover at a representative number of 2m x 2m monitoring stops	Senescent proportion of ling (Calluna vulgaris) cover less than 50%	
		Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	
		Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas	
		Vegetation structure: growth phases of ling	Percentage cover in local vicinity of a representative number of monitoring stops	Outside sensitive areas, all growth phases of ling (Calluna vulgaris) should occur throughout, with at least 10% of cover in the mature phase	
		Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a	Cover of disturbed bare ground less than 10%	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>representative number of 2m x 2m monitoring stops</td><td></td></tr>
<tr><td>Indicators of local distinctiveness</td><td>Occurrence and population size</td><td>No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE000206</td><td>North Dublin Bay cSAC</td><td>
Conservation Objectives Specific Version 1.0 (06/11/13)
To maintain or restore the favourable conservation condition of 9 no. Annex 1 habitat type in the cSAC, as defined by a range of attributes and targets; and of 1 no. Annex II species in the cSAC, as defined by 5 no. attributes and targets.

Annex I Habitats

• Mudflats and sandflats not covered by seawater at low tide [1140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community extent</td><td>Hectares</td><td>Maintain the extent of the Mytilus edulis-dominated community, subject to natural processes.</td></tr>
<tr><td>Community structure: Mytilus edulis density</td><td>Individuals/m²</td><td>Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Fine sand to sandy mud with Pygospio elegans and Crangon crangon community complex; Fine sand with Spio martinensis community complex.</td></tr>
</table>
• Annual vegetation of drift lines [1210]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area increasing, subject to natural processes, including erosion and succession. Total area mapped: South Bull - 0.11ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities with typical species: sea rocket (Cakile maritima), sea sandwort (Honckenya</td></tr>
</table>
</td><td>950m by sea from proposed development

4.8km by sea from the disposal site</td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

		peploides), prickly saltwort (Salsola kali) and oraches (Atriplex spp.)
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover

- *Salicornia* and other annuals colonizing mud and sand [1310]

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: North Bull Island - 29.10ha.
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and subcommunities	Percentage cover	Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)
Vegetation structure: negative indicator species – Spartina anglica	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: North Bull Island - 81.84ha.

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain more than 90% of area outside creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species – Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%</td></tr>
</table>
Petalophyllum ralfsii [1395]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Distribution of populations</td><td>Number and geographical spread of populations</td><td>No decline</td></tr>
<tr><td>Population size</td><td>Number of individuals</td><td>No decline. Population at Bull Island estimated at a maximum of 5,824 thalli. Actual population is more likely to be 5% of this, or
c. 300 thalli</td></tr>
<tr><td>Area of suitable habitat</td><td>Hectares</td><td>No decline. Area of suitable habitat at Bull Island is estimated at c. 0.04ha.</td></tr>
<tr><td>Hydrological conditions: soil moisture</td><td>Occurrence</td><td>Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter</td></tr>
<tr><td>Vegetation structure: height and cover</td><td>Centimetres and percentage</td><td>Maintain open, low vegetation with a high percentage of bryophytes (small acrocarps and liverwort turf) and bare ground</td></tr>
</table>
Mediterranean salt meadows (Juncetalia maritimi) [1410]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession. For sub-site mapped: North Bull Island - 7.98ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain more than 90% of area outside creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species – Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%</td></tr>
</table>

• Embryonic shifting dunes [2110]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession. For sub-sites mapped: North Bull - 2.64ha; South Bull - 3.43ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: plant health of foredune grasses</td><td>Percentage cover</td><td>More than 95% of sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present)</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
</table>
Shifting dunes along the shoreline with Ammophila arenaria ("white dunes") [2120]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes including erosion and succession. North Bull - 2.20ha; South Bull - 0.97ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: plant health of dune grasses</td><td>Percentage cover</td><td>95% of marram grass (Ammophila arenaria) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present)</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
</table>
*Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes including erosion and succession. For subsites mapped: North Bull - 40.29ha; South Bull - 64.56ha.</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: bare ground</td><td>Percentage cover</td><td>Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes</td></tr>
<tr><td>Vegetation structure: sward height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in Delaney et al. (2013)</td></tr>
<tr><td>Vegetation composition: negative indicator species (including Hippophae rhamnoides)</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: scrub/trees</td><td>Percentage cover</td><td>No more than 5% cover or under control</td></tr>
</table>
Humid dune slacks [2190]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: North Bull - 2.96ha; South
Bull - 9.15ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: hydrological and flooding regime</td><td>Water table levels; groundwater fluctuations (metres)</td><td>Maintain natural hydrological regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: bare ground</td><td>Percentage cover</td><td>Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain range of subcommunities with typical species listed in Delaney et al. (2013)</td></tr>
<tr><td>Vegetation composition: cover of Salix repens</td><td>Percentage cover; centimetres</td><td>Maintain less than 40% cover of creeping willow (Salix repens)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
<tr><td>Vegetation composition: scrub/trees</td><td>Percentage cover</td><td>No more than 5% cover or under control</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE000210</td><td>South Dublin Bay cSAC</td><td>
Conservation Objectives Specific Version 1.0 (22/08/13)
To maintain the favourable conservation condition of 1 no. Annex 1 habitat type [1140] in the cSAC, as defined by 4 no. attributes and targets.

Note: Habitat types [1210], [1310] and [2110] were added as qualifying interests in 2015 and the site's conservation objectives have not yet been revised to take account of these features. Their objectives from North Dublin Bay cSAC have been adopted for this assessment.

Annex I Habitats

• Mudflats and sandflats not covered by seawater at low tide [1140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent habitat area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community extent</td><td>Hectares</td><td>Maintain the extent of the Mytilus edulis-dominated community, subject to natural processes.</td></tr>
<tr><td>Community structure: Mytilus edulis density</td><td>Individuals/m²</td><td>Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes</td></tr>
<tr><td>Community distribution</td><td>Hectares</td><td>Conserve the following community types in a natural condition: Fine sand to sandy mud with Pygospio elegans and Crangon crangon community complex; Fine sand with Spio martinensis community complex.</td></tr>
</table>
• Annual vegetation of drift lines [1210]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area increasing, subject to natural processes, including erosion and succession.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes</td></tr>
</table>
</td><td>30m (straight line distance)
2.3km (by sea)

8.0km by sea from the disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities with typical species: sea rocket (Cakile maritima), sea sandwort (Honckenya
peploides), prickly saltwort (Salsola kali) and oraches (Atriplex spp.)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-natives) to represent less than 5% cover</td></tr>
</table>
Salicornia and other annuals colonizing mud and sand [1310]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including
erosion and succession.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions</td></tr>
<tr><td>Physical structure: creeks and pans</td><td>Occurrence</td><td>Maintain creek and pan structure, subject to natural processes, including erosion and succession</td></tr>
<tr><td>Physical structure: flooding regime</td><td>Hectares flooded; frequency</td><td>Maintain natural tidal regime</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation structure: vegetation height</td><td>Centimetres</td><td>Maintain structural variation within sward</td></tr>
<tr><td>Vegetation structure: vegetation cover</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain more than 90% of area outside creeks vegetated</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover</td><td>Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)</td></tr>
<tr><td>Vegetation structure: negative indicator species – Spartina anglica</td><td>Hectares</td><td>No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
Embryonic shifting dunes [2110]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>Area stable or increasing, subject to natural processes, including erosion and succession.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline or change in habitat distribution, subject to natural processes.</td></tr>
<tr><td>Physical structure: functionality and sediment supply</td><td>Presence/ absence of physical barriers</td><td>Maintain the natural circulation of sediment and organic matter, without any physical obstructions</td></tr>
<tr><td>Vegetation structure: zonation</td><td>Occurrence</td><td>Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</td></tr>
<tr><td>Vegetation composition: plant health of foredune grasses</td><td>Percentage cover</td><td>More than 95% of sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present)</td></tr>
<tr><td>Vegetation composition: typical species and subcommunities</td><td>Percentage cover at a representative number of monitoring stops</td><td>Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius)</td></tr>
<tr><td>Vegetation composition: negative indicator species</td><td>Percentage cover</td><td>Negative indicator species (including non-native species) to represent less than 5% cover</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE003000</td><td>Rockabill to Dalkey Island SAC</td><td>
Conservation Objectives Specific Version 1.0 (07/05/13)
To maintain the favourable conservation condition of 1 no. Annex 1 habitat type in the SAC, as defined by 3 no. attributes and targets; and of 1 no. Annex II species in the SAC, as defined by 2 no. attributes and targets.

Annex I Habitats

Reefs [1170]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent area is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Distribution</td><td>Occurrence</td><td>The distribution of reefs is stable or increasing, subject to natural processes.</td></tr>
<tr><td>Community structure</td><td>Biological composition</td><td>Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.</td></tr>
</table>
Annex II Species
</td><td>5.0km by sea from proposed development

Zero –disposal site is within SAC</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
• Harbour porpoise (Phocoena phocoena) [1351]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Access to suitable habitat</td><td>Number of artificial barriers</td><td>Species range within the site should not be restricted by artificial barriers to site use.</td></tr>
<tr><td>Disturbance</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE003015</td><td>Codling Fault Zone cSAC</td><td>
Conservation Objectives Generic Version 6.0 (21/02/18)
Site specific COs have not been published. The generic CO is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected

• Submarine structures made by leaking gases [1180]

Conservation attributes and targets have not been published.
</td><td>31.9km by sea from proposed development

22.9km by sea from the disposal site</td></tr>
<tr><td>IE004024</td><td>South Dublin Bay & River Tolka Estuary SPA</td><td>
Conservation Objectives Specific Version 1.0 (09/03/15)
To maintain the favourable conservation condition of –
• 9 no. overwintering species in the SPA, as defined by 2 no. attributes and targets;
• 3 no. breeding and passage species of terns, as defined by a wider range of attributes and targets; and
• wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as defined by 1 no. attribute and target.

Special Conservation Interests

• Light-bellied Brent Goose (Branta bernicla hrota) [A046]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation</td></tr>
</table>
• Oystercatcher (Haematopus ostralegus) [A130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td>18m. The SPA boundary runs flush to the boundary of the proposed development at Berth 53</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation</td></tr>
</table>
Ringed Plover (Charadrius hiaticula) [A137]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation</td></tr>
</table>
Knot (Calidris canutus) [A143]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation</td></tr>
</table>
Sanderling (Calidris alba) [A144]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation</td></tr>
</table>
Dunlin (Calidris alpina) [A149]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation</td></tr>
</table>
Bar-tailed Godwit (Limosa lapponica) [A157]
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation</td></tr>
</table>
Redshank (Tringa totanus) [A162]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation</td></tr>
</table>
Black-headed Gull (Croicocephalus ridibundus) [A179]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by black-headed gull, other than that occurring from natural patterns of variation</td></tr>
</table>
Roseate Tern (Sterna dougallii) [A192]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Passage population: individuals</td><td>Number</td><td>No significant decline</td></tr>
<tr><td>Distribution: roosting areas</td><td>Number; location; area (hectares)</td><td>No significant decline</td></tr>
<tr><td>Prey biomass available</td><td>Kilogrammes</td><td>No significant decline</td></tr>
<tr><td>Barriers to connectivity</td><td>Number; location; shape; area (hectares)</td><td>No significant increase</td></tr>
<tr><td>Disturbance at roosting site</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns</td></tr>
</table>
Common Tern (Sterna hirundo) [A193]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Breeding population abundance: Apparently occupied nests (AONs)</td><td>Number</td><td>No significant decline</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Productivity rate: fledged young per breeding pair</td><td>Mean number</td><td>No significant decline</td></tr>
<tr><td>Passage population: individuals</td><td>Number</td><td>No significant decline</td></tr>
<tr><td>Distribution: breeding colonies</td><td>Number; location; area (hectares)</td><td>No significant decline</td></tr>
<tr><td>Distribution: roosting areas</td><td>Number; location; area (hectares)</td><td>No significant decline</td></tr>
<tr><td>Prey biomass available</td><td>Kilogrammes</td><td>No significant decline</td></tr>
<tr><td>Barriers to connectivity</td><td>Number; location; shape; area (hectares)</td><td>No significant increase</td></tr>
<tr><td>Disturbance at breeding site</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the breeding common tern population</td></tr>
<tr><td>Disturbance at roosting site</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns</td></tr>
</table>
Arctic Tern (Sterna paradisaea) [A194]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Passage population</td><td>Number of individuals</td><td>No significant decline</td></tr>
<tr><td>Distribution: roosting areas</td><td>Number; location; area (hectares)</td><td>No significant decline</td></tr>
<tr><td>Prey biomass available</td><td>Kilogrammes</td><td>No significant decline</td></tr>
<tr><td>Barriers to connectivity</td><td>Number; location; shape; area (hectares)</td><td>No significant increase</td></tr>
<tr><td>Disturbance at roosting site</td><td>Level of impact</td><td>Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns</td></tr>
</table>
<u>Note</u>: Grey Plover (Pluvialis squatarola) [A140] is proposed for removal from the list of Special Conservation Interests for South Dublin Bay and River Tolka Estuary SPA. As a result, a site-specific conservation objective has not been set for this species.
</td><td></td></tr>
<tr><td>IE004006</td><td>North Bull Island SPA</td><td>
Conservation Objectives Specific Version 1.0 (09/03/15)
To maintain the favourable conservation condition of 17 no. Annex 1 species in the SPA, as defined by 2 no. attributes and targets; and of wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as measured by 1 no. attribute and target

Special Conservation Interests
Light-bellied Brent Goose (Branta bernicla hrota) [A046]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td>875m by sea</td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation

- Shelduck (*Tadorna tadorna*) [A048]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation

- Teal (*Anas crecca*) [A052]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation

- Pintail (*Anas acuta*) [A054]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by pintail, other than that occurring from natural patterns of variation

- Shoveler (*Anas clypeata*) [A056]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation

- Oystercatcher (*Haematopus ostralegus*) [A130]

Attribute	Measure	Target

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation

- Ringed Plover (*Charadrius hiaticula*) [A137]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation

- Golden Plover (*Pluvialis apricaria*) [A140]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation

- Grey Plover (*Pluvialis squatarola*) [A141]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation

- Knot (*Calidris canutus*) [A143]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation

- Sanderling (*Calidris alba*) [A144]

Attribute	Measure	Target

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation

- Dunlin (*Calidris alpina*) [A149]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation

- Black-tailed Godwit (*Limosa limosa*) [A156]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation

- Bar-tailed Godwit (*Limosa lapponica*) [A157]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation

- Curlew (*Numenius arquata*) [A160]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation

- Redshank (*Tringa totanus*) [A162]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation</td></tr>
</table>
Turnstone (Arenaria interpres) [A169]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation</td></tr>
</table>
Black-headed Gull (Croicocephalus ridibundus) [A179]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by black-headed gull, other than that occurring from natural patterns of variation</td></tr>
</table>
Wetlands [A999]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1,713 hectares, other than that occurring from natural patterns of variation.</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE004016</td><td>Baldoyle Bay SPA</td><td>
Conservation Objectives Specific Version 1.0 (27/02/13)
To maintain the favourable conservation condition of 6 no. Annex 1 species in the SPA, as defined by a series of attributes and targets; and of wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as measured by 1 no. attribute and target

Special Conservation Interests
Light-bellied Brent Goose (Branta bernicla hrota) [A046]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation</td></tr>
</table>
Shelduck (Tadorna tadorna) [A048]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td>15.4km by sea</td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation

- Ringed Plover (*Charadrius hiaticula*) [A137]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation

- Golden Plover (*Pluvialis apricaria*) [A140]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation

- Grey Plover (*Pluvialis squatarola*) [A141]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation

- Bar-tailed Godwit (*Limosa lapponica*) [A157]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation

- Wetlands [A999]

Attribute	Measure	Target

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development
		Habitat area Hectares The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263 hectares, other than that occurring from natural patterns of variation.	
IE004113	Howth Head Coast SPA	**Conservation Objectives Generic Version 6.0 (21/02/18)** To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA **Special Conservation Interests** • Kittiwake *(Rissa tridactyla)* [A188] Conservation attributes and targets have not been published.	7.9km by sea from proposed development 2.6km by sea from disposal site
IE004117	Ireland's Eye SPA	**Conservation Objectives Generic Version 6.0 (21/02/18)** To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA **Special Conservation Interests** • Cormorant (*Phalacrocorax carbo)* [A017] • Herring Gull (*Larus argentatus*) [A184] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] Conservation attributes and targets have not been published.	12.3km by sea 7.2km by sea from disposal site 9.1km by air
IE004172	Dalkey Islands SPA	**Conservation Objectives Generic Version 6.0 (21/02/18)** To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA **Special Conservation Interests** • Roseate Tern (Sterna dougallii) [A192] • Common Tern (Sterna hirundo) [A193] • Arctic Tern (Sterna paradisaea) [A194] Conservation attributes and targets have not been published.	9.0km by sea from proposed development 5.5km by sea from disposal site
IE004025	Malahide Estuary SPA	**Conservation Objectives Specific Version 1.0 (16/08/13)** To maintain the favourable conservation condition of 14 no. Annex 1 species in the SPA, as defined by a series of attributes and targets; and of wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as measured by 1 no. attribute and target **Special Conservation Interests** • Great Crested Grebe (*Podiceps cristatus*) [A005] **Attribute** **Measure** **Target**	20km by sea from proposed development 14.0km by sea from disposal site

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great crested grebe, other than that occurring from natural patterns of variation

- Brent Goose (*Branta bernicla hrota*) [A046]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation

- Shelduck (*Tadorna tadorna*) [A048]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation

- Pintail (*Anas acuta*) [A054]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by pintail, other than that occurring from natural patterns of variation

- Goldeneye (*Bucephala clangula*) [A067]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by goldeneye, other than that occurring from natural patterns of variation

- Red-breasted Merganser (*Mergus serrator*) [A069]

Attribute	Measure	Target

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation</td></tr>
</table>
Oystercatcher (Haematopus ostralegus) [A130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation</td></tr>
</table>
Golden Plover (Pluvialis apricaria) [A140]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation</td></tr>
</table>
Grey Plover (Pluvialis squatarola) [A141]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation</td></tr>
</table>
Knot (Calidris canutus) [A143]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation</td></tr>
</table>
Dunlin (Calidris alpina alpine) [A149]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation</td></tr>
</table>
Black-tailed Godwit (Limosa limosa) [A156]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation</td></tr>
</table>
Bar-tailed Godwit (Limosa lapponica) [A157]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation</td></tr>
</table>
Redshank (Tringa totanus) [A162]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation</td></tr>
</table>
Wetlands [A999]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263 hectares, other than that occurring from natural patterns of variation.</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE004015</td><td>Rogerstown Estuary SPA</td><td>Conservation Objectives Specific Version 1.0 (20/05/13)
To maintain the favourable conservation condition of 11 no. Annex 1 species in the SPA, as defined by a series of attributes and targets; and of wetland habitats in the SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, as measured by 1 no. attribute and target

Special Conservation Interests
• Greylag Goose (Anser anser) [A043]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
</table>
</td><td>19.3km by sea from proposed development

15.1km by sea from disposal site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by greylag goose, other than that occurring from natural patterns of variation</td></tr>
</table>
Light-bellied Brent Goose (Branta bernicla hrota) [A046]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation</td></tr>
</table>
Shelduck (Tadorna tadorna) [A048]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation</td></tr>
</table>
Shoveler (Anas clypeata) [A056]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation</td></tr>
</table>
Oystercatcher (Haematopus ostralegus) [A130]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation</td></tr>
</table>
Ringed Plover (Charadrius hiaticula) [A137]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Population trend</td><td>Percentage change</td><td>Long term population trend stable or increasing</td></tr>
</table>
</td><td></td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives	Distance from proposed development

Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation

- Grey Plover (*Pluvialis squatarola*) [A141]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation

- Knot (*Calidris canutus*) [A143]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation

- Dunlin (*Calidris alpina*) [A149]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation

- Black-tailed Godwit (*Limosa limosa*) [A156]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation

- Redshank (*Tringa totanus*) [A162]

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed development</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation</td></tr>
</table>
Wetlands [A999]
<table>
<tr><th>Attribute</th><th>Measure</th><th>Target</th></tr>
<tr><td>Habitat area</td><td>Hectares</td><td>The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 646 hectares, other than that occurring from natural patterns of variation.</td></tr>
</table>
</td><td></td></tr>
<tr><td>IE004069</td><td>Lambay Island SPA</td><td>
Conservation Objectives Generic Version 6.0 (21/02/18)
To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

Special Conservation Interests

Fulmar (Fulmarus glacialis) [A009]
Cormorant (Phalacrocorax carbo) [A017]
Shag (Phalacrocorax aristotelis) [A018]
Greylag Goose (Anser anser) [A043]
Lesser Black-backed Gull (Larus fuscus) [A183]
Herring Gull (Larus argentatus) [A184]
Kittiwake (Rissa tridactyla) [A188]
Guillemot (Uria aalge) [A199]
Razorbill (Alca torda) [A200]
Puffin (Fratercula arctica) [A204]

Conservation attributes and targets have not been published.
</td><td>21.6km by sea from proposed development

16.0km by sea from disposal site</td></tr>
</table>

4.2 ASCERTAINING WHETHER IMPACT PATHWAYS EXIST

The possibility of significant effects is considered using the source-pathway-receptor model. 'Source' is defined as the individual elements of the proposed works that have the potential to affect the identified ecological receptors. 'Pathway' is defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' is defined as the Special Conservation Interests (for SPAs) or Qualifying Interests (of SACs/cSACs) for which conservation objectives have been set for the European sites under consideration. Each element can exist independently however an effect is created when there is a linkage between the source, pathway and receptor.

Possible effects are discussed under four themes:

- Habitat loss
- Water quality and habitat deterioration
- Underwater noise and disturbance
- Aerial noise and visual disturbance

4.3 POSSIBLE EFFECTS

4.3.1 Habitat Loss

The application boundary of the MP2 Project is located outside of any European site, and as such no direct habitat loss from any European site is anticipated as a result of any aspect of the MP2 Project within the application boundary. However, the proposed development is located very close to the boundary of South Dublin Bay and River Tolka Estuary SPA and consideration is given in the next section as to whether or not the proposed development could affect the habitats of that SPA in such close proximity, either at construction phase or during the operational phase. In addition, some aspects of the proposed development could give rise to indirect effects on qualifying habitats or species of a range of European sites further afield and these potential effects are also considered below.

4.3.2 Potential Effects on Water Quality and Potential Habitat Deterioration

4.3.2.1 South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA

As described in Section 3.2.3 above, it is proposed to construct a new Ro-Ro jetty structure of approximately 406m in length as a new river berth (Berth 53). The berth is located outside of but adjacent to South Dublin Bay and River Tolka Estuary SPA. This berth is illustrated in Figure 4.3 below:

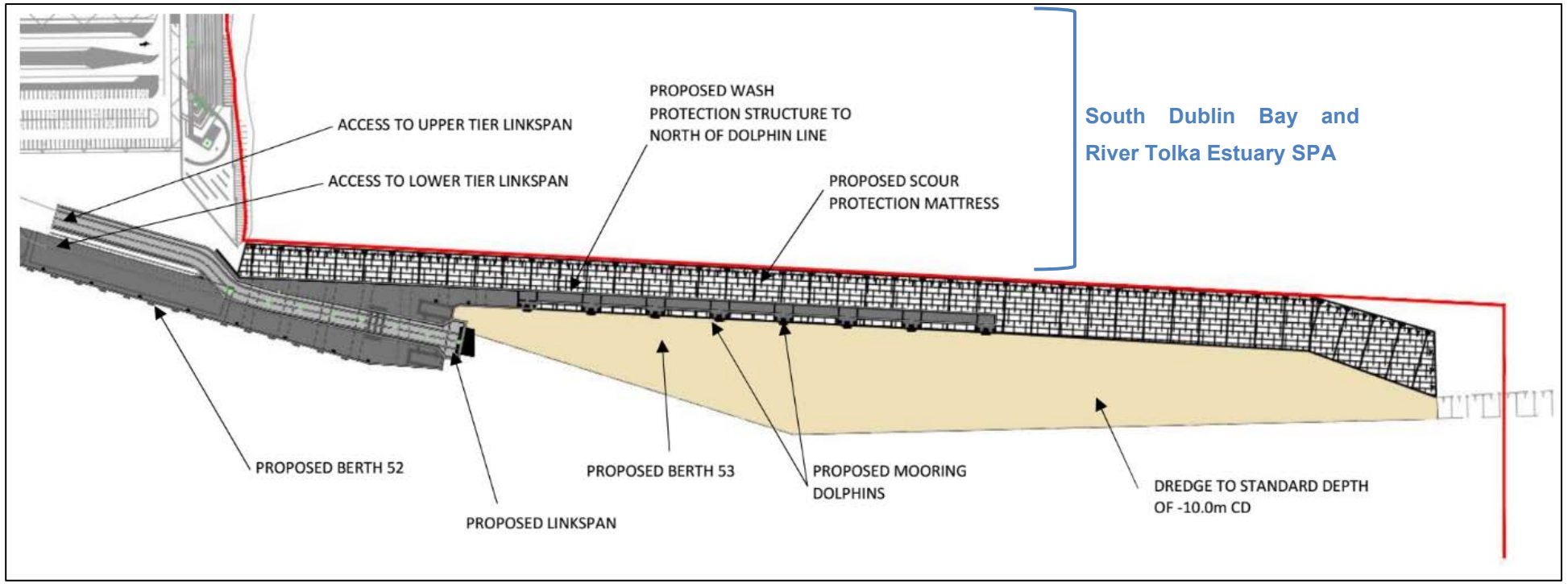

Figure 4.3 Proposed Berth 53 adjacent to the SPA

Berth 53 is also shown on the following Planning Drawings which accompany the application for permission:

- CP1770-BLP-ZZ-ZZ-M2-MA-0100 Berth 53 Plan, Elevation & Section (Sheet 1 of 3)
- CP1770-BLP-ZZ-ZZ-M2-MA-0101 Berth 53 Plan, Elevation & Section (Sheet 2 of 3)
- CP1770-BLP-ZZ-ZZ-M2-MA-0102 Berth 53 Plan, Elevation & Section (Sheet 3 of 3)

The configuration of the Berth, the dredge area and concrete mattresses under the surface of the water can be seen in '*Proposed Section AA of Berth 53'* in Drawing CP1770-BLP-ZZ-ZZ-M2-MA-0101 and '*Proposed Section BB of Berth 53'* in Drawing CP1770-BLP-ZZ-ZZ-M2-MA-0102.

The berth is to be constructed 20m from the SPA boundary, and running parallel to it in a seaward direction. Below the water line, dredging is required up to the SPA boundary to achieve the design depth of -10.0m CD at the berthing pocket in front of the berth. Following dredging, installation of concrete mattresses to provide slope stabilisation and scour protection to the dredged berthing pocket will be required.

Berth 53 will be used predominantly for the berthing of Ro-Ro ferries and will accommodate the bow-to and stern-to berthing of a wide range of ferries up to 240m in length.

In addition, Berth 50A will be extended as described in Section 3.2.4 above to provide a multi-purpose predominately Lo-Lo Container Vessel berth. It will require dredging of a berthing pocket to -11.0m CD.

The Eastern Oil Jetty comprises Oil Berth 3 to the west and Oil Berth 4 to the east. As described in Section 3.2.5 above, the proposed development will involve the removal of Oil Berth 4 and consolidating operations to Oil Berth 3. The berth will be designed as a multi-purpose structure, initially for oil tanker berthing, with a future potential use as a container vessel berth. The basin at Oil Berth 4 will be infilled to provide an additional container terminal storage area.

Infilling of the basin at Oil Berth 4 with engineered fill material and suitable recycled Construction and Demolition (C&D) waste arising from proposed demolition works within the footprint of the MP2 Project development area. The void between the existing Oil Berth 3 and a proposed new sheet pile wall will also be filled with engineered fill material. The quantity of fill material required is approximately 145,000m^3. Oil Berth 3 will require dredging of a berthing pocket to -13.0m CD.

To facilitate the safe navigation and turning of vessels of up to 240m in length, and the expected increased frequency of sailings, channel widening works will be required to the south of the existing navigation channel. Widening will be carried out via dredging works. The standard depth of the channel will be -10.0m CD.

As well as the possibility of mobilised suspended sediments due to dredging or disposal, cement release through general construction activities or spillages of polluting substances are also a potential source of pollution to the marine environment at construction phase, as a result of:

- Demolition of buildings & structures;
- Berth Construction including the construction of waterside berths, quay walls, jetties, open piled structures
- Landside ancillary works to serve the marine operations including the construction of ramps and deck structures to access linkspans, services and drainage installation, and installation of jetty furniture and fender systems
- Accidental release of highly alkaline contaminants from concrete and cement during the demolition of buildings and structures and the construction of hardstand areas, waterside berths, quay walls, jetties, bridging structures
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals

Operational phase impacts associated with the MP2 Project (buildings/structures, berths and associated marine berthing and manoeuvring, and landside works) represents an increase in use of the land over the current normal day-to-day port activities. These associated impacts are currently well understood and managed within the Port's operational and maintenance procedures. The principal potential sources of water quality impact are:

- Increased suspended sediment levels due to port operations including the ongoing maintenance dredging of the proposed new berths;
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals and releases associated with the operation and maintenance of surface water drainage systems;
- Discharges from dredging vessels at construction stage and vessels using the berths of the operational MP2 Project (ballast water, wastewater, oil spillages, fuel bunkering);
- Discharges from cargo handling (leakages from containers, bulk material spillages, losses from conveyor systems);
- Discharges from cargo storage areas and onward transportation (losses from hoppers, flat bulk stores and HGVs).

4.3.2.1.1 Overwintering Waterbirds

4.3.2.1.1.1 Dredging and Disposal

South Dublin Bay & River Tolka Estuary SPA is designated for 13 no regularly occurring migratory waterbird species including 3 no breeding and/or passage species of tern, and wetland habitat. Grey Plover is proposed for removal from the list of SCIs for South Dublin Bay and River Tolka Estuary SPA,

and, as a result, Conservation Objectives (COs) have not been set for this species. However, for the sake of completeness, Grey Plover was a SCI when the site was notified to the Commission and it has been included in this appraisal.

North Bull Island SPA is designated for 17 no regularly occurring migratory waterbird species and wetland habitat.

Looking firstly at the overwintering species, the CO for the overwintering species SCIs in both SPAs is to maintain the favourable conservation condition of the target species in the respective SPA, as defined by 2 no SSCO attributes and targets:

Population trend:	Long term population trend stable or increasing
Distribution:	No significant decrease in the range, timing or intensity of use of areas by the target species, other than that occurring from natural patterns of variation

The targets for the SSCO attribute 'Population trend' is measured in '% change'. The target for 'Distribution' is measured in 'Range, timing and intensity of use of areas'. The North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA Conservation Objectives Supporting Document (NPWS, 2014) notes that factors that can adversely affect the achievement of these objectives include activities that modify discreet areas or the overall habitat(s) within the SPA in terms of how one or more of the listed species use the site (e.g. as a feeding resource) and which could result in the displacement of these species from areas within the SPA and/or a reduction in their numbers.

NPWS (2014) also notes in relation to the conservation objective for wetland habitat that, in order to be in favourable condition, the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 3,904ha, other than that occurring from natural patterns of variation. It notes that the wetland habitats can be categorised into three broad types: subtidal; intertidal and supratidal, and that over time and though natural variation these sub-components of the overall wetland complex may vary due to factors such as changing rates of sedimentation, erosion etc. Many waterbird species will use more than one of the habitat types for different reasons throughout the tidal cycle.

The NPWS document advises that the maintenance of the 'quality' of wetland habitat lies outside the scope of the wetland habitat objective, but for the species of Special Conservation Interest, the scope of the trend and distribution objective covers the need to maintain, or improve where appropriate, the different properties of the wetland habitats contained within the SPA.

Given the possibility that constructing Berth 53 and its associated berthing pocket could result in a plume of suspended sediments entering the SPAs and potentially decrease in the range, timing or intensity of use of part of the SPAs by the SCI species, there is a risk that suspended sediments could undermine the conservation targets set for overwintering SCIs in either or both of South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA.

Further, operating Berth 53 and its associated berthing pocket could possibly result in changes to the existing tidal patterns, currents or wave action in an adjacent area of South Dublin Bay & River Tolka Estuary, and may result in localised changes to the transport sediment regime or morphology of the seafloor in the SPA, such changes could potentially decrease in the range, timing or intensity of use of parts of the South Dublin Bay & River Tolka SPA by the wintering SCI species. If that were to occur, it could potentially undermine the conservation targets set for overwintering SCIs in either or both of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA.

Constructing Berth 53 and its associated berthing pocket could result in potential effects upon the adjacent intertidal area of the South Dublin Bay & River Tolka Estuary SPA, where the qualifying populations of waders and waterbirds of both South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA can occur. At construction stage, there is a possibility that dredging activities could result in a plume of suspended sediments entering the SPA. At operational stage, there is a possibility that the new berth could result in changes to the existing tidal patterns and currents in this adjacent area of the SPA, or localised increases in wave heights due to changes in wave refraction patterns. Such occurrences may result in localised changes to the transport sediment regime in this part of the SPA and potentially result in changes to the morphology of the seafloor.

These construction phase and operational phase risks remain in the absence of further evaluation and analysis and in the absence of consideration of the application of any appropriate measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA. Accordingly, the possibility of likely significant effects cannot be excluded at this stage.

4.3.2.1.1.2 Potential sources of pollution

In addition to the possibility of mobilised suspended sediments due to dredging or disposal, possible cement release through general construction activities or spillages of polluting substances are also a potential source of pollution to the marine environment at construction phase, as outlined in the introduction to Section 4.3.2. Also outlined there are the principal potential sources of water quality deterioration effects at operational phase:

- Increased suspended sediment levels due to port operations including the ongoing maintenance dredging of the proposed new berths;
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals and releases associated with the operation and maintenance of surface water drainage systems;
- Discharges from vessels using the berths of the operational MP2 Project (ballast water, wastewater, oil spillages, fuel bunkering);
- Discharges from cargo handling (leakages from containers, bulk material spillages, losses from conveyor systems);

- Discharges from cargo storage areas and onward transportation (losses from hoppers, flat bulk stores and HGVs).

Despite the significant capacity of the Liffey and Tolka Estuaries to dilute elevated concentrations of polluting substances, and particularly given the proximity of the MP2 Project to the South Dublin Bay & River Tolka Estuary SPA, these construction phase and operational phase risks remain in the absence of any further evaluation and analysis and the likely application of measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA. Accordingly, the possibility of likely significant effects cannot be excluded at this stage.

4.3.2.1.2 Breeding Seabirds

4.3.2.1.2.1 Dredging and Disposal

Considering the breeding and passage seabird species SCIs of South Dublin Bay & River Tolka SPA, the conservation objectives for these SCIs are defined by 5 no attributes in the case of Roseate Tern and Arctic Tern, and 9 no attributes in the case of Common Tern.

One of those attributes is common to the three species of Terns and is considered here under the Water Quality and Habitat Deterioration impact pathway section, with the remainder being assessed under the disturbance impact pathway heading.

The SSCO attribute 'Prey Biomass available' is measured in weight (kg), and the target is for 'no significant decline'. Notes for this SSCO draw attention to that fact that Terns associated with the roost are thought to feed during the day in the wider Dublin Bay area and that evening observations of terns arriving to the roosting area indicated that most flew in from an easterly and south-easterly direction suggesting that the birds were feeding in the shallow waters of the Kish/Bray and Burford Banks. The mean foraging range of Roseate Tern is listed in the South Dublin Bay & River Tolka Estuary SPA Conservation Objectives document (NPWS, 2015) as 12.3km (mean max. 18.28km; max. 30km). The mean foraging range of Common Tern is listed as 8.67km (mean max. 33.81km; max. 37km). The mean foraging range of Arctic Tern is listed as 11.75km (mean max. 12.24km; max. 20.6km). Key prey items for all species are noted as comprising small fish, with crustaceans and other invertebrates also listed for Arctic and Common Terns.

The conservation target is for "no significant decline" in prey biomass available, and these species forage over a considerable range, within the port, close to it and for many kilometres offshore. The issue is whether or not a reduction in prey biomass available would likely be significant if it were to occur temporarily and only in a small part of the SPA.

Given the foraging ranges of these tern species and the known areas where they do forage, and the fact that elevated concentrations of suspended sediments would occur in the water column as a result of dredging and disposal during a season when terns are not present in the SPA, and that elevated

concentrations of suspended sediments would decrease in the water column over time and across the normal tidal cycle as sediments disperse and dilute to background levels outside of the breeding seabird season, a decrease in prey biomass available during the breeding season would not occur as a result of dredging or disposal over the winter period. Dredging and disposal will not conflict with the conservation target for prey biomass available for the species of terns.

However, at operational stage, localised changes to the transport sediment regime or morphology of the seafloor to the north of Berth 53 in part of the South Dublin Bay & River Tolka Estuary SPA where terns feed could alter the prey biomass available to the feature species of terns in this part of their range. This operational phase risks remain in the absence of further evaluation and analysis and consideration of the application of any appropriate measures intended to avoid or reduce the harmful effects of the proposed development on the site. Accordingly, the possibility of likely significant effects cannot be excluded at the screening stage.

4.3.2.1.2.2 Potential Sources of Pollution

Other construction activities and operational activities are potential sources of pollution. For the same reasons as described above for the wintering bird populations, construction phase and operational phase risks as a result of other polluting substances escaping to the marine environment (as described in Section 4.3.2.1.1.2) remain in the absence of further evaluation and analysis and the application of measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay & River Tolka Estuary SPA. Thus, the possibility of likely significant effects cannot be excluded at the screening stage.

In summary, dredging or disposal will not present any risk to achieving or maintaining the conservation target for prey biomass available for breeding terns in South Dublin Bay & River Tolka Estuary SPA, but other potential sources of water pollution at construction and operational stage may, and the risk of localised changes to the transport sediment regime or morphology of the seafloor to the north of Berth 53 may also present any risk to achieving or maintaining the conservation target for prey biomass available.

In the absence of further evaluation and analysis and the likely application of measures intended to avoid or reduce the harmful effects of the proposed development on the site, the possibility of likely significant effects on prey biomass available for breeding terns in South Dublin Bay & River Tolka Estuary SPA cannot be excluded.

4.3.2.2 Rockabill to Dalkey Island SAC

4.3.2.2.1 Reefs

The proposed disposal site (refer to Figure 4.2) is located within Rockabill to Dalkey Island SAC. It is proposed to dispose of 424,644m^3 of dredge material (refer Table 3.1) at the proposed disposal site over 4 winter seasons between 2024 and 2031, periodically levelling the seabed to remove peaks and troughs created by the disposed material:

- Under Berth 53 Jetty (Winter 2024)
- Berth 53 and the channel widening (Winter 2026)
- Oil Berth 3 is dredged (Winter 2030)
- Berth 50A (Winter 2031)

In addition to possible effects of underwater noise on harbour porpoise (and which is dealt with in Section 4.3.3), disposing of this quantum of seabed material within a European site must be considered with respect to the possible implications for the qualifying interest habitat of that European site.

Rockabill to Dalkey Island SAC is an enormous site (in excess of 27,000ha) but the Annex I reef habitat for which it is designated accounts for less than 1% of the site and occurs at a number of locations throughout the European site. The seabed at the disposal site is not in itself a location of Annex I reef habitat and is not a location of a qualifying interest of the European site.

The intertidal reef community complex is recorded on the south coast of Howth, where the exposure regime of the complex ranges from exposed to moderately exposed reef. Exposed reef is also recorded on the east side of Dalkey Island, on the east and southern shores of Ireland's Eye and on all shores of Rockabill and the Muglins. Moderately exposed reef occurs on the western shores of Dalkey and at Howth and Ireland's Eye. The subtidal reef community complex is recorded off the islands within the site and also off the coast between Lambay Island and Rush Village. The exposure regime here ranges from moderately exposed reef at the Muglins to exposed reef over the remainder of the site. The coastlines of Howth Head, Dalkey Island and Ireland's Eye are 3.3km, 5.1km and 7.5km respectively from the proposed disposal site. Lambay Island is 16km north of the proposed disposal site and Rockabill is approximately 30km to the north.

The closest qualifying reef habitat is located 3.3km north of the proposed disposal site and 5km from the MP2 Project in Dublin Port. The issue is whether or not elevated concentrations of suspended sediments or pollutants could result in likely significant effects on the qualifying reef habitat.

Conservation targets for 'Habitat Area' and' Distribution' of reef habitat are met when the permanent area (or distribution as the case may be) is stable or increasing, subject to natural processes. The Rockabill to Dalkey Island SAC Conservation objectives supporting document for Marine Habitats and Species (NPWS, 2013) notes that:

- the 'permanent area' target refer to activities or operations that propose to permanently remove reef habitat, thus reducing the permanent amount of reef habitat; and
- the 'distribution' target refer to activities or operations that propose to permanently remove reef habitat, thus reducing the range over which this habitat occurs.

These targets for do not refer to long or short term disturbance of the biology of reef habitats. Therefore, these conservation targets will not be undermined by any potential water quality or habitat deterioration effects of the proposed development.

However, there is a possibility that the community structure target to conserve the Intertidal and Subtidal reef community complexes in a natural condition may be affected by plumes arising from the disposal of dredged material or polluting events if the activities resulted in elevated concentrations of suspended sediments or pollutants in or at the reef community complexes for prolonged periods. NPWS (2013) notes that this target relates to the structure and function of the reef and therefore it is of relevance to those activities that may cause disturbance to the ecology of the habitat.

Despite the significant capacity of Dublin Bay to dilute elevated concentrations of suspended sediments and polluting substances, construction phase and operational phase risks remain in the absence of any further evaluation and analysis and the likely application of measures intended to avoid or reduce the harmful effects of the proposed development on the qualifying Reef habitat of Rockabill to Dalkey Island SAC. Accordingly, the possibility of likely significant effects cannot be excluded.

4.3.2.2.2 Harbour porpoise

Turning then to the harbour porpoise, the COs for this Annex II species is to maintain the favourable conservation condition of harbour porpoise in Rockabill to Dalkey Island SAC, as defined by 2 no SSCO attributes and targets:

Access to suitable habitat:	Species range within the site should not be restricted by artificial barriers to site use
Disturbance:	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site

The targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Disturbance' is measured in 'Level of impact'. In relation to potential water quality and habitat deterioration effects, the degree to which the water in the SAC is turbid and influence prey availability for the porpoise population does not appear to relate to any of the conservation targets listed above. NPWS (2013) notes however that harbour porpoise is an aquatic predator that feeds on a wide variety of fish, cephalopod and crustacean species occurring in the water column or close to the seabed, with dive depths in excess of 200m having been recorded for the species. Foraging areas for harbour porpoise are often associated with areas of strong tidal current and associated eddies; and the occurrence of porpoises close to shore or adjacent to islands and prominent headlands is commonly reported. NPWS (2013) also notes that the conservation target for disturbance relates *inter* alia to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour porpoises depend, and in the absence of complete knowledge on the ecological requirements of the species in this site, such considerations should be assessed where appropriate on a case-by-case basis.

With that in mind, the disturbance target that "*human activities should occur at levels that do not adversely affect the harbour porpoise community at the site*" could be affected by plumes arising from the disposal of dredged material at the proposed disposal site within the SAC if the activity resulted in

a reduction in prey availability. The question is whether or not a reduction in prey availability would likely be significant if it were to occur temporarily and only in a small part of the SAC.

Given that disposal of dredge material would occur in four winters over an eight year period, that elevated concentrations of suspended sediments would decrease in the water column around the disposal site over time and across the normal tidal cycle as sediments disperse and dilute to background levels, and the fact that harbour porpoise prey is mobile rather than static like the Annex I reef habitat, the possibility can be excluded that a decrease in prey availability would occur as a result of the disposal plume at and in the environs of the disposal site to such an extent as to conflict with the conservation target for disturbance at a community level for harbour porpoise in the SAC.

The risk of suspended sediments escaping into the marine environment as a result of disposal of dredged material providing a hydrological pathway of effect leading to a deterioration of key resources upon which the harbour porpoise community depends within Rockabill to Dalkey Island SAC can be ruled out. Likely significant effects can be excluded.

There are other potential sources of pollution of the marine environment that may arise as a result of the construction and operation of the MP2 Project, as discussed in Section 4.3.2.1.1.2. Significant mixing of seawater occurs in Dublin Bay with freshwater flowing in from the Liffey, Tolka and Dodder. The mixing of any polluting materials that escape to the marine environment as a result of the construction or operation of landside elements of the MP2 Project is further aided by the tidal currents, wind and wave climate which transport the mix of seawater and freshwater (and any polluting substances) both into and out of the Liffey Estuary, and help it disperse throughout Dublin Bay.

The capacity of the Liffey and Tolka Estuaries and Dublin Bay to dilute any elevated concentrations of polluting substances that escape into the marine environment is very significant, and the fact that Rockabill to Dalkey Island SAC is at least 6.5km from the MP2 Project landside elements excludes the possibility of likely significant effects of polluting substances escaping into the marine environment providing a hydrological pathway of effect leading to a deterioration of key resources upon which the harbour porpoise community depends within Rockabill to Dalkey Island SAC. Likely significant effects can be excluded.

4.3.2.3 Lambay Island cSAC

Figure 4.1 shows that Lambay Island cSAC is located to the north of Dublin Bay. It is offshore from Rogerstown Estuary cSAC, and is 22km by sea from Dublin Port. This cSAC is designated for two Annex I habitats (Reefs and Vegetated sea cliffs of the Atlantic and Baltic coasts), and two Annex II species (Grey Seal and Harbour Seal). In relation to potential water quality and habitat deterioration effects, the Annex I habitats of this site are located 16km north of the disposal site and more than 20km by sea from the MP2 Project in Dublin Port.

4.3.2.3.1 Vegetated Sea Cliffs

Vegetated sea cliffs of the Atlantic and Baltic coasts is principally a supratidal habitat but with the base of the slope located in either the intertidal or subtidal zone, thus creating the hydrological pathway link to potential water quality and habitat deterioration effects. The COs for Vegetated Sea Cliffs on Lambay Island cSAC are defined by a list of parameters, attributes and targets. The main parameters are range; area; and structure and function, the last of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition. There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the range or area of Vegetated Sea Cliffs in Lambay Island cSAC.

In relation to the structure and function targets, the Conservation objectives supporting document for coastal habitats at Lambay Island cSAC (NPWS, 2013) was reviewed to see what was behind the 6 no. attributes and targets. The attributes relating the hydrological regime is concerned with groundwater seeps and flushes of the cliffs, rather than the water quality of the sea surrounding the cliffs. Its target is to maintain, or where necessary restore, the natural geomorphological processes without any physical obstructions, and the local hydrological regime including ground water quality. None of the other 5 attributes under structure and function targets for sea cliffs relate to the water quality of the sea surrounding the cliffs.

The possibility of LSEs as a result of water quality and habitat deterioration effects on Vegetated sea cliffs of the Atlantic and Baltic coasts in Lambay Island cSAC does not arise and may be excluded.

4.3.2.3.2 Reefs

Within Lambay Island cSAC, two community types are recorded in the Annex I reef habitat. The conservation targets for area, distribution and community structure of reef habitat the same as described above in Section 4.3.2.2.1 for Rockabill to Dalkey Island cSAC. Thus, adopting the analysis set out above the conservation targets for area and distribution will not be undermined by disposal of dredge material in the proposed disposal site, but the community structure target to conserve the Intertidal and Subtidal reef community complexes in a natural condition may be undermined by plumes arising from the disposal of dredged material if the activity resulted in elevated concentrations of suspended sediments in or at the reef community complexes for prolonged periods.

The qualifying interest Reef habitat of Lambay Island is 16km north of the proposed disposal site and over 20km from the MP2 Project in Dublin Port. The assimilative capacity Dublin Bayand coastal waters of North County Dublin to dilute any elevated concentrations of polluting substances that escape into the marine environment is very significant, and the fact that Lambay Island cSAC is at least 16km by sea from any potential source of elevated suspended sediments or pollutants that may arise as part of the construction or operation of the MP2 Project, the possibility of likely significant effects of suspended sediments or polluting substances escaping into the marine environment providing a hydrological pathway of effect leading to a failure to achieve or maintain the community structure target will not occur. Likely significant effects on the Annex I Reef habitat of Lambay Island cSAC can be excluded.

4.3.2.3.3 Grey Seal and Harbour Seal

Turning then to the two Annex II species (Grey Seal and Harbour Seal) that Lambay Island cSAC is designated for, the COs for these species are to maintain the favourable conservation condition of Harbour Seal (or Grey Seal as the case may be) in Lambay Island cSAC, as defined by 5 no SSCO attributes and targets:

Access to suitable habitat:	Species range within the site should not be restricted by artificial barriers to site use
Breeding behaviour:	The breeding sites should be maintained in a natural condition
Moulting behaviour:	The moult haul-out sites should be maintained in a natural condition
Resting behaviour:	The resting haul-out sites should be maintained in a natural condition
Disturbance:	Human activities should occur at levels that do not adversely affect the harbour seal (or grey seal) population at the site

The targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Breeding behaviour' is measured in 'breeding sites'. The target for 'Moulting behaviour' is measured in 'moult haul-out sites'. The target for 'Resting behaviour' is measured in 'resting haul-out sites'. The target for 'Disturbance' is measured in 'Level of impact'.

Like the harbour porpoises of Rockabill to Dalkey Island SAC, Grey seal and Harbour seal are also successful aquatic predators that feeds on a wide variety of fish and cephalopods (with crustaceans also forming an import part of the diet of Harbour seals).

NPWS (2013) notes that the conservation target for disturbance relates *inter* alia to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour seal (or grey seal as the case may be) depend, and in the absence of complete knowledge on the ecological requirements of the species in this site, such considerations should be assessed where appropriate on a case-by-case basis.

It must be recalled that Lambay Island cSAC is more than 15km by sea from the disposal site and more than 20km by sea from Dublin Port. The question in this case is whether or not a reduction in prey availability more than 15km away at the disposal site (but within the feeding range of the seals) would likely be significant if it were to occur.

Noting the narrative in Section 4.3.2.2.2 above, in relation to potential prey reduction of harbour porpoise within Rockabill to Dalkey Island SAC that disposal of dredge material would occur in four winters over an eight year period, elevated concentrations of suspended sediments would decrease in the water column around the disposal site over time and across the normal tidal cycle as sediments

disperse and dilute to background levels, and the fact that seal prey is mobile rather than static like the Annex I reef habitat; a decrease in prey availability would not occur as a result of the disposal plume at and in the environs of the disposal site to such an extent as to conflict with the conservation target for disturbance at a harbour or grey seal population level in the cSAC.

The risk of suspended sediments or pollutants escaping into the marine environment as a result of disposal of dredged material providing a hydrological pathway of effect leading to a deterioration of key resources upon which the harbour or grey seal populations depend within Lambay Island cSAC can be ruled out in the absence of further evaluation and analysis or the application of measures intended to avoid or reduce the harmful effects of the proposed development on the site. LSEs can be excluded.

4.3.2.4 North Dublin Bay cSAC

This site is designated for one marine habitat type, eight coastal habitat types and an Annex II liverwort species. Of the eight coastal habitats, three are saltmarsh communities and five are sand dune communities but all eight of these habitats are found in close association with each other at Bull Island.

4.3.2.4.1 Saltmarsh Communities

The saltmarsh communities are flooded periodically by the sea and are restricted to the area between mid neap tide level and high water spring tide level (NPWS, 2013). The overall objective for *Salicornia* and other annuals colonising mud and sand in North Dublin Bay cSAC is to restore the habitat to a favourable conservation condition. The overall objective for Atlantic salt meadows and Mediterranean salt meadows is to maintain the favourable conservation condition of the Atlantic and Mediterranean salt meadows habitats; and restore the favourable conservation condition of the *Salicornia* habitat.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets divided into three main headings (Area, Range and Structure and Function).

The conservation target for habitat area of the saltmarsh communities is that the area is stable or increasing, subject to natural processes, including erosion and succession.

The conservation target for habitat distribution of the saltmarsh communities is that there is no decline, or change in habitat distribution, subject to natural processes.

There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the area or range of saltmarsh communities in North Dublin Bay cSAC.

Turning then to structure and function, there are nine attributes to be considered:

- *Physical structure*
    - (i) sediment supply
    - (ii) creeks and pans
    - (iii) flooding regime
- *Vegetation structure*

(iv) zonation
(v) vegetation height
(vi) vegetation cover

- *Vegetation composition*
  (vii) typical species & sub-communities
  (viii) negative indicator species

The target for sediment supply is to maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions. Constructing or operating the MP2 Project will not present any threat to the natural circulation of sediments and organic matter in the saltmarsh communities as there will be no physical obstructions introduced as part of the proposed development anywhere near North Dublin Bay cSAC.

The target for creeks and pans is to maintain creek and pan structure, subject to natural processes, including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the creek and pan structure of saltmarsh communities as there will be no physical works introduced as part of the proposed development anywhere near North Dublin Bay cSAC.

The target for flooding regime is to maintain the natural tidal regime. Constructing or operating the MP2 Project will not present any threat to the maintenance of the natural tidal regime of the saltmarsh communities of North Dublin Bay cSAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the range of coastal saltmarsh habitats including transitional zones in North Dublin Bay cSAC.

The target for vegetation height is to maintain structural variation within the sward. Constructing or operating the MP2 Project will not present any threat to the maintenance of the structural variation within the saltmarsh community swards of North Dublin Bay cSAC.

The target for vegetation cover is to maintain more than 90% of area outside creeks vegetated. Constructing or operating the MP2 Project will not present any threat to the maintenance of more than 90% of areas of saltmarsh communities outside of creeks being vegetated within North Dublin Bay cSAC.

The target for typical species and sub-communities is to maintain the presence of species-poor communities listed in the 2009 Saltmarsh Monitoring Project (the SMP) in the case of *Salicornia* and other annuals colonising mud and sand; and to maintain the range of sub-communities with typical species listed in SMP in the case of Atlantic and Mediterranean salt meadows. Constructing or operating the MP2 Project will not present any threat to maintaining the presence of species-poor communities

within the *Salicornia* habitats; or maintaining the range of sub-communities with typical species listed in SMP in the case of Atlantic and Mediterranean salt meadow habitats of North Dublin Bay cSAC.

The target for negative indicator species is for no significant expansion of common cordgrass with an annual spread of less than 1%. Constructing or operating the MP2 Project will not present any opportunity for significant expansion of common cordgrass within the saltmarsh habitats of North Dublin Bay cSAC.

It follows from the foregoing that the possibility of LSEs as a result of water quality and habitat deterioration effects on the saltmarsh habitats in North Dublin Bay cSAC does not arise and may be excluded.

4.3.2.4.2 Sand Dune Communities

Five dune habitats were recorded by Ryle et al. (2009) (indicated in bold above) are listed as Qualifying Interests for North Dublin Bay cSAC. These habitats include mobile areas at the front, as well as more stabilised parts of dune systems and also humid dune slacks (NPWS, 2013). The overall objective for the following habitats in North Dublin Bay cSAC is to restore to favourable conservation condition:

- Annual vegetation of drift lines
- Embryonic shifting dunes
- Shifting dunes along the shoreline with *Ammophila arenaria*
- Fixed coastal dunes with herbaceous vegetation
- Humid dune slacks

Sand dunes are hills of wind blown sand that have become progressively more stabilised by a cover of vegetation. In general, most sites display a progression through strandline, foredunes, mobile dunes and fixed dunes. Where the sandy substrate is decalcified, fixed dunes may give way to dune heath. Wet hollows, or dune slacks, occur where the dunes have been eroded down to the level of the water-table. Transitional communities can occur between dune habitats and they may also form mosaics with each other. Dune systems are in a constant state of change and maintaining this natural dynamism is essential to ensure that all of the habitats present at a site achieve favourable conservation condition.

All the dune habitats indicated above occur as a complex mosaic of constantly changing and evolving vegetation communities. They are inextricably linked in terms of their ecological functioning and should be regarded as single geomorphological units. As such, no dune habitat should be considered in isolation from the other dune habitats present at a site, or the adjoining semi-natural habitats with which they often form important transitional communities.

The overall objective for the five sand dune habitat types is to restore the favourable conservation condition of the habitats.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets divided into three main headings (Area, Range and Structure and Function).

The conservation target for habitat area of the sand dune habitats is that the area is stable or increasing (or increasing only in the case of humid dune slacks and annual vegetation of drift lines), subject to natural processes, including erosion and succession. The conservation target for habitat distribution of the sand dune habitats is that there is no decline, or change in habitat distribution, subject to natural processes. There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the area or range of the sand dune habitats in North Dublin Bay cSAC.

Turning then to structure and function, there are ten attributes to be considered across the five dune habitat types:

- *Physical structure*
  - (i) functionality and sediment supply
  - (ii) hydrological and flooding regime
- *Vegetation structure*
  - (iii) zonation
  - (iv) bare ground
  - (v) vegetation or sward height
- *Vegetation composition*
  - (vi) plant health of dune grasses
  - (vii) typical species & sub-communities
  - (viii) negative indicator species
  - (ix) scrub / trees
  - (x) cover of creeping willow

The target for functionality and sediment supply is to maintain the natural circulation of sediments and organic matter, without any physical obstructions. Constructing or operating the MP2 Project will not present any threat to the natural circulation of sediments and organic matter in the dune habitats as there will be no physical obstructions introduced as part of the proposed development anywhere near North Dublin Bay cSAC.

The target for hydrological and flooding regime (in the case of humid dune slacks) is to maintain the natural hydrological regime of the water table as measured by groundwater fluctuations. Constructing or operating the MP2 Project will not present any threat to the maintenance of the natural hydrological regime of the water table in humid dune slacks of North Dublin Bay cSAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the range of coastal sand dune habitats including transitional zones in North Dublin Bay cSAC.

The target for bare ground in the case of Fixed coastal dunes is that bare ground should not exceed 10% of fixed dune habitat, subject to natural processes. The target for bare ground in the case of humid dune slacks is that are ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for bare ground in the fixed dune or humid dune slack habitats in North Dublin Bay cSAC.

The target for vegetation height in the case of humid dune slacks (and sward height in the case of fixed dunes) is to maintain structural variation within the sward. Constructing or operating the MP2 Project will not present any threat to the maintenance of the structural variation within the fixed dune or humid dune slack swards of North Dublin Bay cSAC.

For Embryonic shifting dunes, the target for plant health of foredune grasses is that more than 95% of sand couch and/or lyme-grass should be healthy (i.e. green plant parts above ground and flowering heads present). For Shifting dunes along the shoreline, the target for plant health of dune grasses is that 95% of marram grass and/or lyme-grass should be healthy. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for plant health of dune grasses in the Embryonic shifting dunes or Shifting dunes along the shoreline habitats in North Dublin Bay SAC.

The target for typical species and sub-communities in Annual vegetation of drift lines, Embryonic shifting dunes and Shifting dunes along the shoreline is to maintain the presence of species-poor communities with typical species (and those typical species vary between the different dune habitat types). In the case of fixed dunes and humid dune slacks the target is to maintain range of sub-communities with typical species. Constructing or operating the MP2 Project will not present any threat to maintaining the presence of species-poor communities or range of sub-communities with typical species in the sand dune habitats of North Dublin Bay cSAC.

The target for negative indicator species is for negative indicator species (including non-natives) to represent less than 5% cover. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for negative indicator species in the sand dune habitats in North Dublin Bay cSAC.

The target for scrub/trees in fixed dunes and humid dune slacks is that there will be no more than 5% cover of scrub/trees or that the scrub/trees will be under control. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for scrub/trees in the fixed dunes and humid dune slack habitats of North Dublin Bay cSAC.

The target for cover of creeping willow *Salix repens* in humid dune slacks is to maintain less than 40% cover of *S.repens*. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for cover of creeping willow in the humid dune slacks of North Dublin Bay cSAC.

It follows from the foregoing that the possibility of LSEs as a result of water quality and habitat deterioration effects on the sand dune habitats in North Dublin Bay SAC does not arise and may be excluded.

4.3.2.4.3 Petalwort

Petalwort *Petalophyllum ralfsii* is a rare liverwort and an Annex II species, and its occurrence on Bull Island within North Dublin Bay cSAC is the only location this species has been recorded in Ireland which is not on the west coast. The conservation objective for this species is to maintain the favourable conservation condition of Petalwort in North Dublin Bay cSAC, defined by the following list of attributes and targets:

Distribution of populations:	No decline
Population size:	No decline
Area of suitable habitat:	No decline
Hydrological conditions (soil moisture):	Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter
Vegetation structure (height and cover):	Maintain open, low vegetation with a high percentage of bryophytes (small acrocarps and liverwort turf) and bare ground

There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the five conservation targets for petalwort in North Dublin Bay cSAC. LSEs shall not occur and may be excluded at the screening stage.

4.3.2.4.4 Mudflats and sandflats not covered by seawater at low tide

Within North Dublin Bay cSAC three benthic community types are recorded in the Annex I habitat. The conservation objective for this marine habitat is to maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC, as defined by four conservation attributes and targets which relate to the three benthic community types:

Habitat Area:	The permanent habitat area is stable or increasing, subject to natural processes
Community extent:	Maintain the extent of the *Mytilus edulis* dominated community, subject to natural processes
Community structure (Mytilus edulis density):	Conserve the high quality of the *Mytilus edulis* dominated community, subject to natural processes
Community distribution:	Conserve the following community types in a natural condition:

- Fine sand to sandy mud with *Pygospio elegans* and *Crangon crangon* community complex
- Fine sand with *Spio martinensis* community complex

NPWS (2013) notes that in relation to habitat area, the conservation target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area, rather than long or short term disturbance to the biology of the site. Given the distance of the site from the MP2 Project, constructing or operating the MP2 Project will not present any threat to maintaining the conservation target for area of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC.

Conservation targets for the *Mytilus edulis* community seek to maintain its extent and conserve its high quality. The conservation target for community distribution seeks to conserve the two remaining principal benthic communities of the Annex I habitat in a natural condition.

The Annex I mudflat and sandflat habitat of North Dublin Bay cSAC is less than 1km by sea from the locations of proposed capital dredging. In the absence of plume modelling, uncertainty remains as to the risk that may arise from deposition of dredge plumes in relation to the conservation objectives set for the principal benthic communities of the Annex I habitat. There remains a risk of suspended sediments as a result of dredging escaping into the marine environment to provide a hydrological pathway of effect preventing the conservation of the principal benthic communities of the Annex I habitat in a natural condition. LSEs cannot be excluded at this stage.

In relation to other potential sources of pollution at construction and operational stage, despite the significant capacity of the Liffey and Tolka Estuaries to dilute elevated concentrations of polluting substances, and particularly given the proximity of the MP2 Project to the mudflat and sandflat Annex I habitat, these construction phase and operational phase risks remain in the absence of further evaluation and analysis and most likely the application of measures intended to avoid or reduce the harmful effects of the proposed development on North Dublin Bay cSAC. LSEs cannot be excluded at this stage.

Operational phase traffic can also impact directly on local air quality and any sensitive receptors that are located in proximity to the road network, such as wetland habitats of European sites. Emissions from vehicles and shipping vessels may increase in the future, leading to greater levels of deposition of gaseous pollutants on wetland habitats of European sites such as the Mudflats and sandflats not covered by water at all times on North Dublin Bay cSAC. In the absence of calculating the air quality effects of road and shipping traffic, this operational phase risks remains in the absence of further evaluation and analysis or the application of measures intended to avoid or reduce the harmful effects of the proposed development on North Dublin Bay cSAC. LSEs cannot be excluded at this stage.

4.3.2.5 South Dublin Bay cSAC

South Dublin Bay SAC is designated for one marine habitat type and in 2015, three additional coastal habitat types were added to the list of qualifying interests. Of these coastal habitats, one is a saltmarsh habitat and two are sand dune habitats.

4.3.2.5.1 Saltmarsh

As noted previously in Section 4.3.2.4.1, saltmarsh communities are flooded periodically by the sea and are restricted to the area between mid neap tide level and high water spring tide level (NPWS, 2013). The overall objective for *Salicornia* and other annuals colonising mud and sand in South Dublin Bay SAC is assumed to be 'to restore the habitat to a favourable conservation condition', taken from the equivalent conservation objectives of this habitat type in North Dublin Bay cSAC and applied as a proxy objective to this habitat at South Dublin Bay cSAC.

The conservation target for habitat area of the saltmarsh community is that the area is stable or increasing, subject to natural processes, including erosion and succession.

The conservation target for habitat distribution of the saltmarsh community is that there is no decline, or change in habitat distribution, subject to natural processes.

There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the area or range of the saltmarsh community present in South Dublin Bay cSAC.

Turning then to structure and function, there are nine attributes to be considered:

- *Physical structure*
  - (i) sediment supply
  - (ii) creeks and pans
  - (iii) flooding regime
- *Vegetation structure*
  - (iv) zonation
  - (v) vegetation height
  - (vi) vegetation cover
- *Vegetation composition*
  - (vii) typical species & sub-communities
  - (viii) negative indicator species

The target for sediment supply is to maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions. Constructing or operating the MP2 Project will not present any threat to the natural circulation of sediments and organic matter in the saltmarsh community as there will be no physical obstructions introduced as part of the proposed development anywhere near South Dublin Bay cSAC.

The target for creeks and pans is to maintain creek and pan structure, subject to natural processes, including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the creek and pan structure of saltmarsh community as there will be no physical works introduced as part of the proposed development anywhere near South Dublin Bay cSAC.

The target for flooding regime is to maintain the natural tidal regime. Constructing or operating the MP2 Project will not present any threat to the maintenance of the natural tidal regime of the saltmarsh community of South Dublin Bay cSAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the range of coastal saltmarsh and its transitional zones in South Dublin Bay cSAC.

The target for vegetation height is to maintain structural variation within the sward. Constructing or operating the MP2 Project will not present any threat to the maintenance of the structural variation within the saltmarsh community sward of South Dublin Bay cSAC.

The target for vegetation cover is to maintain more than 90% of area outside creeks vegetated. Constructing or operating the MP2 Project will not present any threat to the maintenance of more than 90% of areas of saltmarsh community outside of creeks being vegetated within South Dublin Bay cSAC.

The target for typical species and sub-communities is to maintain the presence of species-poor communities listed in the SMP. Constructing or operating the MP2 Project will not present any threat to maintaining the presence of species-poor communities within the *Salicornia* habitat in South Dublin Bay cSAC.

The target for negative indicator species is for no significant expansion of common cordgrass with an annual spread of less than 1%. Constructing or operating the MP2 Project will not present any opportunity for significant expansion of common cordgrass within the saltmarsh habitat of South Dublin Bay cSAC.

It follows from the foregoing that the possibility of LSEs as a result of water quality and habitat deterioration effects on the saltmarsh habitat in South Dublin Bay cSAC does not arise and may be excluded.

4.3.2.5.2 Sand Dunes

Two dune habitats listed as Qualifying Interests for South Dublin Bay cSAC (in the December 2015 update to the Natura 2000 Standard Data Form). These habitats include mobile areas at the front, as well as more stabilised parts of dune systems and also humid dune slacks (NPWS, 2013). Sand dunes are hills of wind blown sand that have become progressively more stabilised by a cover of vegetation but the dune habitats at this site display only those early stages of progression through strandline and foredunes, with mobile dunes and fixed dunes not (perhaps yet) occurring.

The overall objective for the following habitats in South Dublin Bay cSAC is to restore to favourable conservation condition:

- Annual vegetation of drift lines
- Embryonic shifting dunes

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets divided into three main headings (Area, Range and Structure and Function).The conservation target for habitat area of the sand dune habitats is that the area is stable or increasing (or increasing only in the case of annual vegetation of drift lines), subject to natural processes, including erosion and succession.The conservation target for habitat distribution of the sand dune habitats is that there is no decline, or change in habitat distribution, subject to natural processes.

There is no possibility whatsoever that constructing or operating the MP2 Project will present any threat to maintaining the area or range of the sand dune habitats in South Dublin Bay cSAC.

Turning then to structure and function, there are five attributes to be considered across the five dune habitat types:

- *Physical structure*
  - (xi) functionality and sediment supply
- *Vegetation structure*
  - (xii) zonation
- *Vegetation composition*
  - (xiii) plant health of foredune grasses
  - (xiv) typical species & sub-communities
  - (xv) negative indicator species

The target for functionality and sediment supply is to maintain the natural circulation of sediments and organic matter, without any physical obstructions. Constructing or operating the MP2 Project will not present any threat to the natural circulation of sediments and organic matter in the dune habitats as there will be no physical obstructions introduced as part of the proposed development anywhere near South Dublin Bay cSAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. Constructing or operating the MP2 Project will not present any threat to the maintenance of the range of coastal sand dune habitats including transitional zones in South Dublin Bay cSAC.

For Embryonic shifting dunes, the target for plant health of foredune grasses is that more than 95% of sand couch and/or lyme-grass should be healthy (i.e. green plant parts above ground and flowering heads present). Constructing or operating the MP2 Project will not present any threat to achieving the

conservation targets for plant health of dune grasses in the Embryonic shifting dunes habitat in South Dublin Bay cSAC.

The target for typical species and sub-communities is to maintain the presence of species-poor communities with typical species. Constructing or operating the MP2 Project will not present any threat to maintaining the presence of species-poor communities with typical species in the sand dune habitats of South Dublin Bay cSAC.

The target for negative indicator species is for negative indicator species (including non-natives) to represent less than 5% cover. Constructing or operating the MP2 Project will not present any threat to achieving the conservation targets for negative indicator species in the sand dune habitats in South Dublin Bay cSAC.

It follows from the foregoing that the possibility of LSEs as a result of water quality and habitat deterioration effects on the sand dune habitats in South Dublin Bay cSAC does not arise and may be excluded.

4.3.2.5.3 Mudflats and sandflats not covered by seawater at low tide

Within the site two benthic community types are recorded in the Annex I Mudflats and sandflats not covered by seawater at low tide habitat (and three more are also recorded in the overlapping South Dublin Bay and River Tolka Estuary SPA). The conservation objective for this marine habitat is to maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC, as defined by four conservation attributes and targets which relate to the two benthic community types:

Habitat Area:	The permanent habitat area is stable or increasing, subject to natural processes
Community extent:	Maintain the extent of the *Zostera* dominated community, subject to natural processes
Community structure (Zostera density):	Conserve the high quality of the *Zostera* dominated community, subject to natural processes
Community distribution:	Conserve the following community type in a natural condition: • Fine sands with *Angulus tenuis* community complex

NPWS (2013) notes that in relation to habitat area, the conservation target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area, rather than long or short term disturbance to the biology of the site. Given the distance of the site from the MP2 Project and the fact that the MP2 Project will not result in any form of permanent Mudflat and Sandflat habitat removal from the site, constructing or operating the MP2 Project

will not present any threat to maintaining the conservation target for area of Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC.

Conservation targets for the *Zostera* community seek to maintain its extent and conserve its high quality. The conservation target for community distribution seeks to conserve the Fine sands with *Angulus tenuis* community in a natural condition.

The benthic communities of the Annex I habitat are less than 2.5km from the MP2 Project by sea. For the same reasons as presented in the analysis in Section 4.3.2.4.4 above, sufficient uncertainty remains as to the risk that may arise from deposition of dredge plumes in relation to the conservation objectives set for the principal benthic communities of the Annex I habitat. There remains a risk of suspended sediments escaping into the marine environment to provide a hydrological pathway of effect preventing the conservation of the principal benthic communities of the Annex I habitat in a natural condition. LSEs cannot be excluded at this stage.

Also in relation to other potential sources of pollution at construction and operational stage (as discussed in Section 4.3.2.3.2), and despite the significant capacity of the Liffey and Tolka Estuaries to dilute elevated concentrations of polluting substances, given the proximity of the MP2 Project to the mudflat and sandflat Annex I habitat, these construction phase and operational phase risks remain in the absence of further evaluation and analysis and most likely the application of measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay cSAC. LSEs cannot be excluded at this stage.

Operational phase traffic can also impact directly on local air quality and any sensitive receptors that are located in proximity to the road network, such as wetland habitats of European sites. Emissions from vehicles and shipping vessels may increase in the future, leading to greater levels of deposition of gaseous pollutants on wetland habitats of European sites such as the Mudflats and sandflats not covered by water at all times on South Dublin Bay cSAC. In the absence of calculating the air quality effects of road and shipping traffic, this operational phase risks remains in the absence of further evaluation and analysis or the application of measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay cSAC. LSEs cannot be excluded at this stage.

4.3.2.6 Other European sites which are hydrologically connected

Significant mixing of seawater occurs in Dublin Bay with freshwater flowing in from the Liffey, Tolka and Dodder. The mixing of any elevated levels of suspended sediments or polluting materials that escape to the marine environment as a result of the construction or operation of the MP2 Project is further aided by the tidal currents, wind and wave climate which transport and continue to mix the seawater and freshwater (and any polluting substances) both into and out of the Liffey Estuary, and help it disperse widely to much lower (*de minimis*) concentrations throughout Dublin Bay.

4.3.2.6.1 Baldoyle Bay cSAC and SPA

The cSAC is designated for one marine habitat, four saltmarsh habitats and two sand dune habitat types. The SPA is designated for six overwintering species of waterbird and the wetlands that they use. Given the above analysis and the fact that that the marine and coastal habitats of Baldoyle Bay cSAC and SPA are located more than 8km from the proposed disposal site and more than 10km from the MP2 Project, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.2 Malahide Estuary SAC and SPA

The SAC is designated for one marine habitat and three saltmarsh habitat types. The SPA is designated for fourteen overwintering species of waterbird and the wetlands that they use. Given the above analysis and the fact that that the marine and coastal habitats of Malahide Estuary SAC and SPA are located more than 10km from the proposed disposal site and more than 15km from the MP2 Project, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.3 Rogerstown Estuary SAC and SPA

The SAC is designated for two marine habitats, three saltmarsh habitats and two sand dune habitat types. The SPA is designated for eleven overwintering species of waterbird and the wetlands that they use. Given the above analysis and the fact that that the marine and coastal habitats of Rogerstown Estuary SAC and SPA are located more than 15km from the MP2 Project and associated disposal site, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.4 Ireland's Eye SAC and SPA

The SAC is designated for Vegetated sea cliffs of the Atlantic and Baltic coasts, and Perennial vegetation of stony banks. The SPA is designated for five breeding seabird species and the marine waters adjacent to their breeding sites. Given the analysis at the outset of Section 4.3.2.6; the analysis of how vegetated sea cliff conservation objectives for Lambay Island SAC cannot be offended (in Section 4.3.2.3.1); the fact that dredging and disposal will occur in a part of the year when the breeding seabirds are not present, and the fact that that Ireland's Eye SAC and SPA are located more than 10km from the MP2 Project and more than 5km from the proposed disposal site, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.5 Howth Head cSAC and Howth Head Coast SPA

Howth Head cSAC and Howth Head Coast SPA are located more than 5km from the MP2 Project and more than 2.5km from the proposed disposal site. The cSAC is designated for Vegetated sea cliffs of the Atlantic and Baltic coasts, and European dry heaths. The SPA is designated for one breeding seabird species and the marine waters adjacent to its breeding sites. There is no impact pathway open to offend the conservation objectives of European dry heaths. Given the analysis at the analysis at the outset of Section 4.3.2.6 along with how vegetated sea cliff conservation objectives cannot be offended (in Section 4.3.2.3.1); and the fact that dredging and disposal will occur in a part of the year when the

breeding seabirds are not present, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.6 Codling Fault Zone cSAC

The cSAC is designated for Submarine structures made by leaking gases. Given the analysis at the outset of Section 4.3.2.6 and the fact that this site is located more than 20km from the MP2 Project and associated disposal site, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.2.6.7 Dalkey Islands SPA

The SPA is designated for three breeding seabird species and the marine waters adjacent to their breeding sites. Given the fact that dredging and disposal will occur in a part of the year when the breeding seabirds are not present, and the fact that this site is located 9km from the MP2 Project and more than 5km from the proposed disposal site, LSEs as a result of water quality and habitat deterioration effects can be excluded at this stage.

4.3.3 Underwater Noise and Disturbance

As described in Section 3, some aspects of the MP2 Project will require activities in the marine environment and new marine infrastructure to be constructed and operated. Marine engineering construction includes many activities producing underwater noise, including:

- Ground investigation works to assess the nature of the bedrock and overburden materials including cable percussion boring, rotary coring, and penetration testing
- Demolition of buildings and maritime infrastructure close to the Liffey channel
- Marine piling
- Dredging of 424,644m^3 of sediment to achieve desired depths in the various berths and channel widening
- Dispose of the dredged material at the proposed disposal site
- Increased vessel traffic following construction and operation of new port facilities

These activities carry an inherent risk of noise induced effects upon some marine species as a result of underwater acoustic energy being released into the marine environment. The purpose of the screening assessment is to determine whether or not the possibility of likely significant effects arising from such noise sources can be excluded.

Underwater noise is not a persistent effect, and once the noise source ceases noise levels drop very quickly to pre-existing levels. The natural underwater soundscape of Dublin Port and Dublin Bay is not silent - biological sounds from fish and marine mammals are mixed with sounds from waves and surface noise; current flow and turbulence; rain and wind/storm noise; and noise from shipping and leisure craft activities. The ambient noise levels in coastal and inshore water, bays and harbours are subject to huge variation.

Lambay Island cSAC is designated for its populations of harbour and grey seals. Rockabill to Dalkey Island SAC is designated for its harbour porpoise community. No other European site within 20km of Dublin Bay or its surrounds is designated for a species of marine mammal. Having said this, Bull Island (less than 2km from the proposed dredging areas) is a known seal haul out site and grey seals occur here and also at Lambay Island (16km from the disposal site) and Ireland's Eye (7.6km from the disposal site) which are known breeding sites. Harbour seals also haul out at Bull Island, Lambay Island and Ireland's Eye.

There is a potential for exposure to underwater noise at construction stage to affect the Rockabill to Dalkey Island SAC harbour porpoise community through disturbance during dredging at the berths and channel widening works, and disposal of dredged material at the proposed disposal site.

There is a potential for exposure to underwater noise at construction stage to affect the Lambay Island cSAC (including Bull Island and Ireland's Eye) seal populations through physical injury or disturbance by demolition and piling operations within Dublin Port and disturbance during dredging at the berths and channel widening works, and disposal of dredged material at the proposed disposal site.

There is also the potential for exposure to underwater noise at construction stage to affect the distribution and abundance of preferred prey species of the harbour porpoise community, and grey and harbour seal populations.

Finally, there is also the potential for persistent exposure to increased levels of underwater noise at operational stage to result in disturbance of the harbour porpoise community and grey and harbour seal populations.

As these risks clearly exist, then it follows that the risk of underwater acoustic energy escaping into the marine environment to provide a pathway of effect leading to physical injury or disturbance to the harbour porpoise community and grey and harbour seal populations remains in the absence of further evaluation and analysis and the consideration of application of measures intended to avoid or reduce the harmful effects of the proposed development on Rockabill to Dalkey Island SAC and Lambay Island cSAC. LSEs cannot be excluded at this stage.

4.3.4 Aerial Noise and Visual Disturbance

4.3.4.1 South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA

4.3.4.1.1 Overwintering birds

Whereas habitats are not, species can be vulnerable to aerial noise and visual triggers of disturbance. All of the SPAs considered in this exercise are designated for waders or waterbirds falling into that category. Some sites such as the South Dublin Bay & River Tolka Estuary SPA are immediately adjacent to the MP2 Project, whereas others north of Bull Island, south of Poolbeg and inshore islands occur at much greater distances where the prospect of noise or visual disturbance caused by the MP2 Project diminishes significantly.

Construction and operation the MP2 Project will involve a range of activities emitting aerial noise and associated movement of people, vehicles and vessels. There is a potential for disturbance to the overwintering special conservation interests of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA from construction noise and the presence of construction operatives and their plant at the eastern end of the Port in the MP2 Project area and dredging activity in the river channel.

The proposed construction works will be undertaken over period of approximately 9 years, with existing port operations continuing during the construction period. The overwintering special conservation interests of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA forage in the Tolka Estuary adjacent to aspects of the MP2 Project. The Tolka Estuary is totally covered with water at high tide, and thus this part of the study area is mostly used for foraging during other tidal states. There are no significant high tide roosts.

At low tide, waders and gulls are distributed throughout the Tolka Estuary - on the mudflats in the inner estuary and the sandflats in the outer estuary. Most of the wildfowl are distributed in the inner, muddier parts of the site. However, as the tide rises, the amount of intertidal foraging area is dramatically reduced, and ultimately disappears and the majority of waterbirds leave this part of the estuary. Those that remain during the high tide period include gulls, Black Guillemots, Red-breasted Mergansers, Great Crested Grebes and Cormorants.

Waterbird use of the Tolka Estuary is strongly constrained by tidal conditions, and as mentioned above all non-swimming birds, or those that forage in shallow water, are typically forced to leave this part of the estuary as the tide rises. However, the area was found to be very important for foraging when the sand and mudflats were exposed at low tide. The area of intertidal mud available to waterbirds increases in size during low spring tides, when a larger portion of the sand and mudflats are exposed.

At operational phase, there is also the potential for disturbance to the overwintering special conservation interests of these same SPAs from normal operational port activities in the MP2 Project area and in particular from the operation of Berth 53 and the operation of the Greenway with the proposed Heritage Zone adjacent to the Tolka Estuary as a destination for amenity users.

The conservation targets for the overwintering species are set out in Section 4.3.2.3.1, and are that the long term population trend stable or increasing; and that there should be no significant decrease in the range, timing or intensity of use of areas by the feature species other than that occurring from natural patterns of variation.

The possibility of likely significant noise and visual disturbance effects to the overwintering special conservation interests of these SPAs cannot be excluded at the screening stage.

4.3.4.1.1.1 Lighting Displacement

The construction and operation of the MP2 Project will require the use of outdoor night time lighting. Permanent lighting will be used in port operations during night time hours and for security at the MP2

Project facilities. The lighting within the MP2 Project has been designed in accordance with CIE 140 and EN 13201-2015. It is proposed to utilise the existing and consented lighting where possible with additional High Mast Lighting (HML) and Street Lighting fitted with downward directing lights where required to provide required luminance and uniformity. The locations of HML poles and proposed street lighting for the MP2 Project is indicated within the project drawings.

Much of the overwintering foraging that does occur in the area immediately north of Berth 53 when it becomes available on low tide events occurs in darkness during the winter months. Lighting during this period must be considered also.

Lighting of the construction area could overspill onto the intertidal areas. A study in Portugal evaluated the effects of artificial illumination on the nocturnal habitat selection and foraging behaviour of six wader species with different feeding strategies: three visual foragers, two species that alternate visual and tactile strategies (mixed foragers), and one tactile forager. Four of these species occur regularly in Dublin Bay. They quantified the number of birds and their foraging behaviour at sites affected and not affected by streetlights, and also before and after illuminating experimental sites. Areas illuminated by streetlights were used more during the night by visual foragers, and to a lesser extent by mixed foragers, than non-illuminated areas. Visual foragers increased their foraging effort in illuminated areas, and mixed foragers changed to more efficient visual foraging strategies. These behavioural shifts improved prey intake rate by an average of 83% in visual and mixed foragers (Santos *et al.* 2010).

Another study recorded nocturnal, marine feeding behaviour in the Brown-hooded Gull *(Larus maculipennis)*. The gulls assembled at night at the end of a long pier, extending 800m offshore into the Golfo Nuevo, Argentina. Powerful lights illuminated the water around the end of the pier and attracted many small prey animals to the surface. Several hundreds of gulls, presumed to be local breeders, came every night to feed on this food resource, using various feeding techniques and taking several prey species and sizes. The gulls caught small prey items while swimming, by rapid surface pecking, while they hunted the larger prey species by flying low over the water and performing shallow, vertical plunge-dives. During daylight, only few gulls ventured from land into the bay, indicating that they took advantage of the nocturnal feeding opportunity, facilitated by artificial lighting (Leopold *et al.* 2010).

Literature shows that lighting does not deter waterbirds from using intertidal or subtidal areas if illuminated. Lighting of Berth 53 during its construction or operation of the proposed jetty will not affect foraging waterbirds during the brief periods when there is intertidal exposure of foraging areas over winter. Likely significant displacement effects of lighting on the range, timing or intensity of use of areas of the Tolka Estuary by the overwintering species of South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA can be excluded.

4.3.4.1.2 Breeding seabirds

In relation to the breeding tern special conservation interests of South Dublin Bay & River Tolka Estuary SPA, no direct impacts are predicted on the breeding sites of the terns as there are none of these species nesting in the immediate area of the proposed development. No newly constructed aspect of

the MP2 Project is proposed to be located within 300m of any tern breeding site (refer Figure 4.4). This is the case both for site included within the SPA (the ESB Dolphin) and sites not included within the SPA (the CDL Dolphin and two Tern Pontoons). These tern species feed widely throughout Dublin Bay (as discussed in Section 4.3.2.1.2 above) including the Tolka Estuary and Liffey Channel adjacent to aspects of the MP2 Project.

Figure 4.4 Location of four subsites of Dublin Port tern colony (yellow dots)

The conservation objective for Roseate Tern and Arctic Tern is to maintain the favourable conservation condition of the two species in South Dublin Bay and River Tolka Estuary SPA, as defined by five conservation attributes and targets. Prey biomass available is dealt with in Section 4.3.2.1.2. The remaining conservation targets are:

Passage population: Individuals:	No significant decline
Distribution: Roosting areas:	No significant decline
Barriers to connectivity:	No significant increase
Disturbance at roosting site:	Human activities should occur at levels that do not adversely affect the numbers of roseate tern (or arctic tern) among the post-breeding aggregation of terns

The target for the SSCO attribute '*Passage population: Individuals*' is measured in 'number'. The target for '*Distribution: Roosting areas*' is measured in 'Number; location; area (hectares)'. The target for '*Barriers to connectivity'* is measured in 'Number; location; area (hectares)'. The target for '*Disturbance at roosting site'* is measured in 'Level of impact'.

The conservation objective for Common Tern is to maintain the favourable conservation condition of the species in South Dublin Bay and River Tolka Estuary SPA, as defined by nine conservation attributes and targets. Prey biomass available is dealt with in Section 4.3.2.3. The remaining conservation targets are:

Breeding population abundance: apparently occupied nests (AONs):	No significant decline
Productivity rate: fledged young per breeding pair:	No significant decline
Passage population: Individuals:	No significant decline
Distribution: *breeding colonies*:	No significant decline
Barriers to connectivity:	No significant increase
Disturbance at breeding site:	Human activities should occur at levels that do not adversely affect the breeding common tern population
Disturbance at roosting site:	Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns

The target for the SSCO attribute '*Breeding population abundance: apparently occupied nests (AONs)'* is measured in 'number'. The target for the SSCO attribute '*Productivity rate: fledged young per breeding pair'* is measured in 'mean number'. The target for the SSCO attribute '*Passage population: Individuals*' is measured in 'number'. The target for '*Distribution: breeding colonies'* is measured in 'Number; location; area (hectares)'. The target for '*Distribution: Roosting areas*' is measured in 'Number; location; area (hectares)'. The target for '*Barriers to connectivity'* is measured in 'Number; location; area (hectares)'. The target for '*Disturbance at breeding site'* is measured in 'Level of impact'. The target for '*Disturbance at roosting site'* is measured in 'Level of impact'.

There remains a risk that construction or operation of the MP2 Project in proximity to intertidal feeding areas of the South Dublin Bay & River Tolka Estuary SPA might result in disturbance and/or loss of attractiveness of the areas used by the feature species of that SPA and also North Bull Island SPA (the special conservation interests of which also regularly use intertidal areas of the Tolka Estuary).

These construction phase and operational phase risks remain in the absence of further evaluation and analysis and perhaps the application of measures intended to avoid or reduce the harmful effects of the proposed development on South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA. LSEs as a result of potential noise and visual disturbance cannot be excluded at this stage.

4.3.4.2 Other more distant SPA sites

For all SPA sites at a greater distance than North Bull Island SPA, there is no possibility that construction noise or visual triggers of disturbance could likely significantly affect their overwintering special conservation interests when tested against their conservation objectives.

Construction and operation of the MP2 Project will not delay or prevent achieving the target for the long term population trend of the feature species to be stable or increasing. Construction and operation of the MP2 Project will also not delay or prevent achieving the target for no significant decrease in the range, timing or intensity of use of areas by the feature species other than that occurring from natural patterns of variation.

Similarly, there is no possibility that construction noise or visual triggers of disturbance could likely significantly affect the breeding seabird special conservation interests of the various inshore island SPAs (Ireland's Eye, Dalkey Islands, Lambay Island) when tested against their conservation objectives.

Potential aerial noise and visual disturbance phase effects as a result of the construction and operation of the MP2 Project on these more distant SPA sites shall not arise. LSEs as a result of potential noise and visual disturbance can be excluded at the screening stage.

4.4 IN-COMBINATION EFFECTS

Article 6(3) of the Habitats Directive and Irish national law require that in-combination effects with other plans or projects are considered. The significance of any identified combined effects of the proposed development and other past, present or reasonably foreseeable future plans or projects must also be evaluated. On this basis, a range of other projects were considered in terms of their potential to have in-combination effects with the MP2 Project. Those plans and projects are illustrated in Figures 4.5 and 4.6 and include:

Other Projects within the MP2 Project Area (Figure 4.5)

- Alexandra Basin Redevelopment (ABR) – ABP Reg. Ref. PL29N.PA0034
- Extension Terminal 2 Check-In Area – Reg. Ref. 2299/12
- Vehicular and Pedestrian Entrances off Breakwater Road South – Reg. Ref. 2596/15
- Dublin Port Internal Road Network – Reg. Ref. 3084/16 and 2684/17.
- Demolition of Buildings and Provision of Yard – Reg. Ref. 2429/17
- Floating Dock Section Reg. Ref. 4216/17
- Vehicle Service/Maintenance Facility and Office Accommodation – Reg. Ref. 3143/18

- Asahi Demolition and Provision of Yard – Reg. Ref. 3488/18
- Demolition of Calor Offices and Provision of Yard – Reg. Ref. 3540/18
- Interim Unified Passenger Terminal – Reg. Ref. 3638/18
- Alexandra Road, Dublin Port, Dublin 1 (Reg. Ref. 4521/18)
- Dublin Ferry port Terminal Access – Reg. Ref. 3314/18
- Berth 49 Ramp. Reg. Ref 2756/19
- DPC Post 2019/2021 Maintenance Dredging Campaign (Subject to Dumping at Sea Licence)

Other Projects surrounding the MP2 Project Area (Figure 4.6)

- Dublin Inland Port - Reg Ref. F18A/0139 (not on figure)
- North Lotts & Grand Canal Dock Planning Scheme 2014- BP Ref. PL29N.ZD2011
- Exo Building – Reg. Ref. DSDZ3632/15, DSDZ3686/16, DSDZ3776/17
- Poolbeg West SDZ. BP Ref. PL29N.ZD2013
- Irish Water – Ringsend WwTP –Upgrade Project BP Ref. PL29S.301798
- Howth Yacht Club Marina Extension (not on figure)

4.4.1 Alexandra Basin Redevelopment (ABR) Project

DPC was granted planning permission subject to conditions (ABP Reg. Ref. PL29N.PA0034) in July 2015 for the redevelopment of Alexandra Basin, Berths 52 and 53 and dredging of the channel of the River Liffey together with associated works in Dublin Port. Elements of the proposed development can be summarised as follows:

Alexandra Basin West:

- The infilling of graving Dock No. 2 having an area of 6,055sq.m;
- The excavation and restoration of historic Graving Dock No. 1
- The demolition of the bulk jetty having an area of 3,200sq.m;
- A section of North Wall Quay extension having an area of 21,700sq.m;
- Extension of Alexandra Quay West of 130m in length;
- New 273 m long Ro-Ro jetty and provision of three Ro-Ro ramps; and
- The dredging of: 470,000sq.m of contaminated material to a depth of -10.0m Chart Datum (CD) over an area of 194,000sq.m within the redeveloped Alexandra Basin and its remediation.

Berth 52 and 53:

- The demolition of existing berths 52 and 53;
- Jetty at Berth 52 having an area of 500sq.m;

- Concrete Dolphin at Berth 53 having an area of 500sq.m;
- The construction of:
- A new river berth at Berths 52/53, 300m long;
- A new 75m mooring jetty at the new river berth.
- New 40 m long mooring jetty to extend existing berth 49, 50m long;
- The infilling of the Terminal 5 Ro-Ro basin, an area of 45,650sq.m;
- Raising of existing levels by 1.4 m over an area of 95,000sq.m; and
- Dredging of new river berth to -10.0m CD.

Liffey Channel:

- Construction of a marina protection structure to a height of +7.0m CD and a length of 220m on the south side of the river channel; and
- Dredging of the shipping channel to a depth of -10m CD from a point 55m to the east of the East link bridge, to a location in the vicinity of Dublin Bay, a total distance of 10,320m.

The ABR Project is now being implemented by DPC. The AA Screening Report/NIS prepared for ABR Project 'screened in' likely significant effects upon North Dublin Bay cSAC; South Dublin Bay cSAC; Rockabill to Dalkey Island SAC; North Bull Island SPA; and South Dublin Bay & Tolka Estuary SPA.

Measures intended to avoid or reduce the harmful effects of the proposed development on the sites concerned were proposed and conditioned to the permission. Adverse effects upon the integrity of all sites assessed will not occur as a result.

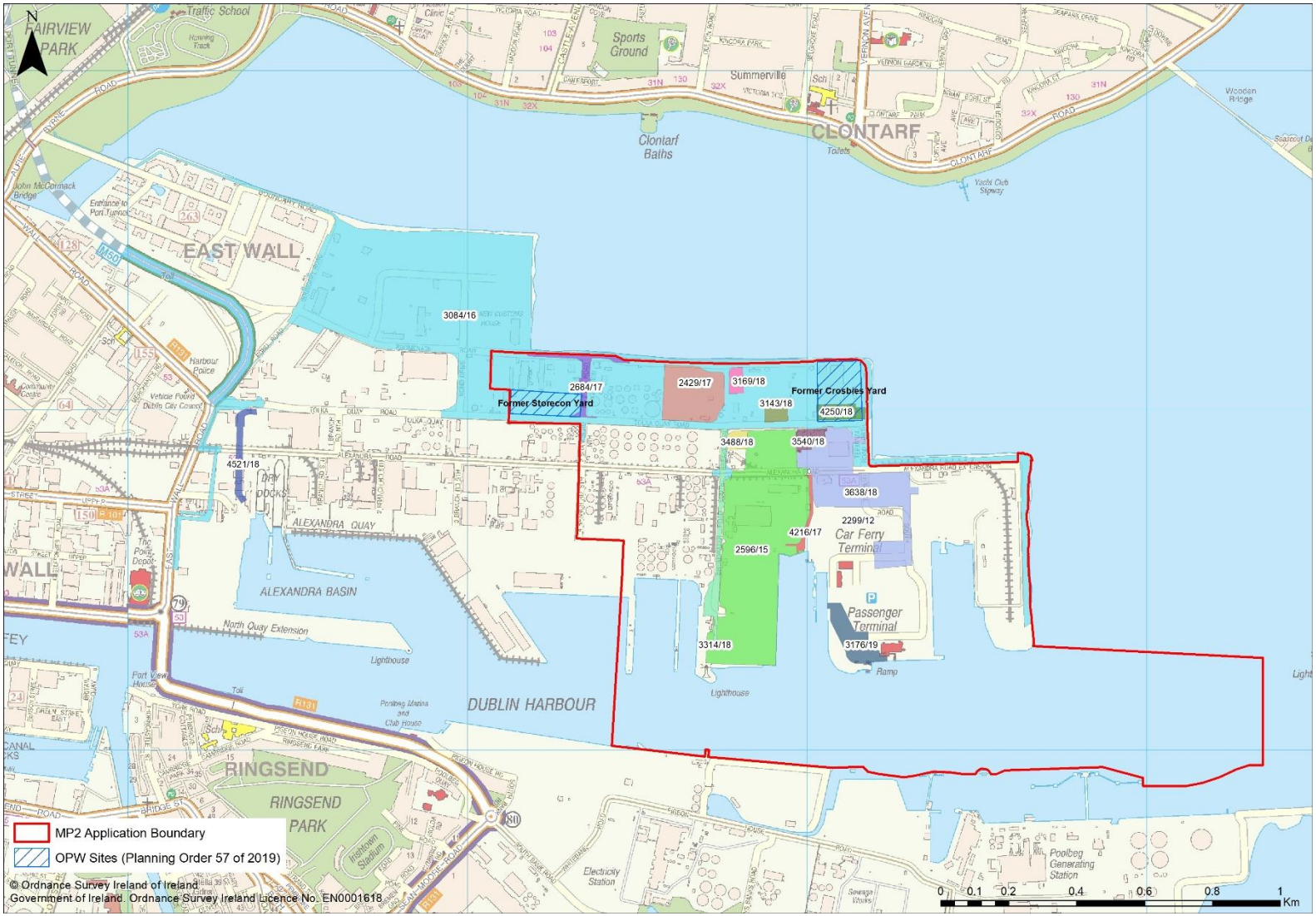

Figure 4.5 Other Projects within the MP2 Project Area

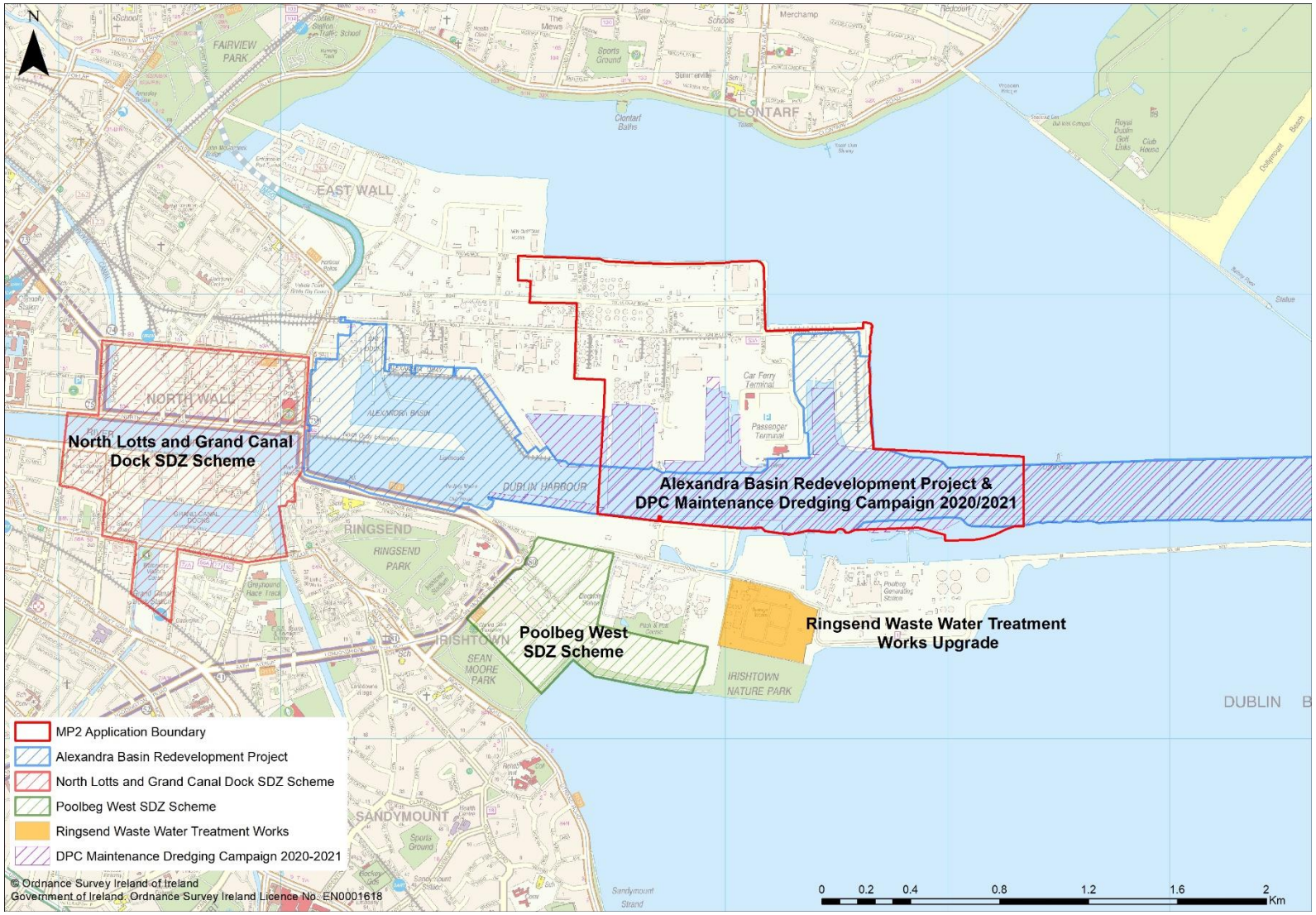

Figure 4.6 Other Projects surrounding the MP2 Project Area

The principal pathways of cumulative effect that might occur with the construction of the MP2 Project in combination with the ABR Project are water quality and habitat deterioration, underwater noise and aerial noise and visual disturbance.

The dredging and disposal of material at sea for MP2 Project is proposed to occur sequentially after that for the ABR Project, and not concurrently. As such, the modelled rates of dredging and disposal will not be exceeded at any given time, and the modelled extent of dredge or disposal plumes, their predicted concentrations of suspended sediments and predicted rates of sedimentation at proximate shorelines remain valid when these activities are considered in combination or cumulatively. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the ABR project can be excluded beyond scientific doubt.

When the timing of dredging and disposal for MP2 Project and its associated vessel movements and underwater sound produced are considered in combination with the ABR Project, the result is that the same magnitudes of underwater noise are predicted, but they will occur for six consecutive winter seasons associated with ABR Project alone, followed by a further four winter seasons, between 2024 and 2031 for MP2 Project. The temporal scale of these effects is increased from six events in six years to ten events in thirteen years. The magnitude of effect remains the same for each event. Cumulatively, when the mitigation measures implemented as part of the ABR Dredging Management Plan and Marine Mammal Management Plan are taken into consideration, the effect dredging and disposal activities will have on the harbour porpoise community of Rockabill to Dalkey Island SAC and the seal populations of Lambay Island cSAC both within the cSAC and at known haul out sites of Ireland's Eye and Bull Island, is predicted to remain the same in combination as it is as a result of the MP2 Project alone. Given the measures to be applied to the ABR activities which are intended to avoid or reduce this effect on the marine mammals, the extended temporal duration is not significant. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the ABR project can be excluded beyond scientific doubt.

When aerial noise and visual disturbance effects are considered in combination, it is to be recalled that the ABR Project NIS assessment considered that the only feature species of the South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA that was likely to be affected by the ABR Project was Light-bellied brent goose as it fed on the quays of Alexandra Quay West. Dredging and disposal were activities to be carried out over winter when the breeding tern population was not present, no significant effects will occur. The ABR Project was sufficiently spatially separated from the intertidal areas of the River Tolka estuary that no significant effects will occur upon the wintering wading and waterbird populations that use it. The MP2 Project will not result in any effects upon this species when both projects are considered together. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the ABR project can be excluded beyond scientific doubt.

4.4.2 Extension Terminal 2 Check-In area

DPC was granted planning permission (Reg. Ref. 2299/12) in June 2012 for the ground level extension and modifications of an existing single storey Terminal 2 building, consisting of a single storey extension to the check-in area. This approval has been implemented by DPC. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. Given that construction phase for this project has long since passed, only operational stage effects could possibly act in combination with MP2 effects. The operational use of this development is contained within a building, itself contained within the heart of the industrial fabric of the operational Port Estate. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Extension Terminal 2 Check-In area project can be excluded beyond scientific doubt.

4.4.3 Vehicular and pedestrian entrances off Breakwater Road South

DPC was granted planning permission (Reg. Ref.2596/15) in July 2015 for relocation of the existing vehicular and pedestrian entrances off Breakwater Road South to a new location off Breakwater Road South, and alterations to the existing layout of the road.

This approval has been implemented by DPC. Given that construction phase for this project has already occurred, only operational stage effects could possibly act in combination with MP2 effects. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Vehicular and Pedestrian Entrances off Breakwater Road South project can be excluded beyond scientific doubt.

4.4.4 Dublin Port Internal Road Network

DPC was granted planning permission in December 2017 (Reg. Ref. 3084/16 and 2684/17) for works to the port's private internal road network which includes works on public roads at East Wall Road, Bond Road and Alfie Byrne Road. The development will consist of:

- Construction of new roads and enhancements to existing roads within the Dublin Port Estate north of River Liffey;
- Construction of enhanced landscaping and a shared pedestrian and cycle amenity route of approximately 4km in length along the northern boundary of the Port Estate (the Greenway);
- Construction of new pedestrian and cycle overbridge at Promenade Road;
- Construction of access ramps to pedestrian and cycle overbridge at Promenade Road;

- Construction of new pedestrian and cycle underpass at Promenade Road;
- Construction of 11 no. new signage gantries;
- Ancillary construction works, including site clearance, demolitions, earthworks, pavement construction, construction of verges, modifications to accesses, construction of new and amended drainage services, diversion and installation of utility services, installation of road markings and signs and accommodation works;
- Works to existing boundaries and construction of new boundaries; and
- Construction of minor works to the junctions of East Wall Road with Tolka Quay Road and East Wall Road with Alexandra Road.

This approval is now being implemented by DPC. A screening for appropriate assessment report accompanied the application and found that a range of disturbance effects could occur (as discussed above in Section 5.3.1) ranging from non-dispersive behavioural changes such as birds looking up or heads raised, temporarily stopping feeding or roosting; to dispersive behavioural changes such as taking flight or leaving the area. A range of measures were proposed to avoid or reduce the visual stimuli triggering behavioural changes in the waders and waterbirds.

As noted previously in Section 5.3, the wintering waterbirds using that part of the Tolka estuary north of Berth 53 are likely to be disturbed at both construction and operational phases of MP2 Project when that area becomes available at very low tides (on approximately 40 occasions per year). Also, disturbance at operational phase of the Greenway development as part of permission Reg. Ref. 3084/16 could also occur. Measures have been applied to reduce the disturbance effects as part of the Greenway development, to ensure that disturbance is avoided or at worst, remains at the lower end of the scale and does not result in dispersive behaviour. When considered in combination, effects could occur at operational stage of both projects due to the cumulative effect of visual disturbance stimuli of both users of the greenway, the heritage zone as a destination for amenity users and operation of Berth 53 resulting in a dispersive behaviour effect which could decrease the range, timing or intensity of use of this part of the South Dublin Bay & River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Dublin Port Internal Road Network project **cannot** be excluded beyond scientific doubt.

4.4.5 Demolition of buildings and Provision of Yard

DPC was granted planning permission (Reg. Ref. 2429/17) in September 2017 for the demolition of 3 no. existing buildings comprising a blockwork structure of c. 283sq.m, a temporary modular structure of c. 303sq.m and a portal frame shed building of c. 112sq.m) and removal of all structural and infrastructural elements, vegetation, plinths, fences etc. A new concrete surface treatment is to be provided across entire site. The new yard facility includes CCTV, new lighting and new approx. 4m high security fence to northern, eastern and southern (Tolka Quay Road) boundaries. The development also includes the closure of the existing (eastern) vehicular entrance and widening of the existing western entrance to provide a 12m sliding gate on Tolka Quay Road.

The subject site is to the northwest of the MP2 Project application boundary. This approval is now being implemented by the DPC. Construction phase for this project and MP2 will not overlap. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Demolition of Buildings and Provision of Yard project can be excluded beyond scientific doubt.

4.4.6 Floating Dock Section

DPC was granted planning permission (Reg. Ref. 4216/17) in January 2018 for floating dock sections (pontoons) with an area of c.321sq.m, access walkway and removal of internal structural and infrastructural elements including vegetation, plinths, fences and bollards; new access roadway. The pontoon shall provide enhanced docking facilities for tug boats operating in the port.

This approval is now being implemented by DPC. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. Construction phase will not overlap between this consented project and MP2. Operational phase of this development comprises the continuation of existing tug boat operations, albeit at enhanced facilities. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Floating Dock Section project can be excluded beyond scientific doubt.

4.4.7 Vehicle service/maintenance facility and office accommodation

DPC was granted planning permission (Reg. Ref. 3143/18) in August 2018 for the construction of a vehicle service/maintenance facility and office accommodation contained in one building (approx. 946sq.m) incorporating vehicle service/maintenance bays, a two storey office area of 260sq.m with offices, meeting/training room, canteen and changing area, toilets, building signage. Associated site works including fencing, 55 no. car parking spaces, reconfiguration and widening of existing entrances/exits and connection to existing services on Tolka Quay Road. The proposed development shall facilitate the consolidation of Calor activities within the Port lands.

The subject site is directly to the north of and adjacent to the MP2 Project application boundary. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it

was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Vehicle Service/Maintenance Facility and Office Accommodation project can be excluded beyond scientific doubt.

4.4.8 Asahi demolition and Provision of Yard

DPC was granted planning permission (Reg. Ref. 3488/18) in November 2018 for the demolition of a redundant storage tank including associated pipework and general site clearance. The area is to be hard surfaced to provide a yard for storage across the extent of the site. CCTV poles, new lighting and a new 4m high security fence on all boundaries is proposed. The development also includes the closure of the existing site access and provision of a 12m wide sliding gate access on Breakwater Road North.

This approval has not yet been commenced, but construction phase for this project and the MP2 Project will not overlap. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Asahi Demolition and Provision of Yard project can be excluded beyond scientific doubt.

4.4.9 Demolition of Calor Offices and Provision of Yard

DPC was granted planning permission (Reg. Ref. 3540/18) in October 2018 for the demolition of a single storey office building (785sq.m); maintenance shed building (840sq.m); reinforced concrete bund and steel tank (42sq.m); boiler room building; and all associated general site clearance. The development also comprises hard surfacing to provide a yard for storage across the extent of the site. The proposed development shall facilitate the consolidation of Calor activities within the Port lands.

This approval is now being implemented by DPC. Construction phase for this project and the MP2 Project will not overlap. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and

activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Demolition of Calor Offices and Provision of Yard project can be excluded beyond scientific doubt.

4.4.10 Interim Unified Passenger Terminal

DPC was granted planning permission (Reg. Ref. 3638/18) in November 2018 for the upgrade of Terminal 1 and 2 facilities including consolidated vehicle check-in facilities and revised stacking and circulation arrangements. The proposed development also includes the provision of State Services facility for control and inspections of passengers and freight comprising:

- 2 no. Inspection Sheds
- 2 no. State Service office blocks
- 5 no. Immigration Control Booths
- 24 no. staff car parking spaces;
- 18 no. HGV parking spaces;
- 20 no. car parking spaces;
- Control Point with Canopy and gates (7.7m high) and 4 no. gateways;
- New 4 lane egress onto Tolka Quay Road.

This approval is now being implemented by DPC. Construction phase for this project and the MP2 Project will not overlap. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the heart of the industrial fabric of the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Interim Unified Passenger Terminal project can be excluded beyond scientific doubt.

4.4.11 Yard Upgrade

DPC was granted planning permission (Reg. Ref. 3269/18) in November 2018 for yard upgrade works at the former Calor site. The development will consist of: the removal of plinths, fences and vegetation etc; new pavement construction including underground drainage and electricity infrastructure; 2 no. CCTV poles (18m high); new lighting (including 2 no. lighting columns 30m high and 10 no. lighting columns 12m high); new 4m high security fence on western and southern boundaries; new 7.2m high fire wall on the eastern boundary and; a 5m sliding gate as fire access on the south eastern corner of the site. The development will also include the closure of the existing site accesses and modifications

to the proposed access permitted under Reg. ref. 3084/16, to provide a 12m wide sliding gate on Breakwater Road North. All development to take place on a site approx. 0.3 hectares. The application is for a 10 year planning permission. The site of the proposed development is a SEVESO site.

Construction phase for this project and the MP2 Project will not overlap. A screening for appropriate assessment report was submitted with this application, and it was reviewed. It noted that owing to the nature and scale of the Project, the duration of construction, ambient disturbance levels in the existing environment, the small area of the site likely to be affected, and the fact that the wide treeline along the northern edge of the port area provides an additional screen against disturbance from the Project to birds in the River Tolka Estuary. The report excluded the possibility of any likely significant effects.

This permitted development is a landside project contained within the operational Port Estate near the Tolka Estuary. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Yard Upgrade project can be excluded beyond scientific doubt.

4.4.12 ESB Substation Demolition and Construction

DPC was granted planning permission (Reg Ref. 4250/18) in June 2018 for the demolition of an existing ESB Substation (approx. 25sq.m and 3.2m height), general site clearance, and construction of new ESB Substation building (approx. 40sq.m and 3.1m height) to include access ramps, handrails, replacement fencing, and pedestrian access gate adjacent to proposed substation; and development also includes dropped kerb access off Tolka Quay Road. All development to take place on a site approximately 0.66 hectares. The application is for a 10 year planning Permission. This development has not yet commenced.

A screening for appropriate assessment report was submitted with this application, and it was reviewed. It noted that owing to the nature and scale of the Project, the duration of construction, ambient disturbance levels in the existing environment, the small area of the site likely to be affected, and the fact that the wide treeline along the northern edge of the port area provides an additional screen against disturbance from the Project to birds in the River Tolka Estuary. The report excluded the possibility of any likely significant effects.

This permitted development is a landside project contained within the operational Port Estate near the Tolka Estuary. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the ESB Substation Demolition and Construction project can be excluded beyond scientific doubt.

4.4.13 Terminal 4 Bridge, Alexandra Road

DPC was granted planning permission (Reg. Ref. 4521/18) in April 2019 for this development which consista of a 150m long, 13m wide two lane vehicular bridge with access ramps over Alexandra Road connecting the CDL yard and Terminal 4, associated lighting columns of up to 8m in height and all associated site development works.

This approval is now being implemented by DPC. Construction phase for this project and the MP2 Project will not overlap. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any underwater noise, water quality, habitat deterioration or habitat loss effects; and it did not predict any likely significant aerial noise, lighting or visual disturbance effects. It is a landside transport project contained within the heart of the industrial fabric of the operational Port Estate. At operational phase it results in redirection of existing port traffic and will not result in more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Terminal 4 Bridge project can be excluded beyond scientific doubt.

4.4.14 Dublin Ferry port Terminals Access

DPC was granted planning permission (Reg. Ref. 3314/18) in September 2018 for the upgrade of access to the Dublin Port Operations Centre and the Dublin Ferryport Terminals (DFT), including; re-alignment of traffic lanes and modification of Alexandra Road and Tolka Quay Road junctions; provision of Optical Character Recognition system to include traffic lights, camera, barriers and gantry; DFT check points with associated barriers, kiosks and traffic signals and; associated site works including fencing, gates, underground drainage and electricity infrastructure.

This approval is now being implemented by DPC. Construction phase for this project and the MP2 Project will not overlap. The Planner's Report was reviewed, and no effects upon any European site were identified by the planning authority. A screening for appropriate assessment report was submitted with this application, and it was reviewed. That report did not predict any likely water quality, habitat deterioration or habitat loss effects; and it did not predict any underwater, aerial or visual disturbance effects. It is a landside project contained within the operational Port Estate. At operational phase it results in no more emissions to the aerial or marine environment than the various operations and activities within Port Estate currently discharge, and it will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Dublin Ferry port Terminal Access project can be excluded beyond scientific doubt.

4.4.15 Berth 49 Approach and Ramp

DPC facilitated Irish Ferries plan to invest in two new vessels before 2020, of which one has been ordered, by submitting an application (Reg.Ref: 3176/19) in June 2019 to upgrade the existing

infrastructure at Berth 49 to facilitate faster loading and unloading times of the new vessels. The proposed development will consist of:

- c.189m long, c.10m wide approach way and ramp;
- 1 no. office and staff facilities building (c.193 sq.m and 7.7m in height);
- 1 no. control kiosk (c.6sq.m and 2.3m in height);
- 1 no. control cabin (c.20sq.m and 2.3m in height);
- new lighting (including 18 no. lighting columns 10m high);
- demolition of 5 no. existing staff facilities buildings with a combined area of c.329sq.m; and
- associated site works to include 15 no. tug parking spaces, drainage, utility services, fencing 2.4m in height and pedestrian gate 2.4m in height on a site of approx. 1.3 hectares.

A screening for appropriate assessment and NIS was submitted with this application, and it was reviewed. That report did not predict any aerial or underwater noise, lighting or visual disturbance effects or habitat loss effects. The possibility of likely significant water quality and habitat deterioration effects on the wetland habitats of the Tolka estuary as a resource for the regularly occurring breeding and non-breeding waterbirds of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA that utilise it could not be excluded at screening stage.

A subsequent Stage Two appraisal (a NIS) of the implications of the proposed development was undertaken to determine if it would adversely affect the integrity of the European sites concerned. A number of mitigation measures were required in order to address likely significant water quality effects associated with the proposed development.

The Berth 49 Ramp development is anticipated to be constructed and operational before construction commences on MP2 Project. Only construction stage pollution prevention measures were applied in the NIS. At operational phase the ramp forms part of the existing waterside port infrastructure to facilitate ongoing port operations. It will result in no more emissions to the aerial or marine environment than the various existing operations and activities within Port Estate. It will not result in any disturbance to those SPA feature species located in the South Dublin Bay and River Tolka Estuary SPA. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Berth 49 Approach and Ramp project can be excluded beyond scientific doubt.

4.4.16 S.I. No. 57 of 2019

In February 2019, the Minster for Public Expenditure and Reform, in advance of the impending withdrawal and/or the withdrawal of the United Kingdom from the European Union on 29 March 2019, made the Planning and Development Act 2000, Section 181(2)(a) Order No. 1, 2019 [S.I. No. 57 of 2019]. Pursuant to that Order, the provisions of the Planning and Development Act 2000, and the provisions of Part 9 of the Planning and Development Regulations, 2001 shall not apply to the development being carried out on behalf of the Minister by the Office of Public Works.

The locations and descriptions of the development are set out in the schedule included within the order. The order relates to development on the following sites:

- Former Crosbie's Yard at Crosbies Yard, Tolka Quay Road, Dublin Port, Dublin 1, DO1 K7T3

  The development will include the refurbishment of existing industrial buildings, the removal of a number of existing industrial buildings, the construction of ancillary custom, agriculture and health inspection structures, staff welfare structures, associated truck and car parking, access and egress gates including ancillary site works, signage and all other necessary works, all within the existing boundary of lands of the Dublin Port Company, for the provision of facilities that are required by reason of the impending withdrawal and/or the withdrawal of the United Kingdom from the European Union on 29 March 2019 in order to provide for the required infrastructure for customs, sanitary and phytosanitary and health checks and controls.

- Former Storecon Site at Tolka Quay Road (site bounded by 1 Branch Road South to the east and by Promenade Road to the north), Dublin Port, Dublin 1, DO1 AH31

  The development will include the removal of a number of existing industrial buildings, the construction of ancillary custom, agriculture and health inspection structures, staff welfare structures, associated truck and car parking, access and egress gates including ancillary site works, signage and all other necessary works, all within the existing boundary of lands of the Dublin Port Company, for the provision of facilities that are required by reason of the impending withdrawal and/or the withdrawal of the United Kingdom from the European Union on 29 March 2019 in order to provide for the required infrastructure for customs, sanitary and phytosanitary and health checks and controls.

There are no technical assessment reports to review, and there is no planning authority report on the development consent authorised pursuant to the Order.

Both of these sites are located within the application boundary for the MP2 Project. It should be noted that the MP2 Project does not encompass or propose development at the former Crosbie's Yard site, however, temporary works are proposed at the Former Storecon Site, i.e., those lands are proposed to be used as a temporary construction compound when the site is not occupied by the Office of Public Works.

The Former Storecon Site is proposed to be used when it is not occupied by the Office of Public Works. This may mean that it may not be available at all, or at particular times, for use as a construction compound for the MP2 Project, and may require the relocation of this compound, on an interim or permanent basis. To the extent that an alternative compound location is to be used as a construction compound for the MP2 Project, it will be located within the area relating to the application for permission for the MP2 Project.

Bearing in mind that construction of MP2 Project will be undertaken over a period of approximately 9 years, with existing port operations in the area relating to the application for permission for the MP2 Project continuing throughout this construction period, changing the use of the Former Storecon Site from custom, agriculture and health inspection facilities to a MP2 Project construction compound and/or vice versa represents a *de minimis* change in port operations. The development envisaged by S.I. No. 57 of 2019 will comprise modest structures of a scale which is in keeping with the existing built fabric of the Port Estate. At operational stage, the use of the development envisaged by S.I. No. 57 of 2019 will include people working within and around a building in the Port Estate, vehicles (i.e. cars, buses and taxis) entering and leaving these sites and moving around the internal port road network. This is so similar to what currently happens that there is no anticipated change as a result of the use of the development envisaged by S.I. No. 57 of 2019 above a *de minimis* level.

Therefore the possibility of significant adverse impacts either cumulatively or in combination with the development consent authorised pursuant to Order S.I. No. 57 of 2019 can be excluded beyond scientific doubt.

4.4.17 DPC Post 2019/2021 Maintenance Dredging Campaign

Dublin Port Company are proposing to carry out maintenance dredging in their navigation channel and various berths in 2020 and 2021. It is proposed that the dredged material will be disposed at the existing offshore dump site at the Burford Bank. It is proposed that 300,000 cubic metres of mostly material will be dredged from the Inner Liffey Channel and Dublin Bay during the 2020 and 2021 maintenance dredging campaigns.

A Dumping at Sea license application was submitted in April 2019 (Ref: S0004-02) and a decision from the EPA is pending. Consultation between the EPA Office of Environmental Sustainability and the Department of Culture, Heritage and the Gaeltacht (20th June 2019) has confirmed that the Department agrees with the conclusions of the Habitats Directive appraisal submitted by DPC.

The Habitats Directive appraisal for the Dumping at Sea application could not exclude the possibility of likely significant:

- underwater noise effects on the harbour porpoise community of Rockabill to Dalkey Island SAC;
- underwater noise effects on the harbour porpoise community of the grey seal and harbour seal populations of Lambay Island cSAC;
- water quality and habitat deterioration effects on Mudflats and sandflats not covered by seawater at low tide of North Dublin Bay cSAC and South Dublin Bay cSAC; and
- water quality and habitat deterioration effects on the wetland habitat of the Tolka Estuary as a resource for the breeding and non-breeding waterbirds of South Dublin Bay & River Tolka Estuary SPA.

Mitigation measures were applied at a Stage 2 appraisal, mirroring the Dredging Management Plan developed for the ABR Project. With the application of targeted dredging technique and pollution

prevention measures intended to avoid or reduce the likely significant effects identified, the NIS concluded that there will be no adverse effects upon the integrity of any European site and no scientific doubt remains as to the absence of such effects.

The ABR project is consented to dredge and dispose of 1.1 million m^3 of sediment each winter up until 2023. The 2019/2021 maintenance dredging campaign will if consented, dredge and dispose of 300,000m^3 of material each year at the same disposal site in the spring/summer periods of 2020 and 2021 to avoid overlap with the ABR Project capital dredging. Dredging and disposal operations for the MP2 Project will span four winter seasons, between 2024 and 2031, with no more than 272,000m^3 of spoil being disposed of in any given winter season.

The principal pathways of cumulative effect that might occur with MP2 Project in combination with the maintenance dredging (and also in combination with the ABR Project capital dredging) are water quality and habitat deterioration, underwater noise and aerial noise and visual disturbance.

The dredging and disposal of material at sea for the proposed maintenance dredging project is proposed to occur at alternate times of year (April – September) than for the MP2 Project (and ABR Project (October-March), and not concurrently. As such, the rates of dredging and disposal modelled for ABR and used for Maintenance dredging predictions will not be exceeded at any given time, and the modelled spatial extent of dredge or disposal plumes, their predicted concentrations of suspended sediments and predicted rates of sedimentation at proximate shorelines remain the same when the rates of dredging or disposal do not increase and the MP2 Project dredging and disposal activities are not undertaken concurrently with any other consented dredging or disposal. As such, when these activities are considered in combination, the possibility of significant adverse impacts either cumulatively or in combination with the DPC Post 2019/2021 Maintenance Dredging Campaign project can be excluded beyond scientific doubt.

When the timing of dredging and dumping for the proposed maintenance dredging project and its associated vessel movements and underwater sound produced are considered in combination with the MP2 Project, and bearing in mind that the dredging and disposal of material at sea for MP2 Project is proposed to commence two winters after the final maintenance dredging campaign, and not concurrently, the result is that the same magnitudes of underwater noise are predicted, but the temporal scale of these effects is increased to six campaigns (two maintenance and four capital) over eleven years (between 2020 and 2031). The magnitude of effect that the dredging and dumping activities will have on the harbour porpoise community of Rockabill to Dalkey Island SAC and the seal populations of Lambay Island cSAC both within the cSAC and at known haul out sites of Ireland's Eye and Bull Island, is predicted to remain the same in combination with maintenance dredging as it is for the MP2 Project alone. Given the measures to be applied to the maintenance dredging activities which are intended to avoid or reduce this effect on the marine mammals, and the minimal impacts predicted to arise as a result of the proposed works, the extended temporal duration is not significant. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the DPC Post 2019/2021 Maintenance Dredging Campaign project can be excluded beyond scientific doubt.

4.4.18 Dublin Inland Port

Fingal County Council granted permission (Reg. Ref. F18A/0139) for the Dublin Inland Port in July 2018. The permitted development comprised construction of an extension to internal access road from Maple Avenue with associated works including public lighting and the development of 2 no. plots generally for industrial, warehouse, storage and logistic use and associated site works.

The Planning Report accompanying the application contained a summary of the Stage 1 screening appraisal. That assessment concluded that likely significant effects would not arise for any European site within 15m of the Inland Port. The site of Dublin Inland Port is in the catchment of the Ward River, which flows northwest through Swords and drains into Malahide Estuary SAC. The possibility of likely significant effects on Malahide Estuary SAC as a result of the construction and operation of MP2 Project alone can be excluded. As MP2 Project does not give rise to LSEs in Malahide Estuary SAC and the Dublin Inland Port also does not give rise to LSEs in this site, being its most proximate hydrologically connected site, the possibility of significant adverse impacts either cumulatively or in combination with the Dublin Inland Port project can be excluded beyond scientific doubt.

4.4.19 North Lotts & Grand Canal Dock Planning Scheme 2014

The North Lotts and Grand Canal Dock Strategic Development Zone (SDZ) is a 66ha SDZ established by Statutory Instrument in December 2012. Subsequently, the North Lotts and Grand Canal Planning Scheme was approved by An Bord Pleanála in May 2014 (Ref: PL29S.ZD2011) and includes lands adjacent to Dublin Port to the west (refer Figure 4.6).

The Planning Scheme includes 22ha of lands within the North Lotts and Grand Canal Dock SDZ available for development, which could accommodate approx. 2,600 dwelling units and 305,000m^2 of commercial floorspace, equating to a residential population of approx. 5,800 and approx. 23,000 workers through provision of residential development, employment services, commercial activities (including financial services and office, hotel, conference, leisure and retail facilities), cultural facilities, embassies, emergency services, childcare services, educational facilities, transport facilities and community facilities. The proximity of Dublin Port to the Planning Scheme lands and the opportunity to maintain the maritime character of the area and integrate better with Dublin Port is recognised in the Planning Scheme.

The Planning Scheme contains specific policies relating to the protection and preservation of the natural environment and designated sites under the Habitats and Birds Directives, while certain objectives of the Scheme itself were viewed by An Bord Pleanála as having a positive impact on Natura 2000 sites, including:

- Policies providing alternative areas for socialising, interaction and recreation
- Policies providing for the protection and improvement of water quality
- Policies providing protection to the designated sites during construction

An appropriate assessment was undertaken by An Bord Pleanála who determined that likely significant effects could not be excluded for the following European sites:

- North Dublin Bay cSAC
- South Dublin Bay cSAC
- Rockabill to Dalkey Islands SAC.
- South Dublin Bay & River Tolka Valley Estuary SPA
- North Bull Island SPA

The effects in question were determined as arising "primarily due to deficiencies in wastewater treatment at Ringsend, increased activity and disturbance due to greater population numbers and construction impacts particularly due to the potentially contaminated nature of land".

In its appropriate assessment, the Board determined that having regard to elements of the Planning Scheme that are likely to result in impacts and "assuming the successful implementation of the mitigatory objectives contained within the Planning Scheme there will be no adverse effects on the integrity of Natura 2000 sites arising from the plan in isolation, or in combination with other plans and projects". The issue of increased wastewater treatment capacity at Ringsend WWTP has now been resolved (see Section 4.4.19 below).

Bringing forward phases of development under the Planning Scheme could overlap with construction phase of the MP2 Project. There is a possibility of release of suspended sediment or contaminated run off during construction into the Lower Liffey during construction phase of elements of the Planning Scheme brought forward. Those individual developments would be constructed in accordance with any necessary conditions and environmental safeguarding measures imposed by the competent authority in order to avoid adverse effects on the integrity of a European site.

At operational stage, visitor numbers to coastal amenity areas in Dublin would very likely increase and this would increase recreational pressures on the coastal Annex I habitats of, for example wetland habitats of North Dublin Bay cSAC, South Dublin Bay cSAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA. The MP2 Project will not result in an increase in recreational pressures on Annex I habitats of Dublin Bay. Potential disturbance effects are concentrated on that part of the eastern Port north of Berth 53. An increase in visitor numbers to this area is possible during the operational lifetime of the Planning Scheme, and it is facilitated by the Greenway amenity route along the northern boundary of the Port Estate which opens up this part of the Tolka estuary to increased visitor numbers. Potential in-combination effects of that development are discussed in Section 4.4.4 above. No other pathways for in-combination effects occur. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the North Lotts and Grand Canal Dock Planning Scheme can be excluded beyond scientific doubt.

4.4.20 Exo Building

Development at a site of 1.1507 ha in the Point Village District Centre at the junction of North Wall Quay and East Wall Road was consented by Dublin City Council in 2016 (DSDZ3632/15). Minor amendments to the permitted development have also been approved under DSDZ3686/16 and DSDZ3776/17. The site is located within the North Lotts & Grand Canal Dock SDZ. The development consists of: Construction of a commercial office building ranging in height from 8 storeys to 17 storeys (including one level of plant) at the northern end. The total gross floor area above ground of this building will be circa 19263 sq.m. The building is raised at ground level to 8m and supported by three elliptical cores. Access via dedicated northern and southern glass entrance foyers. As part of the development there will be an external roof terrace and plant at eighth floor level. Construction of one level of basement beneath the proposed commercial building connecting to the existing constructed basement beneath the Point Village Square (as constructed under Section 25 DD478) accommodating 300 bicycle parking spaces, plant, staff facilities, storage areas and other associated facilities. Cycle access to the basement will be via a dedicated, access controlled cycle ramp in the central core. Reconfiguration of the existing basement level -1 beneath the Point Village Square to facilitate 48 No. car parking spaces at -1 level, plant, storage areas and other associated facilities. This will also involve associated structural reconfiguration of existing basement levels -2 and -3. Vehicular access to the basement will be via the existing ramped access on Sheriff St servicing the Point Village District Centre. The reconfiguration of the basement will involve the removal of the existing external stairs from the Point Village Square to existing underground bar located at -1 level. Construction of 14.5m high restaurant/bar glass box with mezzanine level located within the Point Village Square.

The total above ground gross floor will be circa. 519.4 sq.m. Permission was also sought for revisions to the Point Village Square Public Realm including proposed hard and soft landscaping works. This includes a new bus shelter, taxi shelter, 5 number glass screens and the relocation of existing Point Village Signage on East Wall Rd. The proposed development includes all associated and ancillary works, including site development works. Permission for the development was granted in February 2016 and construction is currently ongoing.

The developer submitted a Habitats Directive stage 1 appraisal report which identifies the possibility of accidental pollution of surface waters at construction stage which would discharge via the surface water drainage network to the River Liffey and Dublin Bay but that because of the pollution prevention measures to be put in place at construction stage, the temporary nature of any discharges and the high absorptive capacity of the marine waters of Dublin Bay likely significant effects would not occur. At operational stage, appropriate levels of attenuation and storage incorporated into the design of the project in order to comply with Dublin City Council Sustainable Urban Drainage Systems requirements, and the collection and treatment of foul water at Ringsend WwTP would ensure no effects on water quality. The Planning Authority's Planning Report notes that the Planning Authority "has carried out its own AA based on the analysis provided and concurs and accepts the conclusion of the AA screening".

The Exo Building project is anticipated to be constructed and operational before construction commences on the MP2 Project. As such, construction stage pollution risks associated with the Exo Building project cannot occur at the same time as construction of the MP2 Project which may also give rise to such risks. Likely significant operational stage risks of the Exo Building project were not identified. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Exo Building project can be excluded beyond scientific doubt.

4.4.21 Poolbeg West SDZ

The Poolbeg West Strategic Development Zone (SDZ) and associated Planning Scheme was consented by An Bord Pleanála in April 2019 (Ref: PL29S.ZD2013). The SDZ is designated a "mixed use development which may principally include residential development, commercial and employment activities including, office, hotel, leisure and retail facilities, port related activities and the provision of educational facilities, transport infrastructure, emergency services and the provision of community facilities including health and childcare services, as appropriate.

The Poolbeg West Planning Scheme lands are south of the Liffey, approximately half of which are owned by Dublin Port Company. Planning permission for this development was approved by An Bord Pleanála in April 2019. In addition to 3,500 residential units, its uses will include leisure, community, educational and commercial facilities.

A Natura Impact Report was prepared to accompany the Planning Scheme. It identified likely significant effects on South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, North Dublin Bay cSAC and South Dublin Bay cSAC. The Baldoyle Bay European sites were also brought forward to a Stage 2 appraisal on a precautionary basis. The likely significant effects identified related to potential pollution and contamination via a hydrological connection. The possibility of likely significant disturbance effects could also not be excluded for North Bull Island SPA. A stage 2 plan level appraisal proposed mitigation measures taking the form of higher level policies and objectives developed in an iterative manner during preparation of the Draft Planning Scheme to minimise noise pollution and amenity use effects, vibrations and sediment release, and adhere to best practice pollution prevention guidelines. The Planning Scheme dictates individual planning applications will be screened for Appropriate Assessment, and mitigation and avoidance measures implemented at project level.

Bringing forward phases of development under the Planning Scheme could overlap with construction phase of the MP2 Project. There is a possibility of release of suspended sediment or contaminated run off during construction into the Lower Liffey or South Dublin Bay and River Tolka Estuary SPA during construction phase of elements of the Poolbeg West SDZ Planning Scheme brought forward. Those individual developments would be constructed in accordance with any necessary conditions and environmental safeguarding measures imposed by the competent authority in order to avoid adverse effects on the integrity of a European site, as required by the plan level mitigation strategy of the NIR.

At operational stage, visitor numbers to coastal amenity areas in Dublin would very likely increase and this would increase recreational pressures on the coastal Annex I habitats of, for example wetland

habitats of North Dublin Bay cSAC, South Dublin Bay cSAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA. The MP2 Project will not result in an increase in recreational pressures on Annex I habitats of Dublin Bay. Potential disturbance effects are concentrated on that part of the eastern Port north of Berth 53. An increase in visitor numbers to this area is possible during the operational lifetime of the Planning Scheme, and it is facilitated by the Greenway amenity route along the northern boundary of the Port Estate which opens up this part of the Tolka estuary to increased visitor numbers. Potential in-combination effects of that development are discussed in Section 4.4.4 above. No other pathways for in-combination effects occur. Therefore the possibility of significant adverse impacts either cumulatively or in combination with the Poolbeg West SDZ and Planning Scheme can be excluded beyond scientific doubt.

4.4.22 Ringsend WwTP Upgrade Project

Irish Water was granted planning permission in April 2019 for strategic infrastructure development by An Bord Pleanála (Ref. PL29S.301798) to upgrade the Ringsend Wastewater Treatment Plant (WwTP). The development comprises works required to facilitate the use of Aerobic Granular Sludge (AGS) technology, to omit the previously permitted long sea outfall tunnel and to upgrade the sludge treatment facilities at Ringsend, Dublin 4, and to provide for a Regional Biosolids Storage Facility in Newtown, Dublin 11.

The Ringsend WwTP is to the south of the MP2 Project, south of the River Liffey. A project website (https://www.ringsendwwtpupgrade.ie/environmental-documents/) exists and contains a screening for appropriate assessment and NIS. These documents were reviewed. Likely significant effects on the following European sites could not be discounted at screening stage:

- South Dublin Bay and River Tolka Estuary SPA
- South Dublin Bay cSAC
- North Bull Island SPA
- North Dublin Bay cSAC
- Howth Head Coast SPA
- Dalkey Islands SPA
- Rockabill to Dalkey Island SAC

Further evaluation and analysis as part of a Stage 2 assessment predicted that

- water quality in Inner Dublin Bay will be enhanced because of a reduction in nutrient load once the proposed development is operational
- it is unlikely that the food resource of waterbirds in the Tolka Estuary will be negatively affected
- reductions in nutrients in the receiving waters resulting from the proposed development will not have any impacts on fish populations in Dublin Bay

- disturbance and displacement of certain qualifying SPA feature species during construction may occur
- accidental spillage of hazardous substances resulting in water quality deterioration of the Liffey Channel and hydrologically connected areas during construction may occur
- significant dust deposition on the grasslands to the south of the site that form part of the South Dublin Bay and River Tolka Estuary SPA may occur

Measures intended to avoid or reduce these potentially significant effects on the European sites were proposed as part of the Stage Two Appropriate Assessment, and there will be no adverse effect on the integrity of any European site as a result.

The appropriate assessment conducted by An Bord Pleanála adopts the approach taken by the Board's Inspector which largely mirrors the analysis and evaluation of Irish Water in its Habitats Directive appraisals.

The Ringsend WwTP Upgrade project is sufficient spatially separated from the MP2 Project to prevent any significant in-combination visual or noise disturbance on SPA feature species at construction stage. With the measures proposed to avoid or reduce the likely significant pollution effects predicted for the WwTP Project, there will be no adverse effects upon the integrity of any European site. Therefore the possibility of significant adverse visual or noise disturbance or water quality or habitat deterioration effects either cumulatively or in combination with the Ringsend WwTP Upgrade project can be excluded beyond scientific doubt.

4.4.23 Howth Yacht Club Marina Extension

Only Howth Yacht Club (HYC) and Dublin Port Company currently hold Dumping at Sea Permits for use of the Dublin Bay disposal site. HYC has the benefit of a Dumping at Sea Permit (Ref. No. S0010-01) to load and dispose of a maximum of 120,000 tonnes of dredged material from Howth Marina over a one year period. In its application documents, HYC estimated a maximum daily quantity for disposal of 1,200 tonnes and 800 tonnes in each load. It also suggested a spring or winter commencement and campaign duration of six months.

This volume of material is equivalent to approximately 6% of the annual permitted quantity of material that may be disposed at this site by Dublin Port Company under Dumping at Sea Permit S0024-01. While disposal by DPC is restricted to the winter months (October to March), no such restriction applies to HYC activities. There is no expiry date of the permit and the activities have not yet commenced.

If or when it does occur, disposal will be subject to the approval of the Dublin Port Harbourmaster and disposal activity will not be permitted by the Harbourmaster for DPC and HYC operations simultaneously. The rates of disposal of dredge material at sea as a result of both projects will not exceed the rate of disposal of the MP2 Project alone for this reason. As stated in Section 4.3.2.2, the possibility of likely significant effects on the qualifying Reef habitat of Rockabill to Dalkey Island SAC

cannot be excluded as a result of disposal at sea activites alone. As such, the possibility of significant adverse impacts either cumulatively or in combination with the Howth Yacht Club Marina Extension project **cannot** be excluded beyond scientific doubt.

Dredging in HYC will occur 15km by sea from the nearest location to any dredging carried out as part of the MP2 Project. Significant mixing of seawater occurs in Dublin Bay with freshwater flowing in from the Liffey, Tolka and Dodder. The mixing of any polluting materials that escape to the marine environment as a result of MP2 dredging activities is further aided by the tidal currents, wind and wave climate which transport the mix of seawater and freshwater (and any polluting substances) both into and out of the Liffey Estuary, and help it disperse throughout Dublin Bay. The possibility of significant adverse water quality or habitat deterioration impacts either cumulatively or in combination with dredging associated with the HYC project can be excluded beyond scientific doubt.

4.5 SUMMARY OF SCREENING APPRAISAL

Table 4.2 summarises the outcome of the screening exercise for each European site considered.

Table 4.2 Screening Summary for European sites considered

Site Code	Site Name	Can the possibility of Likely Significant Effects be excluded at the Screening Stage of assessment?			
		Habitat Loss	Water Quality and Habitat Deterioration	Underwater Noise and Disturbance	Aerial Noise and Visual Disturbance
IE000204	Lambay Island cSAC	√	√	X Grey and Harbour seals	√
IE000208	Rogerstown Estuary SAC	√	√	√	√
IE000205	Malahide Estuary SAC	√	√	√	√
IE000199	Baldoyle Bay cSAC	√	√	√	√
IE002193	Ireland's Eye cSAC	√	√	√	√
IE000202	Howth Head cSAC	√	√	√	√
IE000206	North Dublin Bay cSAC	√	√ Saltmarsh habitats √ Sand dune habitats √ Petalwort X Mudflats and sandflats	√	√
IE000210	South Dublin Bay cSAC	√	X Mudflats and sandflats	√	√
IE003000	Rockabill to Dalkey Island SAC	√	X Reefs	X Harbour porpoise	√
IE003015	Codling Fault Zone cSAC	√	√	√	√
IE004024	South Dublin Bay & River Tolka Estuary SPA	√	X Wetlands X Prey biomass available	√	X Waders and waterbirds
IE004006	North Bull Island SPA	√	X Wetlands	√	X Waders and waterbirds
IE004016	Baldoyle Bay SPA	√	√	√	√
IE004113	Howth Head Coast SPA	√	√	√	√
IE004117	Ireland's Eye SPA	√	√	√	√
IE004172	Dalkey Islands SPA	√	√	√	√
IE004025	Malahide Estuary SPA	√	√	√	√

Site Code	Site Name	Can the possibility of Likely Significant Effects be excluded at the Screening Stage of assessment?			
		Habitat Loss	Water Quality and Habitat Deterioration	Underwater Noise and Disturbance	Aerial Noise and Visual Disturbance
IE004015	Rogerstown Estuary SPA	√	√	√	√
IE004069	Lambay Island SPA	√	√	√	√

4.6 CONCLUSION OF THE SCREENING APPRAISAL

The Screening appraisal was completed in compliance with EU and Irish law and the relevant European Commission and national guidelines to enable the competent authorities to determine whether or not Likely Significant Effects on any European site could or could not be excluded as a result of the construction and operation of the MP2 Project.

From the findings of the Screening appraisal presented, the possibility of Likely Significant Effects upon:

- **six** of the European sites considered **cannot** be excluded beyond scientific doubt; and
- **thirteen** of the European sites considered **can** be excluded beyond scientific doubt,

individually or in combination with other plans or projects, in view of best scientific knowledge and in view of the conservation objectives of the sites concerned.

The following summarises the findings of the Screening appraisal for each site.

4.6.1 SACs and cSACs

4.6.1.1 Lambay Island cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects **cannot be excluded** for this European site.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have significant water quality, habitat loss or deterioration, or aerial noise and visual disturbance effects on Lambay Island cSAC. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant underwater noise and disturbance effect on the Grey seal and Harbour seal populations in this European site.

4.6.1.2 Rogerstown Estuary SAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Rogerstown Estuary SAC. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.1.3 Malahide Estuary SAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Malahide Estuary SAC. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.1.4 Baldoyle Bay cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Baldoyle Bay cSAC. It can be excluded, on the basis of objective

information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.1.5 Ireland's Eye cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Ireland's Eye cSAC. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.1.6 Howth Head cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Howth Head cSAC. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.1.7 North Dublin Bay cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on the saltmarsh habitats, sand dune habitats and Petalwort can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on Mudflats and sandflats not covered by seawater at low tide **cannot be excluded** for this European site.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have significant habitat loss, aerial or underwater noise or visual disturbance effects on North Dublin Bay cSAC. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant water quality and habitat deterioration effect on the conservation objectives for Mudflats and sandflats not covered by seawater at low tide in this European site.

4.6.1.8 South Dublin Bay cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on Mudflats and sandflats not covered by seawater at low tide **cannot be excluded** for this European site.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have significant habitat loss, aerial or underwater noise or visual disturbance effects on South Dublin Bay cSAC. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant water quality and habitat deterioration effect on the conservation objectives for Mudflats and sandflats not covered by seawater at low tide in this European site.

4.6.1.9 Rockabill to Dalkey Island SAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on Reefs **cannot be excluded** for this European site.

The possibility of likely significant Underwater Noise and Disturbance effects on the Harbour porpoise community **cannot be excluded** for this European site.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have significant habitat loss or aerial noise and visual disturbance effects on Rockabill to Dalkey Island SAC. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant Water Quality and Habitat Deterioration effect on Reef habitat, or underwater noise and disturbance effect on the Harbour porpoise community of this European site.

4.6.1.10 Codling Fault Zone cSAC

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Codling Fault Zone cSAC. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2 SPAs

4.6.2.1 South Dublin Bay & River Tolka Estuary SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on the wetland habitat as a resource for the regularly occurring migratory waterbirds that utilise it, and the prey biomass available for the breeding waterbird Special Conservation Interest species in **cannot be excluded** for this European site.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects on the breeding and the non-breeding waterbird Special Conservation Interest species **cannot be excluded** for this European site.

The proposed development, individually or in combination with other plans or projects is not likely to have significant Habitat Loss or Underwater Noise and Disturbance effects on South Dublin Bay & River Tolka Estuary SPA. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant Water Quality and Habitat Deterioration effect on the wetland habitat as a resource for the regularly occurring migratory waterbirds that utilise it, and the prey biomass available for the breeding waterbird Special Conservation Interest species of this European site. It also cannot be excluded on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant Aerial Noise and Visual Disturbance effects on the breeding and the non-breeding waterbird Special Conservation Interest species of this European site.

4.6.2.2 North Bull Island SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects on the wetland habitat as a resource for the regularly occurring migratory waterbirds that utilise it **cannot be excluded** for this European site.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects on the non-breeding waterbird Special Conservation Interest species **cannot be excluded** for this European site.

The proposed development, individually or in combination with other plans or projects is not likely to have significant Habitat Loss or Underwater Noise and Disturbance effects on North Bull Island SPA. It cannot however be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant Water Quality and Habitat Deterioration effect on the wetland habitat as a resource for the regularly occurring migratory waterbirds that utilise it, or Aerial Noise and Visual Disturbance effects on the breeding and the non-breeding waterbird Special Conservation Interest species of this European site.

4.6.2.3 Baldoyle Bay SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Baldoyle Bay SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.4 Howth Head Coast SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Howth Head Coast SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.5 Ireland's Eye SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Ireland's Eye SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.6 Dalkey Islands SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Dalkey Islands SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.7 Malahide Estuary SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Malahide Estuary SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.8 Rogerstown Estuary SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Rogerstown Estuary SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.2.9 Lambay Island SPA

The possibility of likely significant Habitat Loss effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Water Quality and Habitat Deterioration effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Underwater Noise and Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The possibility of likely significant Aerial Noise and Visual Disturbance effects can be excluded for this European site, even without consideration of mitigation measures.

The proposed development, individually or in combination with other plans or projects is not likely to have a significant effect on Lambay Island SPA. It can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or project, will have a significant effect on this European site.

4.6.3 Conclusion

Having regard to the methodology employed and the findings of the screening stage appraisal, it is concluded that an appropriate assessment of the implications of the MP2 Project on the following European sites in view of their conservation objectives is required –

- The possibility of likely significant Underwater Noise and Disturbance effects on:
    - the Grey seal population of Lambay Island cSAC;
    - the Harbour seal population of Lambay Island cSAC; and
    - the Harbour porpoise community of Rockabill to Dalkey Island SAC.

- The possibility of likely significant Water Quality and Habitat Deterioration effects on:
    - Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC;
    - Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC;
    - Reefs in Rockabill to Dalkey Island SAC;
    - the intertidal wetland areas of the Tolka Estuary as a resource for the regularly occurring migratory waterbirds of:
        (i) South Dublin Bay & River Tolka Estuary SPA;
        (ii) North Bull Island SPA; and
    - the prey biomass available for the breeding waterbird Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA.

- The possibility of likely significant Aerial Noise and Visual Disturbance effects on:
    - the breeding waterbird Special Conservation Interest species Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA;
    - the non-breeding waterbird Special Conservation Interest species Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA; and
    - the non-breeding waterbird Special Conservation Interest species of North Bull Island SPA.

5 APPROPRIATE ASSESSMENT

The screening stage appraisal concluded that an appropriate assessment of the implications of the MP2 Project on the following European sites is required in view of their conservation objectives and in combination with any other relevant plans or projects:

Lambay Island cSAC

Underwater Noise and Disturbance effects

- Harbour seals
- Grey seals

Rockabill to Dalkey Island SAC

Underwater Noise and Disturbance effects

- Harbour porpoise

Water Quality and Habitat Deterioration effects

- Reefs

North Dublin Bay cSAC

Water Quality and Habitat Deterioration effects

- Mudflats and sandflats not covered by seawater at low tide

South Dublin Bay cSAC

Water Quality and Habitat Deterioration effects

- Mudflats and sandflats not covered by seawater at low tide

South Dublin Bay & River Tolka Estuary SPA

Aerial Noise and Visual Disturbance effects

- Breeding waterbird Special Conservation Interest species
- Non-breeding waterbird Special Conservation Interest species

Water Quality and Habitat Deterioration effects

- Wetlands
- Prey biomass available for Breeding waterbirds

North Bull Island SPA

Aerial Noise and Visual Disturbance effects

- Non-breeding waterbird Special Conservation Interest species

Water Quality and Habitat Deterioration effects

- Wetlands

The 2018 Commission Notice (EC, 2019) advises that the purpose of the appropriate assessment is to assess the implications of the project in respect of the site's conservation objectives, either individually or in combination with other plans or projects, drawing conclusions to enable the competent authorities to ascertain whether the project will adversely affect the integrity of the sites concerned, where no reasonable scientific doubt remains as to the absence of such effects. Case law confirms that such an assessment must identify all the aspects of the project which can, either individually or in combination with other plans or projects, affect the conservation objectives of the sites concerned in the light of the best scientific knowledge in the field.

EC (2019) advises that an appropriate assessment should:

- include a comprehensive identification of all the potential effects of the project likely to be significant on the sites concerned;
- take into account cumulative and other effects likely to arise as a result of the combined action of the project under assessment with other plans or projects;
- apply the best available techniques and methods to assess the extent of the effects of the project on the integrity of the sites concerned;
- describe the assessment on the site's integrity based on the best possible indicators specific to the qualifying interests of the European site;
- be sufficiently detailed to demonstrate how the final conclusion was reached, and on what scientific grounds.

The competent authorities, in carrying out an appropriate assessment under Article 6(3) and Irish law, are obliged to make a determination as to whether or not the proposed development would adversely affect the integrity of the relevant European site or sites in view of its conservation objectives.

5.1 LAMBAY ISLAND CSAC

5.1.1 Underwater Noise and Disturbance effects

5.1.1.1 Harbour Seal

5.1.1.1.1 Conservation Objectives

Conservation objectives for these Annex II species are to maintain the favourable conservation condition of Harbour seal (or Grey seal as the case may be) population in Lambay Island cSAC, as defined by 5 no SSCO attributes and targets:

Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use

Breeding behaviour:	Species range within the site should not be restricted by artificial barriers to site use
Moulting behaviour:	The moult haul-out sites should be maintained in a natural condition
Resting behaviour:	The resting haul-out sites should be maintained in a natural condition
Disturbance:	Human activities should occur at levels that do not adversely affect the Harbour seal (or Grey seal) population at the site

The targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Breeding behavoiur' is measured in 'Breeding sites'. The target for 'Moulting behavoiur' is measured in 'Moult haul-out sites'. The target for 'Resting behavoiur' is measured in 'Resting haul-out sites'. The target for 'Disturbance' is measured in 'Level of impact'.

The '*Conservation objectives supporting document – Marine habitats and species'* for Lambay Island cSAC (NPWS, 2013) notes that Harbour seal occurs in estuarine, coastal and offshore waters but also utilises a range of intertidal and terrestrial habitats for important life history functions such as breeding, moulting, resting and social activity. Its aquatic range for foraging and inter-site movement extends into continental shelf waters. When hauling out ashore, harbour seals tend to prefer comparatively sheltered locations where exposure to wind, wave action and precipitation, for example, are minimised. Thus in Ireland the species is more commonly found ashore in sheltered bays, inlets and enclosed estuaries.

Harbour seals in Lambay Island cSAC occupy both aquatic habitats and intertidal shorelines that become exposed during the tidal cycle. The species is present at the site throughout the year during all aspects of its annual life cycle which includes breeding (May to July approx.), moulting (August to September approx.) and non-breeding foraging and resting phases.

Harbour seals are vulnerable to disturbance during periods in which time is spent ashore, or in shallow waters, by individuals or groups of animals. This occurs immediately prior to and during the annual breeding season, which takes place predominantly during the months of May to July. Pups are born on land, usually on sheltered shorelines, islets or skerries and uninhabited islands removed from the risk of predation and human interference. While there may be outliers in any year, specific established locations tend to be used annually for breeding-associated behaviour by adult males, adult females and their newborn pups. Such habitats are critical to the maintenance of the species within any site. Pups are able to swim soon after birth and may be observed accompanying their mother close to shore in the early days or weeks of life. They are nursed for a period of several weeks by the mother prior to weaning and abandonment. During this period adult females mate with adult males, an activity that takes place in the water.

Moulting is considered an intensive, energetically-demanding process which incurs further vulnerability for individuals during this period. Terrestrial or intertidal locations where seals can be found ashore are

known as haul-out sites. The harbour seal moult season takes place predominantly during the months of August to September.

5.1.1.2 Grey Seal

5.1.1.2.1 Conservation Objectives

Conservation objectives for this Annex II species is to maintain the favourable conservation condition of Grey seal population in Lambay Island cSAC, as defined by 5 no SSCO attributes and targets:

Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use

Breeding behaviour: Species range within the site should not be restricted by artificial barriers to site use

Moulting behaviour: The moult haul-out sites should be maintained in a natural condition

Resting behaviour: The resting haul-out sites should be maintained in a natural condition

Disturbance: Human activities should occur at levels that do not adversely affect the Grey seal population at the site

The targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Breeding behavoiur' is measured in 'Breeding sites'. The target for 'Moulting behavoiur' is measured in 'Moult haul-out sites'. The target for 'Resting behavoiur' is measured in 'Resting haul-out sites'. The target for 'Disturbance' is measured in 'Level of impact'.

The '*Conservation objectives supporting document – Marine habitats and species'* for Lambay Island cSAC (NPWS, 2013) notes that Grey seal occupies both aquatic and terrestrial habitats in Lambay Island cSAC, including intertidal shorelines and skerries that become exposed during the tidal cycle. It is present at the cSAC throughout the year during all aspects of its annual life cycle which includes breeding (August to December approx.), moulting (December to April approx.) and non-breeding, foraging and resting phases.

Grey seals are vulnerable to disturbance during periods when time is spent ashore by individuals or groups of animals. This occurs immediately prior to and during the annual breeding season, which takes place predominantly during the months of August to December. Pups are born on land, usually on remote beaches and uninhabited islands or in sheltered caves. While there may be outliers in any year, specific established sites are used annually for breeding-associated behaviour by adult females, adult males, newborn and weaned pups. Such habitats are critical to the maintenance of the species within any site since pups are nursed there for a period of several weeks by the mother prior to weaning and abandonment. During this period, adult females also mate with adult males at, or adjacent to, breeding sites.

Current breeding sites in Lambay Island cSAC are broadly distributed around the island among its numerous gullies, caves, beaches, rock ledges and coves where access for seals to intertidal shorelines and the area above high water mark is possible.

Grey seal also occurs at the site during the annual moult (i.e. hair shedding and replacement), a protracted period during which individual animals spend significant periods of days or weeks on the shore. Moulting is considered an intensive, energetically-demanding process that all seals must undergo, incurring further vulnerability for individuals during this period.

Terrestrial or intertidal sites where seals can be found ashore are known as haul-out sites. Moult locations may be preferentially selected by the species, with specific established sites used annually by moulting adult females, adult males and juveniles. The moulting phase in the annual life cycle occurs predominantly during the months of December to April.

5.1.1.3 Marine Mammal Monitoring by Dublin Port Company

There were 209 sightings (70% of total marine mammal sightings) of grey seals during the first season of the ABR Project capital dredging campaign (2017-2018) with only 12 sightings (4%) of harbour seal, as illustrated in Figure 5.1. Grey seals were observed within, and at the mouth of, Dublin Harbour, with sightings decreasing further east and on the spoil ground. Harbour seal followed a similar distribution, but with more sightings at the spoil ground.

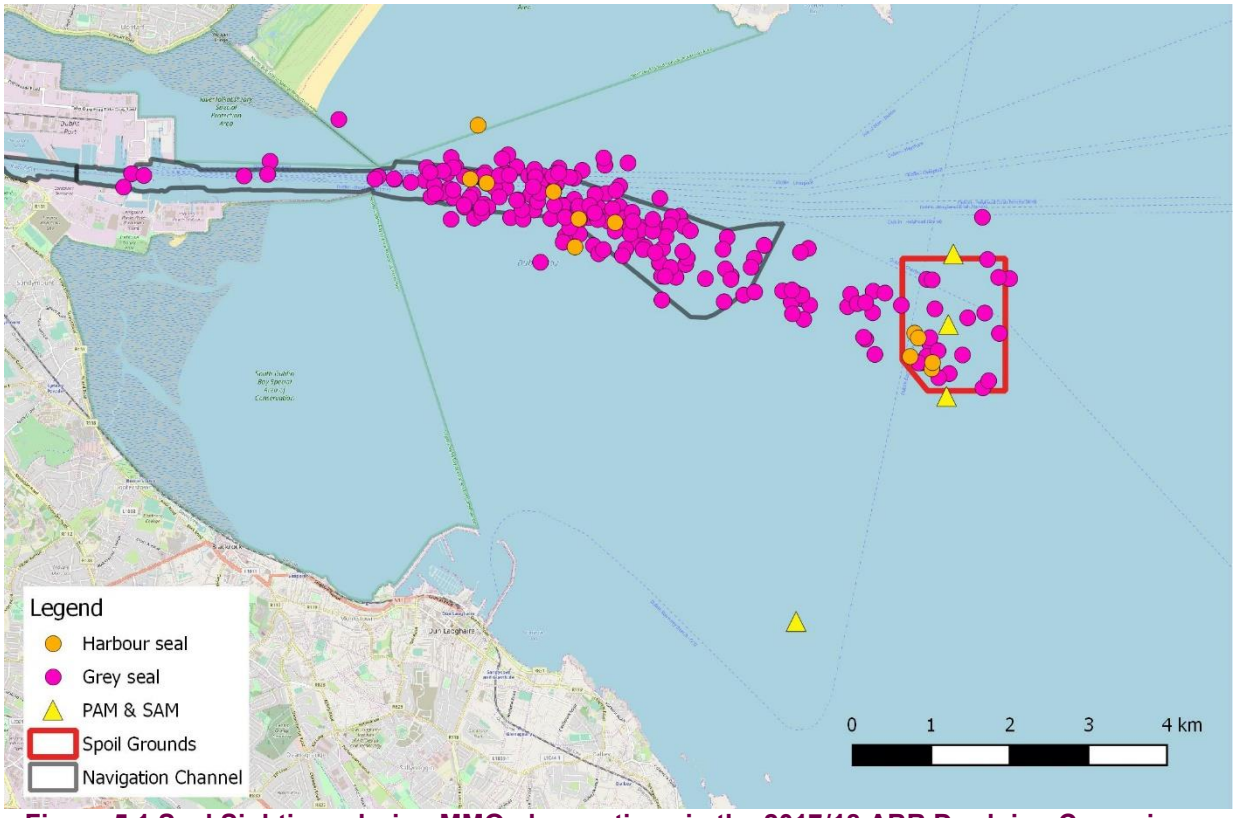

Figure 5.1 Seal Sightings during MMO observations in the 2017/18 ABR Dredging Campaign

There were 143 sightings (76% of total marine mammal sightings) of grey seals during the 2017 maintenance dredging campaign (14 - 30 September 2017) with 12 sightings (6%) of harbour seal.

There were 65 sightings (58% of total marine mammal sightings) of grey seals during the 2018 maintenance dredging campaign (9 - 22 April 2018) with 11 sightings (10%) of harbour seal.

These figures suggest the areas of the port that will be affected by construction by the MP2 Project, the Liffey Channel is used by seals and is the same area as affected during the ABR Project. Seals using the outer harbour and in Dublin Bay will only be affected by dredging and disposal of spoil and shipping traffic.

Bull Island was surveyed for the presence of hauled out seals each month under the ABR Project Marine Mammal Monitoring Programme from May 2016 and August 2018. Grey seals were recorded hauled out on 52% of survey days with highest numbers of individuals recorded in June 2017, with 34 grey seals present. Figure 5.2 shows that their abundance peaked from June to August, with low numbers from September to November and no seals were present in December, which coincides with their breeding and moulting seasons. Grey seals may move to Lambay Island or Ireland's Eye to breed, which are known breeding sites.

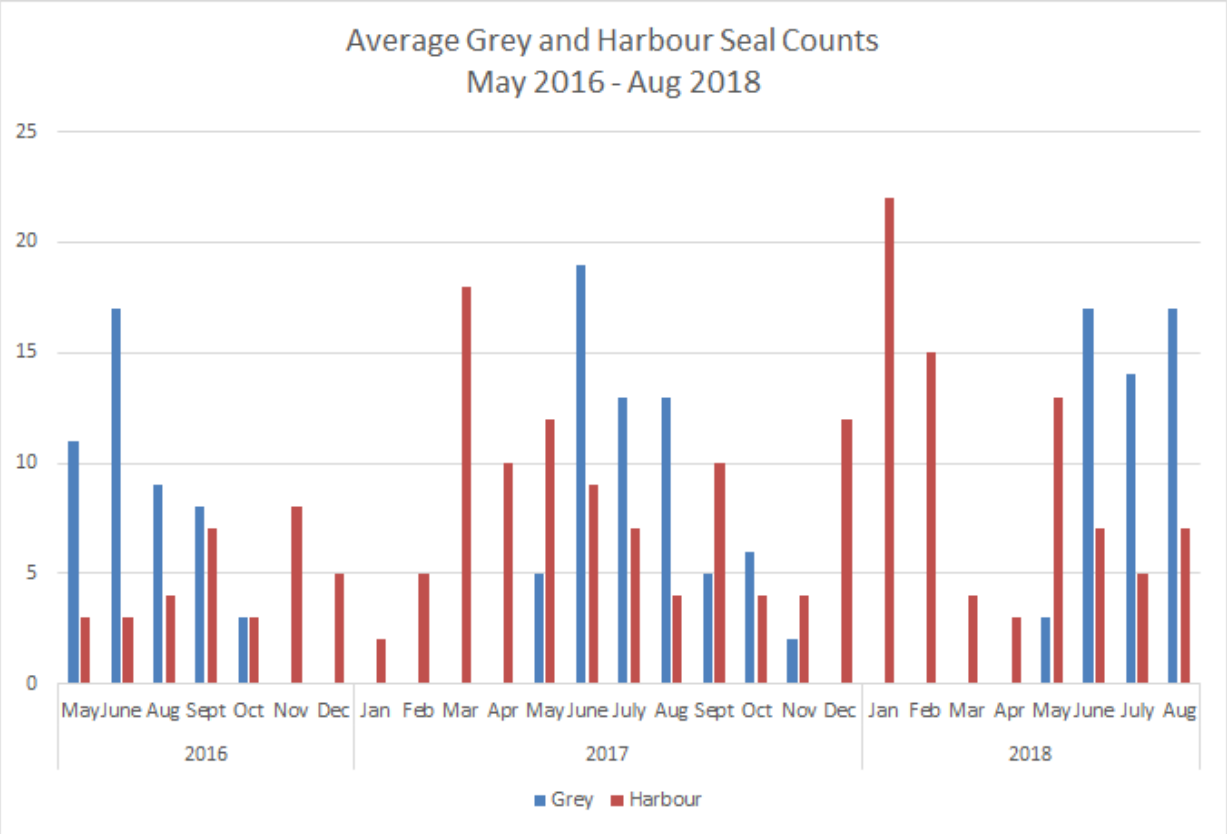

Figure 5.2 Numbers of grey and harbour seals hauled out on Bull Island (May 2016 – Aug 2018)

Harbour seals were present year around on North Bull Island and on 87% of survey days yet there did appear to be a seasonal affect with numbers declining in the summer months and peaking in the winter

months. Harbour seals breeding season occurs from approximately May to June and their annual moult occurring in August to September when they would spend a significant time resting on land, Irelands Eye and Lambay Island. The highest abundance recorded was in January with 22 seals present. Harbour seals were present on 20 out of 23 surveys carried out to date.

5.1.1.4 Underwater noise in Dublin Bay

Dublin Bay is home to Dublin Port along with a number of smaller harbours and marinas. Marine traffic includes large cargo ships, passenger cruise ships, large ferry vessels, fast ferries, trawlers and leisure traffic. The main shipping channels from the Irish Sea are north and south of the Burford Bank towards the Great South Wall light and into the dredged shipping channel on the eastern approaches to the port up the River Liffey as far as the East-Link/Tom Clarke Bridge.

Dublin Port has been in operation for over 300 years with motorised vessels for over 100 years. While the level of traffic has increased, the North Quay Wall was constructed 150 years ago and the port area has centred on the two Alexandra Basins throughout this time. Underwater noise levels related to the MP2 Project will increase temporarily during construction and revert to shipping traffic related noise once constructed.

The central port area from Berth 53 to the Alexandra Basin West is heavily trafficked on a daily basis. This working area in Dublin Port is relatively noisy in comparison to the greater Dublin Bay area. Noise in the port area comes from shipping and a multitude of industrial sources. The port is accessed via the dredged channel which extends some 2.5 km from the Great South Wall light to Berth 53. The channel is approximately 200 m wide and is currently 8 m deep. This narrow shallow channel has the effect of confining noise from the port within that area and a short section of the channel and the River Liffey upstream.

All traffic to and from port uses the dredged navigation channel to the eastern end of the Great South Wall and then heads either north or south of the Burford Bank. West of the Great South Wall light in the dredged channel, noise levels are elevated in the navigation channel as a vessel passes but again fade quickly. The outer Dublin Bay area is also a shallow water area (<30 m deep) and underwater sound does not propagate efficiently, resulting in short elevations in noise levels while a vessel is passing by.

The receiving environment during the construction phase is an enclosed section of a busy port. Existing underwater noise levels in the area are elevated in the presence of shipping traffic but noise attenuates quickly due to absorption by the mud on the seabed. From an underwater noise perspective any sources of additional noise will be confined to an area close to the source and attenuate rapidly.

Noise levels from construction in the port will be contained in the dredged channel close to the source and will not propagate out to the wider bay area. Shipping entering or leaving the port will result in localised increases in noise levels in the outer bay.

Underwater noise levels were measured at locations around Ireland, including Dublin Bay and reported for the EPA by Beck et al. (2011). For Dublin Bay, the noise monitoring equipment was located on the -10m CD contour line on two sites, north and south of the main shipping channel. Weather conditions at each location during the measurements were fair weather with winds of less than 10 knots. Background Noise levels are expected to be higher in adverse weather conditions.

The results were reported as broadband (5 Hz to 20 kHz) RMS values. At the northern side of Dublin Bay, noise levels were between 125 dB and 135 dB re 1 µPa across all frequency bands whereas at the southern site the noise levels were marginally higher, while still remaining below 140 dB re 1 µPa. At the northern site, the low-frequency components (below 100 Hz) were about equal for all noise whereas at the southern end the biological and background noise levels do not appear to have these low-level frequency components. There were significant temporal variations, related to shipping activity and what appears to be elevated noise level during night hours when compared with daytime.

Shipping noise is dependent on the level of shipping traffic. It is similar to road traffic in the sense that a busy international shipping channel is like a motorway, i.e. has a constantly high level. For the majority of Irish waters shipping noise is like road traffic noise on a rural road. As a car/ship goes by there is an elevated level and the noise returns to background levels quickly thereafter.

The ABR Project is currently under construction. Underwater noise levels were measured in 2017 and reported in Table 1 of Appendix 3 of the NIS. The background noise levels are higher than those reported for outer Dublin Bay. Elevated levels due to shipping were similar to the outer bay area in that the levels rose for a short period when the ship was passing.

5.1.1.5 Assessment of Conservation Objectives

In relation to the conservation targets set for harbour seal and grey seal in their conservation objectives, NPWS (2013) advises that in relation to Target 1 '*Species range within the site is not restricted by artificial barriers to site use'*, the target is relevant to proposed activities or operations that will result in the permanent exclusion of harbour seal or grey seal from part of its range within the site, or will permanently prevent access for the species to suitable habitat within the site, and does not refer to short-term or temporary restriction of access or range.

In relation to Target 2 '*Conserve the breeding sites in a natural condition'*, the target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) breeding behaviour by harbour seal or grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual breeding season.

In relation to Target 3 '*Conserve the moult haul-out sites in a natural condition'*, the target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) moulting behaviour by harbour seal or grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual moult.

In relation to Target 4 '*Conserve the resting haul-out sites in a natural condition'*, the target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) resting behaviour by harbour seal or grey seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used for resting.

In relation to Target 5 '*Human activities should occur at levels that do not adversely affect the harbour seal (or grey seal) population at the site'*, the target is relevant to proposed activities or operations that introduce man-made energy at levels that could result in a significant negative impact on individuals and/or the population of harbour seal or grey seal within the site. This refers to both the aquatic and terrestrial/intertidal habitats used by the species in addition to important natural behaviours during the species annual cycle.

These conservation targets are measured by things that do or do not occur within Lambay Island cSAC. Recall that Lambay Island cSAC is over 20km from the MP2 Project and 16km from the sea disposal site. There is no aspect of the MP2 Project that could permanently exclude seals from part of their range within Lambay Island cSAC. There is no aspect of the MP2 Project that could:

- permanently prevent access to suitable habitat within Lambay Island cSAC;
- restrict either temporarily or in the short-term, access to suitable habitat or from part of the seals' range within Lambay Island cSAC;
- result in significant interference with or disturbance of breeding behaviour within Lambay Island cSAC;
- result in significant interference with or disturbance of aquatic/terrestrial/intertidal habitat used during the annual breeding season within Lambay Island cSAC;
- result in significant interference with or disturbance of moulting behaviour within Lambay Island cSAC;
- result in significant interference with or disturbance of aquatic/terrestrial/intertidal habitat used during the annual moult within Lambay Island cSAC;
- result in significant interference with or disturbance of resting behaviour within Lambay Island cSAC;
- result in significant interference with or disturbance of aquatic/terrestrial/intertidal habitat used for resting within Lambay Island cSAC; or
- result in underwater noise levels causing a significant negative impact on individuals and/or the seal populations of harbour seal or grey seal within Lambay Island cSAC.

Targets 1-4 and the first part of Target 5 cannot be offended as a result of the potential effects of the MP2 Project and in that regard the project will not adversely affect the integrity of the sites and no reasonable scientific doubt remains as to the absence of such effects.

However, Target 5 also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour seals or grey seals depend, and

proposed activities or operations that could cause death or injury to individuals to an extent that may ultimately affect the harbour seal or grey seal populations of Lambay Island cSAC (NPWS, 2013).

5.1.1.6 Potential Significant Effects

In the Screening appraisal at Section 4, it was noted that the possibility of a number of likely significant effects could not be excluded in the absence of further evaluation and analysis and the consideration of application of measures intended to avoid or reduce the harmful effects of the proposed development.

There is a potential for exposure to underwater noise at construction stage to affect individuals of the seal populations of Lambay Island cSAC outside of the European site through:

- physical injury or disturbance by demolition and piling operations within Dublin Port;
- disturbance during dredging at the berths and channel widening works;
- disturbance during disposal of dredged material at the proposed disposal site; or
- physical injury or disturbance affecting the distribution and abundance of preferred prey species of the grey and harbour seal populations as a result of these activities in the Lower Liffey channel or at the sea disposal site.

As can be seen in Figure 5.1, many sightings of harbour and grey seals were recorded during ABR dredging campaigns. The above potential effects could undermine Conservation Target 5 in relation to deterioration of key resources or death or injury to individuals of the harbour seal and grey seal populations outside of Lambay Island cSAC.

The extent of dredging and piling operations required for this development is set out in Table 2 of Appendix 3 '*Underwater Noise Assessment'* of the NIS.

5.1.1.6.1 Piling

Underwater noise impacts will occur in two phases, the construction phase and the operations phase. During the operations phase, the impact will be confined to vessel traffic at the port. Underwater noise levels will remain as they are currently, i.e. elevated levels for a short period in the outer bay as a vessel navigates the channel and elevated levels for short periods (10 to 30 minutes) while the vessel berths in the port. The noise levels associated with shipping traffic are outlined in Table 3 of Appendix 3 of the NIS.

Table 4 of Appendix 3 of the NIS outlines underwater noise impact criteria for various species including cetaceans, pinnipeds and fish (part of the diet of marine mammals).

Noise levels during construction will be significantly higher than those arising from port operations. The main activities required during construction with potential underwater noise impacts are outlined in Table 5 of Appendix 3.

It is clear from Table 5 of Appendix 3 that impact piling will cause the worst case underwater noise impacts. Table 6 of Appendix 3 listed the estimated impact piling sound source levels for piling activities

associated with the MP2 Project, which exceeds the noise levels of injury and disturbance to marine mammals and fish noted in Table of Appendix 3. Each of the other activities is at least 30dB quieter than impact piling. All of these values are however theoretical as actual sound source levels are site specific.

To overcome this uncertainty, a site specific underwater noise model was constructed for the MP2 Project (see Section 1.4.3 of Appendix 3 of the NIS). This model has allowed the calculation of predicted Peak and SEL underwater noise levels out to a range of 1,400m as illustrated in 5.3.

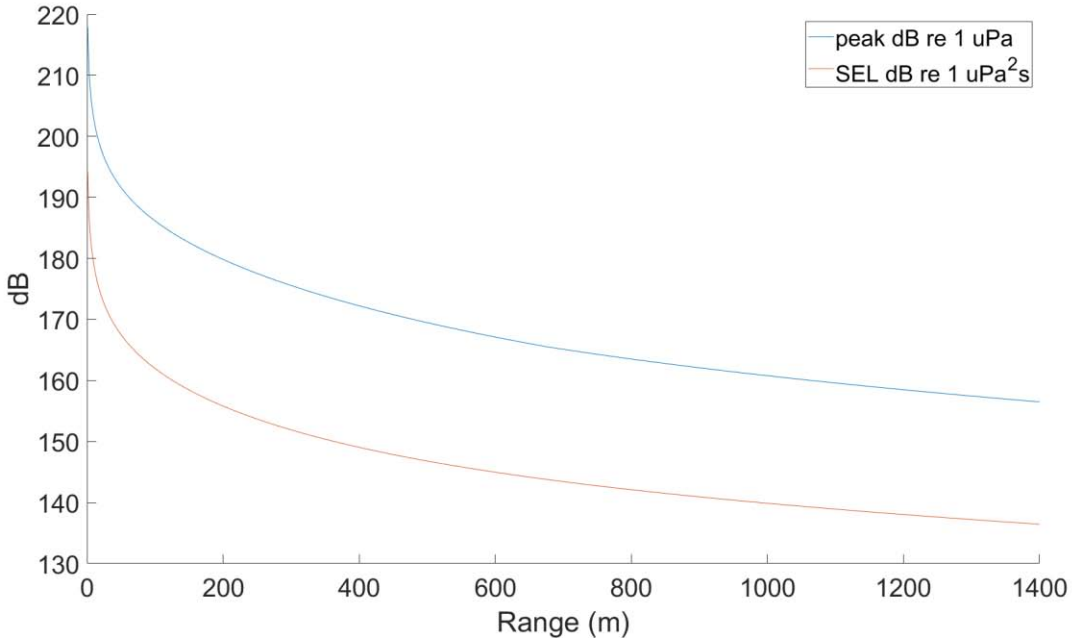

Figure 5.3 Predicted Underwater Noise Levels

Due to the confined shallow space and the narrow channel width, the worst case impact zone is quite small in extent. The potential injury zones are summarised as follows:

- Potential injury to fish species is limited to 12 metres from the source;
- Permanent Threshold Shift injury to marine mammals is limited to 1 metre from the source; and
- Disturbance to marine mammals is limited to 120 metres from the source.

As such, the underwater noise impact zone will be limited to the navigation channel and the River Liffey for the impact zones set out in Table 5.1.

Table 5.1 Underwater Noise Impact Zones

Organism	Impact Type	Threshold dB	Criteria	Range
Fish	Mortality of fish eggs and larvae	210 dB re 1µPa2s	SELcum	n/a
		207 dB re: 1µPa SPLPeak	Peak	10m
	Mortality/ PTS in adult fish*	207 – 219 dB re 1µPa2s	SELcum	n/a
		207 – 213 dB re: 1µPa SPLPeak	Peak	10m
	Recoverable injury in adult fish*	203 – 216 dB re 1µPa2s	SELcum	12m
		207 – 213 dB re: 1µPa SPLPeak	Peak	10m
	Temporary Threshold Shift (TTS)	186 dB re 1µPa2s	SELcum	5m
Cetaceans	Permanent Threshold Shift (PTS) [SPLPeak]	230 dB re: 1µPa SPLPeak	Peak	n/a
		198 dB re 1µPa2s	SEL	n/a
	Behaviour effects	160 dB re: 1µPa SPLRMS	RMS	120m
Pinnipeds	Permanent Threshold Shift (PTS) [SPLPeak]	218 dB re: 1µPa SPLPeak	Peak	1m
		186 dB re 1µPa2s	SEL	1m
Mustelids (Sea Otters)	Permanent Threshold Shift (PTS)	220 dB re 1µPa2s	SEL	n/a

These impact zones are calculated for the activity which will give rise to the greatest levels of underwater noise (impact piling) in Dublin Port. Clearly the zone of impact is very limited in spatial extent, being restricted to a range of 120m from a piling source located over 20km from Lambay Island cSAC. In that regard, Target 5 shall not be imperilled in any way for harbour seal or grey seal in Lambay Island cSAC. Piling proposed as part of the MP2 Project will not adversely affect the integrity of Lambay Island cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.1.1.6.2 Dredging and Disposal at Sea

Dredging has been shown to displace bottlenose dolphins from a busy shipping port in Scotland over a prolonged dredging campaign (Pirotta et al. 2013). Diederichs et al. (2010), through the use of acoustic monitoring with click detectors, showed that harbour porpoises temporarily avoided an area where sand extraction took place off the Island of Sylt, Germany. When the dredger was closer than 600m to the monitoring location, it took three times longer before a porpoise was detected again compared with times without sand extraction. However, a recent guidance document by the World Organisation of Dredging Associations (WODA 2013) suggested that sound produced from dredging has the potential to impact on aquatic life and it is assumed that most of these impacts would concern disruption of communication due to masking or alteration of behaviour patterns.

Dredging will be carried out by a Trailing Suction Hopper Dredger (TSHD) for a period of 6 months. Previous studies on sound production by Trailing Suction Hopper Dredger (TSHD) in silt/mud substrates have found that maximum source levels from the various activities associated with TSHD dredging (including the dredging process, transit to the disposal site, placement, pumping and rainbowing) to be very similar with dredging itself and not producing sounds louder than those produced by the dredger during transit (De Jong et al., 2010). This study was carried out on the sound production by seven TSHDs during construction of a 2,000 hectare harbour extension of the Port of Rotterdam. More recently, Robinson et al. (2011), found that emitted sound levels from TSHDs at frequencies below 500 Hz were similar to a deep-draft draught cargo ship travelling at a moderate speed.

Noise measurements were taken during Dublin Port maintenance dredging in July 2016 to determine the acoustic noise generated during the dredging and disposal operations (RPS 2016). Underwater noise measurements were carried out using an underwater noise recorder, moored less than 300m from the dredging activity and approximately 90m from the disposal activity. Tonal components between 200 Hz and 2 kHz were attributed to the pump with dredging generating more higher-frequency noise than the disposal operation but both showed a significant drop in energy at frequencies above 2 kHz. The sound levels for the dredging operations at ranges of 213 and 268m were below the disturbance threshold for pinnipeds (160 dB re 1 µPa). The sound level for the disposal operation at a range of 90m was above the disturbance threshold for pinnipeds, but this level was still below the general behavioural threshold for marine mammals of 160 dB re 1 µPa SPLRMS adopted by NOAA. This study confirms that noise emitted from dredging operations does not significantly impact marine mammals at a range exceeding 200m, but the noise emitted from disposal operations may disturb seals at closer range.

For the avoidance of all doubt, mitigation is required to ensure Target 5 shall not be imperilled in any way for harbour seal or grey seal in Lambay Island cSAC.

5.1.1.6.2.1 Mitigation

A Marine Mammal Management Plan will be implemented for the duration of the proposed construction works. A draft Marine Mammal Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

A Dredging Management Plan will also be implemented for the duration of the proposed construction works. A draft Dredging Management Plan is presented in Section 3.5.10 of the CEMP at Appendix 5 of the NIS.

The following precautionary measures will be undertaken to minimise the risk of injury or disturbance to marine mammals in the area of operations in line with National Parks and Wildlife Service (NPWS) Guidelines (2014):

- A trained and experienced Marine Mammal Observer (MMO) will be put in place during piling, dredging, demolition and dumping operations. The MMO will scan the surrounding area to ensure no marine mammals are in a pre-determined exclusion zone in the 30-minute period

prior to operations. The NPWS exclusion zone is 500m for dredging and demolition works and 1,000m for piling activities.

- Noise-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring is not possible, the sound-producing activities will be postponed until effective visual monitoring is possible. Visual scanning for marine mammals (in particular harbour porpoise) will only be effective during daylight hours and if sea conditions are WMO Sea State 4 (≈Beaufort Force 4 conditions) or less.
- For piling activities, where the output peak sound pressure level (in water) exceeds 170 dB re: 1µPa @ 1m, a ramp-up procedure will be employed following the pre-start monitoring. Underwater acoustic energy output will commence from a lower energy start-up and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.
- If there is a break in piling / dredging activity for a period greater than 30 minutes then all pre-activity monitoring measures and ramp-up (where this is possible) will recommence as for start-up.
- Once normal operations commence (including appropriate ramp-up procedures), there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate, nor if marine mammals occur within a radial distance of the sound source that is 500m for dredging and demolition works, and 1,000m for piling activities.
- Any approach by marine mammals into the immediate (<50m) works area will be reported to the National Parks and Wildlife Service.
- The MMO will keep a record of the monitoring using a 'MMO form location and effort (coastal works)' available from the National Parks and Wildlife Service (NPWS) and submit to the NPWS on completion of the works.
- In line with best international practice, a combination of visual and acoustic mitigation techniques will be used to ensure there are no significant impacts on all Annex II marine species, including harbour porpoise, grey seal and harbour seal. Static Acoustic Monitoring (SAM) through the deployment of CPODs will be used. Four stations will be monitored, including three at the disposal site to the west of the Burford Bank and one control site within Dublin Bay. These stations will be monitored pre-construction, during construction and for a minimum of two years post-construction in line with best international practice. This technique is to complement and not replace visual techniques.
- The deployment of a SAM system will complement and extend the extensive database currently being collected as part of the ABR Project environmental monitoring programme.

Following the implementation of this mitigation, dredging and disposal at sea activities proposed as part of the MP2 Project will not adversely affect the integrity of the harbour seal or grey seal populations in Lambay Island cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.1.1.6.3 Shipping Traffic

Low frequency continuous sound such as that generated by shipping has been reported as the dominant source of anthropogenic sound in a broad-band range from 5 to 300 Hz (NRC 2003). The

main cause of noise emitted from shipping is though propeller cavitation (Richardson et al., 1995). Characteristics of shipping noise including frequency and source level are roughly related to vessel size and speed although this relationship is further complicated by vessel design and advances in ship technology (Richardson et al. 1995). Generally it has been found that larger vessels emit lower frequency and louder noises (Richardson et al. 1995) with source levels from vessels in excess of 300m length, reported as approximately 190 dB re 1 µPa at 1m (Richardson et al. 1995).

Noise disturbance, through increased vessel traffic could cause a long-term effect, where the low frequency component overlaps with the vocalisations and estimated hearing range of marine mammals.

Baleen whales, which are more sensitive to low frequencies are thought to be more at risk than odontocetes. However, Wisniewska et al. (2016) suggested harbour porpoise can be sensitive to even modest exposures to anthropogenic sound due to their high metabolic life-style. Background noise in Dublin Bay has been estimated at around 113 dB by Beck et al. (2013) and by McKeown (2014). This level is higher than that reported from Galway Bay and the Shannon Estuary and reflects the greater vessel traffic at this site.

The hearing range of harbour and grey seals extends over wide frequencies, including the ultrasonic spectrum. The area of best hearing is between 8 and 25 kHz, with acute hearing also at lower frequencies (Terhune and Turnbull, 1995), which is above the peak sound energy generated which was below 1 kHz. The waters surrounding haul-out sites are a critical habitat for feeding and/or for navigation to more offshore foraging areas. This may lead to chronic exposure to man-made noise, however, in areas with repeated exposure to human activity, mammals may become habituated with a decline in avoidance responses and thus become less sensitive to noise and disturbance (Richardson et al. 1995).

If development consent is granted and once operational, the MP2 Project will result in an increase in the average number of RoRo sailings per day from 13 in 2018 to 18 in 2040. Similarly, LoLo throughput is anticipated to increase in the same period, with the average number of ships per week increasing from 8.3 in 2018 to 11.0 in 2040.

This modest anticipated increase in vessel numbers using the shipping channel in Dublin Bay and the approach to Dublin Port with in the Bull walls will occur in an underwater noise environment which has been subject to significant shipping traffic for more than half a century, as outlined above. Shipping is one of the dominant background noise sources in Dublin Bay and will continue to be throughout the operational phase of the MP2 Project. The shipbuilding industry is not however anticipated to construct noisier ships in the future. New IMO guidelines require quieter ships. The vessels entering Dublin Port are from modern designs and quieter. It is anticipated that this lowering of ship noise levels will continue.

Shipping traffic currently generates underwater noise in Dublin Bay and on approach to Dublin Port throughout the daytime and night time periods every day of the year. Shipping noise in the outer bay occurs as momentary/brief increases in underwater noise levels that revert to background once the vessel has passed. This localised noise event currently occurs throughout the year in the outer bay and

the increase in shipping traffic will not result in a significant change in noise levels outside of the port berthing area. Noise levels in the berthing area will increase due to the increased berthing activity. The underwater noise level due to increased berthing activity will result in noise levels similar to those arising at present but occurring more frequently. The long term increase in berthing noise levels will be slight but momentary moderate increases could occur at busy periods. Whilst the MP2 Project will result in modest increases in shipping frequency for RoRo and LoLo traffic, this does not represent any meaningful intensification of use of the shipping channel when considered from the perspective of marine mammals. The magnitude of the shipping noise source is not anticipated to increase.

Future shipping noise as a result of the operation of the MP2 Project will not adversely affect the conservation objectives set for harbour seal or grey seal populations of Lambay Island cSAC outside of the site.

Shipping noise shall not adversely affect the integrity of Lambay Island cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.2 ROCKABILL TO DALKEY ISLAND SAC

5.2.1 Underwater Noise and Disturbance effects

5.2.1.1 Harbour Porpoise

5.2.1.1.1 Conservation objectives

Conservation objectives for this Annex II species is to maintain the favourable conservation condition of harbour porpoise in Rockabill to Dalkey Island SAC, as defined by 2 no SSCO attributes and targets:

Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use

Disturbance: Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site

The '*Conservation objectives supporting document – Marine habitats and species'* for Rockabill to Dalkey Island SAC (NPWS, 2013) notes that the targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Disturbance' is measured in 'Level of impact'.

This small toothed cetacean species (from the mammal Order Cetacea - whales, dolphins and porpoises) occurs in estuarine, coastal and offshore waters in which it carries out breeding, foraging, resting, social activity and other life history functions. Its distribution extends predominantly throughout continental shelf waters and the species may range over many hundreds or thousands of kilometres. As air-breathing mammals, harbour porpoises must return to the water surface to breathe but they are otherwise wholly aquatic. Individual porpoises of all ages use sound as their primary sensory tool in order to navigate, communicate, avoid predators, or locate and facilitate the capture of prey under

water. Group sizes tend to be small (i.e. in single figures, more commonly 2 to 3 individuals) although larger aggregations may occasionally be recorded, particularly in the summer months. Harbour porpoise breed annually in Ireland, predominantly during the months of May to September. The principal calving period in Irish waters is thought to occur in the months of May and June, although it may extend throughout the summer months and into early autumn. Newborn calves are weaned before they are one year old. Mating commonly occurs several weeks after the calving season.

NPWS (2013) notes that harbour porpoise is an aquatic predator that feeds on a wide variety of fish, cephalopod and crustacean species occurring in the water column or close to the seabed, with dive depths in excess of 200m having been recorded for the species. Foraging areas for harbour porpoise are often associated with areas of strong tidal current and associated eddies; and the occurrence of porpoises close to shore or adjacent to islands and prominent headlands is commonly reported.

5.2.1.2 Marine Mammal Monitoring by Dublin Port Company

Dedicated porpoise surveys off Co Dublin were first carried out in 2008, when density estimates of 2.03 porpoises per km^2 were recorded in North County Dublin and 1.19 porpoises per km^2 in Dublin Bay (Berrow *et al.* 2008). The densities off North County Dublin ranged from 0.54 to 6.93 and were the highest recorded at any of the eight sites surveyed by Berrow *et al.* (2014), including two cSACs off the southwest which were designated to protect harbour porpoise.

A survey of the Rockabill to Dalkey Island SAC in 2013 resulted in density estimates ranging from 1.13-2.61, with an overall density of 1.44 porpoises per km^2 which was similar to an overall density of 1.61 for the two sites combined in 2008. A second survey was carried out in 2016 which reported densities between 1.37 and 1.87 porpoises per km^2 and with an overall density of 1.55 porpoises per km^2. All these density estimates are very consistent and high compared to other sites in Ireland supporting the conclusion that Dublin Bay, and especially North County Dublin, provide some of the most important habitats for harbour porpoise in Ireland. Calves consistently accounted for around 7% of the porpoises surveyed and porpoise are thought to move offshore to calve in April-May before moving back inshore. The diet of harbour porpoise is poorly known but thought to consist of small benthic or demersal fish such as gobies, sandeels, whiting and other gadoids and pelagic species such as herring and sprat when available (Rogan 2008).

There were 77 sightings (26% of total marine mammal sightings) of harbour porpoise during the first season of the ABR Project capital dredging campaign (2017-2018) and one sighting of a single bottlenose dolphin as illustrated in Figure 5.4. All sightings were outside Dublin Harbour with sightings increasing further east and on the spoil ground.

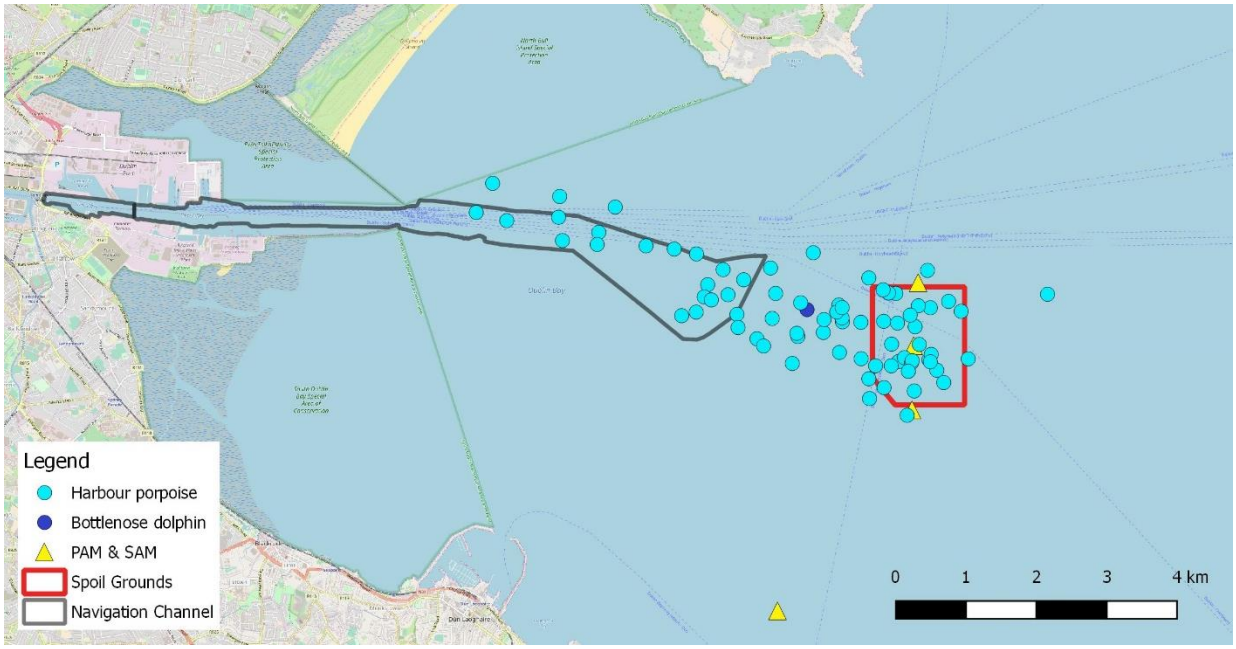

Figure 5.4 Harbour porpoise and bottlenose dolphin sightings during MMO observations in the 2017/18 ABR Dredging Campaign

A similar pattern was recorded during two maintenance dredging campaigns from 14 to 30 September 2017 and 9 to 22 April 2018 with 29 (16%) and 35 sightings (32%) of harbour porpoise (Figure 5.5 and Table 5.2).

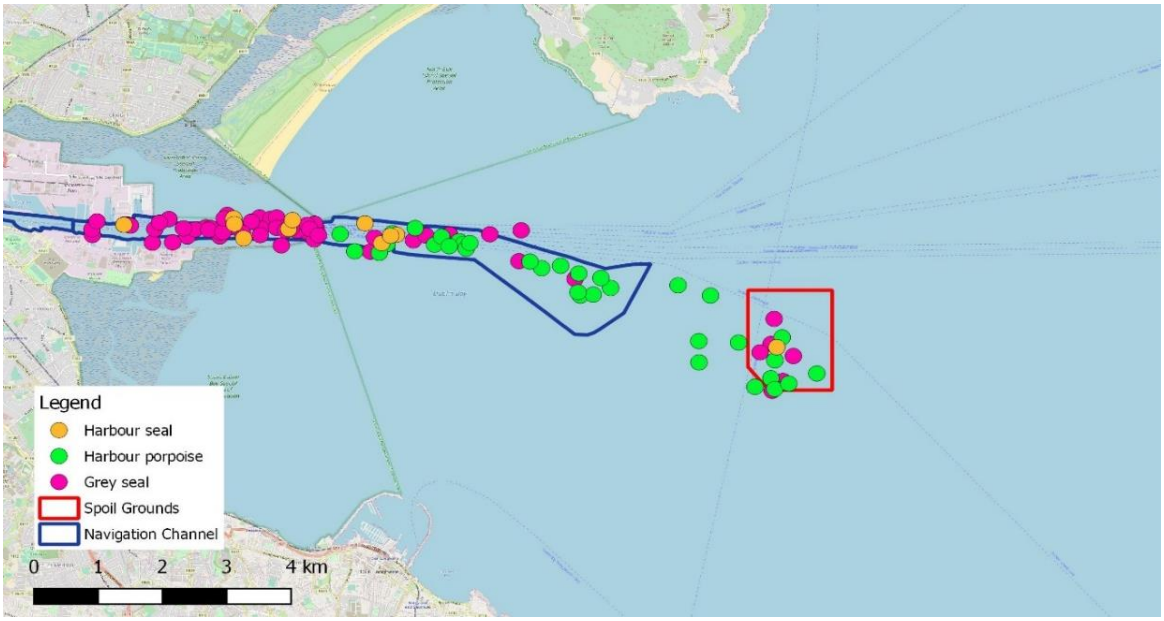

Figure 5.5 Marine mammal sightings during the 2017 (top) and 2018 (bottom) Maintenance Dredging Campaigns

During a Static Acoustic Monitoring programme under the ABR Project, four locations were monitored using C-PODs. The sampling period varied between 140 and 259 days at each location. The highest

detections were at Buoy 1 and 2, with the lowest at Buoy 3 and 4 but this could be an artefact of the early retrieval of the C-POD on Buoy 3 and the loss of the C-POD from Buoy 4, resulting in lower number of monitoring days. Results from this deployment showed that porpoises were the most frequently detected odontocete species, with few confirmed dolphin detections during this deployment apart from detections at Buoys 1 and 3 (Figure 5.6).

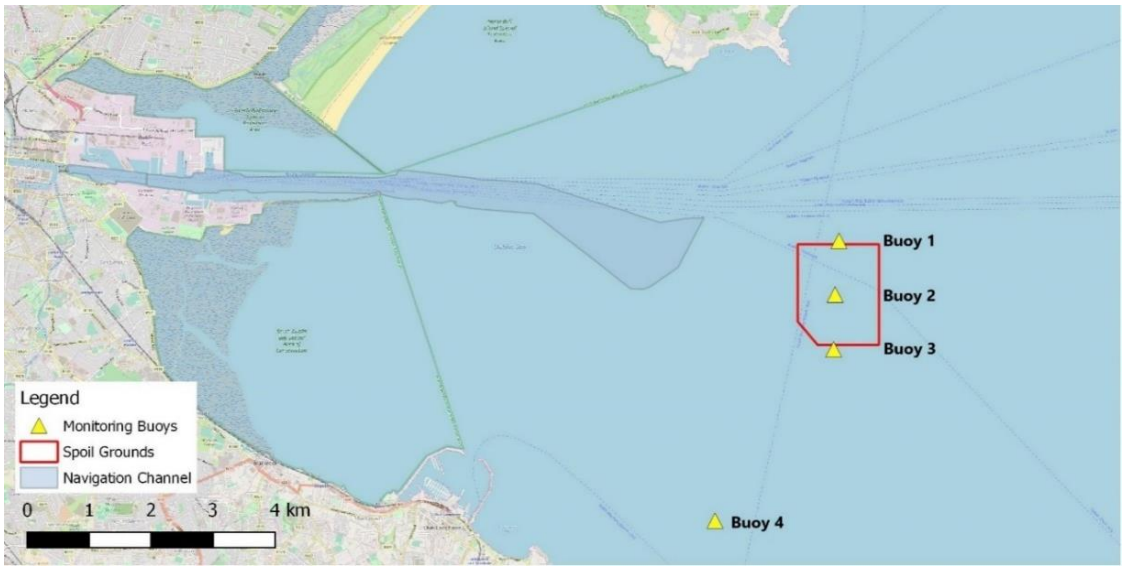

Figure 5-6 Monitoring buoy positions within the spoil grounds and Dublin Bay
(Buoy 1: PAM & SAM, Buoy 2: PAM & SAM, Buoy 3: SAM and Buoy 4: SAM)

Table 5.2 Summary of results of Static Acoustic Monitoring (Sep 2017 to Mar 2018)

Location number	Location	No. of days	Dates	Porpoise	Dolphin	Total	% days detected	Mean DPM/day
Buoy 1	North Spoil Ground	173	18/09/2017-09/03/2018	9,238	262	9,500	99	53.1
Buoy 2	Middle SG	173	18/09/2017-09/03/2018	15,919	65	15,984	100	91.4
Buoy 3	South SG	140	18/09-03/11 22/12/2017-23/03/2018	6,341	101	6,442	97	44.9
Buoy 4	Control off Dalkey	259	18/09/2017-31/05/2018	13,048	32	13,080	100	50.5

Generalized linear mixed-effect models (GLMM) were carried out to assess significant differences between monitoring locations, allowing for a detailed but preliminary assessment of fine scale use of the survey area during the dredging campaign by harbour porpoise. Results across all days monitored at each of the sites showed harbour porpoises to be present on average 97-100% of days monitored. Presence was highest during autumn months for Buoy 3 and during the winter months for Buoy 1 and 2 and during the hours of darkness (incl. dawn and dusk) and a range of tidal cycles and phases (Table 5.3).

Table 5.3 Significant results from the long-term dataset at each site

Significant factors	Buoy 1	Buoy 2	Buoy 3	Buoy 4
Season	Winter	Winter	Autumn	Summer
Diel	Night	Night	Night	Evening
Tidal phase	Neap/Trans	Neap	Trans	Trans
Tidal cycle	High	High	Ebb	Low

Buoy 1 = North SG, Buoy 2 = Middle SG, Buoy 3 = South SG and Buoy 4 = control off Dalkey Island

Harbour porpoise do not use the immediate port area and are rarely recorded inside the harbour. Thus harbour porpoise in Dublin Bay will only be affected by dredging and dumping of spoil and shipping traffic and not construction activities or site investigations within the Liffey channel.

5.2.1.3 Assessment of Conservation Objectives

In relation to the conservation targets set for harbour porpoise in its conservation objectives, NPWS (2013) advises that in relation to Target 1 '*Species range within the site is not restricted by artificial barriers to site use'*, the target is relevant to proposed activities or operations that will result in the permanent exclusion of harbour porpoise from part of its range within the site, or will permanently prevent access for the species to suitable habitat within the site, and does not refer to short-term or temporary restriction of access or range.

In relation to Target 2 '*Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site'*, the target is relevant to proposed activities or operations that introduce man-made energy at levels that could result in a significant negative impact on individuals and/or the community of harbour porpoise within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species annual cycle.

These conservation targets are measured by things that do or do not occur within Rockabill to Dalkey Island SAC. Recall that Rockabill to Dalkey Island SAC is 5km from the MP2 Project but the sea disposal site is located within the European site. As disposal of dredged material at sea occurs within the SAC, it could possibly result in the permanent exclusion of harbour porpoise from part of its range within the site, or will permanently prevent access for the species to suitable habitat within the site. The disposal at sea activity is proposed over 4 winter seasons between 2024 and 2031, periodically levelling the seabed to remove peaks and troughs created by the disposed material:

- Under Berth 53 Jetty (Winter 2024)
- Berth 53 and the channel widening (Winter 2026)
- Oil Berth 3 is dredged (Winter 2030)
- Berth 50A (Winter 2031)

This is a short-term activity to occur four times across an eight year period. NPWS (2013) advises that the conservation target does not apply to short-term or temporary restrictions of access or range. As such, there is no aspect of the MP2 Project that could permanently exclude harbour porpoise from part of its range within Rockabill to Dalkey Island SAC. There is no aspect of the MP2 Project that could: permanent exclusion of harbour porpoise from part of its range within Rockabill to Dalkey Island SAC, or will permanently prevent access for the species to suitable habitat within Rockabill to Dalkey Island SAC.

Target 1 and the first part of Target 2 cannot be offended as a result of the potential effects of MP2 Project and in that regard the project will not adversely affect the integrity of the sites and no reasonable scientific doubt remains as to the absence of such effects.

However, Target 2 also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour porpoise depend, and proposed activities or operations that could cause death or injury to individuals to an extent that may ultimately affect the harbour porpoise community of Rockabill to Dalkey Island SAC (NPWS, 2013).

5.2.1.4 Potential Significant Effects

In the Screening appraisal at Section 4, it was noted that the possibility of a number of likely significant effects could not be excluded in the absence of further evaluation and analysis and the consideration of application of measures intended to avoid or reduce the harmful effects of the proposed development.

There is a potential for exposure to underwater noise at construction stage to affect individuals of the harbour porpoise community of Rockabill to Dalkey Island SAC both within and outside of the site through:

- physical injury or disturbance by demolition and piling operations within Dublin Port;
- disturbance during dredging at the berths and channel widening works;
- disturbance during disposal of dredged material at the proposed disposal site; or
- physical injury or disturbance affecting the distribution and abundance of preferred prey species of the grey and harbour seal populations as a result of these activities in the Lower Liffey channel or at the sea disposal site.

As can be seen in Figures 5.4 and 5.5, many sightings of harbour and grey seals were recorded during ABR dredging campaigns. The above potential effects could undermine Conservation Target 2 in relation to deterioration of key resources or death or injury to individuals of the harbour seal and grey seal populations either inside of our outside of Rockabill to Dalkey Island SAC.

The extent of dredging and piling operations required for this development is set out in Table 2 of Appendix 3 '*Underwater Noise Assessment'* of the NIS.

5.2.1.4.1 Piling

Underwater noise impacts will occur in two phases, the construction phase and the operations phase. During the operations phase, the impact will be confined to vessel traffic at the port. Underwater noise levels will remain as they are currently, i.e. elevated levels for a short period in the outer bay as a vessel navigates the channel and elevated levels for short periods (10 to 30 minutes) while the vessel berths in the port. The noise levels associated with shipping traffic are outlined in Table 3 of Appendix 3 of the NIS.

Table 4 of Appendix 3 of the NIS outlines underwater noise impact criteria for various species including cetaceans, pinnipeds and fish (part of the diet of marine mammals).

Noise levels during construction will be significantly higher than those arising from port operations. The main activities required during construction with potential underwater noise impacts are outlined in Table 5 of Appendix 3.

It is clear from Table 5 of Appendix 3 that impact piling will cause the worst case underwater noise impacts. Table 6 of Appendix 3 listed the estimated impact piling sound source levels for piling activities associated with the MP2 Project, which exceeds the noise levels of injury and disturbance to marine mammals and fish noted in Table of Appendix 3. Each of the other activities is at least 30dB quieter than impact piling. All of these values are however theoretical as actual sound source levels are site specific.

To overcome this uncertainty, a site specific underwater noise model was constructed for the MP2 Project (see Section 1.4.3 of Appendix 3 of the NIS). This model has allowed the calculation of predicted Peak and SEL underwater noise levels out to a range of 1,400m as illustrated in Figure 5.3 in Section 5.1.1.6.1.

Due to the confined shallow space and the narrow channel width, the worst case impact zone is quite small in extent. The potential injury zones are summarised as follows:

- Potential injury to fish species is limited to 12 metres from the source;
- Permanent Threshold Shift injury to marine mammals is limited to 1 metre from the source; and
- Disturbance to marine mammals is limited to 120 metres from the source.

As such, the underwater noise impact zone will be limited to the navigation channel and the River Liffey for the impact zones set out in Table 5.1 in Section 5.1.1.6.1.

These impact zones are calculated for the activity which will give rise to the greatest levels of underwater noise (impact piling) in Dublin Port. Clearly the zone of impact is very limited in spatial extent, being restricted to a range of 120m from a piling source located 5km from Rockabill to Dalkey Island SAC. In that regard, Target 2 shall not be imperilled in any way for harbour porpoise in Rockabill to Dalkey Island SAC. Piling proposed as part of the MP2 Project will not adversely affect the integrity of Rockabill to Dalkey Island SAC and no reasonable scientific doubt remains as to the absence of such effects.

5.2.1.4.2 Dredging and Disposal at Sea

Dredging has been shown to displace bottlenose dolphins from a busy shipping port in Scotland over a prolonged dredging campaign (Pirotta et al. 2013). Diederichs et al. (2010), through the use of acoustic monitoring with click detectors, showed that harbour porpoises temporarily avoided an area where sand extraction took place off the Island of Sylt, Germany. When the dredger was closer than 600m to the monitoring location, it took three times longer before a porpoise was detected again compared with times without sand extraction. However, a recent guidance document by the World Organisation of Dredging Associations (WODA 2013) suggested that sound produced from dredging has the potential to impact on aquatic life and it is assumed that most of these impacts would concern disruption of communication due to masking or alteration of behaviour patterns.

Dredging will be carried out by a Trailing Suction Hopper Dredger (TSHD) for a period of 6 months. Previous studies on sound production by Trailing Suction Hopper Dredger (TSHD) in silt/mud substrates have found that maximum source levels from the various activities associated with TSHD dredging (including the dredging process, transit to the disposal site, placement, pumping and rainbowing) to be very similar with dredging itself and not producing sounds louder than those produced by the dredger during transit (De Jong et al., 2010). This study was carried out on the sound production by seven TSHDs during construction of a 2,000 hectare harbour extension of the Port of Rotterdam. More recently, Robinson et al. (2011), found that emitted sound levels from TSHDs at frequencies below 500 Hz were similar to a deep-draft draught cargo ship travelling at a moderate speed.

Noise measurements were taken during Dublin Port maintenance dredging in July 2016 to determine the acoustic noise generated during the dredging and disposal operations (RPS 2016). Underwater noise measurements were carried out using an underwater noise recorder, moored less than 300m from the dredging activity and approximately 90m from the disposal activity. Tonal components between 200 Hz and 2 kHz were attributed to the pump with dredging generating more higher-frequency noise than the disposal operation but both showed a significant drop in energy at frequencies above 2 kHz. The sound levels for the dredging operations at ranges of 213 and 268m were below the disturbance threshold for harbour porpoise of 140 dB re 1 µPa. The sound level for the dumping operation at a range of 90m was very slightly above the disturbance threshold for harbour porpoise, but this level was still below the general behavioural threshold for marine mammals of 160 dB re 1 µPa SPLRMS adopted by NOAA. This study confirms that noise emitted from dredging operations does not significantly impact marine mammals at a range exceeding 200m, but the noise emitted from disposal operations may disturb individuals of the harbour porpoise community at closer range.

For the avoidance of all doubt, mitigation is required to ensure Target 2 shall not be imperilled in any way for harbour porpoise in Rockabill to Dalkey Island SAC.

5.2.1.4.2.1 Mitigation

A Marine Mammal Management Plan will be implemented for the duration of the proposed construction works. A draft Marine Mammal Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

A Dredging Management Plan will also be implemented for the duration of the proposed construction works. A draft Dredging Management Plan is presented in Section 3.5.10 of the CEMP at Appendix 5 of the NIS.

The following precautionary measures will be undertaken to minimise the risk of injury or disturbance to marine mammals in the area of operations in line with National Parks and Wildlife Service (NPWS) Guidelines (2014):

- A trained and experienced Marine Mammal Observer (MMO) will be put in place during piling, dredging, demolition and dumping operations. The MMO will scan the surrounding area to ensure no marine mammals are in a pre-determined exclusion zone in the 30-minute period prior to operations. The NPWS exclusion zone is 500m for dredging and demolition works and 1,000m for piling activities.
- Noise-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring is not possible, the sound-producing activities will be postponed until effective visual monitoring is possible. Visual scanning for marine mammals (in particular harbour porpoise) will only be effective during daylight hours and if sea conditions are WMO Sea State 4 (≈Beaufort Force 4 conditions) or less.
- For piling activities, where the output peak sound pressure level (in water) exceeds 170 dB re: 1µPa @ 1m, a ramp-up procedure will be employed following the pre-start monitoring. Underwater acoustic energy output will commence from a lower energy start-up and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.
- If there is a break in piling / dredging activity for a period greater than 30 minutes then all pre-activity monitoring measures and ramp-up (where this is possible) will recommence as for start-up.
- Once normal operations commence (including appropriate ramp-up procedures), there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate, nor if marine mammals occur within a radial distance of the sound source that is 500m for dredging and demolition works, and 1,000m for piling activities.
- Any approach by marine mammals into the immediate (<50m) works area will be reported to the National Parks and Wildlife Service.
- The MMO will keep a record of the monitoring using a ‘MMO form location and effort (coastal works)’ available from the National Parks and Wildlife Service (NPWS) and submit to the NPWS on completion of the works.
- In line with best international practice, a combination of visual and acoustic mitigation techniques will be used to ensure there are no significant impacts on all Annex II marine

species, including harbour porpoise, grey seal and harbour seal. Static Acoustic Monitoring (SAM) through the deployment of CPODs will be used. Four stations will be monitored, including three at the disposal site to the west of the Burford Bank and one control site within Dublin Bay. These stations will be monitored pre-construction, during construction and for a minimum of two years post-construction in line with best international practice. This technique is to complement and not replace visual techniques.

- The deployment of a SAM system will complement and extend the extensive database currently being collected as part of the ABR Project environmental monitoring programme.

Following the implementation of this mitigation, dredging and disposal at sea activities proposed as part of the MP2 Project will not adversely affect the integrity of the harbour porpoise community in Rockabill to Dalkey Island SAC and no reasonable scientific doubt remains as to the absence of such effects.

5.2.1.4.3 Shipping Traffic

Low frequency continuous sound such as that generated by shipping has been reported as the dominant source of anthropogenic sound in a broad-band range from 5 to 300 Hz (NRC 2003). The main cause of noise emitted from shipping is though propeller cavitation (Richardson et al., 1995). Characteristics of shipping noise including frequency and source level are roughly related to vessel size and speed although this relationship is further complicated by vessel design and advances in ship technology (Richardson et al. 1995). Generally it has been found that larger vessels emit lower frequency and louder noises (Richardson et al. 1995) with source levels from vessels in excess of 300m length, reported as approximately 190 dB re 1 µPa at 1m (Richardson et al. 1995).

Noise disturbance, through increased vessel traffic could cause a long-term effect, where the low frequency component overlaps with the vocalisations and estimated hearing range of marine mammals.

Baleen whales, which are more sensitive to low frequencies are thought to be more at risk than odontocetes. However, Wisniewska et al. (2016) suggested harbour porpoise can be sensitive to even modest exposures to anthropogenic sound due to their high metabolic life-style. Background noise in Dublin Bay has been estimated at around 113 dB by Beck et al. (2013) and by McKeown (2014). This level is higher than that reported from Galway Bay and the Shannon Estuary and reflects the greater vessel traffic at this site.

The hearing range of harbour and grey seals extends over wide frequencies, including the ultrasonic spectrum. The area of best hearing is between 8 and 25 kHz, with acute hearing also at lower frequencies (Terhune and Turnbull, 1995), which is above the peak sound energy generated which was below 1 kHz. The waters surrounding haul-out sites are a critical habitat for feeding and/or for navigation to more offshore foraging areas. This may lead to chronic exposure to man-made noise, however, in areas with repeated exposure to human activity, mammals may become habituated with a decline in avoidance responses and thus become less sensitive to noise and disturbance (Richardson et al. 1995).

If development consent is granted and once operational, the MP2 Project will result in an increase in the average number of RoRo sailings per day from 13 in 2018 to 18 in 2040. Similarly, LoLo throughput is anticipated to increase in the same period, with the average number of ships per week increasing from 8.3 in 2018 to 11.0 in 2040.

This modest anticipated increase in vessel numbers using the shipping channel in Dublin Bay and the approach to Dublin Port with in the Bull walls will occur in an underwater noise environment which has been subject to significant shipping traffic for more than half a century, as outlined above. Shipping is one of the dominant background noise sources in Dublin Bay and will continue to be throughout the operational phase of the MP2 Project. The shipbuilding industry is not however anticipated to construct noisier ships in the future. New IMO guidelines require quieter ships. The vessels entering Dublin Port are from modern designs and quieter. It is anticipated that this lowering of ship noise levels will continue

Shipping traffic currently generates underwater noise in Dublin Bay and on approach to Dublin Port throughout the daytime and night time periods every day of the year. Shipping noise in the outer bay occurs as momentary/brief increases in underwater noise levels that revert to background once the vessel has passed. This localised noise event currently occurs throughout the year in the outer bay and the increase in shipping traffic will not result in a significant change in noise levels outside of the port berthing area. Noise levels in the berthing area will increase due to the increased berthing activity. The underwater noise level due to increased berthing activity will result in noise levels similar to those arising at present but occurring more frequently. The long term increase in berthing noise levels will be slight but momentary moderate increases could occur at busy periods. Whilst the MP2 Project will result in modest increases in shipping frequency for RoRo and LoLo traffic, this does not represent any meaningful intensification of use of the shipping channel when considered from the perspective of marine mammals. The magnitude of the shipping noise source is not anticipated to increase.

Future shipping noise as a result of the operation of the MP2 Project will not adversely affect the conservation objectives set for the harbour porpoise community of Rockabill to Dalkey Island SAC either inside or outside of the site.

Shipping noise shall not adversely affect the integrity of Rockabill to Dalkey Island SAC and no reasonable scientific doubt remains as to the absence of such effects.

5.2.2 Water Quality and Habitat Deterioration effects

5.2.2.1 Reefs

5.2.2.1.1 Conservation objectives

Conservation objectives for this Annex II species is to maintain the favourable conservation condition of Reefs in Rockabill to Dalkey Island SAC, as defined by 3 no SSCO attributes and targets:

Habitat Area:	The permanent area is stable or increasing, subject to natural processes

Habitat Distribution:	Distribution is stable or increasing, subject to natural processes
Community Structure:	Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex

The '*Conservation objectives supporting document – Marine habitats and species'* for Rockabill to Dalkey Island SAC (NPWS, 2013) notes that the targets for the SSCO attribute 'Access to suitable habitat' is measured in 'number of artificial barriers'. The target for 'Disturbance' is measured in 'Level of impact'.

Rockabill to Dalkey Island SAC is an enormous site (in excess of 27,000ha) but the Annex I reef habitat for which it is designated accounts for less than 1% of the site and occurs at a number of locations throughout the European site. The seabed at the disposal site is not in itself a location of Annex I reef habitat and is not a location of a qualifying interest of the European site.

The intertidal reef community complex is recorded on the south coast of Howth, where the exposure regime of the complex ranges from exposed to moderately exposed reef. Exposed reef is also recorded on the east side of Dalkey Island, on the east and southern shores of Ireland's Eye and on all shores of Rockabill and the Muglins. Moderately exposed reef occurs on the western shores of Dalkey and at Howth and Ireland's Eye. The subtidal reef community complex is recorded off the islands within the site and also off the coast between Lambay Island and Rush Village. The exposure regime here ranges from moderately exposed reef at the Muglins to exposed reef over the remainder of the site. The coastlines of Howth Head, Dalkey Island and Ireland's Eye are 3.3km, 5.1km and 7.5km respectively from the proposed disposal site. Lambay Island is 16km north of the proposed disposal site and Rockabill is approximately 30km to the north.

5.2.2.1.2 Potential Significant Effects

As noted in Section 4.3.2.2 in the Screening appraisal, the conservation targets for 'Habitat Area' and 'Habitat Distribution' will not be undermined by any potential water quality or habitat deterioration effects of the MP2 Project. NPWS (2013) notes that the conservation target for 'Community Structure' to conserve the Intertidal and Subtidal reef community complexes in a natural condition relates to the structure and function of the reefs and therefore it is of relevance to those activities that may cause disturbance to the ecology of the habitat. The reefs may be affected by plumes arising from the disposal of dredged material or polluting events if the activities resulted in elevated concentrations of suspended sediments or pollutants in or at the reef community complexes for prolonged periods.

The process of dredging unavoidably causes disturbance of sediment on the channel bed and dispersal of some material in the water column. Disposal of dredge spoil at the licenced dumping site in Dublin Bay also results in sediment release.

5.2.2.1.3 Assessment of Effects

The closest qualifying reef habitat is located 3.3km north of the proposed disposal site and 5km from the MP2 Project in Dublin Port. The issue is whether or not elevated concentrations of suspended sediments or pollutants could result in likely significant effects on the qualifying reef habitat.

To understand if this risk exists, RPS used the MIKE 21/3 hydrodynamic numerical modelling software package developed by DHI, to address potential coastal processes issues. This was achieved by developing a range of two dimensional and three dimensional numerical models to represent:

- the pre-project scenario (in this case, post-Alexandra Basin Redevelopment (ABR) Project)
- the post-project scenario with the MP2 Project works in place

These models were used in conjunction with hydrographic survey data including bathymetric survey of Dublin Port and the Tolka estuary area and a comprehensive sediment survey of the Tolka estuary, and site specific water quality monitoring data to assess the construction and operational impacts of the MP2 Project in the context of *inter alia* the following coastal processes:

- The dispersion and settlement of sediment plumes generated during dredging operations
- The dispersion of sediment material disposed of at the spoil site
- Sediment dynamics and the morphological response of the seabed within Dublin Port

Modelling outputs and an assessment of these coastal processes as a result of the construction and operation of the MP2 Project is included at Appendix 4 of the NIS. Particle Size Analysis described in Appendix 4 indicated that the material to be dredged as part of the MP2 Project is comprised of three discrete fractions with mean diameters of 200µm, 20µm and 3µm, with each fraction constituting approximately 1/3 of the total volume of sediment to be dredged.

Extensive water quality monitoring using real time turbidity measurements during previous ABR dredging campaigns (AER 2017 and AER 2018) has shown that during disposal of dredged fine sands at the licensed disposal site, the fine sand falls rapidly to the bottom and any sediment plume is short lived and is not dispersed widely. However sediments to be dredged in the MP2 Project are finer and contain a substantial silt fraction.

Therefore, plume modelling was undertaken for the silt fractions with silt losses of 1% at the dredger head being introduced as a sediment source in the bottom layer of the model. The other key parameters relating to the dredging simulations are set out in Table 5 of Appendix 4.

5.2.2.1.3.1 Disposal of Dredge Material

A programme of sediment quality sampling and analysis within the Tolka Estuary and Dublin Port area has shown that that the sediments to be dredged from the Port's navigation channel and basins are suitable for conventional dumping at sea (subject to the granting of a Dumping at Sea Permit by the EPA). The closest and preferred site is located at the approaches to Dublin Bay to the west of the

Burford Bank as presented in Figure 5.7. This disposal option is preferred because it keeps the sand element of the dredge material within the natural Dublin Bay sediment cell.

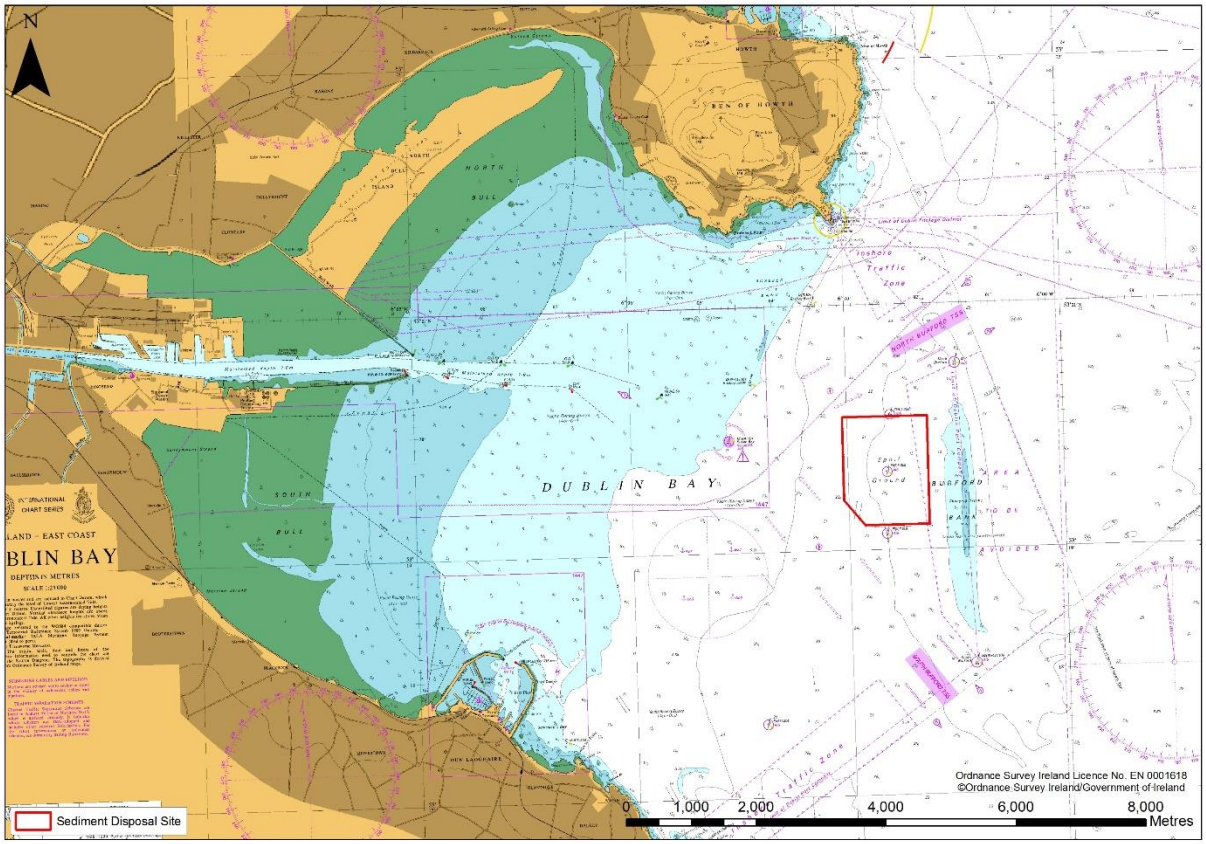

Figure 5.7 Location of the licensed dredged spoil disposal site

The disposal of sediments at sea has the potential to cause a temporary increase in suspended sediments and turbidity levels during the disposal operations and, under certain conditions, could have adverse effects on marine biota (for example, through siltation of benthic communities), changes to sediment structure, or interference with feeding in reduced visibility.

To assess the impact of the MP2 Project disposal operations at the licensed offshore disposal site, a coupled MIKE 21 Hydrodynamic and Sediment Transport model was used to determine the dispersion of the sediment material during the disposal operations.

It was assumed that the Trailer Suction Hopper Dredge would discharge material over the disposal site every *c.* 3 hours and that the equivalent of approximately of 2,030 tonnes (wet weight) would be released per dump. Key parameters relating to the sediment dumping simulations are outlined

Table 5.4.

Table 5.4 Disposal simulation input parameters

Parameter	Value
Trailer Suction Hopper Dredger capacity	4,100 m^3
Ratio of sediment/entrained water during loading	0.3
Average density of material inside hopper	1.65 t/m^3
Average Trip Frequency between Dublin Port and Disposal site	3.0 hours
Average Time to Fill Dredger Hopper	1.5 hours
Time to release load	90 seconds

The model simulations were run for the disposal of the dredged material over the course of a complete lunar month, which includes the full range of spring and neap tidal flow conditions. The characteristics of the sediment modelled in this simulation are equivalent to those described above and in Appendix 4.. As such, the sediment material was characterised by three discrete fractions with mean diameters of 200µm, 20µm and 3µm, with each fraction constituting 1/3 of the total volume of silt to be dredged.

The sediment material was introduced into the surface of the model as a point source that moved across the dump site area during the disposal operation. The model then simulated the dispersion, settlement and re-erosion of each fraction of the silt in response to the tidal currents throughout the model area.

The coarser fraction of the sediment, i.e. the sand fraction that had a mean grain size of 200µm, was found to behave differently relative to the two finer silt fractions that had mean grain diameters of 20µm and 3µm. The sand fraction remained on the dump site, whereas the two finer silt fractions were carried away by the tidal currents.

The results of the simulations are given in terms of maximum total suspended sediment concentrations envelope in Figure 5.8, which depicts the maximum level of the suspended sediment concentration which occurs in each cell at any time during the simulation and is thus an envelope covering all the sediment plume excursions. Figure 5.9 shows the mean total suspended solids concentration envelope.

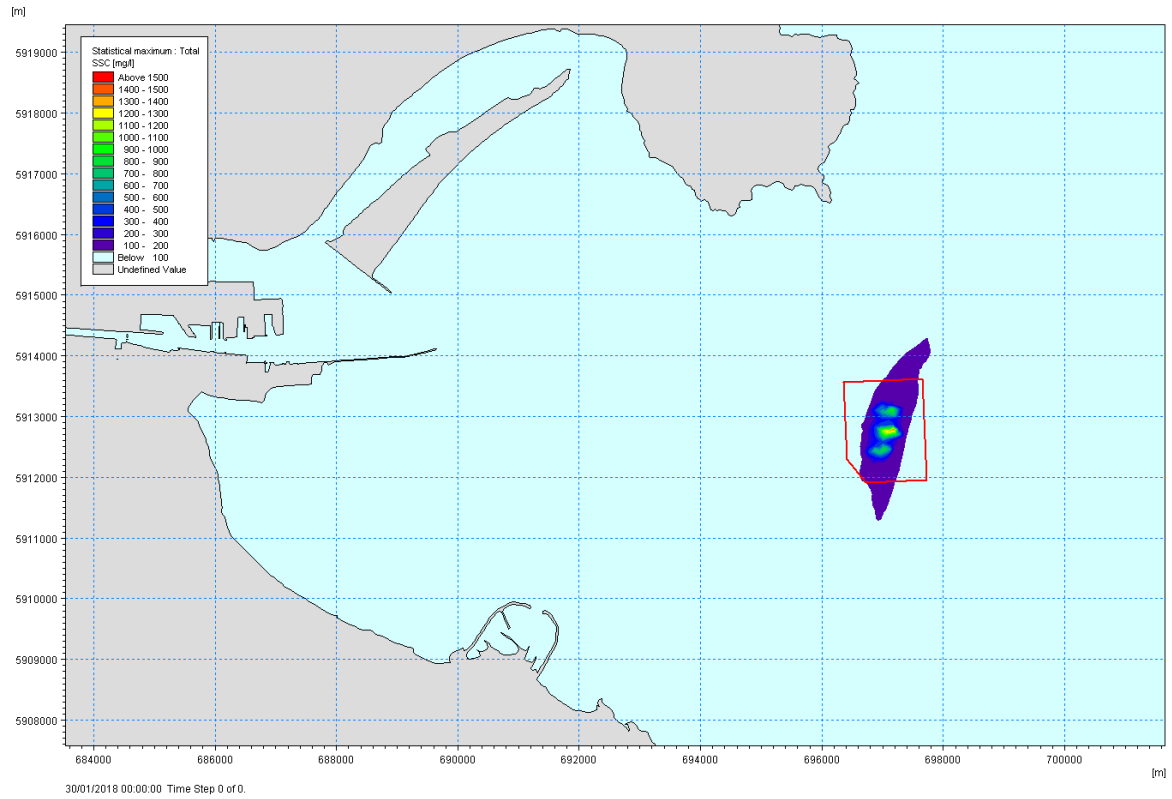

Figure 5.8 Maximum Total Suspended Solids Concentration envelope using a Trailer Suction Dredger dumping circa 2,030 tonnes wet weight at 3 hourly intervals on average within each winter capital dredging season

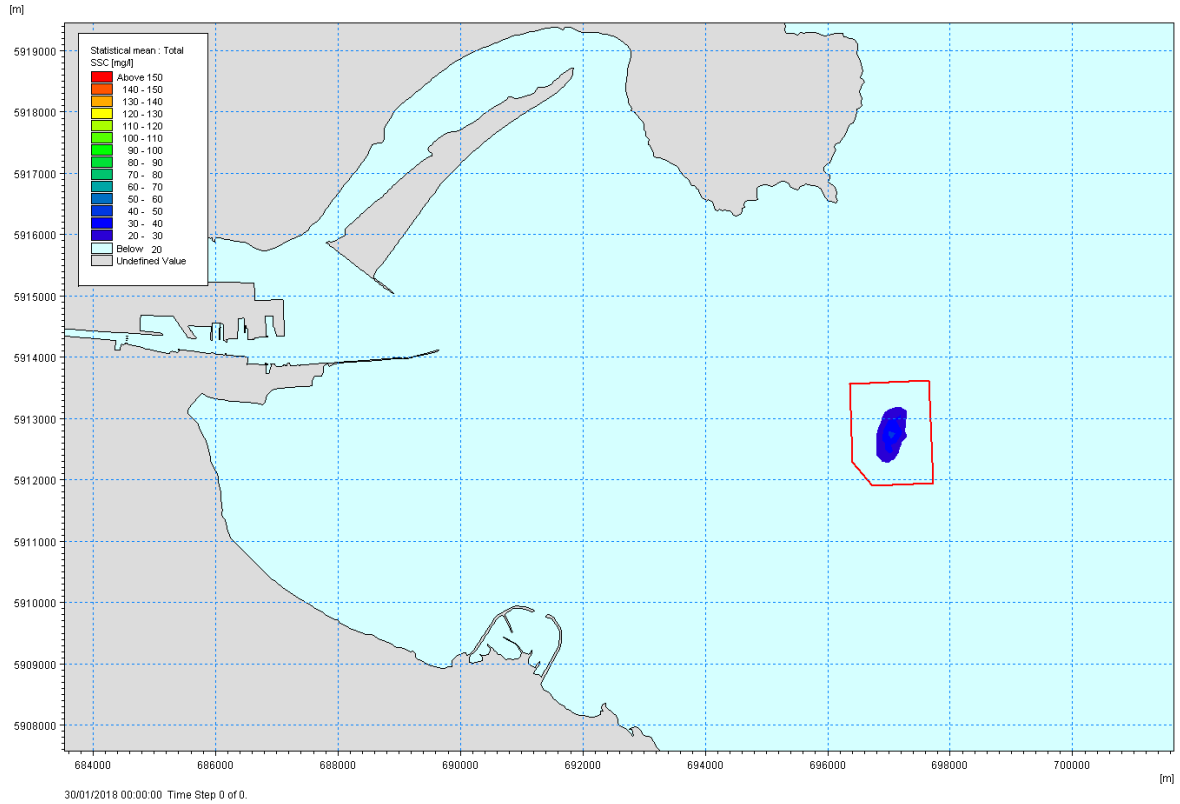

Figure 5.9 Mean Total Suspended Solids Concentration envelope using a Trailer Suction Dredger dumping circa 2,030 tonnes wet weight at 3 hourly intervals on average within each winter capital dredging season

It will be seen from Figure 5.8 that the sediment plume outside the area of the dump site is less than 200mg/l and does not extend further than 750m to the north or south of the dump site.

Based on these results, it can be concluded that the disposal operations associated with the MP2 Project will not result in any significant increases to the background level of suspended sediments.

On this basis, suspended sediment plumes under any tidal and wave climate scenario do not reach within 2.5km of the closest qualifying reef habitat (located 3.3km north of the proposed disposal site at the coastline of Howth Head).

This coastal processes assessment provides scientific certainty that the risk of suspended sediments escaping into the wider marine environment beyond the disposal site will not imperil the conservation target to conserve the Intertidal and Subtidal reef community complexes in Rockabill to Dalkey Island SAC in a natural condition. Disposal of dredge material at sea will not adversely affect the integrity of Rockabill to Dalkey Island SAC and no reasonable scientific doubt remains as to the absence of such effects.

5.2.2.1.3.2 Potential Sources of Pollution

As well as the possibility of mobilised suspended sediments due to disposal of dredge material, spillages of polluting substances are also a potential source of pollution to the marine environment at construction phase, as a result of discharges from dredging vessels at construction stage and vessels using the berths of the port (ballast water, wastewater, oil spillages, fuel bunkering).

If any pollution event were to result in a significant spillage into Rockabill to Dalkey Island SAC it could adversely affect the Annex I Reefs conservation target for 'Community Structure' to conserve the Intertidal and Subtidal reef community complexes in a natural condition. Accordingly, mitigation measures are proposed in order to avoid or reduce harmful effects of any pollution event.

5.2.2.1.3.2.1 Mitigation

A Water Quality Management Plan will be implemented for the duration of the proposed construction works. A draft Water Quality Management Plan is presented in Section 3.5.9 of the CEMP at Appendix 5 of the NIS.

Mitigation measures will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA) and the Northern Ireland Environment Agency (NIEA);
    - GPP2: Above Ground oil storage tanks
    - PPG3: use and design of oil separators in surface water drainage
    - GPP5: Works and maintenance in or near water

- PPG6: Working at construction and demolition sites
- GPP8: Safe Storage and disposal of used oils
- GPP13: Vehicle washing and cleaning
- PPG20: Dewatering underground ducts and chambers
- GPP21: Pollution incident response planning
- GPP22: Dealing with spills

- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:

- Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
- The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011).

A project specific Pollution Incident Response Plan has been prepared consistent with DPC's Environmental Emergency Plan. This is located at Section 3.5.11 of the CEMP at Appendix 5 of the NIS. The Pollution Incident Response Plan for the construction works has been prepared in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures as detailed in the CEMP are implemented, the finalisation of this document is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

A Dredging Management Plan has been prepared and is located at Section 3.5.10 of the CEMP at Appendix 5 of the NIS. The Contractor will comply with all measures and mitigation contained therein

to ensure that water quality is not significantly impacted. The following key relevant mitigation measures will apply to each dredging campaign in the MP2 Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel shall be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site.
- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).
- A documented Accident Prevention Procedure is to be in place prior to commencement.
- A documented Emergency Response Procedure is to be in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

At operational stage, storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly into the marine environment from new jetties and hardstanding areas. The surface water drainage system will consist, inter alia, of heavy duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water into an appropriate full retention oil separator which will trap oils and silts prior to being discharges into the harbour waters through a non-return flap valve. A readily and safely accessible monitoring chamber will be provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged,

At operational stage, the oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: “Use and design of oil separators in surface water drainage systems: PPG3” (Environment Agency, 2006) and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must comply with this standard. In accordance with PPG3 a class 1 bypass separator will be required for general and car parking areas of the site whilst a class 1 full retention separator will be

required for the HGV parking and loading area. Notwithstanding this, full retention separators are proposed for each phase of the development and will be sized in accordance with a design flow of 590l/s for a six hour duration storm and the drainage area to be serviced.

Following the implementation of this pollution prevention mitigation, construction and operation of the MP2 Project will not adversely affect the integrity of Reefs in Rockabill to Dalkey Island SAC and no reasonable scientific doubt remains as to the absence of such effects.

5.3 NORTH DUBLIN BAY CSAC

5.3.1 Water Quality and Habitat Deterioration effects

5.3.1.1 Mudflats and sandflats not covered by seawater at low tide

5.3.1.1.1 Conservation Objectives

Within North Dublin Bay cSAC three benthic community types are recorded in this Annex I habitat. The conservation objective for this marine habitat is to maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC, as defined by four conservation attributes and targets which relate to the three benthic community types:

Habitat Area:	The permanent habitat area is stable or increasing, subject to natural processes
Community extent:	Maintain the extent of the *Mytilus edulis* dominated community, subject to natural processes
Community structure (Mytilus edulis density):	Conserve the high quality of the *Mytilus edulis* dominated community, subject to natural processes
Community distribution:	Conserve the following community types in a natural condition: • Fine sand to sandy mud with *Pygospio elegans* and *Crangon crangon* community complex • Fine sand with *Spio martinensis* community complex

NPWS (2013) notes that in relation to habitat area, the conservation target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area, rather than long or short term disturbance to the biology of the site. Given the distance of the site from the MP2 Project, constructing or operating the MP2 Project will not present any threat to maintaining the conservation target for area of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC.

Conservation targets for the *Mytilus edulis* community seek to maintain its extent and conserve its high quality. The conservation target for community distribution seeks to conserve the two remaining principal benthic communities of the Annex I habitat in a natural condition.

5.3.1.1.2 Potential Significant Effects

The Annex I mudflat and sandflat habitat of North Dublin Bay cSAC is less than 1km by sea from the locations of proposed capital dredging. The Screening appraisal at Section 4 above concluded that in the absence of plume modelling, uncertainty remains as to the risk that may arise from deposition of dredge plumes in relation to the conservation objectives set for the principal benthic communities of the Annex I habitat and as such likely significant effects could not be excluded.

The screening appraisal also concluded in relation to other potential sources of pollution at construction and operational stage that despite the significant capacity of the Liffey and Tolka Estuaries to dilute elevated concentrations of polluting substances, given the proximity of the MP2 Project to the mudflat and sandflat Annex I habitat. As such likely significant effects could not be excluded.

5.3.1.1.3 Assessment of Effects

5.3.1.1.3.1 Dredging

As noted above in Section 5.2.2.1.3, MIKE 21/3 hydrodynamic numerical modelling was used in conjunction with hydrographic survey data including bathymetric survey of Dublin Port and the Tolka estuary area and a comprehensive sediment survey of the Tolka estuary, and site specific water quality monitoring data to address potential coastal processes issues including the dispersion and settlement of sediment plumes generated during dredging operations in Dublin Port. Modelling outputs and an assessment of the effects of dredging as a result of the construction of the MP2 Project is included at Appendix 4 of the NIS.

Three individual simulations were run to simulate the dredging operations at Berth 53, the channel widening area south of the channel, and at Oil Berth 3 and Berth 50A. Each simulation was run for one month to represent the full dredging operation in each area. Model input parameters are described in Table 5.5. The output from these simulations is presented in the following Sections of this Report.

Table 5.5 Dredging simulation input parameters

Parameter	Value
Trailer Suction Hopper Dredger capacity	4,100 m^3
Ratio of sediment/entrained water during loading	0.3
Average density of material inside hopper	1.65 t/m^3
Average Trip Frequency between Dublin Port and Disposal site	3.0 hours
Average Time to Fill Dredger Hopper	1.5 hours
Time to release load	90 seconds
Overspill Trailer Suction Hopper Dredger head	0%
Sediment loss at Trailer Suction Hopper Dredger head	1% of silts

In line with the Dredging Management Plan developed for the ABR Project, no over-spill from the dredger's hopper was included in any of the three model simulations.

5.3.1.1.3.1.1 Dredging of Berth 53

The dispersion of silts during dredging is illustrated by a series of plume diagrams that show the suspended sediment concentration of silt in the water column resulting from the dredging operations. Figure 5.10 to Figure 5.13 represent the dispersion of silt material at times of low water, mid flood, high water and mid ebb at a time during the simulated dredging campaign when the suspended sediment concentrations may be expected to be at their highest values (i.e. when the dredger is active at the site).

These figures show that the suspended sediment concentration plumes are confined to the northern half of the navigation channel at all times. The sediment concentrations of the plumes are generally less than 25 mg/l beyond the immediate dredge area. The lateral extent of the 10mg/l plume envelope is generally less than 750m under most tidal conditions.

Monitoring of the Liffey and Tolka Estuaries between East Link Bridge and the entrance to the Port at Poolbeg Lighthouse has been undertaken by the ABR Project. Measurements of turbidity at the North Bank Light (adjacent to the Tolka Estuary) over the period 2017 – 2018 have ranged from 0 to 39.5 NTU with a mean of 2.6 NTU (n=17,533). This equates to a suspended solids range of 0 to 98 mg/l with a mean of 6.4 mg/l. While there is a relatively small and very local predicted increase in suspended solids due to dredging at Berth 53, this falls within the background range measured close to this location during normal Port operations.

The predicted deposition of the silt fractions lost to the water column during the dredging of Berth 53 at the end of a simulated one-month dredging campaign is presented in Figure 5.14. This Figure shows that the volume of material deposited outside of the dredge area is generally less than 0.40g/m^2 and that the deposition of sediment is generally confined to within the immediate area of the dredging operation. It should be noted that dredging proceeds until the specified design depth is reached and any material deposited within the dredge area will be removed by the dredger until the specification is met.

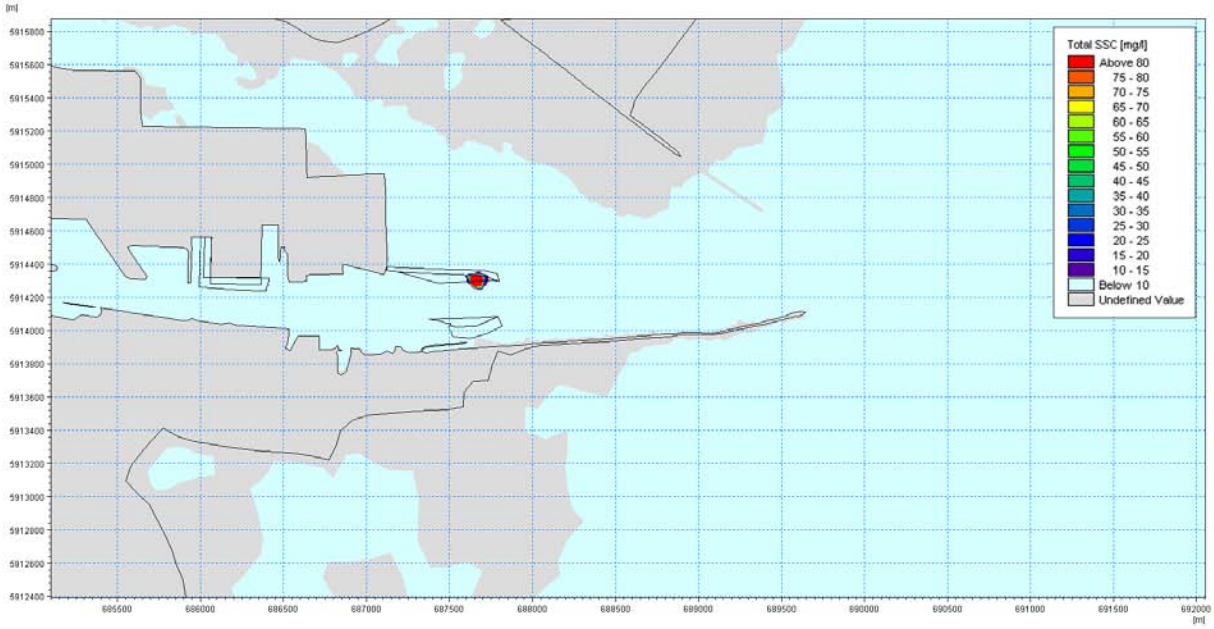

Figure 5.10 Suspended sediment concentration plume in the bottom layer during a typical low water phase of a spring tidal cycle whilst dredging Berth 53

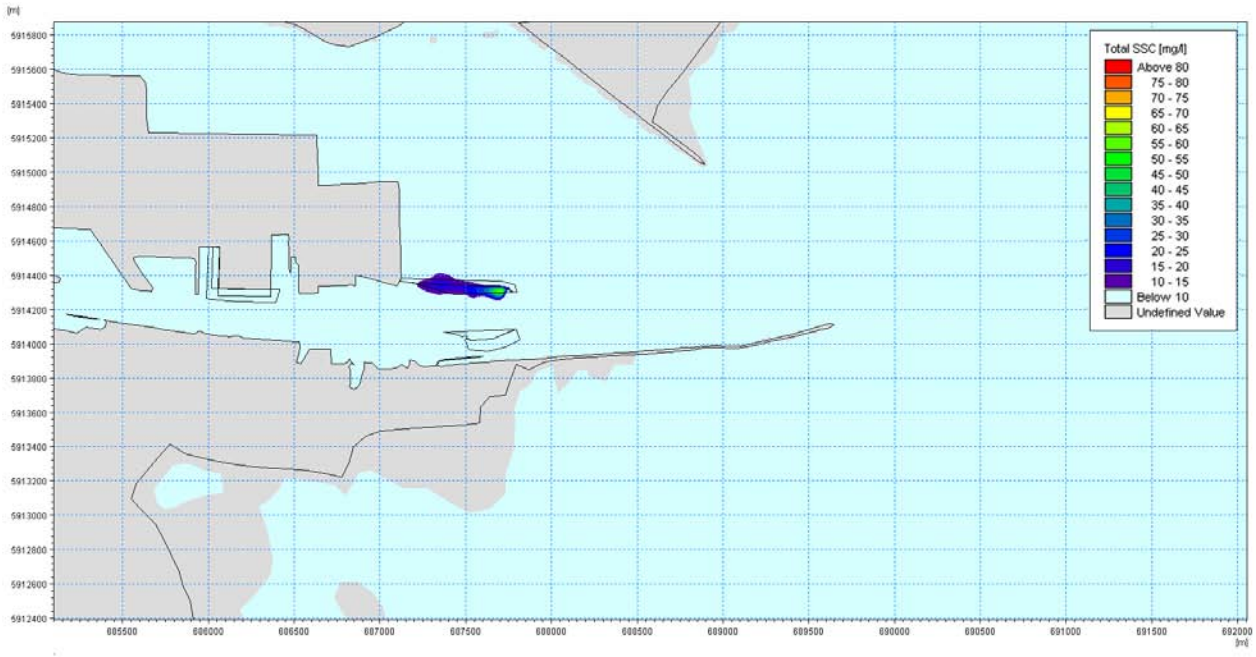

Figure 5.11 Suspended sediment concentration plume in the bottom layer during a typical mid flood phase of a spring tidal cycle whilst dredging Berth 53

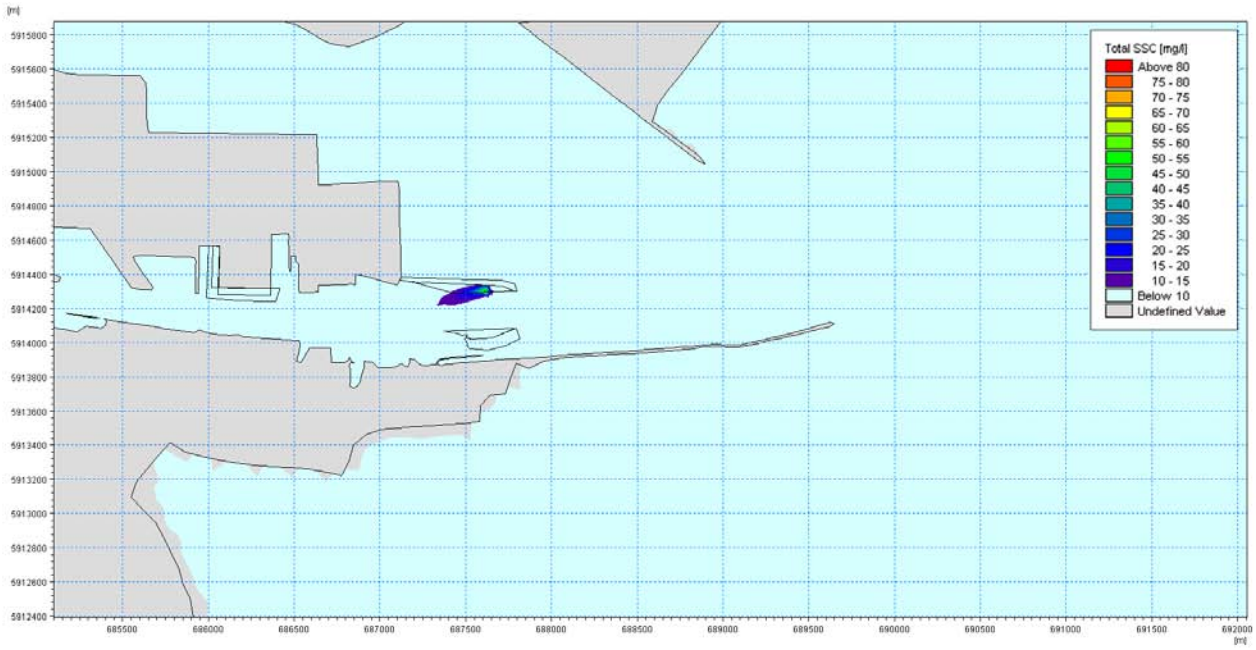

Figure 5.12 Suspended sediment concentration plume in the bottom layer during a typical high water phase of a spring tidal cycle whilst dredging Berth 53

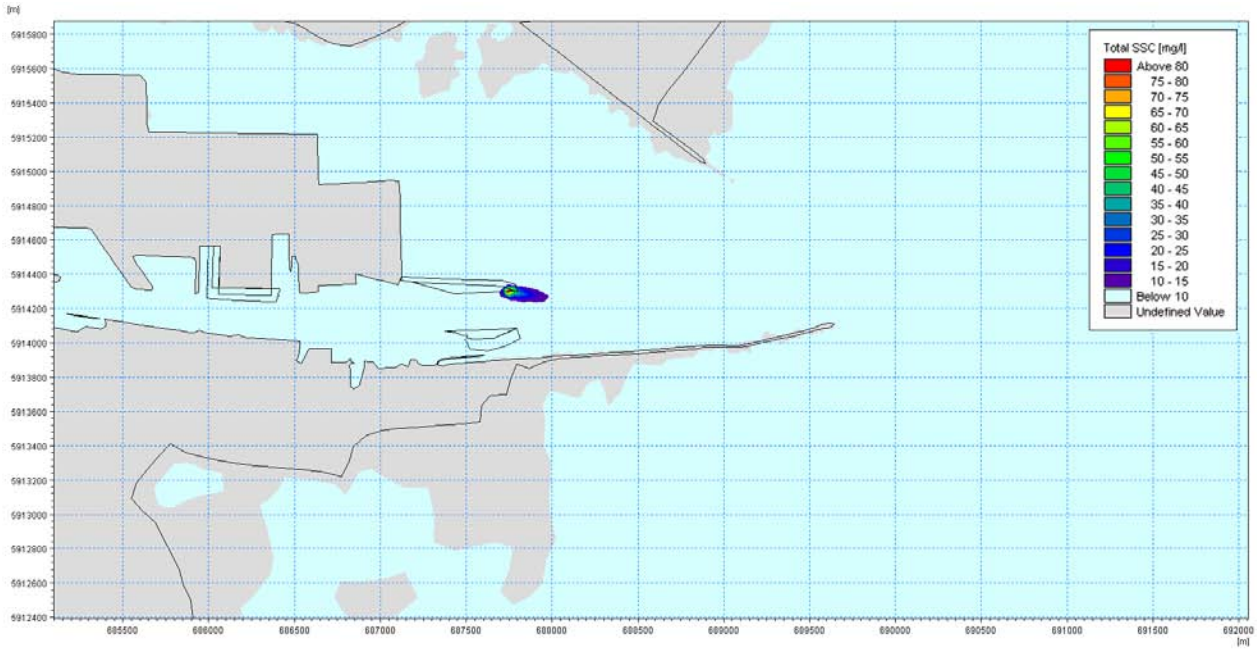

Figure 5.13 Suspended sediment concentration plume in the bottom layer during a typical mid ebb phase of a spring tidal cycle whilst dredging Berth 53

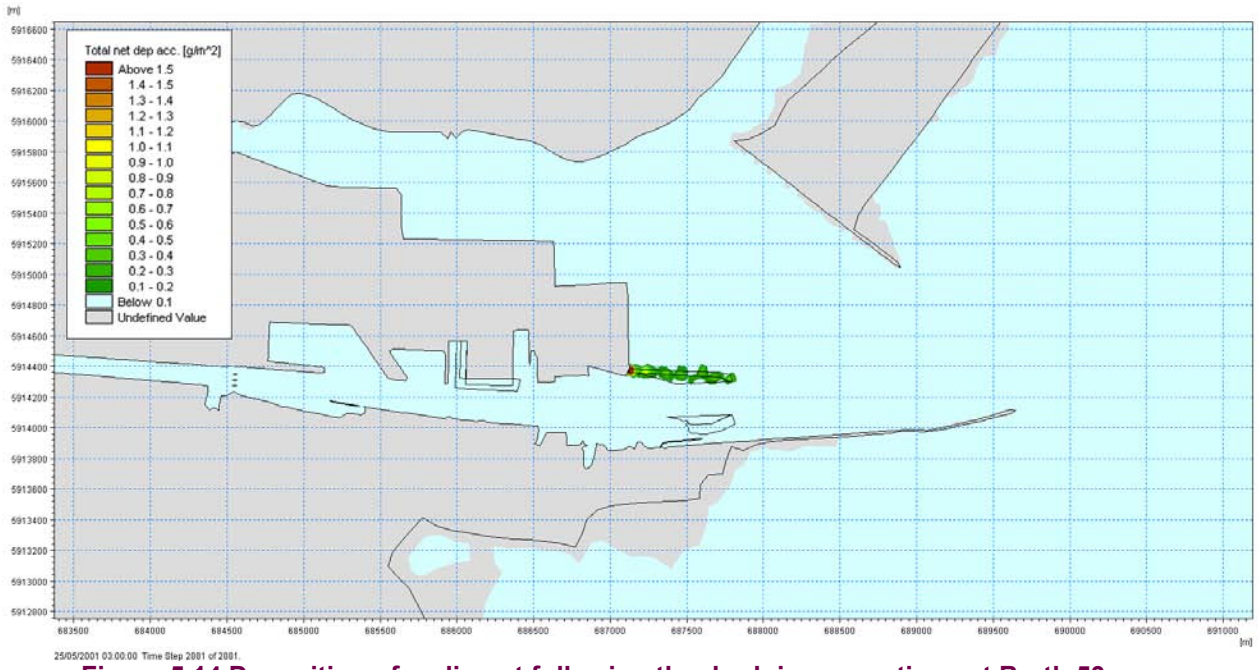

Figure 5.14 Deposition of sediment following the dredging operations at Berth 53

The estimated natural sediment load from the upstream Liffey catchment is estimated at about 200,000 tonnes per annum (DPC Maintenance Dredge AER 2017, Dumping at Sea Permit S0004-01). If dispersed over the Port area between East Link and Poolbeg Light and the Tolka Estuary, the coastal processes assessment at Appendix 4 estimates this quantum to be equivalent to a natural sediment load of 30 kg/m^2 in any year. The small level of deposition predicted as a result of dredging at Berth 53 is therefore highly unlikely to pose any risk through siltation.

It can, therefore, be concluded that the dredging operations required for Berth 53 will not result in any significant impact to water quality in the Lower Liffey channel and Tolka estuary. Plumes do not extent as far as North Dublin Bay cSAC under any modelled wave and tidal scenario.

The coastal processes assessment at Appendix 4 provides scientific certainty that the risk of suspended sediments escaping into the wider marine environment beyond the dredge area at Berth 53 will not imperil the conservation objectives set for the principal benthic communities of the Annex I Mudflats and sandflats not covered by seawater at low tide habitat within North Dublin Bay cSAC.

Dredging of Berth 53 will not adversely affect the integrity of North Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.3.1.1.3.1.2 Channel Dredging Works

The impact of the silt dispersion on the suspended sediment concentration is shown by a series of plume diagrams. Figure 5.15 to Figure 5.18 represent the dispersion of silt material at times of low water, mid flood, high water and mid ebb at a time during the dredging operation when the suspended sediment concentrations may be expected to be at their highest values (i.e. when the dredger is active at the site).

It will be seen from these figures the suspended sediment concentration plumes are confined to the southern half of the navigation channel. The sediment concentration of the plumes is generally less than 25 mg/l beyond the immediate dredge area. As set out in the previous section, this is a relatively small and very local predicted increase in suspended solids due to the channel dredging works and is well within the background range experienced at this location during normal Port operations. The lateral extent of the 10mg/l plume envelope is generally less than 600m under most tidal conditions.

The predicted deposition of the silt fractions lost to the water column during the channel dredging works at the end of a simulated one month dredging campaign is presented in Figure 5.19. This Figure shows that the volume of material deposited outside of the dredge area is generally less than 0.30g/m^2 and that the deposition of sediment is generally confined to within the immediate area of the dredging operation. By comparison with natural background sediment loads (previous section) such a small level of deposition is highly unlikely to pose any risk through siltation and no further mitigation is required. Again, any material deposited within the dredge area will be removed by the dredger until the specification is met.

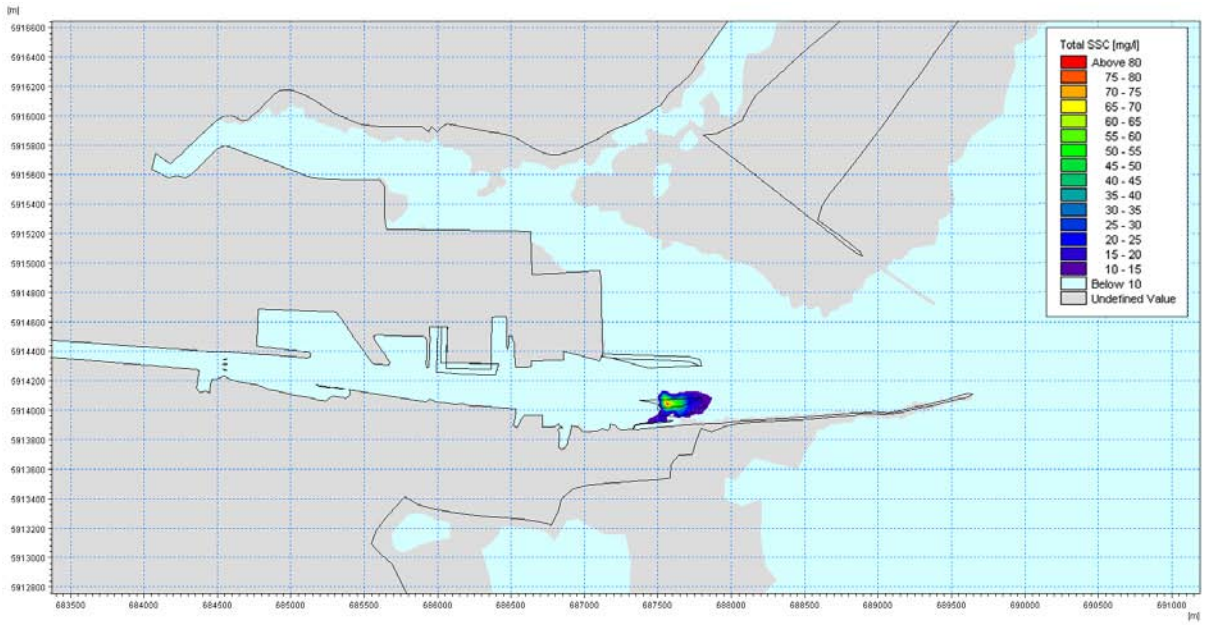

Figure 5.15 Suspended sediment concentration plume in the bottom layer during a typical low water phase of a spring tidal cycle during the Channel Dredging Works

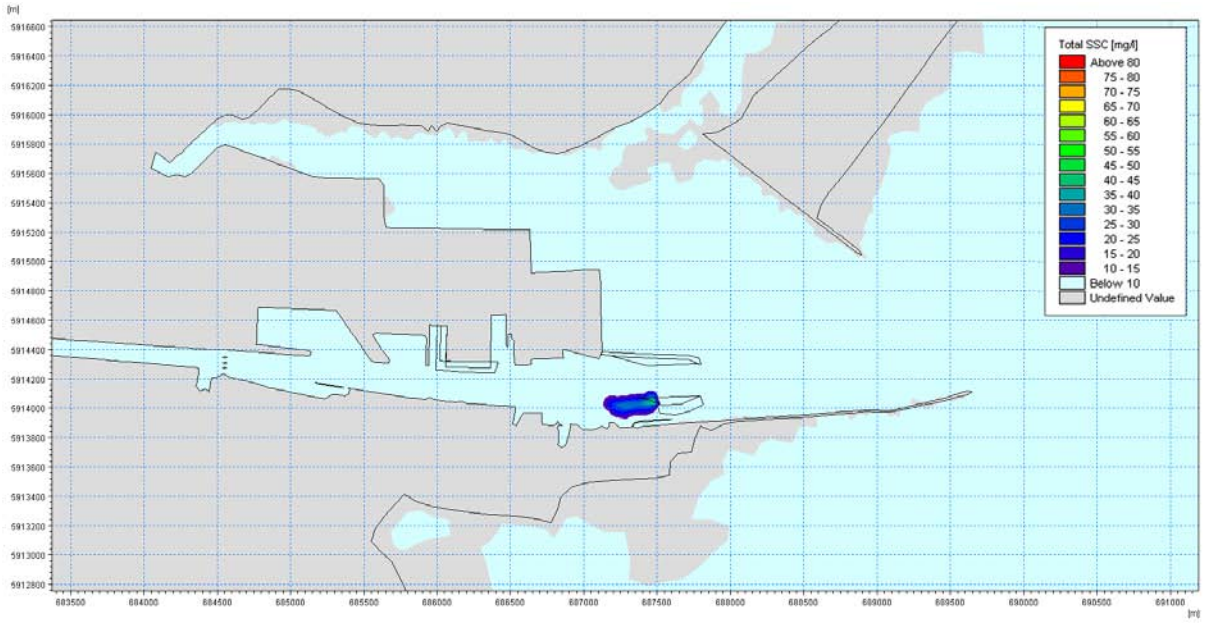

Figure 5.16 Suspended sediment concentration plume in the bottom layer during a typical mid flood phase of a spring tidal cycle during the Channel Dredging Works

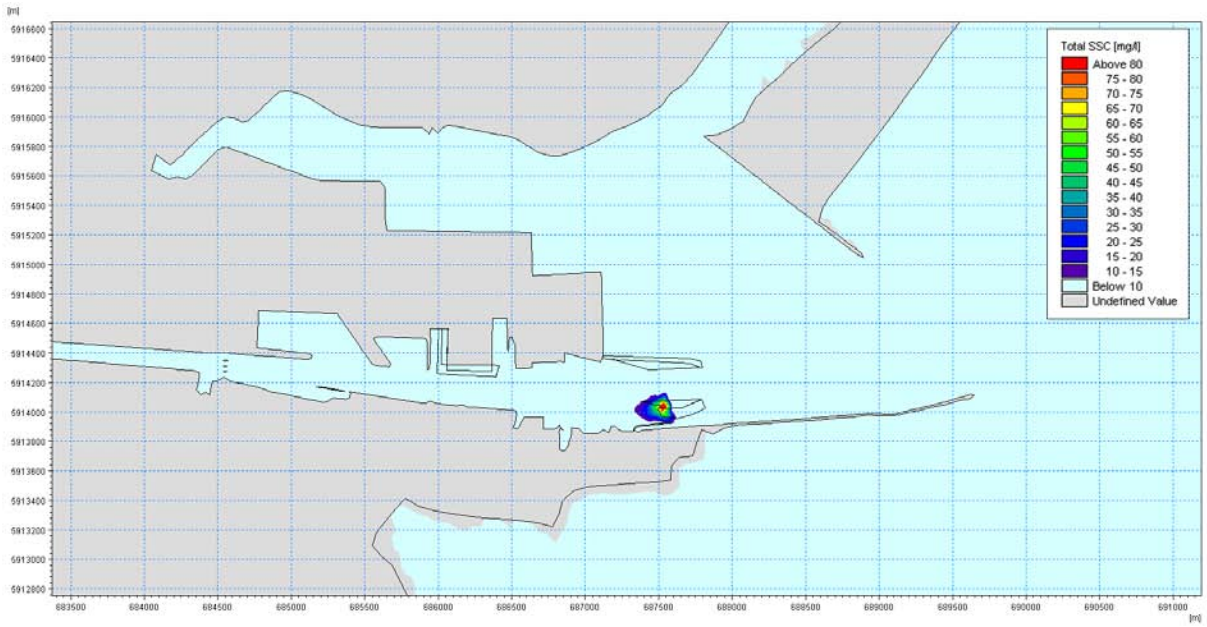

Figure 5.17 Suspended sediment concentration plume in the bottom layer during a typical high water phase of a spring tidal cycle during the Channel Dredging Works

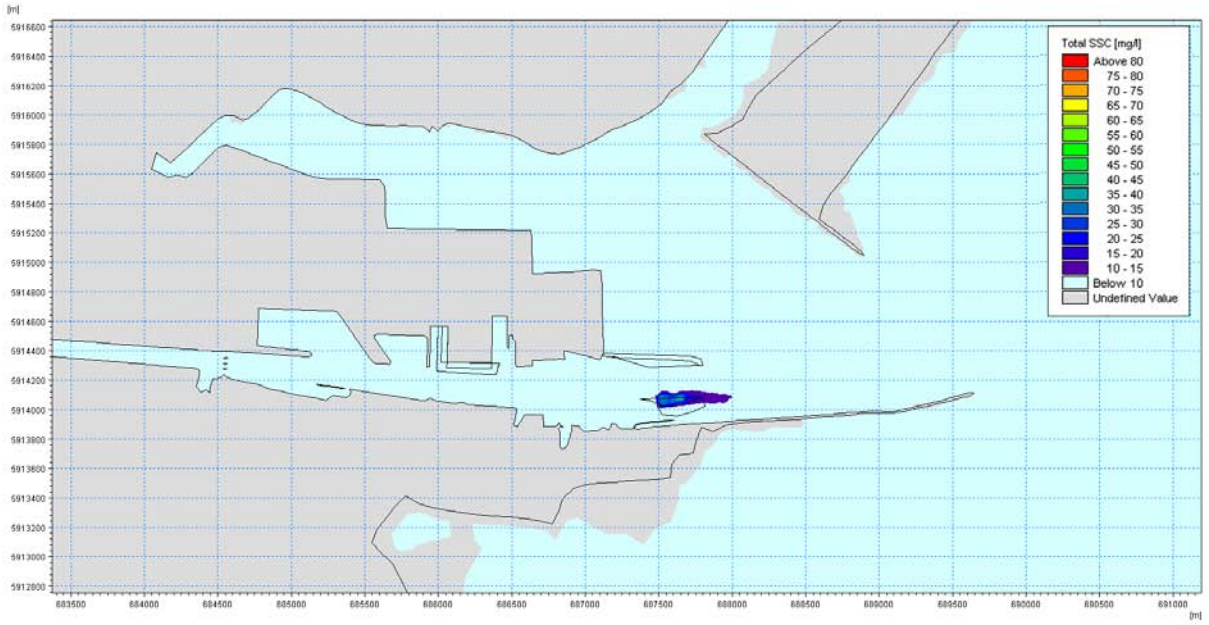

Figure 5.18 Suspended sediment concentration plume in the bottom layer during a typical mid ebb phase of a spring tidal cycle during the Channel Dredging Works

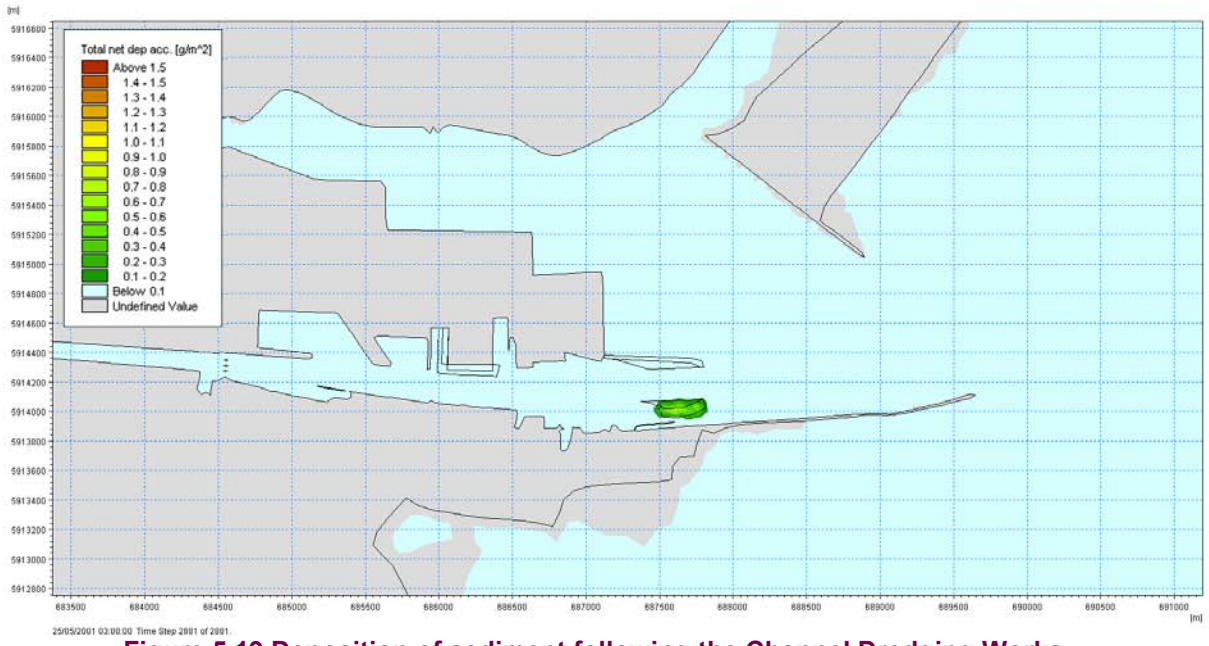

Figure 5.19 Deposition of sediment following the Channel Dredging Works

It can therefore, be concluded that when considered in terms of background conditions, the dredging operations required for the channel dredging works will not result in any significant impact to water quality in the Lower Liffey channel and Tolka estuary. Plumes do not extent as far as North Dublin Bay cSAC under any modelled wave and tidal scenario.

The coastal processes assessment at Appendix 4 provides scientific certainty that the risk of suspended sediments escaping into the wider marine environment beyond the channel dredging will not imperil the conservation objectives set for the principal benthic communities of the Annex I Mudflats and sandflats not covered by seawater at low tide habitat within North Dublin Bay cSAC.

Dredging of the channel will not adversely affect the integrity of North Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.3.1.1.3.1.3 Dredging of the Oil Berth 3 and Berth 50A

The impact of the silt dispersion on the suspended sediment concentration is shown by a series of plume diagrams. Figure 5.21 to Figure 5.23 represent the dispersion of silt material at times of low water, mid flood, high water and mid ebb at a time during the dredging operation when the suspended sediment concentrations may be expected to be at their highest values (i.e. when the dredger is active at the site).

It will be seen from these figures that the suspended sediment concentration plumes are confined to within Oil Berth 3 and the northern half of the navigation channel. The sediment concentrations of the plumes are generally less than 35 mg/l beyond the immediate source point. While there is a relatively small and very local predicted increase in suspended solids due to dredging at Oil Berth 3 and Berth 50A, this is well within the background range experienced at these locations during normal Port operations.

The predicted deposition of the silt fractions lost to the water column during the dredging of Oil Berth 3 and Berth 50A at the end of the one month dredging campaign simulation is presented in Figure 5.24. This Figure shows that the volume of material deposited outside of the dredge area is generally less than 8g/m^2 and that the deposition of sediment is generally confined to within the immediate area of the dredging operation. As with the previous dredging operations, any material deposited within the dredge area would be removed by the dredger until the final design depth is reached. It can be concluded that the silt material lost to the water column during the dredging of the Oil Berth 3 and Berth 50A will be contained within Dublin Port.

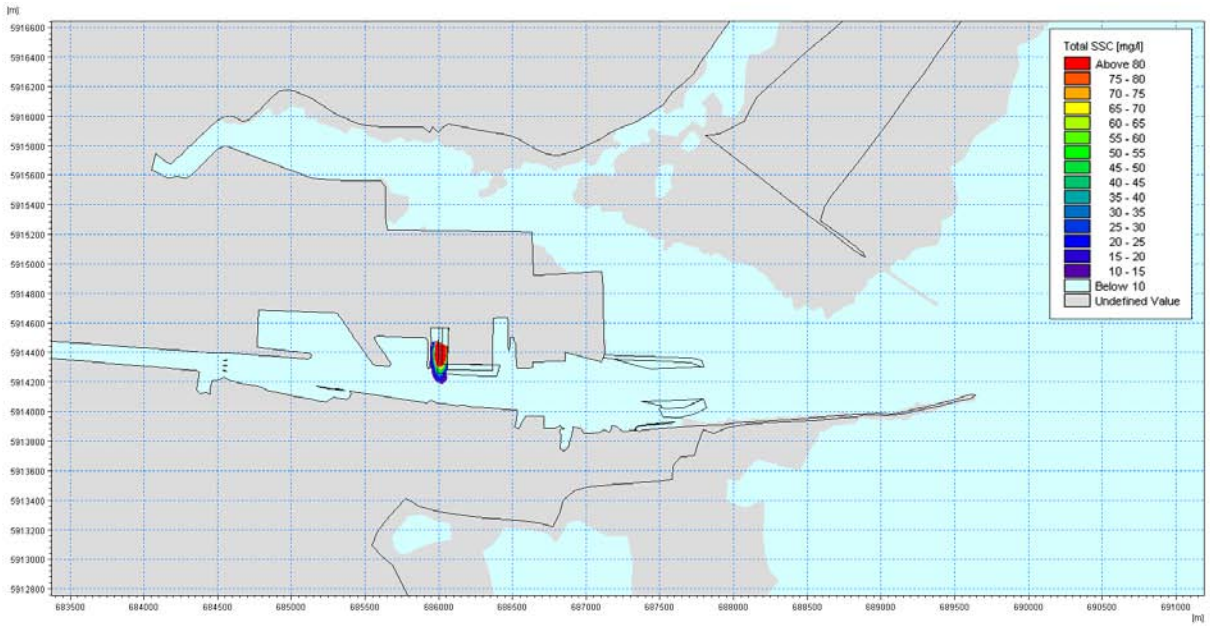

Figure 5.20 Suspended sediment concentration plume in the bottom layer during a typical low water phase of a spring tidal cycle whilst dredging the Oil Berth 3 and Berth 50A

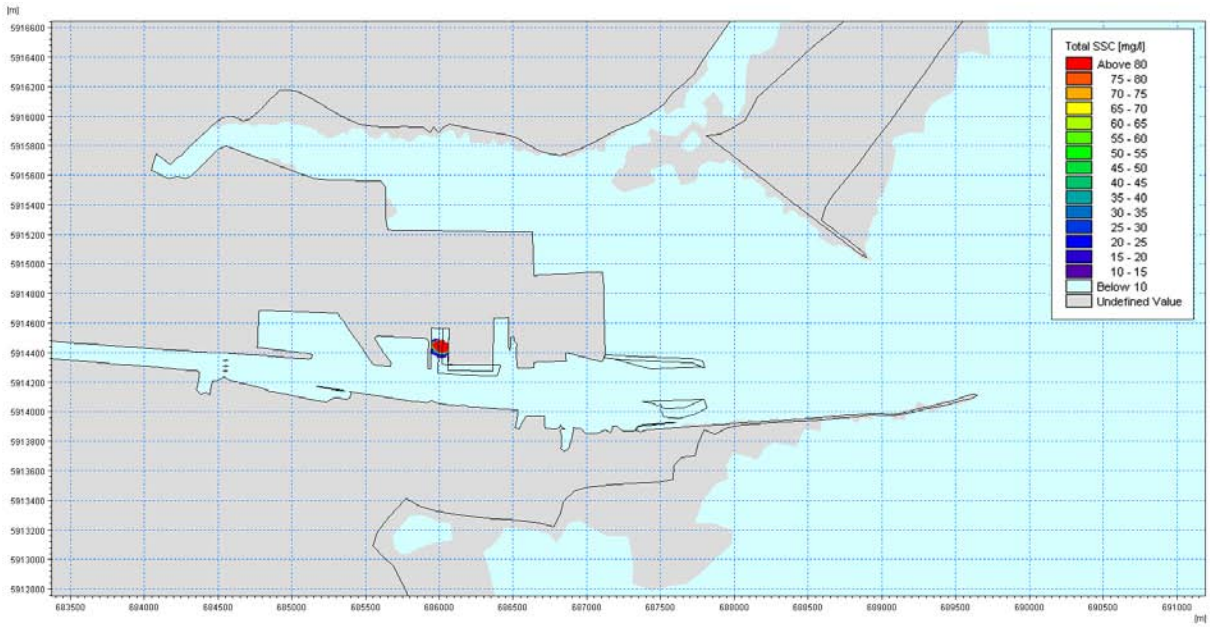

Figure 5.21 Suspended sediment concentration plume in the bottom layer during a mid flood phase of a spring tidal cycle whilst dredging the Oil Berth 3 and Berth 50A

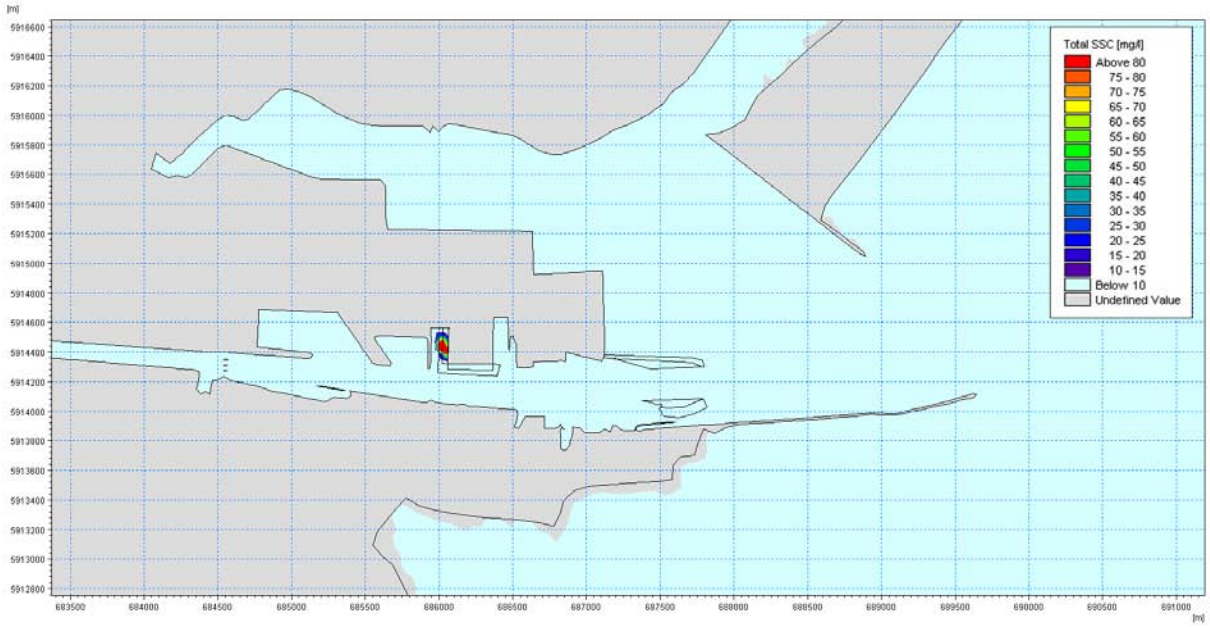

Figure 5.22 Suspended sediment concentration plume in the bottom layer during a typical high water phase of a spring tidal cycle whilst dredging the Oil Berth 3 and Berth 50A

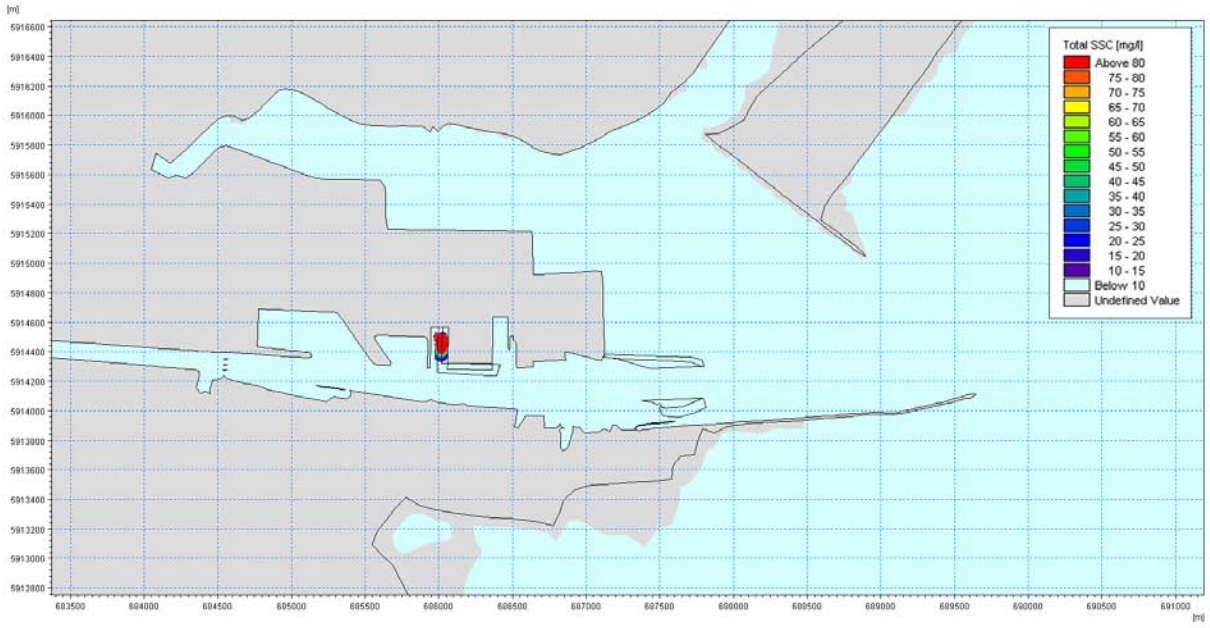

Figure 5.23 Suspended sediment concentration plume in the bottom layer during a typical mid ebb phase of a spring tidal cycle whilst dredging the Oil Berth 3 and Berth 50A

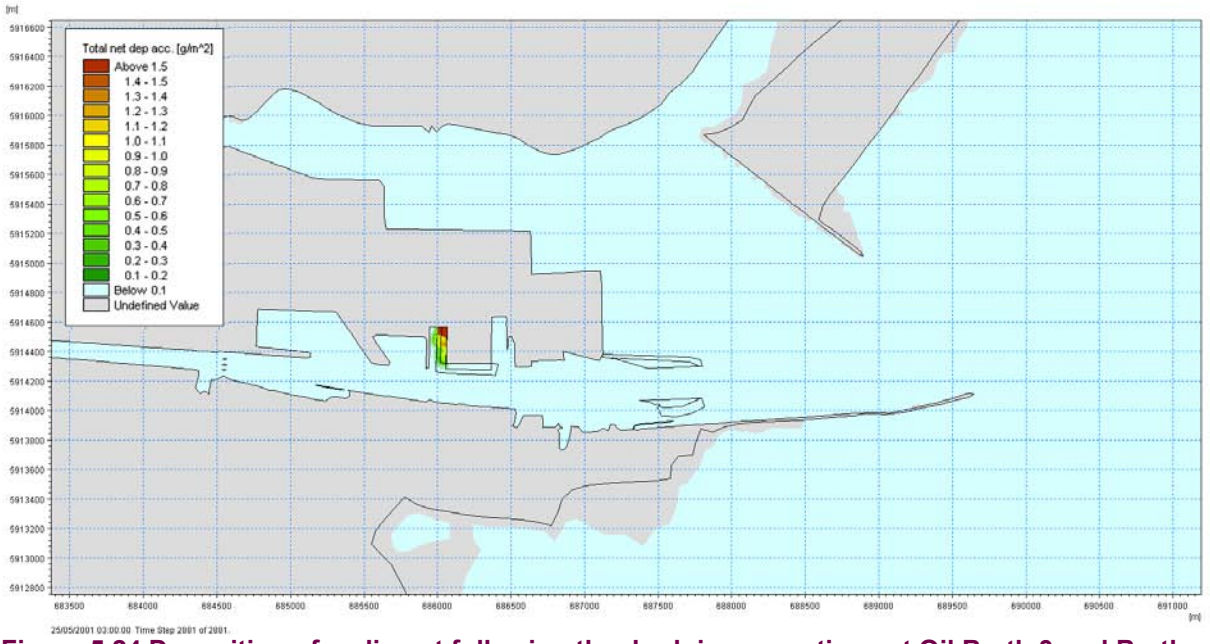

Figure 5.24 Deposition of sediment following the dredging operations at Oil Berth 3 and Berth 50A

It can therefore, be concluded that the dredging operations required for the Oil Berth 3 and Berth 50A will not result in any significant impact to water quality in the Lower Liffey channel and Tolka estuary. Plumes do not extent as far as North Dublin Bay cSAC under any modelled wave and tidal scenario.

The coastal processes assessment at Appendix 4 provides scientific certainty that the risk of suspended sediments escaping into the wider marine environment beyond Oil Berth 3 and Berth 50A will not imperil the conservation objectives set for the principal benthic communities of the Annex I Mudflats and sandflats not covered by seawater at low tide habitat within North Dublin Bay cSAC.

Dredging of Oil Berth 3 and Berth 50A will not adversely affect the integrity of North Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.3.1.1.3.2 Potential Sources of Pollution

As well as the possibility of mobilised suspended sediments due to dredging or disposal, cement release through general construction activities or spillages of polluting substances are also a potential source of pollution to the marine environment at construction phase, as a result of:

- Demolition of buildings & structures;
- Berth Construction including the construction of waterside berths, quay walls, jetties, open piled structures
- Landside ancillary works to serve the marine operations including the construction of ramps and deck structures to access linkspans, services and drainage installation, and installation of jetty furniture and fender systems
- Accidental release of highly alkaline contaminants from concrete and cement during the demolition of buildings and structures and the construction of hardstand areas, waterside berths, quay walls, jetties, bridging structures
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals

Operational phase impacts associated with the MP2 Project (buildings/structures, berths and associated marine berthing and manoeuvring, and landside works) represents an increase in use of the land over the current normal day-to-day port activities. These associated impacts are currently well understood and managed within the Port's operational and maintenance procedures. The principal potential sources of water quality impact are:

- Increased suspended sediment levels due to port operations including the ongoing maintenance dredging of the proposed new berths;
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals and releases associated with the operation and maintenance of surface water drainage systems;
- Discharges from dredging vessels at construction stage and vessels using the berths of the operational MP2 Project (ballast water, wastewater, oil spillages, fuel bunkering);
- Discharges from cargo handling (leakages from containers, bulk material spillages, losses from conveyor systems);
- Discharges from cargo storage areas and onward transportation (losses from hoppers, flat bulk stores and HGVs).

If any pollution event were to result in a significant spillage into North Dublin Bay cSAC it could adversely affect the conservation target for Mudflats and sandflats not covered by seawater at low tide in North

Dublin Bay cSAC. Accordingly, mitigation measures are proposed in order to avoid or reduce harmful effects of any pollution event.

5.3.1.1.3.2.1 Air Pollution

Operational phase traffic can impact directly on local air quality and any sensitive receptors that are located in proximity to the road network, such as wetland habitats of European sites. Emissions from vehicles and shipping vessels may increase in the future, leading to greater levels of deposition of gaseous pollutants on wetland habitats of European sites.

The Institute of Air Quality Management (IAQM) has produced guidance for the assessment of the air quality impacts of development on designated nature conservation sites (IAQM, 2019). Gaseous pollutants, critical levels below which significant harmful effects are not thought to occur have been adopted by, amongst others, the European Union and the United Nations Economic Commission for Europe (UNECE) and are used as regulatory standards. These are summarised in Table 2.1 of IAQM (2019), and the Critical Load for Nitrous Oxides is 30 µg/m^3. An Air Quality assessment in contained at Appendix 2 to the NIS and has predicted increases in gaseous pollutants as a result of traffic on the road network during the operation stage of the MP2 Project in line with the increased throughput of cargo and passengers as predicted under the Masterplan. Table 1.19 makes predictions of average annual nitrous oxide levels in four locations (at Santry, East Wall Road, Sherriff Street Upper and Pigeon House Road). Predicted increases are as follows:

- *R1 (Royal Oak Housing (Santry)*

  Increase of 1.19 µg/m^3 by 2040 to 25.89 µg/m^3 from a 2018 baseline of 24.70 µg/m^3
- *R2 (Residential Housing on East Wall Road)*

  Increase of 0.77 µg/m^3 by 2040 to 24.03 µg/m^3 from a 2018 baseline of 23.26 µg/m^3
- *R3 (Apartments on Sheriff Street Upper)*

  Increase of 1.48 µg/m^3 by 2040 to 23.24 µg/m^3 from a 2018 baseline of 21.76 µg/m^3
- *R4 (Residential Houses on Pigeon House Road)*

  Increase of 1.02 µg/m^3 by 2040 to 25.82 µg/m^3 from a 2018 baseline of 24.80 µg/m^3

This analysis makes clear that the average annual Average NO2 levels predicted with MP2 Project in place are below the critical load for NOx. IAQM (2019) advises that in circumstances where these predicted concentrations exceed 1% of the critical level/load either alone or in-combination, they should be passed onto the Ecologist. The values range between 2.5% - 5% of the critical load for NOx, but more importantly, the critical load is not exceeded as a result of MP2 Project and the highest predicted concentrations do not exceed 90% of critical load. Mitigation is not required.

The MP2 Project will not adversely affect the integrity of North Dublin Bay cSAC as regards the conservation objectives set for Mudflats and sandflats not covered by seawater at low tide and no reasonable scientific doubt remains as to the absence of such effects.

5.3.1.1.3.3 Mitigation

A Water Quality Management Plan will be implemented for the duration of the proposed construction works. A draft Water Quality Management Plan is presented in Section 3.5.9 of the CEMP at Appendix 5 of the NIS.

Construction Phase Best Practice Measures

Mitigation measures will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA) and the Northern Ireland Environment Agency (NIEA);
    - GPP2: Above Ground oil storage tanks
    - PPG3: use and design of oil separators in surface water drainage
    - GPP5: Works and maintenance in or near water
    - PPG6: Working at construction and demolition sites
    - GPP8: Safe Storage and disposal of used oils
    - GPP13: Vehicle washing and cleaning
    - PPG20: Dewatering underground ducts and chambers
    - GPP21: Pollution incident response planning
    - GPP22: Dealing with spills
- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

Suspended Sediment and Sedimentation Measures

Suspended sediment, including all soils, sands and rubble is the single main pollutant to the aquatic environment generated at construction sites and largely arises from the erosion of exposed soils and

sediments by surface water runoff. The contractor will implement appropriate erosion and sediment controls during construction to prevent sediment pollution.

Demolition of existing buildings and structures, berth construction and construction of landside ancillary works

These demolition and construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principles and good working practices as listed in the Netregs Pollution Prevention Guidelines. In addition to the requirements of best practice and relevant guidelines, the following mitigation measures will be employed by the principal contractor during the construction phase.

- Where preferential surface flow paths occur, silt fencing or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.
- Where works are to occur within or in close proximity to the adjacent waterbodies silt curtains will be employed to mitigate against the re-suspension of settled sediments.
- In the event that dewatering of foundations or drainage trenches is required during construction and/or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

Capital Dredging and Disposal

A Dredging Management Plan has been prepared and is located at Section 3.5.10 of the CEMP at Appendix 5 of the NIS. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted. The following key relevant mitigation measures will apply to each dredging campaign in the MP2 Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel shall be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site.

- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).
- A documented Accident Prevention Procedure is to be in place prior to commencement.
- A documented Emergency Response Procedure is to be in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

No other capital or maintenance dredging will take place at Dublin Port at the same time as the MP2 Project capital dredging to ensure that there is no overlap in dredging operations that might result in cumulative impacts. A Dredging Management Plan is presented in Section 3.5.10. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted.

Concrete and Cement Pollution Measures

The impacts in relation to cement and concrete for the MP2 Project are, for the most part (but not limited to); demolition of buildings and structures, construction of piles and foundations for the proposed berthing areas, quay walls etc, the installation of the concrete berthing area areas (to be poured in-situ) and construction of landside ancillary works. The following mitigation measures will be implemented:

- Breaking of concrete (associated with structure demolition) has the potential to emit alkaline dust into the receiving environment. A barrier between the dust source and the sensitive receptor (the water body in this case) will be erected to limit the possibility of dust contacting the receptor.
- Concrete use and production will adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water (2017). Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash etc.; and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10 metres from the aquatic zone.
- The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.
- Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

General Construction Works

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/spillages of fuels, oils, other chemicals and waste water) will be controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels. The contractor will implement the following measures during construction:

- The final CEMP will be prepared which will contain all the measures identified in the draft CEMP (at Appendix 5 of the NIS) and will also include any additional measures required by conditions attached to developments consents granted in respect of the proposed development;
- Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions, and include all mitigation required by the CEMP;
- Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants.
- The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:
    - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
    - The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011);

A project specific Pollution Incident Response Plan has been prepared consistent with DPC's Environmental Emergency Plan. This is located at Section 3.5.11 of the CEMP at Appendix 5 of the NIS. The Pollution Incident Response Plan for the construction works has been prepared in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures as detailed in the CEMP are implemented, the finalisation of this document is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

Operational Phase

Storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly into the marine environment from new jetties and hardstanding areas. The surface

water drainage system will consist, inter alia, of heavy duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water into an appropriate full retention oil separator which will trap oils and silts prior to being discharges into the harbour waters through a non-return flap valve. A readily and safely accessible monitoring chamber will be provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged,

The oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: "Use and design of oil separators in surface water drainage systems: PPG3" (Environment Agency, 2006) and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must comply with this standard. In accordance with PPG3 a class 1 bypass separator will be required for general and car parking areas of the site whilst a class 1 full retention separator will be required for the HGV parking and loading area. Notwithstanding this, full retention separators are proposed for each phase of the development and will be sized in accordance with a design flow of 590l/s for a six hour duration storm and the drainage area to be serviced.

Following the implementation of this pollution prevention mitigation, construction and operation of the MP2 Project will not adversely affect the integrity of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.4 SOUTH DUBLIN BAY CSAC

5.4.1 Water Quality and Habitat Deterioration effects

5.4.1.1 Mudflats and sandflats not covered by seawater at low tide

5.4.1.1.1 Conservation Objectives

Within North Dublin Bay cSAC three benthic community types are recorded in this Annex I habitat. The conservation objective for this marine habitat is to maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC, as defined by four conservation attributes and targets which relate to the three benthic community types:

Habitat Area:	The permanent habitat area is stable or increasing, subject to natural processes
Community extent:	Maintain the extent of the *Mytilus edulis* dominated community, subject to natural processes
Community structure (Mytilus edulis density):	Conserve the high quality of the *Mytilus edulis* dominated community, subject to natural processes
Community distribution:	Conserve the following community types in a natural condition:

- Fine sand to sandy mud with *Pygospio elegans* and *Crangon crangon* community complex
- Fine sand with *Spio martinensis* community complex

NPWS (2013) notes that in relation to habitat area, the conservation target refers to activities or operations that propose to permanently remove habitat from a site, thereby reducing the permanent amount of habitat area, rather than long or short term disturbance to the biology of the site. Given the distance of the site from the MP2 Project, constructing or operating the MP2 Project will not present any threat to maintaining the conservation target for area of Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC.

Conservation targets for the *Mytilus edulis* community seek to maintain its extent and conserve its high quality. The conservation target for community distribution seeks to conserve the two remaining principal benthic communities of the Annex I habitat in a natural condition.

5.4.1.1.2 Potential Significant Effects

The Annex I mudflat and sandflat habitat of North Dublin Bay cSAC is less than 1km by sea from the locations of proposed capital dredging. The Screening appraisal at Section 4 above concluded that in the absence of plume modelling, uncertainty remains as to the risk that may arise from deposition of dredge plumes in relation to the conservation objectives set for the principal benthic communities of the Annex I habitat and as such likely significant effects could not be excluded.

The screening appraisal also concluded in relation to other potential sources of pollution at construction and operational stage that despite the significant capacity of the Liffey and Tolka Estuaries to dilute elevated concentrations of polluting substances, given the proximity of the MP2 Project to the mudflat and sandflat Annex I habitat. As such likely significant effects could not be excluded.

5.4.1.1.3 Assessment of Effects

5.4.1.1.3.1 Dredging

As noted above in Sections 5.2.2 and 5.3.1, coastal process modelling was used in conjunction with hydrographic and sediment surveys to predict the dispersion and settlement of sediment plumes generated during dredging activities in Dublin Port. Modelling outputs and an assessment of the effects of dredging as a result of the construction of the MP2 Project is included at Appendix 4 of the NIS.

As set out in Section 5.3.1.1.3.1 above in relation to potential significant water quality and habitat deterioration effects of dredging on North Dublin Bay cSAC, dredging activities at Berth 53, the channel widening area south of the channel, at Oil Berth 3 and Berth 50A were simulated for one month to represent the full dredging operation in each area.

Plume diagrams of the dispersion of silts during dredging of Berth 53 showing the suspended sediment concentration of silt in the water column are illustrated in Figures 10-13 of Appendix 4 of the NIS. The predicted deposition of silt fractions lost to the water column during the dredging of Berth 53 at the end of a simulated one-month dredging campaign is illustrated in Figure 14 of Appendix 4.

These figures show that the suspended sediment concentration plumes are confined to the northern half of the navigation channel at all times and are generally less than 25 mg/l beyond the immediate dredge area. The lateral extent of the 10mg/l plume envelope is generally less than 750m under most tidal conditions. The volume of material deposited outside of the dredge area is generally less than 0.40g/m^2 and the deposition of sediment is generally confined to within the immediate area of dredging.

Plume diagrams of the dispersion of silts during Channel Dredging Works showing the suspended sediment concentration of silt in the water column are illustrated in Figures 15-18 of Appendix 4 of the NIS. The predicted deposition of silt fractions lost to the water column during Channel Dredging Works at the end of a simulated one-month dredging campaign is illustrated in Figure 19 of Appendix 4.

These figures show that the suspended sediment concentration plumes are confined to the southern half of the navigation channel and are generally less than 25 mg/l beyond the immediate dredge area. The lateral extent of the 10mg/l plume envelope is generally less than 600m under most tidal conditions. The volume of material deposited outside of the dredge area is generally less than 0.30g/m2 and the deposition of sediment is generally confined to within the immediate area of dredging.

Plume diagrams of the dispersion of silts during dredging of Oil Berth 3 and Berth 50A showing the suspended sediment concentration of silt in the water column are illustrated in Figures 21-23 of Appendix 4 of the NIS. The predicted deposition of silt fractions lost to the water column during dredging of Oil Berth 3 and Berth 50A at the end of a simulated one-month dredging campaign is illustrated in Figure 24 of Appendix 4.

These figures show that the suspended sediment concentration plumes are confined to within Oil Berth 3 and the northern half of the navigation channel and are generally less than 35 mg/l beyond the immediate source point. While there is a relatively small and very local predicted increase in suspended solids due to dredging at Oil Berth 3 and Berth 50A, this is well within the background range experienced at these locations during normal Port operations. The volume of material deposited outside of the dredge area is generally less than 8g/m2 and the deposition of sediment is generally confined to within the immediate area of dredging.

It can, therefore, be concluded that dredging activities at Berth 53, the channel widening area south of the channel, at Oil Berth 3 and Berth 50A will not result in any significant impact to water quality in the Lower Liffey channel and Tolka estuary. Plumes do not extent as far as South Dublin Bay cSAC under any modelled wave and tidal scenario.

The coastal processes assessment at Appendix 4 provides scientific certainty that the risk of suspended sediments escaping into the wider marine environment beyond the dredge area at Berth 53, Oil Berth

3, Berth 50A or in the channel will not imperil the conservation objectives set for the principal benthic communities of the Annex I Mudflats and sandflats not covered by seawater at low tide habitat within South Dublin Bay cSAC.

Dredging of Berth 53, Oil Berth 3, Berth 50A or Channel Widening will not adversely affect the integrity of North Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.4.1.1.3.2 Potential Sources of Pollution

As outlined in Section 5.3.1.1.3.2 above in relation to potential sources of pollution and the risks posed in relation to North Dublin Bay cSAC, as well as the possibility of mobilised suspended sediments due to dredging or disposal, cement release through general construction activities or spillages of polluting substances are also a potential source of pollution to the marine environment at construction phase, as a result of:

- Demolition of buildings & structures;
- Berth Construction including the construction of waterside berths, quay walls, jetties, open piled structures
- Landside ancillary works to serve the marine operations including the construction of ramps and deck structures to access linkspans, services and drainage installation, and installation of jetty furniture and fender systems
- Accidental release of highly alkaline contaminants from concrete and cement during the demolition of buildings and structures and the construction of hardstand areas, waterside berths, quay walls, jetties, bridging structures
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals

Operational phase impacts associated with the MP2 Project (buildings/structures, berths and associated marine berthing and manoeuvring, and landside works) represents an increase in use of the land over the current normal day-to-day port activities. These associated impacts are currently well understood and managed within the Port's operational and maintenance procedures. The principal potential sources of water quality impact are:

- Increased suspended sediment levels due to port operations including the ongoing maintenance dredging of the proposed new berths;
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals and releases associated with the operation and maintenance of surface water drainage systems;
- Discharges from dredging vessels at construction stage and vessels using the berths of the operational MP2 Project (ballast water, wastewater, oil spillages, fuel bunkering);
- Discharges from cargo handling (leakages from containers, bulk material spillages, losses from conveyor systems);

- Discharges from cargo storage areas and onward transportation (losses from hoppers, flat bulk stores and HGVs).

If any pollution event were to result in a significant spillage into South Dublin Bay cSAC it could adversely affect the conservation target for Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC. Accordingly, mitigation measures are proposed in order to avoid or reduce harmful effects of any pollution event.

5.4.1.1.3.2.1 Air Pollution

Operational phase traffic can impact directly on local air quality and any sensitive receptors that are located in proximity to the road network, such as wetland habitats of European sites. Emissions from vehicles and shipping vessels may increase in the future, leading to greater levels of deposition of gaseous pollutants on wetland habitats of European sites.

The Institute of Air Quality Management (IAQM) has produced guidance for the assessment of the air quality impacts of development on designated nature conservation sites (IAQM, 2019). Gaseous pollutants, critical levels below which significant harmful effects are not thought to occur have been adopted by, amongst others, the European Union and the United Nations Economic Commission for Europe (UNECE) and are used as regulatory standards. These are summarised in Table 2.1 of IAQM (2019), and the Critical Load for Nitrous Oxides is 30 µg/m^3. An Air Quality assessment in contained at Appendix 2 to the NIS and has predicted increases in gaseous pollutants as a result of traffic on the road network during the operation stage of the MP2 Project in line with the increased throughput of cargo and passengers as predicted under the Masterplan. Table 1.19 makes predictions of average annual nitrous oxide levels in four locations (at Santry, East Wall Road, Sherriff Street Upper and Pigeon House Road). Predicted increases are as follows:

- *R1 (Royal Oak Housing (Santry)*

  Increase of 1.19 µg/m^3 by 2040 to 25.89 µg/m^3 from a 2018 baseline of 24.70 µg/m^3
- *R2 (Residential Housing on East Wall Road)*

  Increase of 0.77 µg/m^3 by 2040 to 24.03 µg/m^3 from a 2018 baseline of 23.26 µg/m^3
- *R3 (Apartments on Sheriff Street Upper)*

  Increase of 1.48 µg/m^3 by 2040 to 23.24 µg/m^3 from a 2018 baseline of 21.76 µg/m^3
- *R4 (Residential Houses on Pigeon House Road)*

  Increase of 1.02 µg/m^3 by 2040 to 25.82 µg/m^3 from a 2018 baseline of 24.80 µg/m^3

This analysis makes clear that the average annual Average NO2 levels predicted with the MP2 Project in place are below the critical load for NOx. IAQM (2019) advises that in circumstances where these predicted concentrations exceed 1% of the critical level/load either alone or in-combination, they should be passed onto the Ecologist. The values range between 2.5% - 5% of the critical load for NOx, but

more importantly, the critical load is not exceeded as a result of the MP2 Project and the highest predicted concentrations do not exceed 90% of critical load. Mitigation is not required.

The MP2 Project will not adversely affect the integrity of North Dublin Bay cSAC as regards the conservation objectives set for Mudflats and sandflats not covered by seawater at low tide and no reasonable scientific doubt remains as to the absence of such effects.

5.4.1.1.3.3 Mitigation

A Water Quality Management Plan will be implemented for the duration of the proposed construction works. A draft Water Quality Management Plan is presented in Section 3.5.9 of the CEMP at Appendix 5 of the NIS.

Construction Phase Best Practice Measures

Mitigation measures will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA) and the Northern Ireland Environment Agency (NIEA);
    - GPP2: Above Ground oil storage tanks
    - PPG3: use and design of oil separators in surface water drainage
    - GPP5: Works and maintenance in or near water
    - PPG6: Working at construction and demolition sites
    - GPP8: Safe Storage and disposal of used oils
    - GPP13: Vehicle washing and cleaning
    - PPG20: Dewatering underground ducts and chambers
    - GPP21: Pollution incident response planning
    - GPP22: Dealing with spills
- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

Suspended Sediment and Sedimentation Measures

Suspended sediment, including all soils, sands and rubble is the single main pollutant to the aquatic environment generated at construction sites and largely arises from the erosion of exposed soils and sediments by surface water runoff. The contractor will implement appropriate erosion and sediment controls during construction to prevent sediment pollution.

Demolition of existing buildings and structures, berth construction and construction of landside ancillary works

These demolition and construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principles and good working practices as listed in the Netregs Pollution Prevention Guidelines. In addition to the requirements of best practice and relevant guidelines, the following mitigation measures will be employed by the principal contractor during the construction phase.

- Where preferential surface flow paths occur, silt fencing or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.
- Where works are to occur within or in close proximity to the adjacent waterbodies silt curtains will be employed to mitigate against the re-suspension of settled sediments.
- In the event that dewatering of foundations or drainage trenches is required during construction and/or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

Capital Dredging and Disposal

A Dredging Management Plan has been prepared and is located at Section 3.5.10 of the CEMP at Appendix 5 of the NIS. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted. The following key relevant mitigation measures will apply to each dredging campaign in the MP2 Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel shall be permitted while the dredging activity is being carried out within the inner Liffey Channel.

- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site.
- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).
- A documented Accident Prevention Procedure is to be in place prior to commencement.
- A documented Emergency Response Procedure is to be in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

No other capital or maintenance dredging will take place at Dublin Port at the same time as the MP2 Project capital dredging to ensure that there is no overlap in dredging operations that might result in cumulative impacts. A Dredging Management Plan is presented in Section 3.5.10. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted.

Concrete and Cement Pollution Measures

The impacts in relation to cement and concrete for the MP2 Project are, for the most part (but not limited to); demolition of buildings and structures, construction of piles and foundations for the proposed berthing areas, quay walls etc, the installation of the concrete berthing area areas (to be poured in-situ) and construction of landside ancillary works. The following mitigation measures will be implemented:

- Breaking of concrete (associated with structure demolition) has the potential to emit alkaline dust into the receiving environment. A barrier between the dust source and the sensitive receptor (the water body in this case) will be erected to limit the possibility of dust contacting the receptor.
- Concrete use and production will adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water (2017). Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash etc.; and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10 metres from the aquatic zone.
- The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water

body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.

- Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

General Construction Works

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/spillages of fuels, oils, other chemicals and waste water) will be controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels. The contractor will implement the following measures during construction:

- The final CEMP will be prepared which will contain all the measures identified in the draft CEMP (at Appendix 5 of the NIS) and will also include any additional measures required by conditions attached to developments consents granted in respect of the proposed development;
- Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions, and include all mitigation required by the CEMP;
- Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants.
- The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:
    - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
    - The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011);

A project specific Pollution Incident Response Plan has been prepared consistent with DPC's Environmental Emergency Plan. This is located at Section 3.5.11 of the CEMP at Appendix 5 of the NIS. The Pollution Incident Response Plan for the construction works has been prepared in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures as detailed in the CEMP are implemented, the finalisation of this document is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant

personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

Operational Phase

Storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly into the marine environment from new jetties and hardstanding areas. The surface water drainage system will consist, inter alia, of heavy duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water into an appropriate full retention oil separator which will trap oils and silts prior to being discharges into the harbour waters through a non-return flap valve. A readily and safely accessible monitoring chamber will be provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged,

The oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: “Use and design of oil separators in surface water drainage systems: PPG3” (Environment Agency, 2006) and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must comply with this standard. In accordance with PPG3 a class 1 bypass separator will be required for general and car parking areas of the site whilst a class 1 full retention separator will be required for the HGV parking and loading area. Notwithstanding this, full retention separators are proposed for each phase of the development and will be sized in accordance with a design flow of 590l/s for a six hour duration storm and the drainage area to be serviced.

Following the implementation of this pollution prevention mitigation, construction and operation of the MP2 Project will not adversely affect the integrity of Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.5 SOUTH DUBLIN BAY & RIVER TOLKA ESTUARY SPA

5.5.1 Aerial Noise and Visual Disturbance effects

The resulting effects of disturbance stimuli on waterbirds are variable. Disturbance can lead to a reduction in feeding time, and birds can expend greater levels of energy walking or flying away in response to disturbance. It is important to note that not all observed effects (e.g. walking or flying away) equate to negative impacts (e.g. reduced foraging success, decrease in survival, reduced fitness of the population). The term habituation is used to describe birds that have become accustomed to particular sources of disturbance.

There is potential for aerial noise and visual disturbance effects on breeding and non-breeding waterbird SCIs of South Dublin Bay and River Tolka Estuary SPA from construction and operation of the MP2 Project. Significant noise producing activities, and the movement of personnel and machinery has the potential to cause disturbance.

Construction and operation the MP2 Project will involve a range of activities emitting aerial noise and associated movement of people, vehicles and vessels at the eastern end of the Port in the MP2 Project area and dredging activity in the river channel.

The proposed construction works will be undertaken over period of approximately 9 years, with existing port operations continuing during the construction period.

5.5.1.1 Breeding waterbird Conservation Objectives

The conservation objective for Roseate Tern and Arctic Tern is to maintain the favourable conservation condition of the two species in South Dublin Bay and River Tolka Estuary SPA, as defined by five conservation attributes and targets. Prey biomass available is dealt with separately in Section 5.5.2.2. The remaining conservation targets are:

Passage population: Individuals:	No significant decline
Distribution: Roosting areas:	No significant decline
Barriers to connectivity:	No significant increase
Disturbance at roosting site:	Human activities should occur at levels that do not adversely affect the numbers of roseate tern (or arctic tern) among the post-breeding aggregation of terns

The target for the SSCO attribute '*Passage population: Individuals*' is measured in 'number'. The target for '*Distribution: Roosting areas*' is measured in 'Number; location; area (hectares)'. The target for '*Barriers to connectivity'* is measured in 'Number; location; area (hectares)'. The target for '*Disturbance at roosting site'* is measured in 'Level of impact'.

The conservation objective for Common Tern is to maintain the favourable conservation condition of the species in South Dublin Bay and River Tolka Estuary SPA, as defined by nine conservation attributes and targets. Prey biomass available is dealt with separately in Section 5.5.2.2. The remaining conservation targets are:

Breeding population abundance: apparently occupied nests (AONs):	No significant decline
Productivity rate: fledged young per breeding pair:	No significant decline
Passage population: Individuals:	No significant decline
Distribution: *breeding colonies*:	No significant decline
Barriers to connectivity:	No significant increase

Disturbance at breeding site:	Human activities should occur at levels that do not adversely affect the breeding common tern population
Disturbance at roosting site:	Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns

The target for the SSCO attribute '*Breeding population abundance: apparently occupied nests (AONs)'* is measured in 'number'. The target for the SSCO attribute '*Productivity rate: fledged young per breeding pair'* is measured in 'mean number'. The target for the SSCO attribute '*Passage population: Individuals*' is measured in 'number'. The target for '*Distribution: breeding colonies'* is measured in 'Number; location; area (hectares)'. The target for '*Distribution: Roosting areas*' is measured in 'Number; location; area (hectares)'. The target for '*Barriers to connectivity'* is measured in 'Number; location; area (hectares)'. The target for '*Disturbance at breeding site'* is measured in 'Level of impact'. The target for '*Disturbance at roosting site'* is measured in 'Level of impact'.

5.5.1.2 Non-breeding waterbird Conservation Objectives

South Dublin Bay & River Tolka Estuary SPA is designated for 13 no regularly occurring migratory waterbird species including 3 no breeding and/or passage species of tern, and wetland habitat. Grey Plover is proposed for removal from the list of SCIs for South Dublin Bay and River Tolka Estuary SPA, and, as a result, Conservation Objectives (COs) have not been set for this species. However, for the sake of completeness, Grey Plover was a SCI when the site was notified to the Commission and it has been included in this appraisal. As such, SCI species considered are:

- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Knot (*Calidris canutus*) [A143]
- Sanderling (*Calidris alba*) [A144]
- Dunlin (*Calidris alpina*) [A149]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Redshank (*Tringa totanus*) [A162]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

The conservation objectives for the overwintering species SCIs in the SPA is to maintain the favourable conservation condition of the SCI species in the SPA, as defined by 2 no SSCO attributes and targets:

Population trend:	Long term population trend stable or increasing
Distribution:	No significant decrease in the range, timing or intensity of use of areas by the target species, other than that occurring from natural patterns of variation

The targets for the SSCO attribute 'Population trend' is measured in '% change'. The target for 'Distribution' is measured in 'Range, timing and intensity of use of areas'. The North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA Conservation Objectives Supporting Document (NPWS, 2014) notes that factors that can adversely affect the achievement of these objectives include activities that modify discreet areas or the overall habitat(s) within the SPA in terms of how one or more of the listed species use the site (e.g. as a feeding resource) and which could result in the displacement of these species from areas within the SPA and/or a reduction in their numbers.

5.5.1.3 Surveys conducted to inform the Assessment

5.5.1.3.1 Non-breeding waterbird surveys

There is a long history of bird surveys in the area of the MP2 Project from the 1990s to 2019 and the results of all of these surveys have been reviewed for this project. The Irish Wetland Bird Survey (I-WeBS) has been carried out consistently between 1994/95 and 2018/19 covering the entire intertidal area of Dublin Bay (Crowe 2005, Boland & Crowe 2012). This is normally undertaken on a rising tide but is confined to the months of September to March each year. Additional surveys of this area have been undertaken at low tide during all months between July 2013 and March 2019 as part of the Dublin Bay Birds Project which is funded by Dublin Port Company. A series of surveys of all waterbirds in the Tolka Estuary was undertaken within two hours either side of low tide as part of the Dublin Bay Birds Project. Birds were counted and mapped in their foraging areas from a series of vantage points on the northern, eastern and southern shorelines of the estuary (Figure 5.25). During these Tolka Estuary counts there was no intertidal exposure in the area immediately to the north of the proposed Berth 53.

To ensure that the area north of Berth 53 was adequately assessed, additional surveys were undertaken on eight dates in 2018 and 2019. These dates were selected in advance as some intertidal substrate may be exposed in the area within 200m of Berth 53 when the tide falls below the 0.25m OD level. At levels in excess of this no intertidal area is exposed. On the lowest spring tides, both a gravel zone and a sandflat area are exposed. However, atmospheric pressure and wind direction can affect the height of tide and there are a number of these dates when there is no intertidal exposure in the area of the proposed Berth 53. Some of the extreme low tides during winter occur in darkness or semi-darkness. For this reason, floodlighting was used to survey the birds foraging on the site on some of the dates.

Figure 5.25 Low tide survey area in the Tolka Estuary during the period 2013 to 2019

The area immediately to the north of the proposed Berth 53 is covered by shallow water at most stages of the tidal cycle. However, intertidal substrate within the MP2 Project area is exposed when the tide falls below about 0.25m OD. At levels in excess of this no intertidal area is exposed. On the lowest spring tides, both a gravel zone and a sandflat area are exposed (Plate 5.1). Table 5.6 outlines the species that were recorded here.

Plate 5.1 Oystercatchers feeding on gravel north of the proposed Berth site 19 March 2003 (0.15m+LAT) (Photograph: John Coveney).

Table 5.6 Waterbirds recorded in the area within 200m of the proposed Berth 53 during extreme low tides on 8 dates in 2018 and 2019.

SCIs of South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA Bay are indicated by an asterisk (*) and shaded..

Date	01/02/18	02/02/18	31/03/18	10/10/18	21/01/19	22/01/19	20/02/19	21/03/19	Peak number
Survey times	*16:45-18:30*	*17:20-18:40*	*17:45-19:15*	*05:45-07:00*	*16:40-17:30*	*17:30-18:30*	*17:20-18:30*	*16:55-18:00*	
Low tide time	*17:45*	*18:30*	*18:15*	*06:30*	*17:17*	*17:57*	*17:42*	*17:25*	
Low tide height (m)	*0.20*	*0.20*	*0.23*	*0.25*	*0.20*	*0.24*	*0.05*	*0.01*	
Black-headed Gull*	0	0	2	0	0	0	0	400	400
Black-tailed Godwit*	43	0	0	0	0	0	0	1	43
Common Gull	0	0	3	0	0	0	0	35	35
Cormorant	0	0	1	0	0	0	0	0	1
Curlew*	5	0	0	0	0	0	0	0	5
Great Black-backed Gull	0	0	19	0	0	0	5	10	19
Great Crested Grebe	0	0	1	0	0	0	0	0	1
Grey Heron	2	0	0	0	0	0	0	0	2
Herring Gull	260	0	68	0	70	0	81	290	290
Oystercatcher*	15	0	4	0	0	0	1	0	15
Pale-bellied Brent Goose*	0	0	0	0	0	0	2	2	2
Redshank*	0	0	0	0	0	0	0	1	1
Total	325	0	98	0	70	0	89	739	739

5.5.1.3.2 Breeding tern surveys

From 2013 to 2018 monitoring of Common Terns and Arctic Terns nesting within Dublin Port has been carried out by BirdWatch Ireland as part of the Dublin Bay Birds Project which is funded by Dublin Port Company. The author has been a member of the survey team for this period. The monitoring involved a census of Apparently Occupied Nests (AON) on each of these structures following the methods of Mitchell et al. (2004) andBirdWatch Ireland carried out additional studies on the tern colony including ringing and productivity estimates. On two separate dates each year, two surveyors undertook walked transects through each subsite of the colony recording the number of egg clutches of each species present. One clutch of eggs is treated as one Apparently Occupied Nest (AON). Monitoring was carried out under licence. Locations of the Tern Colony subsites are illustrated in Figure 4.4. The total nesting populations on each of these structures in 2018 are given in Table 5.7. A comparison between total number of nests in each of the sub-sites over the six years 2013-2018 is given in Table 5.8.

The number of nests in the overall colony had declined in 2016 due to the partial collapse of the ESB Dolphin and possible disturbance on the CDL Dolphin but this was partly buffered by the provision of

the two DPC pontoons. The ESB Dolphin was reconstructed on 2017 but the number of nests in the port colony in 2017 was treated as a minimum figure as no census was undertaken on the ESB Dolphin in that year.

Table 5.7 The breeding tern colony in Dublin Port on four nesting structures in 2018

Structure	Common Tern nests 2018	Arctic Tern nests 2018	Total nests 2018
CDL Dolphin	87	18	105
ESB Dolphin	150	2	152
Pontoon TP 1	131	1	132
Pontoon TP 2	201	2	203
Total colony	**569**	**23**	**592**

Table 5.8 The total number of Common and Arctic Tern nests at each of the breeding structures in Dublin Port between 2013 and 2018[1].

Subsite	2013	2014	2015	2016	2017	2018
CDL Dolphin	25	76	58	0	24	105
ESB Dolphin[2]	418	427	416	382	n/a	152
Pontoon TP1[3]	1	38	73	7	84	132
Pontoon TP2[4]	-	-	1	114	305	203
Total colony	**444**	**541**	**548**	**503**	**(413)[2]**	**592**

1. Data on breeding tern populations was collected by BirdWatch Ireland as part of the Dublin Bay Birds Project which is funded by Dublin Port Company.
2. The total number of nests in the colony in 2017 is treated as an absolute minimum as no census was undertaken the ESB Dolphin in that year.
3. DPC Pontoon TP1 was deployed for the first time in 2013.
4. DPC Pontoon TP2 was deployed in 2015

5.5.1.4 Assessment of Effects

The sounds that birds hear can be divided into threatening and non-threatening sounds. Examples of non-threatening sounds are wave noise on a beach or constant traffic noise from a road. Threatening sounds include impulsive sounds such as gunfire, explosion or barking of a dog. The sound of construction is not impulsive (sudden, loud or shocking) but tends to be continuous and low frequency noise such as that made by machinery and vehicular traffic. On average, birds hear less well than many mammals, including humans. Acoustic deterrents or gas banger devices are not generally effective because birds habituate to them and eventually ignore them completely. Devices that purport to use sound frequencies outside the hearing range of humans are most certainly inaudible to birds as well because birds have a narrower range of hearing than humans do (Birkhead 2012).

Disturbance often implies a short-term or temporary effect that is unlikely to impact upon the individuals or populations of waterbirds concerned. However, it is a term that covers a wide range of responses in waterbirds. Waterbirds are defined as “birds that are ecologically dependent on wetlands’’ (Ramsar Convention 1971). Disturbance is any situation in which human activities cause a bird to behave differently from the behaviour it would be reasonably expected to exhibit without the presence of that

activity. In the estuarine environment, disturbance can manifest in a number of forms of varying severity depending on the nature, duration and intensity of the disturbance source:

- Birds looking up or heads raised, temporarily stopping feeding or roosting
- Birds moving away from the cause of the disturbance by walking or swimming before resuming previous activity
- Birds taking flight and landing somewhere in the same feeding area or roosting site
- Birds taking flight and leaving their preferred foraging or roosting area completely

Dooling (2002) reviewed the literature on how well birds can hear in noisy (windy) conditions and suggested that birds cannot hear certain mechanical noises as well as humans can in these conditions. Results of a trial for a colony of a different species, the Crested Tern *(Sterna bergii)* in Australia, found that the maximum responses observed, preparing to fly or flying off, were restricted to exposures to simulated aircraft noise levels of greater than 85 dB(A). A scanning behaviour involving bead-turning was the minimum response, and this, or a more intense response, was observed in nearly all birds at all levels of exposure. However, an intermediate response, an alert behaviour, demonstrated a strong positive relationship with increasing exposure. It was suggested that visual stimulus is likely to be an important component of aircraft noise disturbance (Brown 1990). The proposed development will not be visible from the tern colony.

Wright *et al.* (2010) investigated the effects of impulsive noise on water birds and reported that disturbance at levels above 65.5dB(A) are more likely to result in behavioural response of some kind rather than no response. At above 72.25dB(A) flight with abandonment of the site became the most likely outcome of the disturbance.

Cutts *et al*. (2009) considered impacts to birds utilising the Humber Estuary and summarised the general thresholds due to the potential effects of construction disturbance on birds. Noise up to 50dB(A) is found to have no effect whereas noise between 50dB(A) and 85dB(A) causes head turning, scanning behaviour, reduced feeding and movement to nearby areas. Above 85dB(A), response includes preparing to fly away, flying away and possibly leaving the area (Refer to Figure 6 of the ornithological assessment at Appendix 7). The authors in that study recommend that ambient construction noise levels should be restricted to below 70dB(A). Birds will habituate to regular noise below this level (Cutts *et al*. 2009).

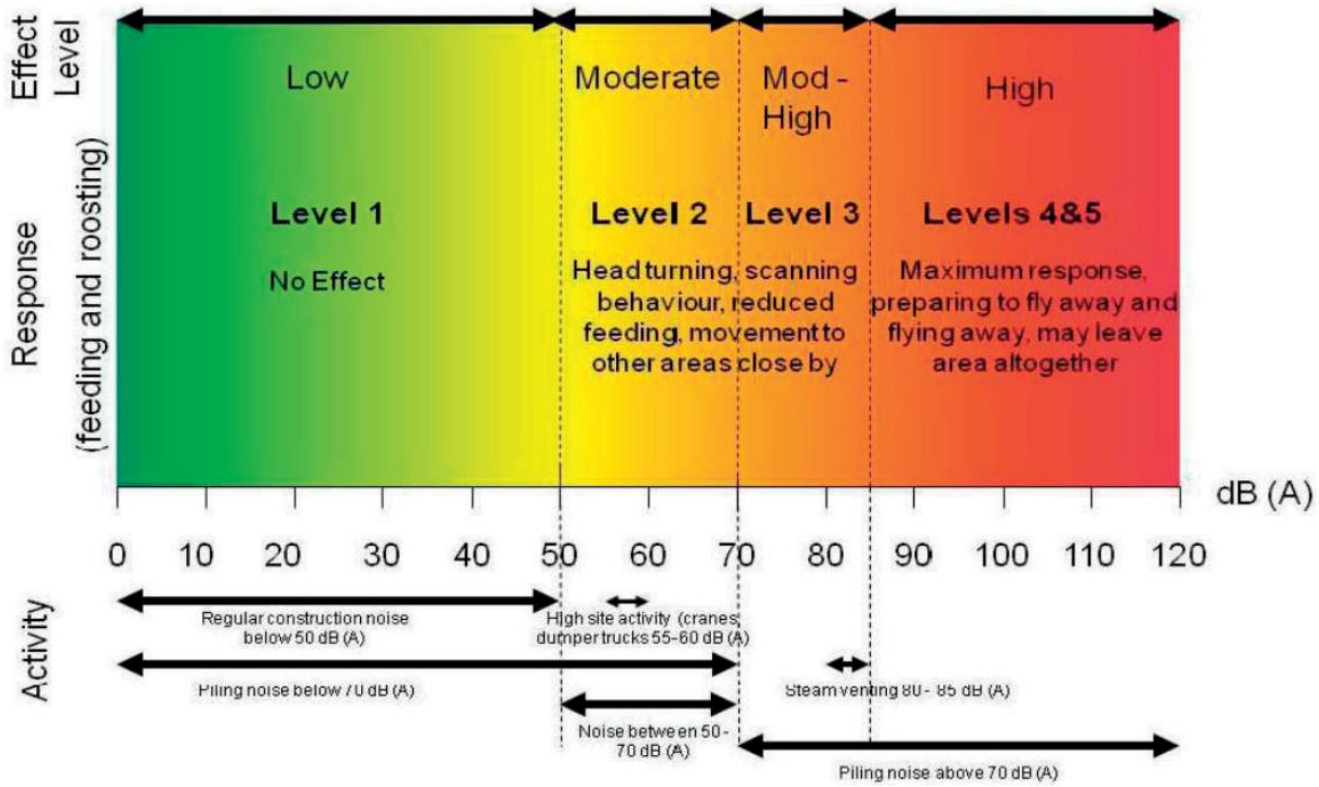

Figure 5.26 Waterbird response to construction disturbance (from Cutts et al. 2009)

IECS (2007) showed that birds were found in general, to accept a wide range of steady state noise level from 55dB(A), up to 85dB(A), therefore complete exclusion within up to 250m was considered very unlikely. Evidence presented by Cutts *et al*. (2009) from repair work to a pipeline in the Humber Estuary has shown that disturbed birds (within 100m) are likely to return within a short time frame once disturbance ceases, potentially within 30 minutes, and with no evidence of effects on numbers during surveys the following week, emphasising the short-term nature of any impacts.

A study was undertaken on the effects of piling noise and vibration disturbance in birds within the Humber Estuary SPA, Eastern England (RPS 2014). Despite consistent periods of double hydraulic piling activity on the landward side of the seawall on the Humber, birds appeared to be largely unaffected by the noise of piling. On some occasions, birds were recorded arriving to feed during periods of piling activity. It was considered that the screening of the mudflats by the seawall was effective in minimising disturbance effects. The study results suggest that any disturbance caused by piling activity may also have been due to the increased presence of people.

Phalan and Nairn (2007) reported on disturbance to waterbirds in South Dublin Bay. Waterbird numbers, human activities and disturbance events were systematically recorded at Irishtown in South Dublin Bay over a three-month period in the winter of 2000/2001. Birds feeding in the study area generally seemed habituated to people, dogs and vehicles that moved predictably along paths, and even to low-flying aircraft.

A review of the impacts of capital and maintenance dredging in the Tamar estuary, in south-west England, was published by Widdows *et al.* (2007). This estuary is a SPA under the EU Birds Directive which requires annual maintenance dredging as well as occasional capital dredging for new installations. Maintenance dredging here involves annual removal of between 5,000 and 200,000 tonnes of dry sediment per year. During two periods of capital dredging in the Tamar, the amount of sediment dredged was between 500,000 and 700,000 tonnes per year. Annual estimates for ten species of wildfowl and waders were analysed over several decades in the Tamar Estuary. There were no significant correlations between overwintering bird numbers and dredging activity. Declines in Teal and Wigeon over 30 years were related to milder winters which changed the migratory patterns of these species. An assessment of the ecological impacts of maintenance dredging noise in the Plymouth Sound and Estuaries European Marine Site reached similar conclusions (Debut Services, 2011)

Another source of disturbance to waterbirds would be the activity of construction workers close to the shoreline. Waders using Mutton Island in Galway Bay were studied over a period of 5 years, during and after the construction of a major sewage treatment plant which was situated between 150m and 200m from the main high tide roost. The waders became more concentrated on the undeveloped part of the island but otherwise showed no negative effects of disturbance. Numbers of birds using the roost were higher towards the end of the period as human disturbance decreased due to controls on access to the island and because of a high wall around the construction site which screened construction workers from the birds (Nairn, 2005).

The only bird species breeding in the site of the MP2 Project is Black Guillemot which is not a SCI of any SPA and it is not appraised in this report. Both Common Tern and Arctic Terns nest on several artificial structures within the port as described in Tables 5.6 and 5.7. The nearest of these structures is approximately 250m from the proposed construction area (Figure 4.4). During the breeding season (May to August) the birds nest in dense colonies on these structures. Their main foraging areas are in the wider area of Dublin Bay but occasionally the birds forage in the wake of ships moving through the port where prey items are brought to the surface by the movement of the ships.

At breeding seabird colonies, such as those which occur on some structures in Dublin Port, a response to disturbance can be a moderate response such as a heads up. A greater response is flushing (i.e. the entire colony flying away from the nests). Repeated flushing during incubation or chick-rearing periods can lead to egg or chick loss because of displacement from the breeding site, egg breakage or predation. Effects of flushing on birds that are not attending eggs or chicks include disruption of courtship, nest site defence and prospecting activities.

Worst-case predicted construction noise levels from the proposed development will be less than 50dB(A) at the tern nesting locations (see Figure 5.27). Cutts *et al*. (2009) describe 50dB(A) as being a noise threshold below which no effect of construction disturbance on birds has been observed to occur. A tern colony itself generates noise up to 70 to 80 dB(A) in the breeding season through the continuous calling of the terns (trial measurements carried out by Richard Nairn and Eugene McKeown

within Dublin Port, 09 June 2015). This would far exceed the noise being generated at the MP2 construction site.

At low spring tides in the months from May to September, terns occasionally use the area north of the proposed Berth 53 site for feeding by plunge-diving into the shallow water around exposed mudflats (Plate 5.4). As this exposure only occurs on a few dates each month and for short periods in daylight, the occurrence of tern feeding at the site is rare. The terns involved are almost certainly those which nest on the nearby mooring dolphins and pontoons on the south side of the River Liffey and in the Tolka Estuary (see Table 5.8). Terns feed mostly on small fish and they follow the fish shoals wherever they occur. They are not confined to particular areas for feeding.

Dredging will take place in the River Liffey channel during construction of the proposed development. Terns have continued to forage in the River Liffey channel over the duration of Dublin Port's regular maintenance dredging operations over the period 2012 – 2018 (Dumping at Sea permit S0024-01) in addition to capital dredging permitted by the ABR Project. Their breeding populations in Dublin Port have been increasing during this period (refer Table 5.7). Their principal foraging areas are in the wider Dublin Bay and birds can be seen commuting to and from these areas throughout the breeding season.

The MP2 Project will not adversely affect the integrity of the site as regards the conservation objectives set for its breeding waterbirds SCIs and no reasonable scientific doubt remains as to the absence of such effects.

Non-breeding waterbirds use the site north of the proposed Berth 53 in several different ways. This depends largely on the time of year and tidal level, although factors such as weather conditions and disturbance are undoubtedly important. At normal barometric pressure there will be on average only 40 occasions per year. At some low spring tides, when some intertidal sediment is exposed for short periods, flocks of waders and gulls select this area for feeding (Plate 5.2 and Plate 5.3). The visits by waterbird flocks are generally short and infrequent due to the limited period of exposure (usually a maximum of 1-2 hours per day). Most of the extreme low tide periods in winter months occur in darkness or poor light. Waterbirds do not use the site at other parts of the tidal cycle (median or high tides) or on other dates when spring tides do not occur. There are no non-breeding waterbird high tide roosts on or close to the site.

Plate 5.2 Birds feeding on intertidal exposure north of proposed Berth 53 (Tide level 0.23m OD) 31 March 2018 (Photo: John Fox)

Plate 5.3 Birds feeding on intertidal exposure north of proposed Berth 53 (Tide level 0.01m OD) 21 March 2019 (Photo: Richard Nairn)

Plate 5.4 Common terns and black-headed gulls feeding at the site of proposed Berth 53 (Tide level 0.25m+LAT), 24 July 2001 (Photo: John Coveney)

Table 5.6 shows that 6 feature species of South Dublin Bay and River Tolka Estuary SPA occur in that part of South Dublin Bay and River Tolka Estuary SPA that is within 200m of proposed Berth 53 and the heritage installations. Those species are:

- Black-headed Gull
- Black-tailed Godwit
- Curlew
- Oystercatcher
- Pale-bellied Brent Goose
- Redshank

In consultation with the acoustics consultants, worst-case predicted noise levels at six locations (refer Figure 5.25) in the South Dublin Bay and River Tolka Estuary SPA were predicted to better understand the likelihood of aerial noise induced effects at construction stage. The highest worst-case predicted noise level of 63 dB(A) occurs at location C immediately to the north of Berth 53. This is close to but importantly below the noise threshold of 65.5dB(A) cited in Wright *et al.* (2010) as being the value above which impulsive construction noise is more likely to result in a behavioural response of some kind.

At locations A, B, D, E and F predicted worst-case noise levels range from 45-49 dB(A) which is below the value of 50dB(A) cited in Cutts *et al*. (2009) as being a noise threshold below which no effect of construction disturbance on birds was observed to occur, providing certainty beyond reasonable scientific doubt.

All predicted worst-case noise levels are below the thresholds cited as being likely to result in the greatest levels of disturbance, i.e. flight abandonment above 72.25dB(A) [Wright *et al.* (2010)]; and flying away and possibly leaving the area above 85dB(A) [Cutts *et al*. (2009)]. At location C, temporary behavioural effects are likely to occur which are categorised as ranging between head turning and scanning behaviour at the lower end of the spectrum, to reduced feeding and movement to nearby areas at the higher end of the spectrum.

The feature species that use this part of the site do so only at very low tides. At normal barometric pressure there will be on average only 40 occasions per year when the tidal levels are low enough (below 0.35m CD) for waders to feed in this part of the SPA (and approximately 23 low tides each year between September and March when the non-breeding SCIs are generally present and using the SPA). Each event when the tide is below 0.35m will on average last for just under 1 hour. During these periods six non-breeding waterbird feature species of South Dublin Bay and River Tolka Estuary SPA forage here on sand and gravel and while wading in shallow water. These birds will not occur in proximity to the construction noise arising at Berth 53 and the heritage installations as often as they might otherwise do if that part of the Tolka estuary was available at all low tidal states (and there are approximately 700 low tides per annum or approximately 400 low tides each year between September and March when the non-breeding SCIs are generally present and using the SPA).

Although this is a small part of the SPA, and is only available for intertidal feeding on average 23 times each year for one hour at a time, loss of attractiveness of this part of the SPA as a result of construction of elements of the MP2 Project when it would otherwise be available would decrease the range, timing or intensity of use of this part of the South Dublin Bay & River Tolka Estuary SPA for the feature species of the SPA which use it.

Mitigation measures must be applied at construction stage to prevent noise (and principally pile-driving activities) from significantly decreasing the range, timing or intensity of use of this part of the South Dublin Bay & River Tolka Estuary SPA when it becomes available for the feature species of the SPA that use it.

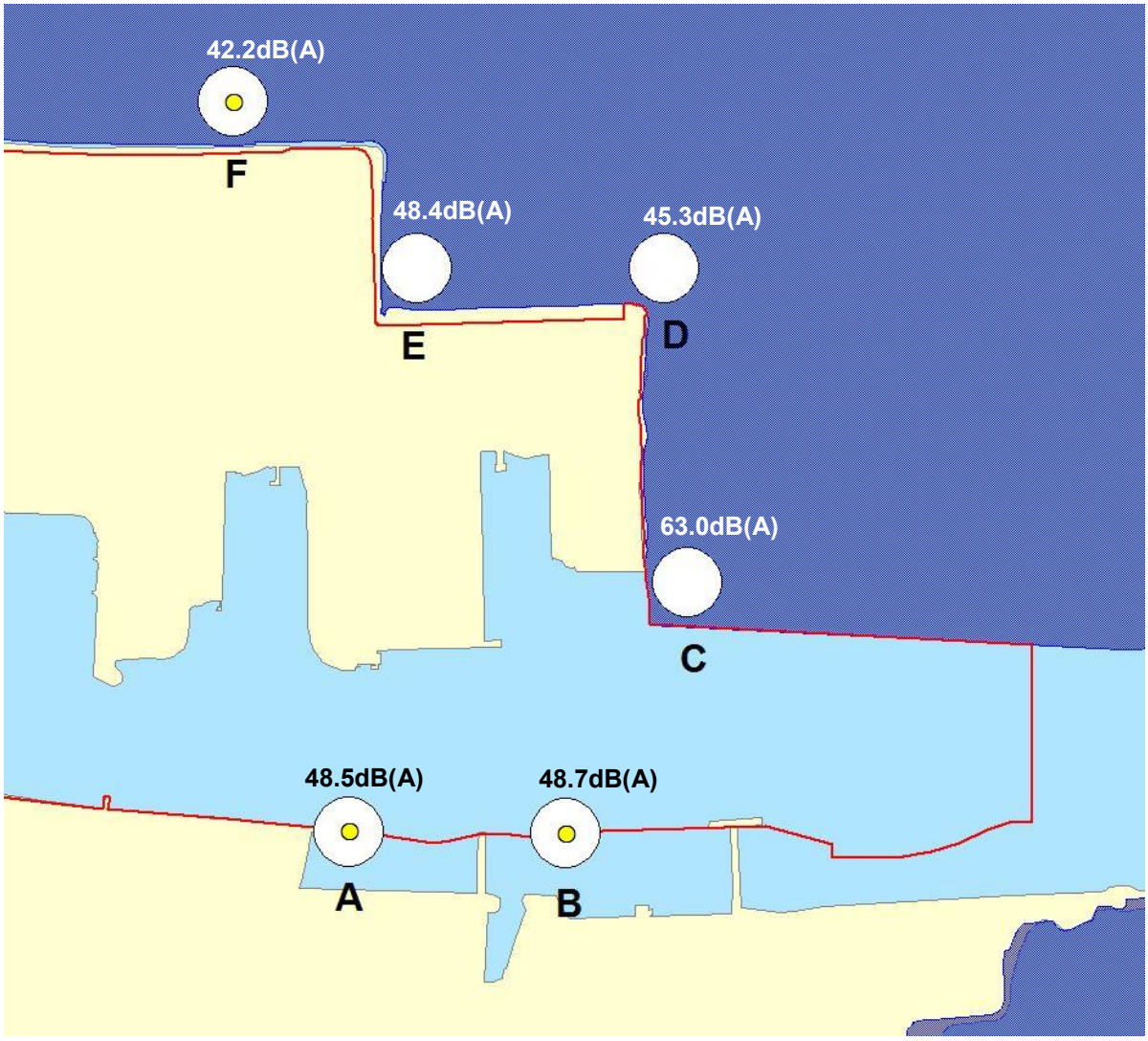

Figure 5.27 Locations and values of worst-case noise levels

(Tern nest sites in yellow, SPA in dark blue)

5.5.1.5 Mitigation

A Bird Management Plan will be implemented for the duration of the proposed construction works. A draft Bird Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

The capital dredging scheme will be confined to the winter months (October – March) when the terns have migrated from the site.

Construction of Berth 53 and heritage installations will temporarily cease during periods of greatest low spring tides to avoid disturbance at exposed feeding grounds within the Tolka Estuary.

Gates will be used at the site of the Greenway to control the movement of people during periods of greatest low spring tides, again, to avoid disturbance at feeding grounds within the Tolka Estuary.

Following the implementation of mitigation to prevent disturbance, construction and operation of the MP2 Project will not adversely affect the integrity of the South Dublin Bay and River Tolka Estuary SPA

as regards the conservation objectives set for its breeding and non-breeding waterbird SCIs and no reasonable scientific doubt remains as to the absence of such effects.

5.5.2 Water Quality and Habitat Deterioration effects

5.5.2.1 Wetlands

The Screening appraisal at Section 4 concluded that at operational stage, Berth 53 and its associated berthing pocket could possibly result in changes to the existing tidal patterns, currents or wave action in an adjacent area of South Dublin Bay & River Tolka Estuary, and may result in localised changes to the transport sediment regime or morphology of the seafloor in the SPA, such changes could potentially decrease in the range, timing or intensity of use of parts of the South Dublin Bay & River Tolka SPA by the wintering SCI species. If that were to occur, it could potentially undermine the conservation targets set for overwintering SCIs in either or both of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA.

5.5.2.1.1 Morphological changes to the Tolka Estuary

The coastal processes assessment at Appendix 4 of the NIS contains at Section 5 an analysis of potential changes to the sediment transport regime to determine if operating Berth 53 would disrupt the circulation patterns and sediment transport processes that may impact upon foraging areas within the Tolka Estuary during low tide, due to the changes in bathymetry and construction of the Berth 53.

To assess the potential operational phase impact of ship movements in the area of Berth 53, propeller and thruster jet scour calculations were undertaken for representative ship manoeuvres from navigational simulation studies, as described in Section 1.5.2.3 of Appendix 4.

This assessment found that, under normal conditions the piled deck structure of Berth 53 results in a small localised change to the sea bed within the SPA but that this principally occurs in the subtidal and as such would have a very limited effect on intertidal bird feeding areas. Simulations also found that when ship bow thrusters operated at 100%, the resultant peak axial velocity at the boundary of the SPA will be *c.* 4.3m/s and that this velocity would likely result in scour of the neighbouring SPA area. This was considered potentially significant as it could impact the long term stability of the dredged side slope at Berth 53 and thus, in the longer term, potentially affect bed levels and modify the position of the lowest astronomical tide across the winter foraging areas within the SPA. Such an effect could result in a decrease in the range, timing or intensity of use of this area by the six non-breeding waterbird feature species that use it (refer Section 5.5.1.4 above).

Mitigation is required to prevent morphological changes in the Tolka Estuary significantly decreasing the range, timing or intensity of use of this part of the South Dublin Bay & River Tolka Estuary SPA when it becomes available for the feature species of the SPA that use it.

5.5.2.1.2 Mitigation

To mitigate the potential operational impact of the MP2 Project as described above, a wash protection structure has been designed to reduce scouring associated with manoeuvring vessels within the Berth

53 area. The design and performance of this wash protection structure was assessed and quantified through an extensive numerical modelling programme.

The sediment transport regime was simulated using the 3D coupled MIKE 3 Hydrodynamic and Sediment Transport model described in Section **Error! Reference source not found.** of Appendix 4, in conjunction with the post-project scenario model with the wash protection structure *in situ.* The morphological response of the seabed in the area of Berth 53 was assessed over a typical month of tides. The seabed in this area was represented by gravely sandy silt, sandy gravel and fine sand in the wider Tolka estuary area. This distribution of sediments is illustrated in Figure 44 of Appendix 4 and was based on information derived from the Particle Size Analysis described in Section **Error! Reference source not found.** of Appendix 4

The assessment found the wash protection structure effectively reduced propeller and thruster jet velocities caused by manoeuvring ships and therefore reduced scour in the area of Berth 53. To determine if the morphological response of the seabed in the area of Berth 53 with the wash protection structure *in situ* would impact on foraging areas within the Tolka Estuary, the position of the Lowest Astronomical Tide (LAT) mark following one month of typical tides were compared for pre-project scenario and post-project scenario model runs. The predicted change to the position of LAT is illustrated in Figure 5.28 (reproduced from Figure 45 of Appendix 4). This figure shows that the change to the position of LAT as a result of the MP2 Project will be negligible. The only predicted change was localised accretion immediate behind the wash protection structure in subtidal areas below the LAT mark.

This area which becomes available for short periods on few occasions shall not be reduced.

Overall the particular area under consideration will remain available and the project will not result in a decrease in the range, timing or intensity of use of this area by the six non-breeding waterbird SCI species that regularly use it.

Figure 5.28 Position of the Lowest Astronomical Tide mark post ABR (red line) and post MP2 with the thruster screen in situ (green line).

Following the implementation of mitigation to prevent long term morphological changes to the Tolka Estuary, operation of the MP2 Project will not adversely affect the integrity of the South Dublin Bay and River Tolka Estuary SPA as regards the conservation objectives set for its non-breeding waterbird SCIs and no reasonable scientific doubt remains as to the absence of such effects.

5.5.2.2 Prey biomass available for Breeding waterbirds

The Screening appraisal concluded that in the absence of measures intended to avoid or reduce pollution at construction and operational stages of the proposed development, the possibility of likely significant effects on prey biomass available for breeding terns in South Dublin Bay & River Tolka Estuary SPA could not be excluded.

Accordingly, mitigation measures are proposed in order to avoid or reduce harmful effects of any pollution event.

5.5.2.2.1 Mitigation

A Water Quality Management Plan will be implemented for the duration of the proposed construction works. A draft Water Quality Management Plan is presented in Section 3.5.9 of the CEMP at Appendix 5 of the NIS.

Construction Phase Best Practice Measures

Mitigation measures will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA) and the Northern Ireland Environment Agency (NIEA);
    - GPP2: Above Ground oil storage tanks
    - PPG3: use and design of oil separators in surface water drainage
    - GPP5: Works and maintenance in or near water
    - PPG6: Working at construction and demolition sites
    - GPP8: Safe Storage and disposal of used oils
    - GPP13: Vehicle washing and cleaning
    - PPG20: Dewatering underground ducts and chambers
    - GPP21: Pollution incident response planning
    - GPP22: Dealing with spills
- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

Suspended Sediment and Sedimentation Measures

Suspended sediment, including all soils, sands and rubble is the single main pollutant to the aquatic environment generated at construction sites and largely arises from the erosion of exposed soils and sediments by surface water runoff. The contractor will implement appropriate erosion and sediment controls during construction to prevent sediment pollution.

Demolition of existing buildings and structures, berth construction and construction of landside ancillary works

These demolition and construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principles and good working practices as listed in the Netregs Pollution Prevention Guidelines. In addition to the requirements of best practice and relevant guidelines,

the following mitigation measures will be employed by the principal contractor during the construction phase.

- Where preferential surface flow paths occur, silt fencing or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.
- Where works are to occur within or in close proximity to the adjacent waterbodies silt curtains will be employed to mitigate against the re-suspension of settled sediments.
- In the event that dewatering of foundations or drainage trenches is required during construction and/or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

Capital Dredging and Disposal

A Dredging Management Plan has been prepared and is located at Section 3.5.10 of the CEMP at Appendix 5 of the NIS. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted. The following key relevant mitigation measures will apply to each dredging campaign in the MP2 Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel shall be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site.
- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).
- A documented Accident Prevention Procedure is to be in place prior to commencement.
- A documented Emergency Response Procedure is to be in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

No other capital or maintenance dredging will take place at Dublin Port at the same time as the MP2 Project capital dredging to ensure that there is no overlap in dredging operations that might result in cumulative impacts. A Dredging Management Plan is presented in Section 3.5.10. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted.

Concrete and Cement Pollution Measures

The impacts in relation to cement and concrete for the MP2 Project are, for the most part (but not limited to); demolition of buildings and structures, construction of piles and foundations for the proposed berthing areas, quay walls etc, the installation of the concrete berthing area areas (to be poured in-situ) and construction of landside ancillary works. The following mitigation measures will be implemented:

- Breaking of concrete (associated with structure demolition) has the potential to emit alkaline dust into the receiving environment. A barrier between the dust source and the sensitive receptor (the water body in this case) will be erected to limit the possibility of dust contacting the receptor.
- Concrete use and production will adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water (2017). Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash etc.; and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10 metres from the aquatic zone.
- The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.
- Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

General Construction Works

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/spillages of fuels, oils, other chemicals and waste water) will be controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels. The contractor will implement the following measures during construction:

- The final CEMP will be prepared which will contain all the measures identified in the draft CEMP (at Appendix 5 of the NIS) and will also include any additional measures required by conditions attached to developments consents granted in respect of the proposed development;
- Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are

being carried out in accordance with required permits, licences, certificates and planning permissions, and include all mitigation required by the CEMP;

- Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants.
- The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:
    - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
    - The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011);

A project specific Pollution Incident Response Plan has been prepared consistent with DPC's Environmental Emergency Plan. This is located at Section 3.5.11 of the CEMP at Appendix 5 of the NIS. The Pollution Incident Response Plan for the construction works has been prepared in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures as detailed in the CEMP are implemented, the finalisation of this document is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

Operational Phase

Storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly into the marine environment from new jetties and hardstanding areas. The surface water drainage system will consist, inter alia, of heavy duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water into an appropriate full retention oil separator which will trap oils and silts prior to being discharges into the harbour waters through a non-return flap valve. A readily and safely accessible monitoring chamber will be provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged,

The oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: “Use and design of oil separators in surface water drainage systems: PPG3” (Environment Agency, 2006) and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must

comply with this standard. In accordance with PPG3 a class 1 bypass separator will be required for general and car parking areas of the site whilst a class 1 full retention separator will be required for the HGV parking and loading area. Notwithstanding this, full retention separators are proposed for each phase of the development and will be sized in accordance with a design flow of 590l/s for a six hour duration storm and the drainage area to be serviced.

Following the implementation of this pollution prevention mitigation, construction and operation of the MP2 Project will not adversely affect the integrity of Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC and no reasonable scientific doubt remains as to the absence of such effects.

5.6 NORTH BULL ISLAND SPA

5.6.1 Aerial Noise and Visual Disturbance effects

The Screening stage appraisal concluded that possibility of likely significant disturbance effects on the non-breeding SCI species of North Bull Island SPA could not be excluded at the screening stage.

5.6.1.1 Non-breeding waterbird Conservation Objectives

North Bull Island SPA is designated for 17 no regularly occurring migratory waterbird species and wetland habitat.

The CO for the overwintering species SCIs in the SPA is to maintain the favourable conservation condition of the target species in the SPA, as defined by 2 no SSCO attributes and targets:

Population trend:	Long term population trend stable or increasing
Distribution:	No significant decrease in the range, timing or intensity of use of areas by the target species, other than that occurring from natural patterns of variation

The targets for the SSCO attribute 'Population trend' is measured in '% change'. The target for 'Distribution' is measured in 'Range, timing and intensity of use of areas'. The North Bull Island SPA & South Dublin Bay and River Tolka Estuary SPA Conservation Objectives Supporting Document (NPWS, 2014) notes that factors that can adversely affect the achievement of these objectives include activities that modify discreet areas or the overall habitat(s) within the SPA in terms of how one or more of the listed species use the site (e.g. as a feeding resource) and which could result in the displacement of these species from areas within the SPA and/or a reduction in their numbers.

NPWS (2014) also notes in relation to the conservation objective for wetland habitat that, in order to be in favourable condition, the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 3,904ha, other than that occurring from natural patterns of variation. It notes that the wetland habitats can be categorised into three broad types: subtidal; intertidal and supratidal, and that over time and though natural variation these sub-components of the overall wetland

complex may vary due to factors such as changing rates of sedimentation, erosion etc. Many waterbird species will use more than one of the habitat types for different reasons throughout the tidal cycle.

5.6.1.2 Assessment of Effects

As outlined in Section 5.5.1.3 above, a campaign of non-breeding waterbird surveys has informed the Habitats Directive appraisal in relation to North Bull Island SPA. Table 5.6 outlines those SCI species of North Bull Island SPA that regularly use the area of the Tolka Estuary proximate to Berth 53 and the heritage installations. This area is used by the same SCIs of North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA.

Section 5.5.1.4 presents the analysis of waterbird disturbance in relation to South Dublin Bay and River Tolka Estuary SPA but this analysis is equally applicable to the same SCIs of North Bull Island SPA that use this area.

The analysis concludes that although this is a small part of the South Dublin Bay and River Tolka Estuary SPA, and is only available for intertidal feeding on average 23 times each year for one hour at a time, loss of attractiveness of this part of the SPA as a result of construction of elements of the MP2 Project when it would otherwise be available would decrease the range, timing or intensity of use of this part of the SPA for the feature species of North Bull Island SPA which use it.

Mitigation measures must be applied at construction stage to prevent noise, including pile-driving activities, and visual stimuli causing disturbance and significantly decreasing the range, timing or intensity of use of this part of the South Dublin Bay & River Tolka Estuary SPA when it becomes available for the feature species of North Bull Island SPA that use it.

5.6.1.3 Mitigation

A Bird Management Plan will be implemented for the duration of the proposed construction works. A draft Bird Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

Construction of Berth 53 and heritage installations will temporarily cease during periods of greatest low spring tides to avoid disturbance at exposed feeding grounds within the Tolka Estuary.

Gates will be used at the site of the Greenway to control the movement of people during periods of greatest low spring tides, again, to avoid disturbance at feeding grounds within the Tolka Estuary.

Following the implementation of mitigation to prevent disturbance, construction and operation of the MP2 Project will not adversely affect the integrity of North Bull Island SPA as regards the conservation objectives set for its non-breeding waterbird SCIs and no reasonable scientific doubt remains as to the absence of such effects.

5.7 SUMMARY OF MITIGATION MEASURES

5.7.1 Water Quality

A Water Quality Management Plan will be implemented for the duration of the proposed construction works. A draft Water Quality Management Plan is presented in Section 3.5.9 of the CEMP at Appendix 5 of the NIS.

5.7.1.1 Construction Phase Best Practice Measures

Mitigation measures will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP), Pollution prevention guidelines (PPGs) in relation to a variety of activities developed by the Environment Agency (EA), the Scottish Environmental Agency (SEPA) and the Northern Ireland Environment Agency (NIEA);
- GPP2: Above Ground oil storage tanks
- PPG3: use and design of oil separators in surface water drainage
- GPP5: Works and maintenance in or near water
- PPG6: Working at construction and demolition sites
- GPP8: Safe Storage and disposal of used oils
- GPP13: Vehicle washing and cleaning
- PPG20: Dewatering underground ducts and chambers
- GPP21: Pollution incident response planning
- GPP22: Dealing with spills
- Fisheries Guidelines for Local Authority Works. Department of Communications, Marine & Natural Resources, Dublin, (Anonymous, 1998);
- Guidelines on protection of fisheries habitats during construction projects (Eastern Regional Fisheries Board, 2006);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.

5.7.1.2 Suspended Sediment and Sedimentation Measures

5.7.1.2.1 Demolition of existing buildings and structures, berth construction and construction of landside ancillary works

These demolition and construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principles and good working practices as listed in the Netregs Pollution Prevention Guidelines. In addition to the requirements of best practice and relevant guidelines, the following mitigation measures will be employed by the principal contractor during the construction phase.

- Where preferential surface flow paths occur, silt fencing or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.
- Where works are to occur within or in close proximity to the adjacent waterbodies silt curtains will be employed to mitigate against the re-suspension of settled sediments.
- In the event that dewatering of foundations or drainage trenches is required during construction and/or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

5.7.1.2.2 Capital Dredging and Disposal

A Dredging Management Plan has been prepared and is located at Section 3.5.10 of the CEMP at Appendix 5 of the NIS. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted. The following key relevant mitigation measures will apply to each dredging campaign in the MP2 Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel shall be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site.
- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).

- A documented Accident Prevention Procedure is to be in place prior to commencement.
- A documented Emergency Response Procedure is to be in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

No other capital or maintenance dredging will take place at Dublin Port at the same time as the MP2 Project capital dredging to ensure that there is no overlap in dredging operations that might result in cumulative impacts. A Dredging Management Plan is presented in Section 3.5.10. The Contractor will comply with all measures and mitigation contained therein to ensure that water quality is not significantly impacted.

5.7.1.3 Concrete and Cement Pollution Measures

The impacts in relation to cement and concrete for the MP2 Project are, for the most part (but not limited to); demolition of buildings and structures, construction of piles and foundations for the proposed berthing areas, quay walls etc, the installation of the concrete berthing area areas (to be poured in-situ) and construction of landside ancillary works. The following mitigation measures will be implemented:

- Breaking of concrete (associated with structure demolition) has the potential to emit alkaline dust into the receiving environment. A barrier between the dust source and the sensitive receptor (the water body in this case) will be erected to limit the possibility of dust contacting the receptor.
- Concrete use and production will adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water (2017). Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash etc.; and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10 metres from the aquatic zone.
- The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.
- Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

5.7.1.4 General Construction Works

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/spillages of fuels, oils, other chemicals and waste water) will be

controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels. The contractor will implement the following measures during construction:

- The final CEMP will be prepared which will contain all the measures identified in the draft CEMP (at Appendix 5 of the NIS) and will also include any additional measures required by conditions attached to developments consents granted in respect of the proposed development;
- Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions, and include all mitigation required by the CEMP;
- Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants.
- The use of oils and chemicals on-site will receive significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:
    - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and PPG 26 “Safe storage – drums and intermediate bulk containers” (Environment Agency, 2011) shall be implemented to ensure safe storage of oils and chemicals;
    - The safe operation of refuelling activities shall be in accordance with PPG 7 “Safe Storage – The safe operation of refuelling facilities” (Environment Agency, 2011);

A project specific Pollution Incident Response Plan has been prepared consistent with DPC's Environmental Emergency Plan. This is located at Section 3.5.11 of the CEMP at Appendix 5 of the NIS. The Pollution Incident Response Plan for the construction works has been prepared in accordance with PPG 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures as detailed in the CEMP are implemented, the finalisation of this document is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

5.7.1.5 Operational Phase

Storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly into the marine environment from new jetties and hardstanding areas. The surface water drainage system will consist, inter alia, of heavy duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water into an appropriate full retention oil separator which will trap oils and silts prior to being discharges into the harbour waters through a non-return flap valve. A readily and safely accessible monitoring

chamber will be provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged,

The oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: “Use and design of oil separators in surface water drainage systems: PPG3” (Environment Agency, 2006) and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must comply with this standard. In accordance with PPG3 a class 1 bypass separator will be required for general and car parking areas of the site whilst a class 1 full retention separator will be required for the HGV parking and loading area. Notwithstanding this, full retention separators are proposed for each phase of the development and will be sized in accordance with a design flow of 590l/s for a six hour duration storm and the drainage area to be serviced.

5.7.2 Marine Mammals

A Marine Mammal Management Plan will be implemented for the duration of the proposed construction works. A draft Marine Mammal Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

A Dredging Management Plan will also be implemented for the duration of the proposed construction works. A draft Dredging Management Plan is presented in Section 3.5.10 of the CEMP at Appendix 5 of the NIS.

The following precautionary measures will be undertaken to minimise the risk of injury or disturbance to marine mammals in the area of operations in line with National Parks and Wildlife Service (NPWS) Guidelines (2014):

- A trained and experienced Marine Mammal Observer (MMO) will be put in place during piling, dredging, demolition and dumping operations. The MMO will scan the surrounding area to ensure no marine mammals are in a pre-determined exclusion zone in the 30-minute period prior to operations. The NPWS exclusion zone is 500m for dredging and demolition works and 1,000m for piling activities.
- Noise-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring is not possible, the sound-producing activities will be postponed until effective visual monitoring is possible. Visual scanning for marine mammals (in particular harbour porpoise) will only be effective during daylight hours and if sea conditions are WMO Sea State 4 (≈Beaufort Force 4 conditions) or less.
- For piling activities, where the output peak sound pressure level (in water) exceeds 170 dB re: 1µPa @ 1m, a ramp-up procedure will be employed following the pre-start monitoring. Underwater acoustic energy output will commence from a lower energy start-up and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.

- If there is a break in piling / dredging activity for a period greater than 30 minutes then all pre-activity monitoring measures and ramp-up (where this is possible) will recommence as for start-up.
- Once normal operations commence (including appropriate ramp-up procedures), there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate, nor if marine mammals occur within a radial distance of the sound source that is 500m for dredging and demolition works, and 1,000m for piling activities.
- Any approach by marine mammals into the immediate (<50m) works area will be reported to the National Parks and Wildlife Service.
- The MMO will keep a record of the monitoring using a 'MMO form location and effort (coastal works)' available from the National Parks and Wildlife Service (NPWS) and submit to the NPWS on completion of the works.
- In line with best international practice, a combination of visual and acoustic mitigation techniques will be used to ensure there are no significant impacts on all Annex II marine species, including harbour porpoise, grey seal and harbour seal. Static Acoustic Monitoring (SAM) through the deployment of CPODs will be used. Four stations will be monitored, including three at the disposal site to the west of the Burford Bank and one control site within Dublin Bay. These stations will be monitored pre-construction, during construction and for a minimum of two years post-construction in line with best international practice. This technique is to complement and not replace visual techniques.
- The deployment of a SAM system will complement and extend the extensive database currently being collected as part of the ABR Project environmental monitoring programme.

5.7.3 Waterbird disturbance

A Bird Management Plan will be implemented for the duration of the proposed construction works. A draft Bird Management Plan is presented in Section 3.5.7 of the CEMP at Appendix 5 of the NIS.

The capital dredging scheme will be confined to the winter months (October – March) when the terns have migrated from the site.

Construction of Berth 53 and heritage installations will temporarily cease during periods of greatest low spring tides to avoid disturbance at exposed feeding grounds within the Tolka Estuary.

Gates will be used at the site of the Greenway to control the movement of people during periods of greatest low spring tides, again, to avoid disturbance at feeding grounds within the Tolka Estuary.

Following the implementation of mitigation to prevent disturbance, construction and operation of the MP2 Project will not adversely affect the integrity of the South Dublin Bay and River Tolka Estuary SPA as regards the conservation objectives set for its breeding and non-breeding waterbird SCIs and no reasonable scientific doubt remains as to the absence of such effects.

5.7.4 Effectiveness of Mitigation Measures

5.7.4.1 Evidence of Effectiveness

The Annual Environmental Monitoring Reports** required under EPA Dumping at Sea Permit S0024-01 summarise environmental monitoring works undertaken during construction of ABR Project to confirm the efficacy of the mitigation measures implemented as part of construction phase of ABR.

** 1st AER available at http://www.epa.ie/licences/lic_eDMS/090151b280601fc9.pdf
2nd AER available at http://www.epa.ie/licences/lic_eDMS/090151b2806845db.pdf

5.7.4.1.1 Water Quality

In agreement with the competent authority, monitoring stations were established in the Port to provide detailed information on relevant water quality parameters. They measure real time water quality and continuously relay the data to a shore based location for compliance assessment. Trigger levels of dissolved oxygen (falling below 6 mg/l) and peak suspended solids (rising more than 100 mg/l above background levels) that initiate investigations have been set.

High frequency water quality monitoring at three locations in the port has shown water quality to be satisfactory during the period reported. Occasional low dissolved oxygen and high turbidity values were recorded but these were of no environmental significance and did not reflect any environmental effects of construction activities associated with the ABR Project.

Data collected during a maintenance dredging campaign provides evidence that the disposal of dredge material at the disposal site had no measurable effect on water quality outside the dumpsite, or even within the dump site at relatively short distances away from the spot where the dredger released its load. The same measures proposed in the ABR Water Quality Management Plan are to be applied in the MP2 Water Quality Management Plan described in Table 5.9.

5.7.4.1.2 Marine Mammals

Part of the environmental monitoring being undertaken as part of compliance with ABR project consents includes visual and acoustic monitoring of marine mammals. This also falls under the reporting procedure of the EPA Annual Environmental Report (AER) associated with Dumping at Sea Permit S0024-01.

In 2018, MMOs carried out 24 pre-start watches and 1,134 monitoring watches in advance of the start of dredging operations. Monitoring effort-watches were carried out during all transits of the dredging vessel between the loading sites and the disposal site.

A total of 105 mitigation measures were instigated by the MMOs during dredging operations, which all related to marine mammals being present in the Monitoring Zone. On the majority of occasions (102 out of 105) the dredge vessel relocated to a loading or dumping site where marine mammals were not present within the 500m Monitoring Zone. On the remaining three occasions, operations were permitted to commence once the animal had left the Monitoring Zone for a period of more than 30 minutes.

This demonstrates that the Marine Mammal Management Plan (MMMP) implemented for construction of the ABR Project contains mitigation that is effective. The same measures proposed in the ABR MMMP are to be applied in the MP2 MMMP described in Table 5.9.

5.7.4.2 Implementation of Mitigation Measures

DPC intends to appoint a Contractor(s) to undertake each phase of the works. Mitigation measures set out in the CEMP will form part of the Contract Documents for the construction stage to ensure that the Contractor undertakes the works required to implement the mitigation measures.

DPC has an established liaison group for the ABR Project which includes representatives of DPC, the Contractor, Dublin City Council (DCC) and The Department of Housing, Planning and Local Government (DHPLG) Foreshore Unit. The group meets at quarterly intervals each year with an agenda and minutes taken of the meetings. It is proposed that this liaison group will be maintained to provide environmental oversight of the construction phase of the MP2 Project also.

DPC will appoint a suitably qualified person to the role of Environmental Facilities Manager (Environmental Clerk of Works) to monitor the MP2 Project construction works. The Environmental Facilities Manager will have the authority to:

- review method statements;
- oversee work;
- provide instruction to the Contractor(s); and
- require the temporary cessation of works, where necessary.

The Environmental Facilities Manager will provide monthly reports to the members of the liaison group. The Environmental Facilities Manager will work closely with the Contractor's site supervisors to monitor activities and ensure that all relevant environmental legislation is complied with and that the requirements and implementation of the mitigation measures and relevant management plans of the CEMP are implemented.

Management plans of the CEMP relevant to the mitigation contained in the NIS and to be implemented are summarised in Table 5.9. This table includes details on reporting requirements and reporting procedures.

5.7.4.3 Monitoring of Effectiveness

Commission guidance (EC, 2019) requires that information must be provided on what arrangements will be put in place to monitor the effectiveness of the mitigation measures specified. Table 5.10 outlines the environmental monitoring programmes to be implemented by DPC of mitigation measures proposed in the NIS and CEMP. This table includes details on how monitoring effort is reported, reporting requirements, procedures and reporting frequency.

Table 5.9 Summary of Environmental Management Plans

Type of Environmental Management Plan	Ongoing Mitigation Required	Ongoing Mitigation Specific Requirements	Ongoing Monitoring/ Auditing Required	Timing of Ongoing Monitoring	Reporting Requirements	Reporting Procedures	Ongoing Liaison Required	Other Specific Requirements
Marine Mammals Management Plan	Yes	Compliance with NPWS Guidelines	Use of MMOs, installation of SAM system	Preconstruction, during construction and for 2 years after works completion	Monthly Reports, input to Annual Environmental Report	Report submitted to Planning Authority and NPWS	Yes	Close liaison required with NPWS
Birds and Marine Ecology Management Plan	Yes	Adherence to piling and dredging mitigation measures	Specialist surveys required	Preconstruction, during construction and for 2 years after works completion	Monthly Reports, input to Annual Environmental Report	Report submitted to Planning Authority and NPWS	Yes	Existing Black Guillemot nest boxes to be removed and replaced at specific time of year.
Water Quality Management Plan	Yes	Compliance with EPA Guidelines etc	Installation of real-time water quality monitoring system	Preconstruction and during construction	Monthly Reports, input to Annual Environmental Report	Report submitted to Planning Authority and EPA	Yes	Complaints Procedure
Dredging Management Plan	Yes	Adherence to dredging mitigation measures and compliance with Dumping at Sea Permit and Foreshore Licence	Yes	During Construction	Monthly Reports, input to Annual Environmental Report	Report submitted to Planning Authority and EPA	Yes	Complaints Procedure
Pollution Incident Response Plan	Yes	Adherence to guidelines for rapid and efficient response to minimize environmental impact	Monitoring of pollution events required and records of pollution prevention equipment.	During construction	Detailed record of all pollution events and responses, costs involved and environmental impacts.	Report submitted to Planning Authority and EPA	Yes	Specific training, and debriefing post pollution events to establish causes of events, lessons learned and preventive or corrective action required.

Table 5.10 Summary of Environmental Monitoring Programmes

Monitoring Programme	Monitoring Element	Frequency of Monitoring	Location	Parameters Measured	Surveyors / Support	Sampling Constraints	Action Threshold	Monitoring and Reporting	Report / Frequency
BIRDS	**Census of Common and Arctic Terns nesting in Dublin Port**	Annually in period 10 June to 15 July	Permanent Structures and Pontoons in Dublin Port	Number of apparently occupied nests (egg clutches or flush count).	2 / Boat Support	Moderate weather and sea conditions.		Bird Specialist	Annually (year ending March) by 31st July each year.
	Winter Wetland Birds	Monthly from October 1 to March 31 during each year of the project	Intertidal areas between Dún Laoghaire West Pier and Bull Wall.	Bird Flocks - species and approx. numbers.		Low tide ± 2 hours. Daylight. Good weather conditions.		Bird Specialist	Annually (year ending March) by 31st July each year.
MARINE MAMMALS	**Marine Mammal Observation in exclusion zones**	For piling, dredging, dumping and demolition operations within the foreshore	Within 500m of dredging /dumping operations. Within 1,000m of piling operations.	Presence of marine mammals	1 to 3 as required	Suitable vantage point. Accommodation on dredging vessels.	Presence of marine mammal in exclusion zone.	Marine Mammal Observer	NPWS MMO Location and Effort Forms
	Continuous Static Acoustic Monitoring	Ongoing data logging at four stations (to be confirmed)	4 locations in Dublin Bay	Echolocation clicks of dolphins and porpoises				Marine Mammal Ecologist	
	Seal Haul Out Sites Dublin Bay	Monthly	North Bull Island and adjacent areas. Dublin Bay within zones of influence.	Species. Maturity Stage. Behaviour.	Coordinate with NPWS surveys	Low water ± 2 hours.		Marine Mammal Ecologist	
MARINE BENTHOS	**Benthic Grab and Video Surveys**	Before and after capital dredging programme	Dublin Bay	Benthic Communities Biomass of major Phyla Granulometry Organic Matter Content	Boat Support	Good weather, sea and visibility conditions		Fisheries Specialist	

Monitoring Programme	Monitoring Element	Frequency of Monitoring	Location	Parameters Measured	Surveyors / Support	Sampling Constraints	Action Threshold	Monitoring and Reporting	Report / Frequency
	Beam Trawl Surveys	Before and after capital dredging programme	Dublin Bay	Fish Communities - Species rank / size ranges					
WATER QUALITY	**Water quality in lower Liffey in Dublin Port**	High frequency (15min) real time at four stations	4 locations Inner Liffey channel	Dissolved Oxygen Turbidity Temperature Salinity pH				Environmental Facilities Manager	

6 CONCLUSION OF THE HABITATS DIRECTIVE APPRAISALS

Having regard to the relevant legislation and the methodology followed, a Stage One Screening appraisal was undertaken as to whether or not the MP2 Project is likely to have a significant effect on ten SACs/cSACs and nine SPAs as described in Table 4.1.

LSEs could not be excluded at screening stage for the following European sites, without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the proposed development on the sites concerned:

- The possibility of likely significant Underwater Noise and Disturbance effects on:
    - the Grey seal population of Lambay Island cSAC;
    - the Harbour seal population of Lambay Island cSAC; and
    - the Harbour porpoise community of Rockabill to Dalkey Island SAC.

- The possibility of likely significant Water Quality and Habitat Deterioration effects on:
    - Mudflats and sandflats not covered by seawater at low tide in North Dublin Bay cSAC;
    - Mudflats and sandflats not covered by seawater at low tide in South Dublin Bay cSAC;
    - Reefs in Rockabill to Dalkey Island SAC;
    - the intertidal wetland areas of the Tolka Estuary as a resource for the regularly occurring migratory waterbirds of:
        (iii) South Dublin Bay & River Tolka Estuary SPA;
        (iv) North Bull Island SPA; and
    - the prey biomass available for the breeding waterbird Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA.

- The possibility of likely significant Aerial Noise and Visual Disturbance effects on:
    - the breeding waterbird Special Conservation Interest species Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA;
    - the non-breeding waterbird Special Conservation Interest species Special Conservation Interest species of South Dublin Bay & River Tolka Estuary SPA; and
    - the non-breeding waterbird Special Conservation Interest species of North Bull Island SPA.

A subsequent Stage Two appraisal of the implications of the MP2 Project on European sites in view of their conservation objectives was then undertaken so as to enable the competent authorities to determine if the proposed development would adversely affect the integrity of any European site.

Having considered the further investigation and analysis, which is set out in the NIS, the competent authorities may conclude that there will be no adverse effects upon the integrity of any European site with the application of mitigation measures.

Accordingly, the competent authorities may conclude, beyond reasonable scientific doubt, that the construction and operation of the MP2 Project will not adversely affect the integrity of any European site.