DUBLIN PORT COMPANY

Dublin Harbour Capital Dredging Project

Screening for Appropriate Assessment & Natura Impact Statement

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James McCrory CEcol CEnv MCIEEM CBiol MRSB		2021-07-01

Prepared by:

RPS Ireland Ltd (RPS)

James McCrory
Senior Associate

Elmwood House, 74 Boucher Road
Belfast, Co. Antrim BT12 6RZ

Prepared for:

Dublin Port Company (DPC)

Eamon McElroy
Port Engineer

Port Centre, Alexandra Road,
Dublin 1, Ireland

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1 INTRODUCTION

With the introduction of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitat 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 domestic legislation transposing Directive 92/43/EEC, and Special Protection Areas (SPAs, including proposed SPAs) classified under the Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) and designated under the same domestic 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. It should be noted that 'European sites' are defined in Regulation 2(1) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended ('the 2011 Regulations') and Section 177R of the Planning and Development Act 2000, as amended ('the 2000 Act').

1.1 Appropriate Assessment

1.1.1 The Habitats Directive

A key protection mechanism in the Habitats Directive is the requirement to subject plans and projects to Appropriate Assessment (AA) in line with the requirements of Article 6(3) of the Habitats Directive, which 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) defines a step-wise procedure for considering plans and projects:

- The first part of this procedure consists of a preliminary 'screening' stage 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 the first sentence of Article 6(3).
- The second part of the procedure, governed by the second sentence of Article 6(3), relates to the appropriate assessment and the decision of the competent national authorities.

1.1.2 Domestic Transposition

Screening

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.

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.

Appropriate Assessment

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.

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.

1.1.3 The Appropriate Assessment Process

According to European Commission guidance document 'Assessment of plans and projects significantly affecting Natura 2000 sites' (EC, 2001), the assessment requirements of Article 6 establish a step-by-step approach as follows:

Stage 1 - Screening for Appropriate Assessment: An initial or preliminary assessment of the project or plan's effect on a European site(s). If it cannot be concluded that there will be no significant effect upon a European site, an appropriate assessment of the implications of a plan or project must be conducted.

Stage 2 - Appropriate Assessment: The consideration of the impact of the project or plan on the integrity of a European site, either alone or in combination with other projects of plans, and with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts. A Natura Impact Statement or a Natura Impact Report is prepared at this stage.

Stage 3 – Assessment of alternative solutions: If assessment does not end after the preceding step, a further set of steps are envisaged. Stage 3 is a process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of a European site.

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain: An assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

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 this document which contains a Stage 1 screening appraisal for appropriate assessment and a Stage 2 appraisal for appropriate assessment is to provide Habitats Directive appraisals contained in a Natura Impact Statement ("NIS") to the competent authority to assist them in carrying out a screening for appropriate assessment in the first instance and, thereafter, an appropriate assessment of the implications of the Dublin Harbour Capital Dredging Project and associated dumping at sea 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 to the Office of Environmental Sustainability of the Environmental Protection Agency ("EPA") for a Dumping at Sea Permit, and an application to the Department of Housing, Local Government and Heritage ("DHLGH") for a Foreshore Licence.

This report seeks to assist the EPA and the DHLGH as public authorities under the 2011 Regulations in fulfilling their obligations to conduct a Stage 1 screening for appropriate assessment, and Stage 2 appropriate assessment.

1.3 Document Structure

1.3.1 Methodology and Guidance

Section 2 of the document, 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 proposed development, the general methodology sequence and activities to be undertaken.

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. In accordance with EC guidance and settled case law of the CJEU, 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.

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. At a Stage 2 appraisal, it is permissible to take into account mitigation measures proposed to avoid adverse effects of the proposed development.

2 METHODOLOGY

2.1 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);
- European Commission Notice "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); and
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites' (version 1.1). Institute of Air Quality Management, London (IAQM, 2020).

2.2 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* or negligible threshold – thus, plans or projects that have no appreciable or imperceptible effects 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.

2.3 Mitigation Measures

In determining whether or not likely significant effects will occur or can be excluded in the Stage 1 appraisal, 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 this screening stage appraisal. This approach is consistent with EU guidance and the case law of the Court of Justice of the European Union (CJEU).

EC (2001) states that "project and plan proponents are often encouraged to design mitigation measures into their proposals at the outset. However, it is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site". This direction in the European Commission's guidance document is unambiguous in that it does not permit the inclusion of mitigation at screening stage.

In April 2018, the Court of Justice of the European Union issued a ruling in case C-323/17 People Over Wind & Peter Sweetman v Coillte Teoranta ("People Over Wind") that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

The judgment in People Over Wind is further reinforced in EC (2019) which refers to CJEU Case C-323/17.

2.4 Consideration of ex-situ effects

EC (2019) advises that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites but which are likely to have significant effects on any of them.

The CJEU developed this point when it issued a ruling in case C-461/17 ("Brian Holohan and Others v An Bord Pleanála") that determined inter alia that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an appropriate assessment must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.

In that regard, consideration has been given in this Habitats Directive appraisal to implications for habitats and species located both inside and outside of the European sites considered in the screening appraisal with reference to those sites' Conservation Objectives where effects upon those habitats and/or species are liable to affect the conservation objectives of the sites concerned.

2.5 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.

2.5.1 Site-Specific Conservation Objectives

NPWS began preparing detailed Site-Specific Conservation Objectives (SSCOs) for European sites in 2011. The European sites within 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.

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. It is essential that the date and version are included when objectives are cited.

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 April 2021.

2.5.2 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. Whilst the Directive does not explicitly define which other plans and projects are within the scope of the in-combination provision of Article 6(3), it is important to note that the underlying intention of this provision is to take account of cumulative impacts, and these will often only occur over time.

In that context, one can consider plans or projects which are completed, approved but uncompleted, or proposed. EC (2019) specifically advises [on p43] 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

3.1 Project Description

The Dublin Harbour Capital Dredging Project at Dublin Port is being proposed for consent in accordance with the Dublin Port Masterplan, reviewed 2018. The Masterplan identifies the land uses and infrastructure projects on port lands which will allow the port to increase its capacity to 77.2 million gross tonnes by 2040. The Masterplan identifies that this is the ultimate capacity of Dublin Port.

The Dublin Harbour Capital Dredging Project brings forward for consent key elements of the capital dredging works required to create the required depth of the navigation channel, basins and berthing pockets.

The works proposed in the Dublin Harbour Capital Dredging Project comprise a number of elements:

- Deepening the navigation channel between North Wall Quay Extension and the Western Oil Jetty, including riverside Berth 35;
- Deepening of Alexandra Basin East and deepening/widening of berths;
- Deepening of the Oil Basin and widening of berths;
- Deepening of the Ferryport Basin;
- Deepening of riverside Berth 52;
- Widening the South Port (Berths 42 - 47) berths, and
- Removal of ridge between the navigation channel and the Poolbeg Oil Jetty (Berth 48).

The proposed capital dredging works will be restricted to the winter period (October – March). Maintenance dredging will be restricted to the summer period (April – September). This separation provides the clarity required by the EPA to enforce proposed separate capital and maintenance dredging Dumping at Sea Permits.

The loading of dredged material will be restricted to those areas of the navigation channel, basins and berthing pockets which contain sediments which are suitable for disposal at sea (Class 1 : uncontaminated, no biological effects likely). Confirmation of the suitability of the dredged sediments for disposal at sea is made through a programme of sediment chemistry sampling and analysis and eco-toxicological testing.

It is proposed to dispose of the dredged sediments at the existing licenced offshore disposal site located at the entrance to Dublin Bay to the west of the Burford Bank, (6.75 km from the lighthouse at the end of the Great South Wall). Dredging will be carried out by a trailer suction hopper dredger and/or backhoe dredger and support vessels.

The location of the proposed works are illustrated in Figure 3-1. The licenced offshore disposal site ("dump site") is illustrated in Figure 3-2.

The volume of capital dredging required for each element of the works, as described above, comprises approximately 500,000 cubic metres of material, as summarised in Table 3-1. This material consists mostly of silt and sand with elements of clay, gravel and cobbles. Individual dredge areas and the proposals for each of these areas is set out below.

Table 3-1 Capital Dredging Volumes

Dredge Zone	Estimated Dredge Volume above design (m^3)
Zone 1 – Navigation Channel	121,008
Zone 2 – South Port Berths	26,146
Zone 3 – Alexandra Basin East	47,020
Zone 4 – Oil Berths	7,842
Zone 5 – Ferryport Basin	27,970
Zone 6 – Riverside Berth 52	127,515
Zone 7 – Poolbeg Oil Jetty (Berth 48)	11,296
Dredge Volume (m^3)	368,797 m^3
Siltation Tolerance / Contingency (m^3)	131,203 m^3
Total Dredge Volume (m^3)	**500,000 m^3**

Note: Volumes include for all Berths to be widened to 50m (the existing Berths range from 24m to 35m wide)

3.1.1 Navigation Channel

Capital dredging is required within the main navigation channel between the North Wall Quay Extension and the Western Oil Jetty to deepen the channel from -7.8m CD to a standard depth of -10.0m CD. This element of dredging will complete the dredging of the navigation channel envisaged by the Alexandra Basin Redevelopment (ABR) Project, originally permitted under Foreshore Licence MB/2016/01725 but which only remains valid to 20th June 2022.

The dredging of the navigation channel will terminate 15m downstream of an existing 220 kV cable crossing of the River Liffey which is located between Poolbeg Marina and the terminus of the North Wall Quay Extension as shown in Figure 3-2. The cable lies at a depth of circa -10m CD. Terminating the capital dredging 15m downstream of the cable crossing creates a sufficient buffer to ensure it is not affected in any way.

The proposed capital dredging works will also enable the riverside Berth 35 at the southern end of Ocean Pier to operate at a standard depth of -10.0m CD. Berth 35 is designed for multi-purpose use utilising mobile cranes to transfer the cargo from ship to shore.

3.1.2 Alexandra Basin East

Alexandra Basin East hosts a number of port activities including a Lo-Lo (Lift-on Lift-off) Container Freight Terminal, Ro-Ro (Roll-on Roll-off) Freight Terminal and multi-purpose use of berths.

In order to facilitate access by a larger range of cargo vessels it is proposed the Alexandra Basin East is deepened from the current level of -7.8m CD to -10.0m CD with Berths 36 and 37 widened to 50m and Berths 38, 39 and 40 deepened to -11.0m CD and widened to 50m.

3.1.3 Oil Basin and 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 Western Oil Jetty forms the boundary between Alexandra Basin East and the Oil Basin. The Dublin Harbour Capital Dredging Project includes for dredging Oil Berth 1, Oil Berth 2 and the Oil Basin. 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. It is proposed that the Oil Basin is deepened from -7.8m CD to -10.7m CD with Berths OB1 and OB2 widened to 50m.

3.1.4 Ferryport Basin

There are currently three Berths within the Ferryport Basin with ramps for Ro-Ro freight and passengers, Berth 49A, Berth 51 and Berth 51A. These berths are served by two ferry terminal buildings. Terminal 2 is used by Stena Line and Terminal 1 is used by Irish Ferries, with seasonal use by Isle of Man Steam Packet Company. Terminal 2 will be demolished as part of the consented MP2 Project with the existing Terminal 1 Building being used as a unified terminal building thereafter. The eastern perimeter of the Ferryport Basin (Berth 50) forms part of a major Lo-Lo Container Freight Terminal. It is proposed that the Ferryport Basin is deepened from -7.8m CD to -10.0m CD.

3.1.5 Riverside Berth 52/53

Berths 52 / 53 are currently located within a basin at the eastern end of the Port, on the northern side of the River Liffey. Both Berths 52 and 53 are fitted with Ro-Ro ramps and are currently used by Seatruck for their Ro-Ro services to the UK. In 2014, the Alexandra Basin Redevelopment Project was granted permission by An Bord Pleanála (ABP Ref. PL29N.PA0034). The permissions included for: the dismantling and removal of the existing Berth 52/53 infrastructure; the construction of a new quay wall (Riverside Berth 52); Infilling of existing Berth 52 / 53 with treated dredged material raising of existing surface levels by approx.1.4m and the installation of a Ro-Ro ramp. In July 2020, An Bord Pleanála granted Planning Permission for the MP2 Project (ABP Ref. ABP 304888-19) which included the construction of a new Ro-Ro Jetty (Berth 53) and re-orientating the already consented Berth 52. The new riverside berths (Berth 52 and Berth 53) will be used predominantly used for the berthing of Ro-Ro ferries. The new berthing infrastructure will accommodate the bow-to and stern-to berthing of a wide range of ferries up to 240m in length.

It is proposed to deepen the approach channel to the riverside Berth 52 to -10.0mCD and create a berthing pocket, also to -10.0mCD following completion of the new riverside Berth 52 quay infrastructure which will be constructed under the MP2 Project (ABP-304888-19).

3.1.6 South Port Berths

The South Port Berths 42 – 47 are located on the River Liffey, adjoining the Poolbeg Peninsula. The berths are currently used to support a major Lo-Lo Container Freight Terminal and Bulk Cargo operations. The Bulk Cargo operations utilise a number of yards, warehouses and silos for the temporary storage of the cargo. It is proposed that the South Port Berths 42, 43, 44, 45, 46 and 47 are widened to 50m.

3.1.7 Poolbeg Oil Jetty (Berth 48)

The Poolbeg Oil Jetty (Berth 48) is located north of the ESB Generating Station on the Poolbeg Peninsula. It is used to transfer petroleum products to and from the nearby oil tanks operated by the National Oil Reserves Agency (NORA) and ESB. Berth 48 has a charted depth of -11.0mCD.

It is proposed to dredge an area surrounding Berth 48 to -10.0mCD to eliminate an elevated ridge on the riverbed between the Berth and the navigation channel which has recently been dredged to -10mCD under the ABR project (ABP Ref. PL29N.PA0034).

3.1.8 Dredging Programme

The Dublin Port Masterplan approach of redeveloping existing brownfield sites which are already in operation, to deliver strategic infrastructure projects such as the ABR Project and MP2 Project is not straightforward. The areas where much needed infrastructural improvements is required are in daily use and throughput volumes are expected to grow to 77.2 million tonnes by 2040.

DPC is currently constructing the ABR Project by way of discrete work packages designed to allow existing customers' growing businesses to continue with minimum disruption. The same approach will be necessary for the already consented MP2 Project.

The Dublin Harbour Capital Dredging Project supports these significant infrastructure developments by providing sufficient water depth within Dublin Harbour's navigation channel, basins and berths for the safe movement of vessels to and from the port. The same constraints are applicable whereby the project will need to be delivered through a series of discrete work packages to minimise disruption to existing port activities.

The experience of recent years suggests that there can be unforeseen circumstances which impact on the timing of planned project works in Dublin Port. In such circumstances, it is very difficult to predict when individual works packages within the Dublin Harbour Capital Dredging Project should commence.

Because of such uncertainties, DPC requires an 8 year Foreshore Licence and associated Dumping at Sea Permit to provide the required flexibility to deliver the capital dredging project at the optimum times within that timeframe.

DPC estimates that the total cost of implementing the Dublin Port Masterplan 2040 will be in the order of €1.7 billion (2020 prices). In the shorter term, DPC has a €1 billion ten year capital expenditure programme from 2019 to 2028. By any standards, the scale of the infrastructural development challenge in Dublin Port is enormous.

In this dynamic environment, the construction timescales for individual projects within the overall Masterplan development programme are liable to change in response to circumstances. This is an inevitable consequence

of DPC's preferred sustainable approach to the brownfield development of the existing Dublin Port estate rather than the less sustainable greenfield development at another location where construction timelines could be far shorter and more certain. DPC's choice of the brownfield approach rather than a greenfield approach is founded on DPC's commitment to the principles of proper planning and sustainable development.

The framework of the Dublin Port Masterplan (including the 2018 review) and the related Strategic Environmental Assessment (SEA) and Natura Impact Statement (NIS) in conjunction with the Environmental Impact Assessment Report (EIAR) and the NIS at the project level of the Dublin Harbour Capital Dredging Project provide a robust basis for DHLGH and the EPA to complete all relevant environmental assessments to facilitate consents of 8 years duration.

The proposed capital dredging will nevertheless be restricted to the winter period (October – March). Maintenance dredging works are restricted to the winter period (April – September). This separation provides the clarity required by the EPA to enforce separate permits for maintenance and capital dredging programmes by DPC.

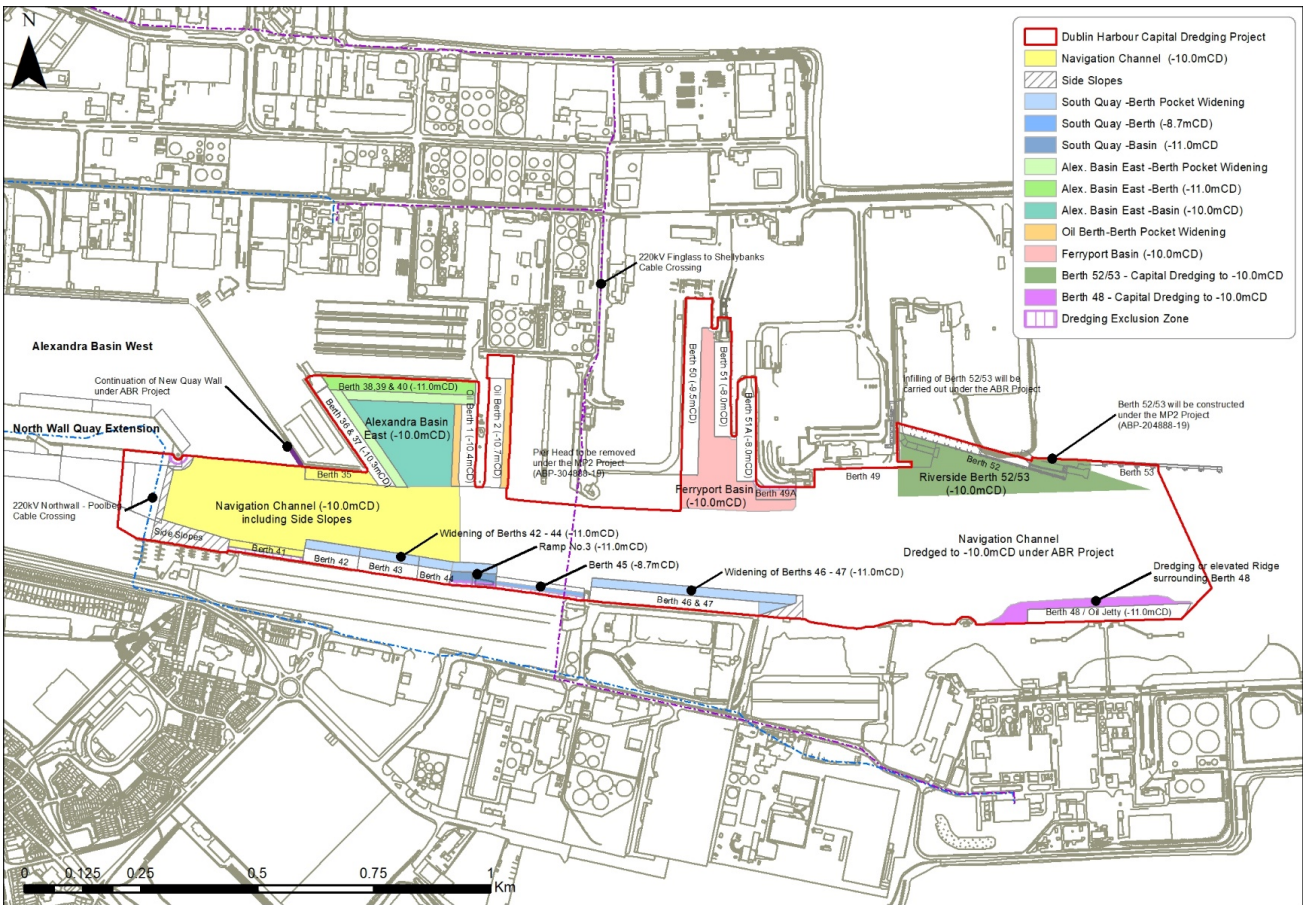

Figure 3-1 Location of the Proposed Development

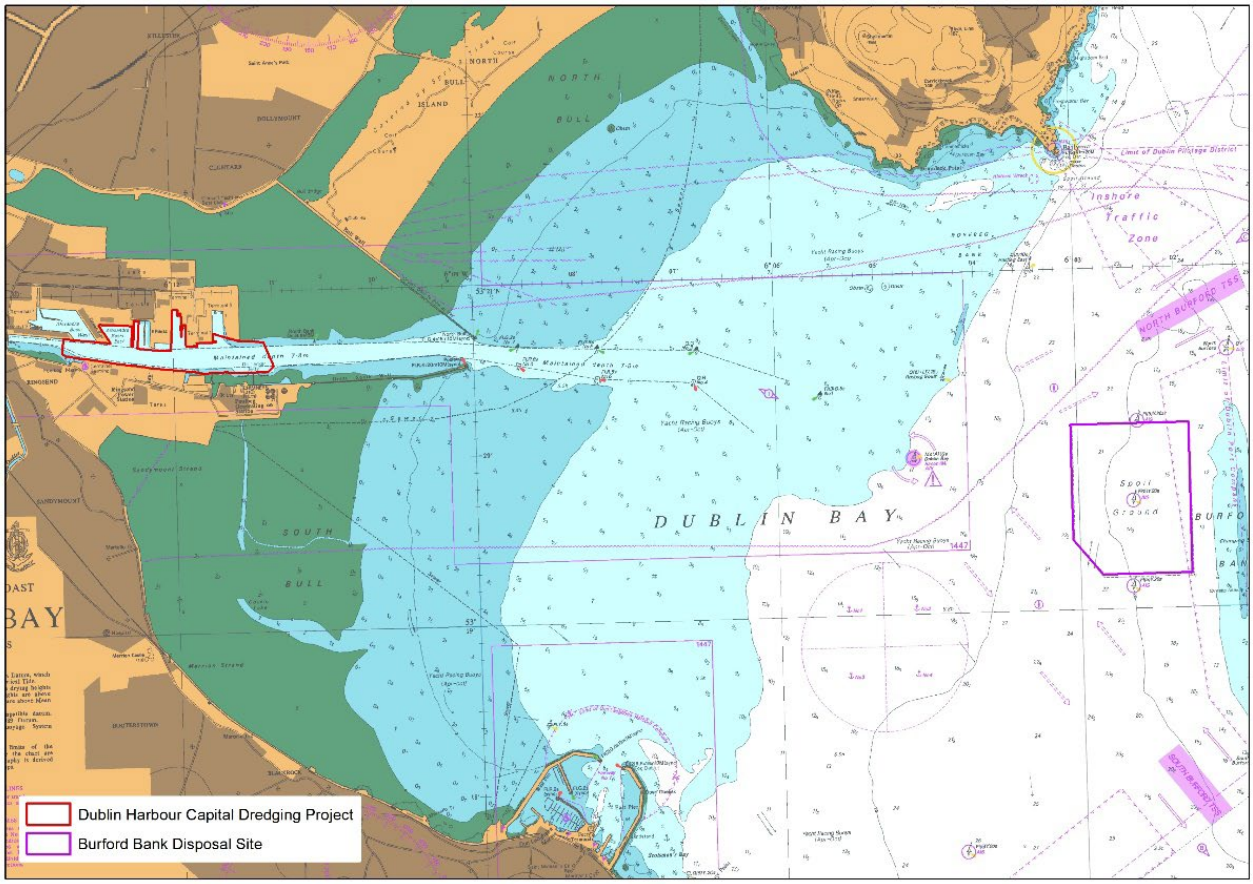

Figure 3-2 Location of licenced offshore disposal site

4 STAGE 1 SCREENING APPRAISAL FOR APPROPRIATE ASSESSMENT

4.1 Is the Project directly connected with or necessary to the management of any site as a European Site

The proposed Dublin Harbour Capital Dredging Project relates to the deepening of various berths and basins within Dublin Port. Capital dredging is necessary in order to achieve the desired depths and therefore ensure safe navigation for vessels entering and existing the port. On this basis, the proposed development is not directly connected with or necessary to the management of any site as a European Site.

4.2 European Sites in proximity to Dublin Port

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; it is governed by the first sentence of Article 6(3).

In addition, the provisions of national legislation, such as Regulation 42 of the 2011 Regulations 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 and SPAs), NHAs and pNHAs, Ramsar sites, IBAs 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 European Council Directives 92/43/EEC and 2009/147/EC. 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 site and, secondly, whether it is likely to have a significant effect on the site.

The most up-to-date Conservation Objectives 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 and their Conservation Objectives, sourced from NPWS in April 2021.

Candidate SACs (“cSACs”) and SACs described in Table 4-1 are illustrated in Figure 4-1. SPAs described in Table 4-1 are illustrated in Figure 4-2.

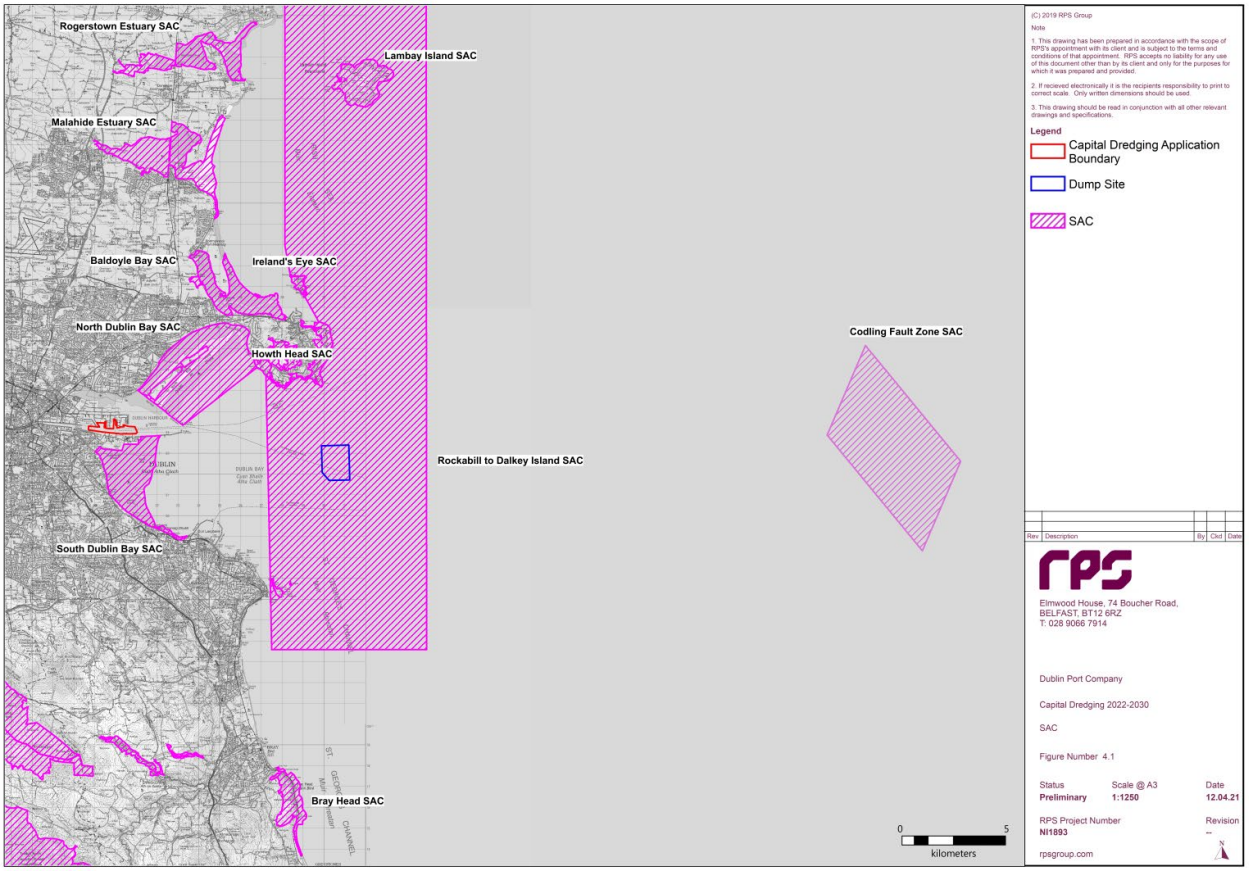

Figure 4-1 cSACs and SACs considered in the Habitats Directive Appraisals

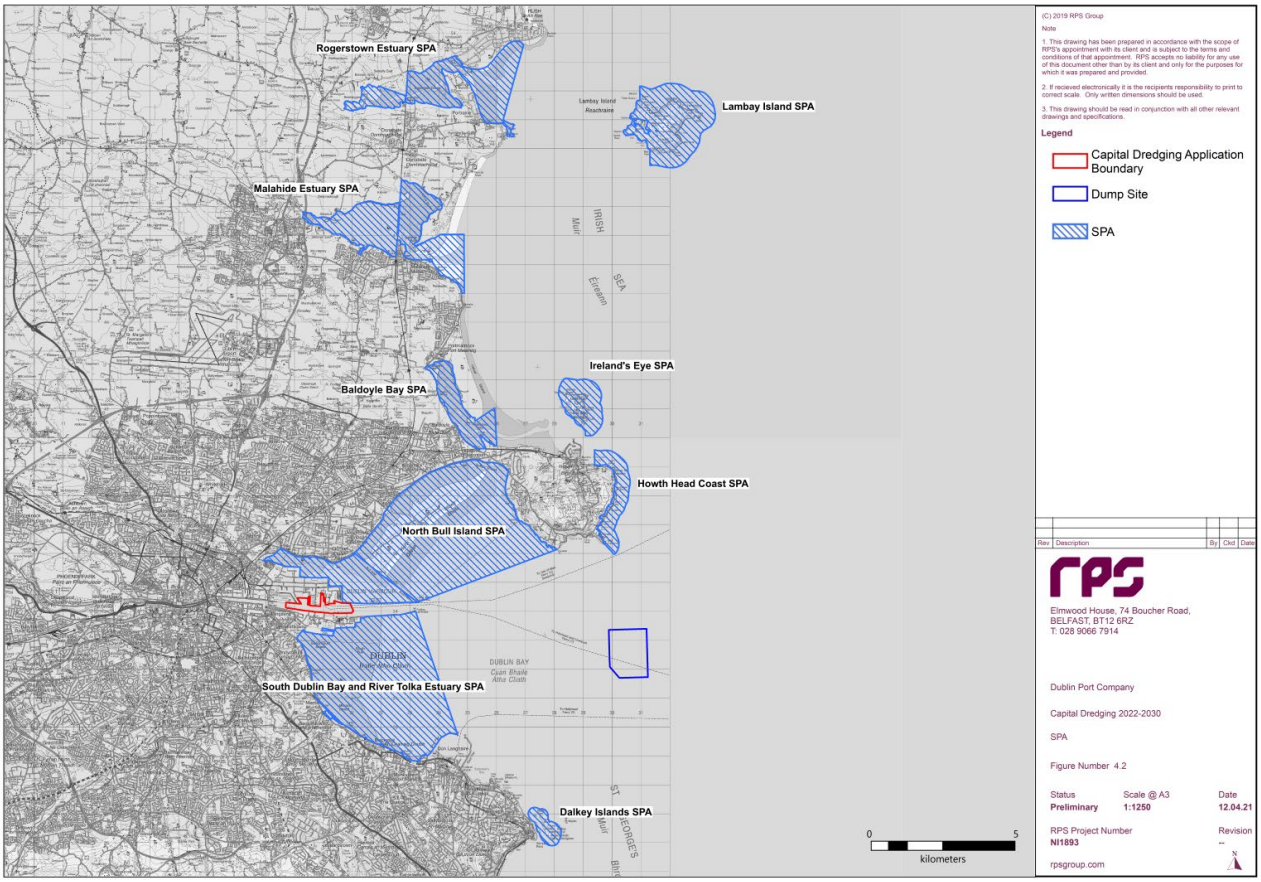

Figure 4-2 SPAs considered in the Habitats Directive Appraisals

Table 4-1Qualifying 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 project</th></tr>
<tr><td>IE000204</td><td>Lambay Island SAC</td><td>
Conservation Objectives Specific Version 1.0 (22/07/13)
To maintain the favourable conservation condition of the 2 no. Annex I habitat types in the SAC, as defined by a range of attributes and targets; and of 2 no. Annex II species in the SAC, 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>
</table>
</td><td>23.0km by sea from proposed capital dredging

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Vegetation composition: bracken and woody species	Percentage	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%	
		Annex II Species • Grey Seal (Halichoerus grypus) [1364]			
		Attribute	**Measure**	**Target**	
		Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
		Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition.	
		Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition.	
		Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition.	
		Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	
		• Harbour seal (Phoca vitulina) [1365]			
		Attribute	**Measure**	**Target**	
		Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	
		Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition.	
		Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition.	
		Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition.	
		Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	
IE000208	Rogerstown Estuary SAC	**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]			25.1km by sea from proposed capital dredging 19km by sea from dump site
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Community extent	Hectares	Maintain the extent of the Zostera-dominated community and the Mytilus edulis-dominated community, subject to natural processes.	
		Community structure: Zostera density	Shoots/m²	Conserve the high quality of the Zostera-dominated community, subject to natural processes	
		Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes	
		Community distribution	Hectares	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.	
		• Mudflats and sandflats not covered by seawater at low tide [1140]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	
		Community extent	Hectares	Maintain the extent of the Zostera-dominated community and the Mytilus edulis-dominated community, subject to natural processes.	
		Community structure: Zostera density	Shoots/m²	Conserve the high quality of the Zostera-dominated community, subject to natural processes	
		Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes	
		Community distribution	Hectares	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.	
		• Salicornia and other annuals colonising 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: Rogerstown Estuary 0.90ha.	
		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 sample	Maintain more than 90% of area outside creeks vegetated	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
			of monitoring stops		
		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	
		• 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: Rogerstown Estuary-2.18ha.	
		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	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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**	
		Habitat area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rush - 1.25ha, Portrane - 1.31ha.	
		Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation composition: plant health of dune grasses	Percentage cover	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)	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)	
		Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td></td><td></td><td>
• 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>
<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>
</table>
</td><td>20.7km by sea from proposed capital dredging

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	
		Community extent	Hectares	Maintain the extent of the Zostera-dominated community and the Mytilus edulis-dominated community complex, subject to natural processes.	
		Community structure: Zostera density	Shoots/m²	Conserve the high quality of the Zostera-dominated community, subject to natural processes	
		Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes	
		Community distribution	Hectares	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.	
		• *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: Malahide Estuary- 1.93ha.	
		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 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	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td></td><td></td><td>
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]
<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 - 25.33ha.</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>Allow 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 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 sample of monitoring stops</td><td>Maintain more than 90% 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 typical 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 known to occur</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: Malahide Estuary - 0.64ha.</td></tr>
<tr><td>Habitat distribution</td><td>Occurrence</td><td>No decline, subject to natural processes.</td></tr>
</table>
</td><td></td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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**	
		Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. Total area mapped: 1.80ha.	
		Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation composition: plant health of dune grasses	Percentage cover	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)	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius)	
		Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	
		• *Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130]			
		Attribute	**Measure**	**Target**	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. Total area mapped: 21.42ha.	
		Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	
		Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in Ryle et al. (2009)	
		Vegetation composition: negative indicator species (including Hippophae rhamnoides)	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	
		Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	
IE000199	Baldoyle Bay SAC	**Conservation Objectives Specific Version 1.0 (19/11/12)** To maintain the favourable conservation condition of 4 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]			15.3km by sea from proposed capital dredging 8.4km by sea from dump site
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	
		Community distribution	Hectares	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 T*ubificoides benedii* community complex.	
		• *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: Baldoyle - 0.383ha.	
		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	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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	Centimeters	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 sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (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: Baldoyle - 11.98ha.	
		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	Maintain/restore 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 the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: vegetation height	Occurrence	Maintain structural variation within sward	
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the area outside of the creeks vegetated	
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in the Saltmarsh Monitoring Project (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%	
		• Mediterranean salt meadows (*Juncetalia maritimi*) [1410]			

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td></td><td></td><td>
<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>
<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 SAC</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 SAC, 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>
</table>
</td><td>14.1km by sea from proposed capital dredging

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover	
		• Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			
		Attribute	**Measure**	**Target**	
		Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. Total length of cliff mapped: 2.57km.	
		Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes	
		Physical structure: functionality and Hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures	
		Vegetation structure: zonation	Occurrence	Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)	
		Vegetation composition: negative indicator species	Percentage	Negative indicator species (including non-native species) to represent less than 5% cover	
		Vegetation composition: bracken and woody species	Percentage	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%	
IE000202	Howth Head SAC	**Conservation Objectives Specific Version 1.0 (06/12/16)** To maintain the favourable conservation condition of 2 no. Annex 1 habitat type in the SAC, as defined by a range of attributes and targets. **Annex I Habitats** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]			6.4km by sea from proposed capital dredging 3.0km by sea from dump site
		Attribute	**Measure**	**Target**	
		Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. Total length of cliff: 8.22km.	
		Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures	
		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	

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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 representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	
		Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	
IE000206	North Dublin Bay SAC	**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 SAC, as defined by a range of attributes and targets; and of 1 no. Annex II species in the SAC, as defined by 5 no. attributes and targets. **Annex I Habitats** • Mudflats and sandflats not covered by seawater at low tide [1140]			1.4km by sea from proposed capital dredging 4.8km by sea from dump site

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	
		Community extent	Hectares	Maintain the extent of the Mytilus edulis-dominated community, subject to natural processes.	
		Community structure: Mytilus edulis density	Individuals/m²	Conserve the high quality of the Mytilus edulisdominated community, subject to natural processes	
		Community distribution	Hectares	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.	
		• Annual vegetation of drift lines [1210]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area increasing, subject to natural processes, including erosion and succession. Total area mapped: South Bull - 0.11ha.	
		Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	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.)	
		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	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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.	
		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 at a representative number of monitoring stops	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%	
		• *Petalophyllum ralfsii* [1395]			
		Attribute	**Measure**	**Target**	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Distribution of populations	Number and geographical spread of populations	No decline	
		Population size	Number of individuals	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	
		Area of suitable habitat	Hectares	No decline. Area of suitable habitat at Bull Island is estimated at c. 0.04ha.	
		Hydrological conditions: soil moisture	Occurrence	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	Centimetres and percentage	Maintain open, low vegetation with a high percentage of bryophytes (small acrocarps and liverwort turf) and bare ground	
		• 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: North Bull Island - 7.98ha.	
		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 at a representative number of monitoring stops	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%	
		• Embryonic shifting dunes [2110]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: North Bull - 2.64ha; South Bull - 3.43ha.	

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	
		Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in Delaney et al. (2013)	
		Vegetation composition: negative indicator species (including Hippophae rhamnoides)	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	
		Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	
		• Humid dune slacks [2190]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: North Bull - 2.96ha; South Bull - 9.15ha.	
		Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations (metres)	Maintain natural hydrological regime	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground	
		Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in Delaney et al. (2013)	
		Vegetation composition: cover of Salix repens	Percentage cover; centimetres	Maintain less than 40% cover of creeping willow (Salix repens)	
		Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	
		Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td>IE000210</td><td>South Dublin Bay SAC</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 SAC, 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 SAC 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>
<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>
</table>
</td><td>0.25km (by sea) from the proposed capital dredging

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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%	
		• Embryonic shifting dunes [2110]			
		Attribute	**Measure**	**Target**	
		Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	
		Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	
		Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
		Vegetation composition: plant health of foredune grasses	Percentage cover	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)	
		Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities with typical species: sand couch (Elytrigia juncea) and/or lyme-grass (Leymus arenarius)	
		Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></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

• 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>6.2km - by sea from proposed capital dredging

Zero –dump site is within SAC</td></tr>
<tr><td>IE003015</td><td>Coding Fault Zone SAC</td><td>
Conservation Objectives Generic Version 8.0 (23/03/21)
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 SAC has been selected

• Submarine structures made by leaking gases [1180]

Conservation attributes and targets have not been published.
</td><td>33.1km by sea from proposed capital dredging

22.9km by sea from dump 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>
</table>
</td><td>Zero – A small area of the SPA lies adjacent to the proposed capital dedging area in Dublin Port.

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

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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	
		• Oystercatcher (*Haematopus ostralegus*) [A130]			
		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 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	
		• 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**	
		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	
		• 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	
		• Redshank (*Tringa totanus*) [A162]			
		Attribute	**Measure**	**Target**	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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 redshank, other than that occurring from natural patterns of variation	
		• Black-headed Gull (*Croicocephalus ridibundus*) [A179]			
		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-headed gull, other than that occurring from natural patterns of variation	
		• Roseate Tern (*Sterna dougallii*) [A192]			
		Attribute	**Measure**	**Target**	
		Passage population: individuals	Number	No significant decline	
		Distribution: roosting areas	Number; location; area (hectares)	No significant decline	
		Prey biomass available	Kilogrammes	No significant decline	
		Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	
		Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	
		• Common Tern (*Sterna hirundo*) [A193]			
		Attribute	**Measure**	**Target**	
		Breeding population abundance: Apparently occupied nests (AONs)	Number	No significant decline	
		Productivity rate: fledged young per breeding pair	Mean number	No significant decline	
		Passage population: individuals	Number	No significant decline	
		Distribution: breeding colonies	Number; location; area (hectares)	No significant decline	
		Distribution: roosting areas	Number; location; area (hectares)	No significant decline	
		Prey biomass available	Kilogrammes	No significant decline	
		Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	
		Disturbance at breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population	

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	
		• Arctic Tern (*Sterna paradisaea*) [A194]			
		Attribute	**Measure**	**Target**	
		Passage population	Number of individuals	No significant decline	
		Distribution: roosting areas	Number; location; area (hectares)	No significant decline	
		Prey biomass available	Kilogrammes	No significant decline	
		Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	
		Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns	
		Note: 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.			
IE004006	North Bull Island SPA	**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]			1.4km by sea from proposed capital dredging 4.8km by sea from dump site
		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	
		• 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]			

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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**	
		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 project
		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	
		Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	
		• Turnstone (*Arenaria interpres*) [A169]			
		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 turnstone, other than that occurring from natural patterns of variation	

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td></td><td></td><td>
• 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>
<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>
• 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>
• 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>
</table>
</td><td>16.5km by sea from proposed capital dredging

9.9km by sea from dump site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</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 golden plover, other than that occurring from natural patterns of variation</td></tr>
<tr><td colspan="3">• Grey Plover (Pluvialis squatarola) [A141]</td></tr>
<tr><td>Attribute</td><td>Measure</td><td>Target</td></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>
<tr><td colspan="3">• Bar-tailed Godwit (Limosa lapponica) [A157]</td></tr>
<tr><td>Attribute</td><td>Measure</td><td>Target</td></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>
<tr><td colspan="3">• Wetlands [A999]</td></tr>
<tr><td>Attribute</td><td>Measure</td><td>Target</td></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>IE004113</td><td>Howth head Coast SPA</td><td>Conservation Objectives Generic Version 8.0 (23/03/21)
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.</td><td>9.0km by sea from proposed capital dredging

2.8km by sea from dump site</td></tr>
<tr><td>IE004117</td><td>Ireland’s Eye SPA</td><td>Conservation Objectives Generic Version 8.0 (23/03/21)
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.</td><td>13.4km by sea from proposed capital dredging

8.8km by sea from dump site</td></tr>
</table>

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
<tr><td>IE004172</td><td>Dalkey Islands SPA</td><td>Conservation Objectives Generic Version 8.0 (23/03/21)
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.</td><td>9.2km by sea from proposed capital dredging

5.5km by sea from dump site</td></tr>
<tr><td>IE004025</td><td>Malahide Estuary SPA</td><td>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]
<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 great crested grebe, other than that occurring from natural patterns of variation</td></tr>
</table>
• 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>
• Pintail (Anas acuta) [A054]
<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 pintail, other than that occurring from natural patterns of variation</td></tr>
</table>
• Goldeneye (Bucephala clangula) [A067]</td><td>19.8km by sea from proposed capital dredging

14.0km by sea from dump site</td></tr>
</table>

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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**	
		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 red-breasted merganser, other than that occurring from natural patterns of variation	
		• Oystercatcher (*Haematopus ostralegus*) [A130]			
		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 oystercatcher, 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	
		• Dunlin (*Calidris alpina 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]			

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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	
		• Redshank (*Tringa totanus*) [A162]			
		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 redshank, other than that occurring from natural patterns of variation	
		• Wetlands [A999]			
		Attribute	**Measure**	**Target**	
		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.	
IE004015	Rogerstown Estuary SPA	**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]			23.6km by sea from proposed capital dredging 15.1km by sea from dump site
		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 greylag goose, other than that occurring from natural patterns of variation	
		• Light-bellied 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]			

Site Code	Site Name	Qualifying Interests & Conservation Objectives			Distance from proposed project
		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	
		• 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**	
		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	
		• 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]			

<table>
<tr><th>Site Code</th><th>Site Name</th><th>Qualifying Interests & Conservation Objectives</th><th>Distance from proposed project</th></tr>
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<tr><td colspan="3">• Wetlands [A999]</td></tr>
<tr><td>Attribute</td><td>Measure</td><td>Target</td></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 8.0 (23/03/21)
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>22.2km by sea from proposed capital dredging

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

4.3 Establishing an Impact Pathway

The possibility of significant effects is considered in this report 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 feature (or receptor). 'Pathway' is defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' is defined as the Special Conservations Interests (for SPAs) or Qualifying Interests (of SACs/cSACs) for which conservation objectives have been set for the European sites under consideration (refer to Table 4=1). 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; and
- Aerial noise and visual disturbance.

It is noted that the above effects relate to those which may arise during the proposed capital dredging works, as the proposals will not lead to any significant change in the operational use of Dublin Port beyond its continued safe operation. Potential effects upon European sites arising as a result of the day-to-day operation of the port are currently well understood and managed within the Port's operational and maintenance procedures. As such the proposed works do not comprise an operational phase in the usual sense and there is therefore no potential for a likely significant effect to arise following completion of the proposed loading and dumping activities associated with the capital dredging works.

4.4 Potential Effects

4.4.1 Habitat Loss

The proposed capital dredging area does not lie within the boundary of any European site. The dump site however lies within the Rockabill to Dalkey Island SAC.

Proposed capital dredging at riverside Berth 52 runs parallel and in close proximity to the South Dublin Bay and River Tolka Estuary SPA for approximately 280m. Proposed capital dredging at the Poolbeg Oil Jetty (Berth 48) will be undertaken in close proximity to a single part of the South Dublin Bay and River Tolka Estuary SPA, that being platforms raised up from the Liffey Channel which are designated as part of the same SPA for the breeding colonies of Terns that they support.

The loading areas are in proximity to three further European sites, those being North Dublin Bay SAC, South Dublin Bay SAC, and North Bull Island SPA. While it is not considered that the proposed development would lead to any direct loss of habitat within North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA, consideration is given in the following section as to whether

the proposed project would result in effects upon habitats supported within these European sites, given their close proximity, during the dredging (loading) activity and disposal at sea (dumping) activity.

In addition, where the proposed project has potential to give rise to such potential effects, these have also been considered in the context of European sites which lie further afield where relevant.

4.4.1.1 South Dublin Bay and Tolka Estuary SPA

A small and isolated area of this SPA is supported within the main navigation channel within Dublin Port. This comprises a dolphin which supports a breeding Tern colony. Dredging will occur around this structure (Berth 48 Oil Jetty) but the structure itself will not be imperilled by the proposed activities and shall remain untouched before and after the dredging activities. As such, there is no potential likely significant effect that could arise through direct loss of habitat to this part of the SPA.

A waterbird roost occurs outside of the SPA at the cooling water outfall from ESB's Poolbeg Power Station located at the base of the Great South Wall in the Liffey Channel, where a small area of mudflat is exposed at low-tide. This area is used by SCI species of the South Dublin Bay and Tolka Estuary SPA and North Bull Island SPA.

As dredging is restricted to the berths and navigation channel and does not extend into the Tolka Estuary or the area at the cooling water outfall, there is no potential likely significant effect that could arise through *in-situ* direct loss of habitat to the parts of the SPA in the Tolka estuary or *ex-situ* direct loss of habitat to the parts of the low tide roost at the cooling water outfall.

4.4.1.2 Rockabill to Dalkey Island SAC

On the basis that the proposed dump site lies entirely within the Rockabill to Dalkey Island SAC boundary, it is considered that the proposed development has potential to result in loss of habitat within this European site. It is proposed to dredge and subsequently dump 500,000m^3 of dredge material over an eight year period at the dump site. Dumping of such a quantity of seabed material intermittently over this period of time within a European site must be considered with respect to the potential for habitat loss within that European site.

Rockabill to Dalkey Island SAC is an enormous site (in excess of 27,000ha) but the single Annex I habitat (reefs) for which it is designated accounts for less than 1% of the site and occurs at a number of specific locations throughout the site. The seabed at the dump site does not in itself represent a qualifying habitat of the 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 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 situated 3.3km, 5.1km and 7.5km respectively from the proposed dump site. Lambay Island is 16km north of the proposed dump site and Rockabill is approximately 30km to the north.

Conservation targets for 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 these targets refer to activities or operations that propose to permanently remove reef habitat, thus reducing the permanent amount of reef habitat (or range over which this habitat occurs as the case may be). Importantly, the targets do not refer to long or short term disturbance of the biology of reef habitats. On this basis, it is not considered that these conservation targets will be undermined by proposed extraction and disposal of dredge material into the proposed dump site and on this basis the proposed development will not lead to the direct loss of qualifying Annex I habitat within the SAC.

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 habitat loss, 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.

It is noted that the proposed works, which involve the dredging of sediments and subsequent dumping within the licenced dump site in Dublin Bay, would potentially lead to a temporary effect upon the supported marine habitats which provide opportunities for harbour porpoise however it is not considered that such an effect would equate to a permanent loss of habitat for the species and any potential effects associated with the proposed

works have been assessed below in respect of water quality and habitat deterioration, underwater noise and disturbance and aerial noise disturbance.

Where dredging will lead to alterations to the seabed, both within the SAC boundary and in areas surrounding this European site that may provide a supporting function for harbour porpoise such as foraging habitat, it is considered that the extent of previous consented dredging and dumping of sediments from within the zones into the licenced dump site are likely to have affected the nature of the seabed in these areas and the proposed works will simply maintain these pre-existing conditions.

On the basis of the above it is not considered that the proposed works would have potential to give rise to a likely significant effect upon the Rockabill to Dalkey Island SAC through loss of habitat.

4.4.2 Water Quality and Habitat Deterioration

4.4.2.1 Suspended Solids

As set out above, in Section 3, the proposed development will involve the dredging of areas of Dublin Harbour and will result in temporary suspension and release of sediments at the loading sites. Disposal of dredged material or spoil within the licenced dump site in Dublin Bay will also give rise to temporary sediment plumes within the licenced dump site.

The extent to which the proposed works have potential to result in a significant effect upon the aquatic environment has been discussed in detail within the Water Quality Chapter of the EIAR (Chapter 9) and the Coastal Processes Chapter of the EIAR (Chapter 13) which accompanies the applications for consent. It included modelling to determine:

- The dispersion and settlement of sediment plumes generated during dredging operations; and
- The dispersion of sediment material disposed of at the spoil site.

This work revealed that the proposed capital dredging of the port navigation channel, basins and berths and associated dumping of dredge spoil was not predicted to significantly alter the suspended sediment regime in Dublin Bay beyond the specific areas in which sediment is dredged and dumped. Simulations revealed that silty material dredged from the navigation channel, basins and berths and disposed of at the Burford Bank dump site will be carried away by the tide and largely dispersed to the Irish Sea and that any associated sediment plume will be limited to suspended solids rates of below 200mg/l within 750m of the dump site.

This is a negligible degree of disturbance and demonstrates that in a scenario where circa 500,000 m^3 of seabed material is dredged and dumped over an intermittent eight year campaign, no measurable elevated levels of suspended sediments shall be dispersed to European sites outside of the dredge/dump zones.

The findings of this study were informed by plume model predictions made in the 2014 EIS and relied upon in the 2014 NIS for the ABR capital dredging project, which were validated through water quality monitoring of the

ABR capital dredging and dumping works reported to the EPA in the Annual Environmental Reports required under Dumping at Sea Permit S0024-01.

The Annual Environmental Monitoring Reports summarise environmental monitoring works undertaken including a real-time monitoring regime to confirm the efficacy of the mitigation measures implemented as part of construction phase of the ABR Project.

In agreement with the Planning Authority, monitoring stations were established in the Port to provide detailed information on relevant water quality parameters. They measured 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 four 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 impact resulting from the ABR Project.

Data collected during this dredging campaign provides credible evidence that the disposal of dredge material at the dump site had no measurable effect on water quality outside the dump site, or even within the dump site at relatively short distances away from the spot where the dredger released its load.

Those activities and associated results of water quality were achieved only with the application of mitigation measures applied during the dredge and dump cycle.

In addition to modelling undertaken in respect of previous similar projects, further extensive monitoring has been undertaken in association with the 2020 dredging campaign, by Hydromaster Ltd in March 2020. This monitoring data was used to verify modelling undertaken by RPS in respect of the proposed capital dredging project and provided evidence that the dumping of dredge spoil within the licenced dump site does not give rise to significantly altered turbidity and suspended sediment levels outside of the dump site.

Despite the above information, in the absence of mitigation measures, in line with those proposed for previous dredging campaigns within Dublin Port, likely significant effects cannot be excluded.

Given the nature of the proposed works, it is considered that a pathway for a likely significant effect upon water quality and habitat deterioration associated with the proposals occurs as a result of suspended sediment and sedimentation associated with the proposed dredging and dumping of spoil.

4.4.2.2 Pollution Incidents

There is a risk involved with any vessel activity in the marine environment that a pollution incident might arise and result in spills or leaks of polluting substances into the water. There is potential for pollution events to occur from discharges from vessels using the port (ballast water, wastewater, oil spillages, fuel bunkering).

The risk of such pollution events occurring must be managed to ensure their likelihood is low and that there are effective measures put in place in the event that they do occur to prevent any wide reaching or long term adverse effects.

4.4.2.3 South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA

Wintering Birds

The proposed works which will involve the dredging of sediments within close proximity to the South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA could result in potential effects upon the supported intertidal area, within this 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. Dredging activities could result in a plume of suspended sediments entering the SPAs and, while the potential for significant increase in the quantity of suspended sediments has been discussed above, the implications of this must be considered.

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.

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 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 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.

This 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.

The proposed works could 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 in the absence of mitigation if suspended sediment plumes were to travel into those areas and reduce the range, timing or intensity of use of areas by the target species.

There are other potential sources of pollution of the marine environment that may arise as a result of the proposed works, limited to the release of substances from vessels, including oil and fuel.

Likely significant effects cannot be excluded at the screening stage.

Breeding Birds

Looking next at 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 theme, with the remainder being assessed under the disturbance impact pathway theme (Section 4.4.4).

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 question 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 timescales associated with the proposed capital dredging works, which will take place within the winter months only (October to March), breeding bird species will be absent from Dublin Port and the surrounding area during the proposed works. Furthermore, elevated concentrations of suspended sediments, which may occur in the water column as a result of dredging next to the SPA and disposal of dredge spoil at the dump site, would be fully dispersed prior to the breeding seasons for these SCI bird species. This rationale also applies in respect of other potential sources of pollution including the release of oil and fuel. On this basis a likely significant effect upon breeding birds within the South Dublin Bay and River Tolka Estuary SPA is excluded at the screening stage.

4.4.2.4 Rockabill to Dalkey Island SAC

As discussed above in respect of habitat loss, the proposed dump site (refer to Figure 4-1), is located within Rockabill to Dalkey Island cSAC. It is proposed to dredge and subsequently dump approximately 500,000m^3 of dredge material from the capital dredging zones into the licenced dump site within the 8 year capital dredging programme. In addition to possible effects of underwater noise on harbour porpoise (and which is dealt with in Section 4.4.3), dumping of around 500,000 m^3 of seabed material from Dublin Harbour within a European site must be considered with respect to the possible implications for habitats of that European site.

As previously discussed Rockabill to Dalkey Island SAC comprises an area in excess of 27,000ha however, the single 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 site. The seabed at the dump site is not in itself a qualifying habitat of the 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 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 situated 9.0km, 5.9 and 7.6km from the red line boundary respectively and 3.3km, 9.2km and 13.4km respectively from the proposed dump site. Lambay Island is 16km north of the proposed dump site and Rockabill is approximately 30km to the north.

While conservation targets for 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. On this basis, these conservation targets will not be undermined by disposal of dredge material at the proposed dump site.

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 dredging process and through disposal of dredged material if the activity resulted in elevated concentrations of suspended sediments 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.

Given that qualifying reef habitat occurs in the site at distance of 3.3km north of the proposed dump site, it must be determined whether or not it is possible for elevated concentrations of suspended sediments to travel that distance, or greater.

In the coastal processes chapter of the accompanying EIAR, morphological model simulations were used to assess the impact of the proposed capital dredging programme, including deposition of 500,000m^3 of dredge material within the dump site, modelled on the basis of dumping of 4,100 m^3 (6,765 tonnes of wet material) every three hours. This assessment concluded that the proposed dredging and disposal would not give rise to any significantly elevated suspended sediments outside of the immediate capital dredging area or dump site, with suspended sediment concentrations predicted to be within 200mg/l within 750m of the dump site, and within 20mg/l in the wider area which is consistent with the background levels in Dublin Bay. These morphological model simulations were validated through comparison with the findings of extensive monitoring studies undertaken of Dublin Bay during the maintenance dredging campaign of 2020 by Hydromaster Ltd. This modelling also assessed the effects of the proposed capital dredging works within the proposed loading areas. Modelled sediment plumes were extremely limited, to within the immediate dredge areas and as such will not give rise to elevated levels of suspended sediments within the wider environment.

The current and previous scientific assessments of proposed dredging provide sufficient scientific certainty that the risk of suspended sediments escaping into the marine environment to provide a hydrological pathway of effect leading to a disturbance to the ecological structure and function of the reef community complexes of Rockabill to Dalkey Island SAC can be ruled out, as the reefs are located beyond the reach of any reasonably predicted elevated concentrations of dumped dredge material. Furthermore, as mentioned, this assessment was conducted of dredging proposals involving a volume of dredged and dumped sediment approximately tenfold of that proposed annually for the capital dredging works. Likely significant effects as a result of dumping at sea can therefore be excluded at the screening stage and in the absence of mitigation measures.

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 dredging process and disposal of dredged material at the proposed dump 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 elevated concentrations of suspended sediments would decrease in the water column within and around the redline boundary and dump site over time and across the normal tidal cycle as sediments disperse and dilute to background levels, it is very unlikely that a decrease in prey availability would occur as a result of the dump plume at and in the environs of the dump site to such an extent as to conflict with the conservation target for disturbance at a community level. This conclusion is supported by the findings of the fisheries assessment detail at Chapter 7-1 of the accompanying EIAR, which concludes that dredging and dumping of spoil will give rise to displacement of fish species in proximity to the dump site and within Dublin Port, with recolonisation of any vacant niches being relatively rapid following the proposed works.

The risk of suspended sediments escaping into the marine environment as a result of dredging and 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 therefore 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 at the screening stage and in the absence of mitigation measures.

There are other potential sources of pollution of the marine environment that may arise as a result of the proposed works, limited to the release of substances from vessels, including oil and fuel. 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 dredging operationst would be

further aided by the tidal currents, wind and wave climate which transport the mix of seawater and freshwater (and any polluting substances) and help them 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, given the small scale of any potential inputs which may arise as a result of the proposed project, 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.

4.4.2.5 Lambay Island SAC

Figure 4-1 shows that Lambay Island SAC is located to the north of Dublin Bay. It is offshore from Rogerstown Estuary SAC and is 23 km by sea from the red line boundary of the proposed works. This SAC is designated for 2 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 23km and 16km north of the red line boundary and dump site respectively.

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 SAC 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 that the proposed capital dredging works will present any threat to maintaining the range or area of Vegetated Sea Cliffs in Lambay Island SAC.

In relation to the structure and function targets, the Conservation objectives supporting document for coastal habitats at Lambay Island SAC (NPWS, 2013) was reviewed to see what was behind the 6 no. attributes and targets. The attribute relating to 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 SAC does not arise.

Within Lambay Island SAC, 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 4.4.2.4 for Rockabill to Dalkey Island SAC. Thus, adopting the analysis set out above the conservation targets for area and distribution will not be undermined by the dredging process or disposal of dredge material in the proposed dump 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.

As discussed in Section 4.4.2.4 above, sediment plume modelling associated with the proposed project and the previously assessed ABR Project provides sufficient scientific certainty that the risk of suspended sediments escaping into the marine environment to provide a hydrological pathway of effect leading to a disturbance to the ecological structure and function of the reef community complexes of Rockabill to Dalkey Island SAC can be ruled out, as the reefs of Lambay Island SAC are located far (16km) beyond the reach of any reasonably predicted elevated concentrations of dumped dredge material. LSEs can be excluded at the screening stage and in the absence of mitigation measures.

Turning then to the two Annex II species (Grey Seal and Harbour Seal) that Lambay Island SAC is designated for, the COs for these species are to maintain the favourable conservation condition of Harbour Seal or Grey Seal in Lambay Island SAC, 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 feed 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 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 SAC is more than 20km by sea from the red line boundary of the proposed works and the dump site. The question in this case is whether or not a reduction in prey availability more than 20km away at the dump site (but within the feeding range of the seals) would likely be significant if it were to occur.

Noting the narrative above in relation to potential prey reduction of harbour porpoise within Rockabill to Dalkey Island SAC that elevated concentrations of suspended sediments would decrease in the water column around the dump site over time and across the normal tidal cycle as sediments disperse and dilute to background levels, it is also very unlikely that a decrease in prey availability would occur as a result of the dredging or dump plumes at and in the environs of the red line boundary or dump site to such an extent as to conflict with the conservation target for disturbance at a harbour or grey seal population level.

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 or grey seal populations depend within Lambay Island SAC 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 at the screening stage and in the absence of mitigation measures.

As discussed above, there are also other potential sources of pollution of the marine environment that may arise as a result of the construction and operation of the proposed capital dredging project.

For the same reasons stated above in Section 4.4.2.4, the capacity of the Liffey and Tolka Estuaries and Dublin Bay to dilute any temporarily elevated concentrations of polluting substances that escape into the marine environment is very significant, and the fact that Lambay Island SAC is in excess of 15km from the proposed redline boundary a reasonable conclusion can be drawn that the risk 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 or grey seal populations depend within Lambay Island SAC 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 project on the site. LSEs can be excluded at the screening stage and in the absence of mitigation measures.

4.4.2.6 North Dublin Bay SAC

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.

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 SAC 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 the proposed capital dredging project will present any threat to maintaining the area or range of saltmarsh communities in North Dublin Bay SAC.

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. The proposed capital dredging 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 in the vicinity of North Dublin Bay SAC.

The target for creeks and pans is to maintain creek and pan structure, subject to natural processes, including erosion and succession. The proposed capital dredging 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 SAC.

The target for flooding regime is to maintain the natural tidal regime. The proposed capital dredging project will not present any threat to the maintenance of the natural tidal regime of the saltmarsh communities of North Dublin Bay SAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. The proposed capital dredging project will not present any threat to the maintenance of the range of coastal saltmarsh habitats including transitional zones in North Dublin Bay SAC.

The target for vegetation height is to maintain structural variation within the sward. The proposed capital dredging project will not present any threat to the maintenance of the structural variation within the saltmarsh community swards of North Dublin Bay SAC.

The target for vegetation cover is to maintain more than 90% of area outside creeks vegetated. The proposed capital dredging 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 SAC.

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. The proposed capital dredging 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 SAC.

The target for negative indicator species is for no significant expansion of common cordgrass with an annual spread of less than 1%. The proposed capital dredging project will not present any opportunity for significant expansion of common cordgrass within the saltmarsh habitats of North Dublin Bay SAC.

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 SAC does not arise.

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 SAC. 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 SAC 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 the proposed capital dredging project will present any threat to maintaining the area or range of the sand dune habitats in North Dublin Bay SAC.

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. The proposed capital dredging 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 SAC.

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. The proposed capital dredging 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 SAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. The proposed capital dredging project will not present any threat to the maintenance of the range of coastal sand dune habitats including transitional zones in North Dublin Bay SAC.

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. The proposed capital dredging 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 SAC.

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. The proposed capital dredging 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 SAC.

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. The proposed capital dredging 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. The proposed capital dredging 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 SAC.

The target for negative indicator species is for negative indicator species (including non-natives) to represent less than 5% cover. The proposed capital dredging project will not present any threat to achieving the conservation targets for negative indicator species in the sand dune habitats in North Dublin Bay SAC.

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. The proposed capital dredging 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 SAC.

The target for cover of creeping willow *Salix repens* in humid dune slacks is to maintain less than 40% cover of *S.repens*. The proposed capital dredging 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 SAC.

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.

Petalwort

Petalwort *Petalophyllum ralfsii* is a rare liverwort and an Annex II species, and its occurrence on Bull Island within North Dublin Bay SAC 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 SAC, 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 proposed capital dredging project will present any threat to maintaining the five conservation targets for petalwort in North Dublin Bay SAC. LSEs shall not occur.

Mudflats and sandflats not covered by seawater at low tide

Within North Dublin Bay SAC 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 SAC, 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 proposed capital dredging project, it is considered that the proposed works 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 SAC.

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 analysis presented above in Section 4.4.2.4 refers to the coastal processes assessment undertaken to inform the proposed capital dredging programme in addition to the 2014 ABR Project silt dispersion simulation of c.6,000,000m^3 of capital dredging. Whilst these assessments tell us that suspended sediment plumes arising as a result of disposal of dredged material at the dump site with concentrations elevated >20 mg/litre above background do not appear to extend any great distance from the dump site under any tidal or storm scenario, and not as far as North Dublin Bay SAC, it also tells us where plumes from dredging within the Liffey Channel and Navigation Channel will go, with the vast majority of material contained within the main channel resulting in a deposition rate of less than 0.2g/m^3. The Annex I mudflat and sandflat habitat of North Dublin Bay SAC is less than 2km by sea from the proposed capital dredging works. While the silt dispersion simulations illustrate the difference in bed level change as a result of that proposed capital dredging scheme after particular storm events, bed levels are shown not to change within North Dublin Bay SAC.

Based on the analysis undertaken in respect of the proposed project and the 2014 assessment of the ABR project, it is considered that the proposed capital dredging project has no potential to result in a LSE upon this Annex I habitat.

In relation to other potential sources of pollution at construction stage, for the same reasons stated above in Section 4.4.2.4, 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, the fact that North Dublin Bay cSAC is beyond the North Bull Wall, and the fact that mudflat and sandflat habitats are subject to constant tidal flushing, it can be concluded that the risk of polluting substances escaping into the marine environment providing a hydrological pathway of effect leading to a likely significant effect as a result of water quality and habitat deterioration effects on the mudflat and sandflat habitats can be excluded.

4.4.2.7 South Dublin Bay SAC

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.

Saltmarsh

As noted previously in Section 4.3.2.6.1, 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 SAC and applied as a proxy objective to this habitat at South Dublin Bay SAC.

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 the proposed capital dredging project will present any threat to maintaining the area or range of the saltmarsh community present in South Dublin Bay SAC.

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. The proposed capital dredging 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 SAC.

The target for creeks and pans is to maintain creek and pan structure, subject to natural processes, including erosion and succession. The proposed capital dredging 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 SAC.

The target for flooding regime is to maintain the natural tidal regime. The proposed capital dredging project will not present any threat to the maintenance of the natural tidal regime of the saltmarsh community of South Dublin Bay SAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession the proposed capital dredging project will not present any threat to the maintenance of the range of coastal saltmarsh and its transitional zones in South Dublin Bay SAC.

The target for vegetation height is to maintain structural variation within the sward. The proposed capital dredging project will not present any threat to the maintenance of the structural variation within the saltmarsh community sward of South Dublin Bay SAC.

The target for vegetation cover is to maintain more than 90% of area outside creeks vegetated. The proposed capital dredging 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 SAC.

The target for typical species and sub-communities is to maintain the presence of species-poor communities listed in the SMP The proposed capital dredging project will not present any threat to maintaining the presence of species-poor communities within the *Salicornia* habitat in South Dublin Bay SAC.

The target for negative indicator species is for no significant expansion of common cordgrass with an annual spread of less than 1%. The proposed capital dredging project will not present any opportunity for significant expansion of common cordgrass within the saltmarsh habitat of South Dublin Bay SAC.

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 SAC does not arise.

Sand Dunes

Two dune habitats listed as Qualifying Interests for South Dublin Bay SAC (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 SAC 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 the proposed capital dredging project will present any threat to maintaining the area or range of the sand dune habitats in South Dublin Bay SAC. Turning then to structure and function, there are five attributes to be considered across the five dune habitat types:

- *Physical structure*
  - (i) functionality and sediment supply
- *Vegetation structure*
  - (ii) zonation
- *Vegetation composition*
  - (iii) plant health of foredune grasses
  - (iv) typical species & sub-communities
  - (v) 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. The proposed capital dredging 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 SAC.

The target for zonation is to maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. The proposed capital dredging project will not present any threat to the maintenance of the range of coastal sand dune habitats including transitional zones in South Dublin Bay SAC.

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). The proposed capital dredging 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 SAC.

The target for typical species and sub-communities is to maintain the presence of species-poor communities with typical species. The proposed capital dredging 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 SAC.

The target for negative indicator species is for negative indicator species (including non-natives) to represent less than 5% cover. The proposed capital dredging project will not present any threat to achieving the conservation targets for negative indicator species in the sand dune habitats in South Dublin Bay SAC.

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 SAC does not arise.

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 SAC, 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 separation of the site from the proposed capital dredging, the proposed 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 SAC.

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 sand*s* with *Angulus tenuis* community in a natural condition.

The benthic communities of the Annex I habitat are less than 1km from the proposed dredging by sea. However, for the same reasons as presented in the analysis in Section 4.3.2.6.4 above, in respect of 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, it is considered that the vast majority of any potential dredge plume will be contained within the main dredging channel with extremely low deposition rates, even within this channel. It is

therefore considered that there is no risk of suspended sediments escaping into the marine environment to provide a hydrological pathway of likely significant effect preventing the conservation of the principal benthic communities of the Annex I mudflat and sandflat habitat in a natural condition.

In relation to other potential sources of pollution at construction stage, for the same reasons stated above in Section 4.3.2.6.4, 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, the fact that South Dublin Bay cSAC is beyond the Bull Wall, and the fact that mudflat and sandflat habitats are subject to constant tidal flushing, it can be concluded that the risk of polluting substances escaping into the marine environment providing a hydrological pathway of effect leading to a likely significant effect as a result of water quality and habitat deterioration effects on the mudflat and sandflat habitats can be excluded.

4.4.2.8 Other European sites which are hydrologically connected

As noted above in Section 4.4.2.1 above in relation to elevated concentrations of suspended sediments as a result of dredging an disposal of dredged material at the proposed dump site, the coastal processes assessment, in respect of the proposal, in addition to previous assessment of dredging proposals within Dublin Port, silt dispersion simulation taking account of tides, waves, sediment transport and morphological changes to the seabed during extreme storm events from the North Easterly, Easterly and South Easterly sectors reveals that suspended sediment plumes with concentrations elevated >20 mg/litre above background do not appear to extend any great distance (and no more than 2.5km) from the areas of activity (i.e dredging site or dump site) under the range of tide, wave and storm scenarios. These assessments provide sufficient scientific certainty to establish whether or not more distant European sites are located beyond the reach of any reasonably predicted plume containing elevated concentrations of suspended sediments arising from dredge or dumping activities associated with the proposed capital dredging project.

Also, as noted in Section 4.4.2.2 in relation to other potential sources of pollutants entering the marine environment at construction stage of the proposed capital dredging 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 the proposed capital dredging 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.

Baldoyle Bay SAC and SPA

The SAC 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 SAC and SPA are located more than 8km from the proposed dump site and more than 16km from the proposed capital dredging project, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

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 dump site and more than 19km from the proposed capital dredging project, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

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 25km from the proposed capital dredging project and associated dump site, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

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 in Section 4.3.2.5 of how vegetated sea cliff conservation objectives for Lambay Island SAC cannot be offended; the fact that dredging and dumping 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 14km from the proposed capital dredging project and more than 5km from the proposed dump site, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

Howth Head SAC and Howth Head Coast SPA

The SAC 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 previous analysis of how vegetated sea cliff conservation objectives for Lambay Island SAC cannot be offended and the fact that that Howth Head SAC and SPA are located more than 6.4km from the proposed capital dredging Project and the proposed dump site, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

Codling Fault Zone SAC

The SAC is designated for Submarine structures made by leaking gases. Given the analysis at Section 4.3.2.4 and the fact that this site is located more than 20km from the proposed capital dredging project and associated

dump site, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

Dalkey Islands SPA

The SPA is designated for three breeding seabird species and the marine waters adjacent to their breeding sites. Given the analysis at the outset of Section 4.3.2.4 and the fact that this site is located more than 9km from the proposed capital dredging project and the proposed dump site, LSEs as a result of water quality and habitat deterioration effects can be excluded at the screening stage and in the absence of mitigation measures.

4.4.3 Underwater Noise and Disturbance

As described in Section 3, some aspects of the proposed capital dredging will require activities in the marine environment including activities producing underwater noise, including:

- Dredging of approximately 500,000 m^3 of spoil over the eight year campaign to achieve desired depths of berths, basins and navigation channel within Dublin Harbour, as shown at Figure 3-1.
- Disposal of the dredged material at the proposed licenced dump site.

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 such risks 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 SAC 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 dump site) and Ireland's Eye (7.6km from the dump 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 to affect the Rockabill to Dalkey Island SAC harbour porpoise community through disturbance during dredging works and disposal of dredged material at the proposed dump site.

There is a potential for exposure to underwater noise at construction stage to affect the Lambay Island SAC (including Bull Island and Ireland's Eye) seal populations through disturbance during dredging works and disposal of dredged material at the proposed dump site.

There is also the potential for exposure to underwater noise during dredging and disposal works to affect the distribution and abundance of preferred prey species 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 disturbance to the harbour porpoise community and grey and harbour seal populations remains in the absence of further evaluation and analysis and possibly the application of measures intended to avoid or reduce the harmful effects of the proposed development on Rockabill to Dalkey Island SAC and Lambay Island SAC. LSEs cannot be excluded at this stage.

4.4.4 Aerial Noise and Visual Disturbance

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

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 in close proximity to the proposed capital dredging 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 proposed capital dredging diminishes significantly.

The proposed capital dredging will involve activities emitting aerial noise and associated with the movement of vessels. Given that the proposed dredging will occur within and be restricted exclusively to the operational port area, its berths and navigation channel where small and large seagoing vessels arrive and depart, turn and berth many times each day there is no potential for disturbance to the overwintering special conservation interests of South Dublin Bay & River Tolka Estuary SPA and North Bull Island SPA from aerial noise or visual disturbance associated with the proposed dredging and disposal works as it is simply another ship.

There is a potential for *ex-situ* disturbance from dredging activity in the berths and river channel at a low tide roost on the south side of the River Liffey channel, at the cooling water outfall from ESB's Poolbeg Power Station located at the base of the Great South Wall, where a small area of mudflat is exposed at low-tide. A dredging campaign of the navigation channel as part of ABR Project and consented under Dumping at Sea Permit S0024-01 was undertaken in late October 2019. This activity presented an opportunity to capture any disturbance events that might occur when previously permitted capital dredging activity was taking place in proximity to this area used by overwintering waterbird SCI species.

The dredging vessel, Freeway, was a 92m LOA trailing suction hopper dredger. During monitoring the dredger slowly passed by the survey area at the inner limit of the dredging area, approximately 200m from shore, or approximately 150m from the low water mark. During operations, the dredger was passing the survey area for 10-15 minutes. This study is included at Appendix I to the NIS. It revealed that waterbirds were not disturbed when using the area within 150m of dredging activities. It is considered in light of this evidence that the likelihood of disturbance effects during dredging operations is low, in the context of the existing levels of shipping activity

and associated noise and visual disturbance which occur within Dublin Port on a daily basis. As such LSEs can be excluded at the screening stage and in the absence of mitigation measures.

Breeding Birds

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 the proposed project will take place during the winter months (October to March) and therefore outside of the breeding season for the breeding bird SCIs of this SPA. Likely significant noise and visual disturbance effects can therefore be excluded.

4.4.4.2 Other more distant SPA sites

For all SPA sites at a greater distance than South Dublin Bay and River Tolka Estuary SPA, there is no possibility that noise or visual triggers of disturbance, arising as a result of the proposed works could likely significantly affect their overwintering special conservation interests when tested against their conservation objectives.

The proposed capital dredging project will therefore not delay or prevent achieving the target for the long-term population trend of the feature species to be stable or increasing. The proposed capital dredging 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 noise or visual triggers of disturbance arising as a result of the proposed works 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 proposed capital dredging project on these more distant SPA sites shall not arise. In the absence of any further evaluation and analysis and the application of measures intended to avoid or reduce the harmful effects of the proposed development on these more distant SPAs, LSEs as a result of potential noise and visual disturbance can be excluded at screening stage.

4.5 In-Combination Effects

Article 6(3) of the Habitats Directive and Irish national law requires 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 proposed capital dredging project. Those plans and projects include:

Dublin Port Company Plans and Projects

- Alexandra Basin Redevelopment (ABR) Project - (Strategic Infrastructure) - Reg. Ref. PL29N.PA0034
- MP2 Project - (Strategic Infrastructure) - Reg. Ref. PL29N.304888
- Dublin Port 2020-2021 Maintenance Dredging - S0004-02
- Dublin Port 2022 – 2029 Maintenance Dredging (application submitted, not yet determined)

- Berth 49 Ramp
- Dublin Port Internal Road Network – Reg. Ref. 3084/16
- Extension Terminal 2 Check-In area - Reg. Ref. 2299/12
- Floating Dock Section Reg. Ref. 4216/17
- Interim Unified Passenger Terminal - Reg. Ref. 3638/18
- Dublin Ferryport Terminals Access - Reg. Ref. 3314/18
- Vehicular and pedestrian entrances off Breakwater Road South - Reg. Ref.2596/15
- Demolition of Calor Offices and Provision of Yard - Reg. Ref. 3540/18
- Asahi demolition and Provision of Yard - Reg. Ref. 3488/18
- Vehicle service/maintenance facility and office accommodation - Reg. Ref. 3143/18
- Demolition of buildings and Provision of Yard - Reg. Ref. 2429/17

Developments in the Surrounding Area

- Ringsend Wastewater Treatment Plant – BP Ref. PL29S.301798
- Howth Yacht Club

4.5.1 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;
- The excavation and restoration of historic Graving Dock No. 1;
- The demolition of the bulk jetty;
- The demolition of a section of North Wall Quay extension;
- Extension of Alexandra Quay West;
- New Ro-Ro jetty and provision of three Ro-Ro ramps; and
- The dredging of contaminated material to a depth of -10.0m Chart Datum (CD) within Alexandra Basin West and its remediation.

Berth 52 and 53:

- The demolition of existing berths 52 and 53;
- The construction of:
    - A new river berth at Berths 52/53;
    - New mooring jetty at new river berth;
    - New mooring jetty to extend existing berth 49;

- The infilling of the Terminal 5 Ro-Ro basin;
- Raising of existing levels by 1.4 m; and
- Dredging of new river berth to -10.0m CD.

Liffey Channel:

- Construction of a marina protection structure on the south side of the river channel; and
- Dredging of the navigation 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 SAC; South Dublin Bay cSAC; Rockabill to Dalkey Island cSAC; 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.

The principal pathways of cumulative effect that might occur with the capital dredging in combination with the ABR Project are water quality and habitat deterioration and underwater noise.

However, the dredging and dumping of material at sea for the proposed Dublin Harbour Capital Dredging Project is proposed to commence in 2022 and the final capital dredge campaign for the ABR Project has now been completed (March 2021). Dredging or dumping for both projects cannot occur concurrently. As such, the modelled rates of dredging and dumping will not be exceeded at any given time, and the modelled extent of dredge or dumping plumes, their predicted concentrations of suspended sediments and predicted rates of sedimentation at proximate shorelines remain valid when these activities are considered in combination. No additional effects occur cumulatively or in combination in this regard beyond scientific doubt.

When aerial noise and visual disturbance effects are considered in combination, it is to be recalled that for the ABR Project alone, the 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. Given that dredging and dumping 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. As the proposed capital dredging works are to take place in alternate years to dredging works associated with proposed in respect of the ABR project, it is considered that a similar (or lower) magnitude of aerial noise or visual disturbance will occur in following years. As such the temporal scale of these effects is increased, however the combined magnitude of disturbance which may result is not increased. The proposed capital dredging project will therefore not result in any effects upon this species and as such when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.2 MP2 Project

DPC was granted planning permission subject to conditions (ABP Reg. Ref. ABP-304888-19) in July 2020 for the redevelopment of lands at the eastern section of the North Port. Elements of the proposed development can be 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.

The AA Screening Report and NIS prepared for MP2 Project screened in likely significant water quality 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. The NIS also screened in likely significant disturbance effects upon 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. Adverse effects upon the integrity of all sites assessed will not occur as a result.

Construction of MP2 Project is anticipated to commence in 2022 (subject to the grant of Foreshore and Dumping at Sea Consent). The capital dredging associated with MP2 Project will occur over the same winter periods with the proposed Dublin Harbour Capital Dredging Project. However, the capital dredging for the two projects will be undertaken sequentially, that is, only one dredger will operate at any given time. The modelled rates of dredging and dumping will therefore not be exceeded at any given time, and the modelled extent of dredge or dumping plumes, their predicted concentrations of suspended sediments and predicted rates of sedimentation at proximate shorelines remain valid when these activities are considered in combination. No additional effects occur cumulatively or in combination in this regard beyond scientific doubt.

Therefore the possibility of significant water quality or disturbance effects of the proposed capital dredging project either cumulatively or in combination with the MP2 Project can be excluded beyond scientific doubt.

4.5.3 Dublin Port 2020 - 2021 Maintenance Dredging Campaign

Dublin Port Company undertook maintenance dredging in their navigation channel and various berths in September 2020 and April 2021 with further maintenance dredging planned within the period August-September 2021. These dredging campaigns are permitted under Dumping at Sea Permit S0004-02 and Foreshore Licence (Ref: FS006980). The dredged material is being disposed at the existing licenced offshore dump site located at the approaches to Dublin Bay, west of the Burford Bank. A total of 300,000 cubic metres per annum of mostly material is being dredged from the Inner Liffey Channel and Dublin Bay during the 2020 and 2021 maintenance dredging campaigns.

The Habitats Directive appraisals for the Dumping at Sea and Foreshore licence applications 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 consented ABR Project and applied also to the MP2 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 only pathway of potential cumulative effect that might occur between the 2020-2021 maintenance dredging and the 2022-20309 capital dredging is in the water column where increased suspended sediments could lead to deterioration of water quality and wetland habitats. It has been conclusively demonstrated however in previous analysis that effects of turbidity and increased suspended sediments does not remain in the water column for more than a short period of time as tidal cycles and currents disperse sediments to background levels quickly.

The dredging and disposal of material at sea for the proposed capital dredging project is proposed to occur between October and March in 2022 to 2030. This cannot overlap with the maintenance dredging to be undertaken in 2020 and 2021 under Permit S0004-02. The possibility of significant water quality effects either cumulatively or in combination between the two distinct dredging projects can be excluded beyond scientific doubt in the absence of mitigation measures.

4.5.4 Dublin Port 2022-2029 Maintenance Dredging Programme

Dublin Port Company (DPC) need to carry out regular maintenance dredging of the navigation channel, basins and berthing pockets in order to maintain their advertised charted depths and hence provide safe navigation for vessels to and from the Port.

The loading of dredged material will be restricted to those areas of the navigation channel, basins and berthing pockets which contain sediments which are suitable for disposal at sea (Class 1 : uncontaminated, no biological effects likely). Confirmation of the suitability of the dredged sediments for disposal at sea is made through a programme of sediment chemistry sampling and analysis and eco-toxicological testing. It is proposed to dispose of the dredged sediments at the existing licenced offshore disposal site located at the entrance to Dublin Bay to the west of the Burford Bank, (6.75 km from the lighthouse at the end of the Great South Wall).

The maximum amount of material to be dredged is 300,000 cubic metres per annum and it consists mostly of silt and sand with elements of clay, gravel and cobbles. Dredging will be carried out by a trailer suction hopper dredger and support vessels. It is proposed to undertake the maintenance dredging and disposal at sea operations within the period April to September each year between 2022 and 2029. An additional closed period will operate within the inner Liffey channel upstream of Berth 49, including the main channel and channel side berths but not including the basins between 1st April and 14th May to protect migrating Atlantic salmon smolts and River lamprey. The dredging campaign within each of these periods is expected to last approximately 4-6 weeks, depending on weather conditions.

These works have been subject to appraisal under the Habitats Directive. Subject to the implementation of mitigation measures in respect of the proposed maintenance dredging and associated dumping it is not envisaged that the project will give rise to any adverse impacts upon the integrity of any European site. Furthermore maintenance dredging will take place in the summer months only, while the proposed capital

dredging will take place within the winter months only, therefore avoiding the potential for additive in-combination effects. There is limited potential for cumulative effects through increased suspended sediments could lead to deterioration of water quality and wetland habitats across the year. It has been conclusively demonstrated however in previous analysis that effects of turbidity and increased suspended sediments does not remain in the water column for more than a short period of time as tidal cycles and currents disperse sediments to background levels quickly.

When the timing of dredging and dumping for the proposed capital dredging project and its associated vessel movements and underwater sound produced are considered in combination with the Maintenance Dredging Project, the result is that the same magnitudes of underwater noise are predicted, but they will continue to occur across the year in combination (i.e. in all months) rather than during the winter period only, as associated with proposed capital dredging alone. The temporal scale of these effects is increased. 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 SAC both within the SAC 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 proposed capital dredging 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. No additional effects occur cumulatively or in combination in this regard beyond scientific doubt.

Likely significant cumulative or in-combination effects of the proposed capital dredging and the Dublin Port maintenance dredging campaign 2022-2029 can be excluded beyond scientific doubt.

4.5.5 Berth 49 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. Permission was granted in September 2019. The permitted development consists of:

- Approach road and ramp;
- Office and staff facilities building;
- Control kiosk;
- Control cabin;
- New lighting (including 18 no. lighting columns 10m high);
- Demolition of 5 no. existing staff facilities buildings; and
- Associated site works to include 15 no. tug parking spaces, drainage, utility services, fencing and pedestrian gate 2.4m.

A screening for appropriate assessment and NIS was submitted with this application. The reports 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 the proposed capital dredging activities commence. 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 water quality effects either cumulatively or in combination with the Berth 49 Ramp project can be excluded beyond scientific doubt.

4.5.6 Dublin Port Internal Road Network

DPC was granted planning permission in December 2017 (Reg. Ref. 3084/16) 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 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.

Disturbance of the wintering waterbirds using that part of the Tolka estuary north of Berth 53 was identified as potentially arising as a result of operational phase of the Greenway development as part of permission Reg. Ref. 3084/16. 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. As the proposed capital dredging works not predicted to give rise to any potential aerial noise or visual disturbance effects upon wintering birds, it is not considered that effects could occur as a result of both projects, in combination, due to the cumulative effect of aerial noise or visual disturbance upon the South Dublin Bay & River Tolka Estuary SPA. Likely significant in-combination effects in this regard are therefore excluded at the screening stage.

4.5.7 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 effects associated with the proposed capital dredging works. 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.8 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 will provide enhanced docking facilities for tug boats operating in the port.

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. 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 the proposed capital dredging works. Operational phase of this development comprises the continuation of existing tug boat operations, albeit at enhanced facilities. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.9 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 has now been implemented by DPC. Construction phase for this project and the proposed capital dredging works 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.10 Dublin Ferryport 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 proposed capital dredging works 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.11 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 effects arising as a result of the proposed capital dredging works. 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.12 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 proposed capital dredging works 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.13 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 is now being implemented by DPC. Construction phase for this project and the proposed capital dredging works 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.14 Vehicle service/maintenance facility & 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 lies to the north of the proposed capital dredging works. 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.15 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 proposed capital dredging works red line boundary. This approval is now being implemented by the DPC. Construction phase for this project and the proposed capital dredging works 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. As such, when both projects are considered together, there will be no additional effects cumulatively or in combination in this regard beyond scientific doubt.

4.5.16 Ringsend Wastewater Treatment Plant

Irish Water has submitted a planning application for strategic infrastructure development to An Bord Pleanála (Ref. PL29S.301798) seeking permission to further progress the upgrade of the Ringsend Wastewater Treatment Plant (WwTP). The application seeks permission for 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 proposed development at Ringsend is on the south bank of the River Liffey. The application was granted permission in April 2019.

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 excluded at the screening stage:

- South Dublin Bay and River Tolka Estuary SPA
- South Dublin Bay SAC
- North Bull Island SPA
- North Dublin Bay SAC
- 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 Ringsend WwTP project is sufficient spatially separated from proposed capital dredging 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. When both projects are considered together, there will be no additional effects cumulatively or in combination beyond scientific doubt.

4.5.17 Howth Yacht Club

Only Howth Yacht Club (HYC) and Dublin Port Company currently hold Dumping at Sea Permits for use of the Dublin Bay dump site. HYC has the benefit of a Dumping at Sea Permit (Ref. No. S0010-01) to load and dump 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 dumping 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 dumped at this site by Dublin Port Company under Dumping at Sea Permit S0024-01. Dumping will be subject to the approval of the Dublin Port Harbour Master and dumping activity will not be permitted by the Harbour Master for DPC and HYC operations simultaneously.

When this project is considered together with the proposed capital dredging works, there will be no additional effects cumulatively or in combination between disposal of dredged material from HYC and the proposed works beyond scientific doubt.

4.6 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 SAC	✓	✓	**X** Grey and Harbour seals	✓
IE000208	Rogerstown Estuary SAC	✓	✓	✓	✓
IE000205	Malahide Estuary SAC	✓	✓	✓	✓
IE000199	Baldoyle Bay SAC	✓	✓	✓	✓
IE002193	Ireland's Eye SAC	✓	✓	✓	✓
IE000202	Howth Head SAC	✓	✓	✓	✓
IE000206	North Dublin Bay SAC	✓	✓	✓	✓
IE000210	South Dublin Bay SAC	✓	✓	✓	✓
IE003000	Rockabill to Dalkey Island SAC	✓	✓	**X** Harbour porpoise	✓
IE003015	Codling Fault Zone SAC	✓	✓	✓	✓
IE004024	South Dublin Bay & River Tolka Estuary SPA	✓	**X** Wetlands	✓	✓
IE004006	North Bull Island SPA	✓	**X** Wetlands	✓	✓
IE004016	Baldoyle Bay SPA	✓	✓	✓	✓
IE004113	Howth Head Coast SPA	✓	✓	✓	✓
IE004117	Ireland's Eye SPA	✓	✓	✓	✓
IE004172	Dalkey Islands SPA	✓	✓	✓	✓
IE004025	Malahide Estuary SPA	✓	✓	✓	✓
IE004015	Rogerstown Estuary SPA	✓	✓	✓	✓
IE004069	Lambay Island SPA	✓	✓	✓	✓

4.7 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 determine whether or not Likely Significant Effects on any European site could be excluded as a result of the proposed capital dredging project. From the findings of the Screening appraisal, the possibility of Likely Significant Effects upon the European sites considered in the Stage 1 appraisal is summarised below.

4.7.1 Special Areas of Conservation

4.7.1.1 Lambay 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 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.

4.7.1.2 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.

4.7.1.3 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.

4.7.1.4 Baldoyle Bay 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 Baldoyle Bay 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.

4.7.1.5 Ireland's Eye 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 Ireland's Eye 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.

4.7.1.6 Howth Head 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 Howth Head 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.

4.7.1.7 North Dublin Bay 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 significant effect on North Dublin Bay Island 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.

4.7.1.8 South Dublin Bay 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 significant effect on South Dublin Bay 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.

4.7.1.9 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 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 **cannot be excluded** for this European site, 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.

4.7.1.10 Codling Fault Zone 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 Codling Fault Zone 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.

4.7.2 Special Protection Areas

4.7.2.1 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 overwintering SCI species 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 breeding and overwintering Special Conservation Interest species can be excluded for this European site.

4.7.2.2 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 overwintering SCI species 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 can be excluded for this European site, even without consideration of mitigation measures.

4.7.2.3 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.

4.7.2.4 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.

4.7.2.5 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.

4.7.2.6 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.

4.7.2.7 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.

4.7.2.8 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.

4.7.2.9 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.

4.7.3 Scope of the Stage 2 Appraisal

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 proposed capital dredging project on the following European sites in view of certain conservation objectives is required:

- The possibility of likely significant Underwater Noise and Disturbance effects cannot be excluded for Lambay Island SAC; or Rockabill to Dalkey Island SAC.
- The possibility of likely significant Water Quality and Habitat Deterioration effects on the intertidal areas of the Tolka Estuary cannot be excluded as a resource for the regularly occurring breeding and migratory waterbirds of South Dublin Bay & River Tolka Estuary SPA and migratory waterbirds of North Bull Island SPA that utilise it.

5 STAGE 2 APPRAISAL FOR APPROPRIATE ASSESSMENT

The screening stage appraisal concluded that a shadow appropriate assessment of the implications of the proposed capital dredging 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 SAC

Underwater Noise and Disturbance effects

- Harbour seals
- Grey seals

Rockabill to Dalkey Island SAC

Underwater Noise and Disturbance effects

- Harbour porpoise

South Dublin Bay & River Tolka Estuary SPA

Water Quality and Habitat Deterioration effects

- Wetlands

North Bull Island SPA

Water Quality and Habitat Deterioration effects

- Wetlands

Regulation 42 of the 2011 Regulations similarly requires *inter alia* that in carrying out an appropriate assessment a public authority shall take into account:

- the Natura Impact Statement;
- any other plans or projects that may, in combination with the project under consideration, adversely affect the integrity of a European Site;
- any supplemental information furnished in relation to any such statement;
- if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura Impact Statement;
- any information or advice obtained by the public authority;
- if appropriate, any written submissions or observations made to the public authority in relation to the application for consent for proposed project; and
- any other relevant information.

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.

5.1 Water Quality and Habitat Deterioration Effects

5.1.1 Suspended sediments from dredging in proximity to South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA

The proposed works could 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 in the absence of mitigation if suspended sediment plumes were to travel into those areas and reduce the range, timing or intensity of use of areas by the target species.

Measures must be prescribed to eliminate the risk of plumes causing a reduction in the range, timing or intensity of use of areas by the target species.

As noted in Section 4.4.2.1, the plume model predictions made in respect of the proposed capital dredging project and the 2014 EIS and relied upon in the 2014 NIS were validated through water quality monitoring of the ABR capital dredging and dumping works reported to the EPA in the ABR Annual Environmental Report in addition to monitoring of maintenance dredging works undertaken in 2020 by Hydromaster Ltd., but this was only the case in circumstances where mitigation measures were applied during dredging of the basin and navigation channel.

With the application of the same mitigation, the project will not adversely affect the integrity of the site and no reasonable scientific doubt remains as to the absence of such effects. The application of measures intended to avoid or reduce the harmful effects of dredging on this SPA is specified in Section 5.3.

5.2 Underwater Noise and Disturbance Effects

5.2.1 Disturbance to Harbour Porpoise from the Rockabill to Dalkey Island SAC community and disturbance to Harbour Seal and Grey Seal from the Lambay Island SAC populations

The potential for disturbance to marine mammals is greatest when elevated levels of underwater noise occur. Marine mammals, especially cetaceans, have well developed acoustic capabilities and are sensitive to sound at much higher frequencies than humans (Richardson et al. 1995). They are less sensitive to the lower frequencies but there is still great uncertainty over the effects of sound pressure levels on marine mammals and thus the assessment of its impact. Sources of noise include that generated by the vessel during dredging and transiting to and from the dump site, the noise generated by dredging and that generated during dumping.

Received levels of dredging noise by marine mammals can exceed ambient levels to considerable distances depending on the type of dredger used (Richardson et al. 1995). Hopper dredges produced broadband sound between 20-1000 Hz and the highest levels occurred during loading. Evans (2000) suggested dredging activities produce sounds varying from 172-185 db re 1 µPa at 1 metre over the broadband range 45 Hz to 7 kHz but there have been no studies examining the reaction of odontocetes to this activity. Audiograms for bottlenose dolphins show peak sensitivity between 50-60 kHz and no sensitivity below 2 kHz and above around 130 Khz (Richardson et al. 1995). Because of rapid attenuation of low frequencies in shallow water dredge noise normally is undetectable underwater at ranges beyond 20-25km (Richardson et al. 1995). The effects of low frequency (4-8 kHz) noise level and duration in causing threshold shifts in bottlenose dolphins were predicted by Mooney et al. (2009). They found that if the Sound Exposure Level was kept constant significant shifts were induced by longer duration exposures but not for shorter exposures.

NPWS (2014) identify increased sound pressure levels above ambient do occur due to dredging which could be detected up to 10km from shore. These levels are thought to potentially cause masking or behavioural effects but are not thought to cause injury to a marine mammal. There is no guidance on the effects of noise generated by dumping of dredge material on marine mammals.

McKeown (2016) carried out underwater noise measurements during the 2016 maintenance dredging campaign. The PSD plots of the dredging operation show some lower frequency tonal components between 200 Hz and 2 kHz are attributed to the pump. The dredging operation has a higher frequency signal in comparison to the dumping operation.

Sound levels for the dredging operations at ranges of 213 and 268 m were below the disturbance threshold for harbour porpoise of 140 dB re 1 µPa SPLRMS and 140 dB re 1µPa² s SEL. The sound level of 142.7 dB re 1 µPa SPLRMS for the dumping operation at a range of 90 m were 2.7 dB re 1 µPa SPLRMS above the disturbance threshold for harbour porpoise, suggesting porpoise may react <100m of the dredger during dumping. However, this level is still below the NOAA general behavioural threshold for marine mammals of 160 dB re 1 µPa SPLRMS.

Increased noise is restricted to <100m from the dredger during dredging (McKeown 2016), thus there will be no sound pressure associated with dredging within the SAC so sound exposure levels will be at or below ambient noise levels at Burford Bank for dredging activity. The outer reaches of the navigation channel within Dublin Bay extends into the Rockabill to Dalkey Island SAC however no capital dredging works will take place within the SAC and will be spatially separated by a distance of approximately 6.2km from the proposed capital dredging area. It is therefore no considered that the proposed dredging works are likely to expose porpoises within the SAC to increased noise and disturbance and as such will not lead to any significant impact.

Shipping produces low broadband and “tonal” narrowband sounds. The primary sources are propeller cavitation and singing and propulsion of other machinery (Richardson et al. 1995). For large and medium vessels tones dominate up to around 50Hz and broadband components may extend to 100Hz.

Many odontocetes show considerable tolerance to vessel traffic. Sini *et al.* (2005) showed bottlenose dolphins resident in the Moray Firth generally exhibited a positive reaction to medium (16-30m) and large vessels (>30m) and showed some evidence of habituation. Buckstaff (2004) suggested an exposure level of 110-120 dB from vessel noise solicited no observable effect on bottlenose dolphins. A similar exposure level solicited minor changes in orientation behaviour and locomotion changes in minke whales (Palka and Hammond 2001). Harbour porpoise are frequently observed near vessels but tend to change behaviour and move away and this avoidance may occur up to 1-1.5km from a ship but is stronger with 400m (cited from Richardson et al. 1995). Seals show considerable tolerance to vessel activity but this does not exclude the possibility that it has an effect.

The presence of a dredger in the area will lead to increased vessel traffic and associated noise. Large vessels produce low frequency sounds and TSHD are large (e.g. MV Freeway is 92m in length). However given the busy nature of Dublin Port and shipping lane and increased ambient noise already experienced at this site (Beck et al. 2013) the presence of an additional vessel and associated noise, is extremely unlikely to be significant. The increased noise above ambient levels generated by the dump vessel will be of relatively short duration.

The disposal site has been routinely used for the dumping of dredged material, with approximately eight million tonnes of material dumped at this site between 1997 and 2012 at an average rate of around 550,000 m^3 per annum. The ABR Project Dumping at Sea Permit for capital dredging (Reference number: S0024-01) permited a maximum of 8,760,000 tonnes (equivalent to 5,300,000 m^3) of dredged material to be loaded and dumped at sea up until and including March 2021.

Increased noise is restricted to <100m from the dredger during disposal (McKeown 2016), thus increased sound pressure associated with spoil disposal within the SAC will be above ambient noise levels at Burford Bank within a very small area (radius <100m). The outer reaches of the navigation channel within Dublin Bay extends into the Rockabill to Dalkey Island SAC.

The risk of injury or mortality is considered extremely low as marine mammals are exposed to considerable vessel traffic on a daily basis and would be aware of their presence. The dredge vessel is slow moving and not able to turn quickly thus any animals in the area would have sufficient time to avoid any collisions and thus injury or mortality. The chance of actually releasing dredged material on top of a marine mammal is extremely unlikely.

The duration of the release of dredged material last around 10-20 minutes and the vessel slows down during spoil release.

Collisions are unlikely due to the slow speed of the TSHD. Dredging is unlikely to cause damage to marine mammal auditory systems, but masking and behavioural changes are possible (Todd et al. 2015). Sediment disturbance and any increases in turbidity are unlikely to affect marine mammals that use echolocation, or pinnipeds since research indicates that vision is not essential to pinnipeds' survival or ability to forage (McConnell et al. 1999). Static acoustic monitoring of harbour porpoises recorded a significant increase in acoustic detections during dumping. Whether this is due to increased occurrence, increased click rate due to increased foraging opportunities or a decrease in visibility due to increased turbidity is unclear (Russell et al. 2018) and requires further exploration but clearly there is no evidence of an aversive reaction. During maintenance dredging of the Port of Cork, grey seals approached the TSHD after commencement of loading operations which did not appear to cause any disturbance to them. They came very close to the TSHD to investigate on a number of occasions, possibly using it as a feeding opportunity (Russell and Levesque, 2014).

The dumping of dredged material will not cause any adverse effects on cetaceans or seals in the area providing mitigation measures are in place but may affect prey availability. Small shoaling fish that occur regularly in the diet of seals and porpoises (Rogan 2008) and are likely to be affected during operations. However, with the benthos and demersal fish species subject to periodic smothering over the last 15 years, together with an increase in acoustic detections of harbour porpoise during dumping (Russell et al. 2018), there is no evidence of an aversive reaction leading to impacts on species life cycle. Any displacement resulting from indirect impacts on available prey will be short-term and local, with fish returning to the area at the completion of dumping activity.

Increased turbidity will result from dumping spoil within the dump site which is located within the Rockabill to Dalkey Island SAC. Turbidity is monitored and maintained at or below permitted levels. Increased turbidity is unlikely to have a direct effect of marine mammals but may have an indirect effect through impacts on prey (Todd et al. 2015). There is limited evidence for an effect of increased turbidity on marine mammals. Harbour porpoise use echolocation to navigate and locate prey and thus would not be affected by increased turbidity. Even when increased turbidity has been shown to substantially reduce visual acuity in seals, which are not known to use sonar for prey detection, there is no evidence of reduced foraging efficiency (Todd et al. 2015).

As set out above the operation of dredgers on silty material results in underwater noise levels in the same range as shipping traffic. While the dredger is operating suction equipment, it is travelling at slow speed. Shipping traffic in the area is usually larger vessels, generally travelling at higher speeds or manoeuvring using thruster engines. Given that noise from dredging vessels will not be any greater than background shipping noise, disturbance and displacement upon the harbour porpoise community within Rockabill to Dalkey Island SAC shall not occur, and disturbance and displacement upon the grey and harbour seal populations within Lambay Island SAC shall not occur. The project will not adversely affect the integrity of the sites and no reasonable scientific doubt remains as to the absence of such effects.

Notwithstanding this finding, to reduce the risk of disturbance to passing individuals of these species, measures intended to avoid or reduce the harmful effects of dredging and dumping must be applied. Those measures are

set out in Section 5.3 of this document and mirror the measures proposed in a Marine Mammal Risk Assessment set out in the Biodiversity, Flora and Fauna Chapter of the EIAR (Chapter 7, Section 7.2) which accompanies the applications for consent.

5.3 Mitigation Measures

5.3.1 Water Quality

DPC has completed its winter capital dredging seasons for the ABR Project. These successive dredging campaigns over the past 4 winter seasons have been fully compliant with the requirements of all the development consents, as confirmed by high resolution environmental monitoring results reported in the Annual Environmental Reports submitted to the EPA Office of Environmental Enforcement (OEE). The monitoring included year-round real-time measurement of water quality parameters in the Liffey Channel and in Dublin Bay at eight monitoring stations and at various water depths. This was supplemented by sediment plume and hydrographic monitoring that validated Plume Dispersal Modelling.

A Dredging Management Plan was developed for the ABR Project and is set out in *Alexandra Basin Redevelopment Project Construction Environmental Management Plan (CEMP) Rev. F August 2018*. The mitigation proposed for dredging operations in the proposed Dublin Harbour Capital Dredging Project has been informed by the ABR Project monitoring and experience working in the same locations. The following key relevant mitigation measures will apply to each dredging campaign:

- 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 avoid overlap with the Dublin Port maintenance dredging campaigns.
- No over-spilling from the vessel will 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 dump 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 capital dredging zone at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.

5.3.2 Marine Mammals

To minimise any disturbance effects on individuals of the seal and harbour porpoise populations the NPWS Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS 2014) shall be applied to dredging and dumping operations.

The mitigation measures recommended by the NPWS are for the presence of a trained and experienced Marine Observer (MMO) and the use of "ramp up" procedures for noise and vibration emitting operations.

The following mitigation measures are proposed to minimise the potential impacts on marine mammals and to allow animals move away from the area of dredging operations:

- A trained and experienced Marine Mammal Observer (MMO) will be put in place during dredging 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 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 the sea state is WMO Sea State 4 (≈Beaufort Force 4 conditions) or less.
- If there is a break in 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, 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 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.

As an additional mitigation measure for harbour porpoises, it is proposed to maintain the static acoustic monitoring (SAM) programme established during the ABR Project for the duration of the proposed project. This will provide long-term data on the use of Dublin Bay by the species. It is proposed that four monitoring stations will be maintained.

In addition to the above, monthly counts of seals hauled out on Bull Island will be undertaken to ensure there is no long-term impact of construction activities at Dublin Port on this important haul out site and to contribute to increasing knowledge of seals using this UNESCO World Heritage site.

6 CONCLUSION OF THE HABITATS DIRECTIVE APPRAISALS

Having regard to the relevant legislation and the methodology followed, a Stage One Screening appraisal was prepared of as to whether or not the proposed Dublin Harbour Capital Dredging Project is likely to have a significant effect on ten SACs and nine SPAs as described in Table 4-1.

Likely Significant Effects 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 Lambay Island SAC or Rockabill to Dalkey Island SAC;
- The possibility of likely significant 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 or North Bull Island SPA.

A subsequent Stage Two appraisal of the implications of the proposed Dublin Harbour Capital Dredging Project on European sites in view of their conservation objectives to determine if the proposed development would adversely affect the integrity of a European site was conducted. The NIS considered four impact themes and focused on the following possible Likely Significant Effects:

- Habitat Hoss
- Water Quality and Habitat Deterioration effects
- Underwater Noise and Disturbance effects
- Aerial Noise and Visual Disturbance effects

Having conducted further investigation and analysis and applied mitigation measures where necessary 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.

Appendix I: Poolbeg Dredging Disturbance Study

ECOLOGICAL SURVEY FOR BIRDS

ESB Cooling Water Outfall, Poolbeg

NI1893 | Dublin Port Company
MP2 Project
Final
November 2019

www.rpsgroup.com

Prepared by**:**

RPS Ireland Ltd

Adam McClure
Senior Ecologist

Elmwood House, 74 Boucher Road
Belfast, Co. Antrim, BT12 6RZ

T 028 9066 7914
E adam.mcclure@rpsgroup.com

Prepared for**:**

Dublin Port Company

Sarah Horgan
Programme Management Office

Port Centre, Alexandra Road,
Dublin Port, D01 H4C6

T +353 (0) 1 8876861
E shorgan@dublinport.ie

Contents

1 INTRODUCTION

RPS was commissioned by Dublin Port Company to undertake an Ecological Survey for Birds at the ESB Power Station cooling water outfall adjacent to Poolbeg Tank Farm and the Great South Wall, Dublin Bay.

The purpose of these surveys was to record any disturbance events relevant to Special Conservation Interest species of South Dublin Bay and River Tolka Estuary Special Protection Area (SPA), observed by the ornithologist before, during and after dredging being carried out under Dumping at Sea Permit S0024-01 in the navigation channel in October 2019

1.1 Ecological Survey for Birds

The Ecological Survey Report has been written in accordance with the Chartered Institute of Ecological and Environmental Management (CIEEM) *Guidelines for Ecological Report Writing* (CIEEM 2017).

The aim of the report is to provide a description of the bird survey methods used and to provide the results of bird surveys; to inform an interpretation of the results by the appointed MP2 Project ornithologist.

2 METHODOLOGY

2.1 Statement of Authority

The ornithological surveyor and report author, Adam McClure BSc, is a Senior Ecologist with RPS with over 10 years of experience in the field of ornithology. Adam has extensive expertise and experience in conducting a wide range of ornithological surveys, including bird disturbance surveys. Adam is also a Full member of CIEEM and is currently a member of the CIEEM Irish Section Committee.

The second ornithological surveyor, Nick Veale BSc MSc, is an independent ecologist with over 18 years' experience in consulting ecology and specialising in ornithology. Nick has extensive expertise and experience in conducting a wide range of ornithological surveys, including bird disturbance surveys.

The information prepared and provided is true and accurate at the time of issue of this report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM, 2019).

We confirm that the professional judgement expressed herein is the true and bona fide opinion of our professional ecologists.

2.2 Consultation

As part of the planning application determination process, An Bord Pleanála received a submission from BirdWatch Ireland dated 6th September 2019.

BirdWatch Ireland raised concerns that the proposed dredging works to widen the current navigation channel could cause disturbance to an area which they identified as "a notable area for waterbirds", including "many gulls, but also smaller numbers of Sanderling, Black-tailed Godwits, Redshank and others".

The area in question is the cooling water outfall from ESB's Poolbeg Power Station located at the base of the Great South Wall in the Liffey Channel, where a small area of mudflat is exposed at low-tide.

BirdWatch Ireland noted that they were unable to discount the possibility of disturbance from dredging activities to Special Conservation Interest (SCI) species from neighbouring SPA sites, and in particular Black-headed Gull.

2.3 Disturbance Monitoring Survey

Permission has been granted under Dumping at Sea Permit S0024-01 to allow Dublin Port Company to dredge the navigation channel as part of Alexandra Basin Redevelopment

A dredging campaign was programmed for late October 2019 and a decision was taken to make use of that campaign as it presented an opportunity to capture any disturbance events that might occur when the permitted dredging activity was taking place.

In order to assess potential disturbance events caused by the presence of the dredging vessel, suitable vantage points overseeing the outfall and surrounding lands were established.

The dredging vessel, Freeway, is a 92m hopper dredger. During monitoring the dredger slowly passed by the survey area at the inner limit of the dredging area, approximately 200m from shore, or approximately 150m from the low water mark. During operation, the dredger was passing the survey area for 10-15 minutes.

A vantage point (VP), located on the southern bank of the Liffey, on the quayside adjacent to Poolbeg Tank Farm was chosen.

Due to restrictions on access over a bank holiday weekend, a second vantage point was required. The second VP was located on reclaimed land adjacent to Terminal 5 on the northern bank of the Liffey (Figure 1.0).

Figure 1.0 – Showing location of vantage points and area of interest

Vantage point watches were conducted within a window, +/- 2.5 hours either side of low water on days where day light permitted.

Observers recorded all disturbance events during surveys, including potential disturbance events, noting the species and numbers present and their reaction to the disturbance event.

In order to provide a series of control observations, surveys were conducted over several days prior to the dredger moving into the area, as well as during dredging activities and after dredging activities had ceased.

The response of waterbirds present was assigned a score on a scale from 0 to 3:

- 0 - No behavioural change
- 1 - Behavioural change (e.g. vigilance or alarm call) but not flight
- 2 - Flew but soon returned to the site
- 3 - Flew and abandoned the site

3 RESULTS

3.1 Disturbance Monitoring Survey

A total of 24 hours and 40 minutes of survey were carried out over six days between 22nd October and 27th October 2019 (see Table 3.2).

Full results of disturbance events are presented as Appendix 2. A summary is presented below.

Observers recorded 100 events which had the potential to cause disturbance, mostly passing ships entering or leaving Dublin Port.

Eighty-two events did not cause any behavioural change in any of the birds present within the survey area (see Table 3.1).

The presence of the dredger, both during operation or when passing the survey area, did not cause any behavioural change in any of the birds present onsite.

Table 3.1 – Disturbance events recorded and levels of severity

Severity level	0	1	2	3	Total
No. of disturbance events	82	11	5	2	100

Eighteen disturbance events resulted in behavioural change:

- Eleven events, all caused by small wakes produced by passing ships, resulted in behavioural change (e.g. vigilance or alarm call) but not flight
- Five events, all caused by potentially predatory birds flying over, resulted in some of the birds present taking flight, but they soon returned to the site; and
- Two events, both caused by wakes produced by the Dublin Port Authority pilot vessel passing at speed, resulted in some of the birds present taking flight and not returning.

Table 3.2 – Conditions during survey

Date	Observer	VP	Control / Dredging	Start	End	Tide	Sunrise / Sunset	Cloud (Oktas)	Visibility (Met Eireann, 2019)	Wind (Beaufort scale)	Temp. (°C)	Precipitation
22.10.2019	AM	Poolbeg	Control	10:15	14:15	12:18	n/a	8/8	Excellent	1 SW	10	None
23.10.2019	NV	Poolbeg	Control	11:30	16:00	13:41	n/a	6/8	Very good	3-4 SW	13	None
24.10.2019	NV	Poolbeg	Dredging	12:10	16:50	14:50	18:09	2/8	Very good	4-5 NW	12	None
25.10.2019	AM	Poolbeg	Dredging	13:45	14:45	15:45	18:07	8/8	Moderate	2-3 SW	6	Rain throughout
		Terminal 5		15:15	17:45							
26.10.2019	AM	Terminal 5	Dredging	14:00	17:30	16:30	18:05	3/8	Excellent	3 SW	7	None
27.10.2019	NV	Terminal 5	Dredging	14:00	18:00	16:15	17:03	0/8	Excellent	1-2 NW	10-3	None

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Appendices

Appendix 1 - BTO Species Codes

BTO SPECIES CODES

AC	Arctic Skua	GA	Gadwall	LE	Long-eared Owl	SM	Sand Martin
AE	Arctic Tern	GX	Gannet	LT	Long-tailed Tit	SS	Sanderling
AV	Avocet	GW	Garden Warbler	MG	Magpie	TE	Sandwich Tern
BO	Barn Owl	GY	Garganey	MA	Mallard	VI	Savi's Warbler
BY	Barnacle Goose	GC	Goldcrest	MN	Mandarin Duck	SQ	Scarlet Rosefinch
BA	Bar-tailed Godwit	EA	Golden Eagle	MX	Manx Shearwater	SP	Scaup
BR	Bearded Tit	OL	Golden Oriole	MR	Marsh Harrier	CY	Scottish Crossbill
BS	Berwick's Swan	GF	Golden Pheasant	MT	Marsh Tit	SW	Sedge Warbler
BI	Bittern	GP	Golden Plover	MW	Marsh Warbler	NS	Serin
BK	Black Grouse	GN	Goldeneye	MP	Meadow Pipit	SA	Shag
TY	Black Guillemot	GO	Goldfinch	MU	Mediterranean Gull	SU	Shelduck
BX	Black Redstart	GD	Goosander	ML	Merlin	SX	Shorelark
BJ	Black Tern	GI	Goshawk	M.	Mistle Thrush	SE	Short-eared Owl
B.	Blackbird	GH	Grasshopper Warbler	MO	Montagu's Harrier	SV	Shoveler
BC	Blackcap	GB	Great Black-backed Gull	MH	Moorhen	SK	Siskin
BH	Black-headed Gull	GG	Great Crested Grebe	MS	Mute Swan	S.	Skylark
BN	Black-necked Grebe	ND	Great Northern Diver	N.	Nightingale	SZ	Slavonian Grebe
BW	Black-tailed Godwit	NX	Great Skua	NJ	Nightjar	SN	Snipe
BV	Black-throated Diver	GS	Great Spotted Woodpecker	NH	Nuthatch	SB	Snow Bunting
BT	Blue Tit	GT	Great Tit	OP	Osprey	ST	Song Thrush
BU	Bluethroat	GE	Green Sandpiper	OC	Oystercatcher	SH	Sparrowhawk
BL	Brambling	G.	Green Woodpecker	PX	Peafowl/Peacock	AK	Spotted Crake
BG	Brent Goose	GR	Greenfinch	PE	Peregrine	SF	Spotted Flycatcher
BF	Bullfinch	GK	Greenshank	PH	Pheasant	DR	Spotted Redshank
BZ	Buzzard	H.	Grey Heron	PF	Pied Flycatcher	SG	Starling
CG	Canada Goose	P.	Grey Partridge	PW	Pied Wagtail	SD	Stock Dove
CP	Capercaillie	GV	Grey Plover	PG	Pink-footed Goose	SC	Stonechat
C.	Carrion Crow	GL	Grey Wagtail	PT	Pintail	TN	Stone-curlew
CW	Cetti's Warbler	GJ	Greylag Goose	PO	Pochard	TM	Storm Petrel
CH	Chaffinch	GU	Guillemot	PM	Ptarmigan	SL	Swallow
CC	Chiffchaff	FW	Guineafowl (Helmeted)	PU	Puffin	SI	Swift
CF	Chough	HF	Hawfinch	PS	Purple Sandpiper	TO	Tawny Owl
CL	Cirl Bunting	HH	Hen Harrier	Q.	Quail	T.	Teal
CT	Coal Tit	HG	Herring Gull	RN	Raven	TK	Temminck's Stint
CD	Collared Dove	HY	Hobby	RA	Razorbill	TP	Tree Pipit
CM	Common Gull	HZ	Honey Buzzard	RG	Red Grouse	TS	Tree Sparrow
CS	Common Sandpiper	HC	Hooded Crow	KT	Red Kite	TC	Treecreeper
CX	Common Scoter	HP	Hoopoe	ED	Red-backed Shrike	TU	Tufted Duck
CN	Common Tern	HM	House Martin	RM	Red-breasted Merganser	TT	Turnstone
CO	Coot	HS	House Sparrow	RQ	Red-crested Pochard	TD	Turtle Dove
CA	Cormorant	JD	Jackdaw	FV	Red-footed Falcon	TW	Twite
CB	Corn Bunting	J.	Jay	RL	Red-legged Partridge	WA	Water Rail
CE	Corncrake	K.	Kestrel	NK	Red-necked Phalarope	W.	Wheatear
CI	Crested Tit	KF	Kingfisher	LR	Redpoll (Lesser)	WM	Whimbrel
CR	Crossbill (Common)	KI	Kittiwake	RK	Redshank	WC	Whinchat
CK	Cuckoo	KN	Knot	RT	Redstart	WG	White-fronted Goose
CU	Curlew	LM	Lady Amherst's Pheasant	RH	Red-throated Diver	WH	Whitethroat
DW	Dartford Warbler	LA	Lapland Bunting	RE	Redwing	WS	Whooper Swan
DI	Dipper	L.	Lapwing	RB	Reed Bunting	WN	Wigeon
DO	Dotterel	TL	Leach's Petrel	RW	Reed Warbler	WT	Willow Tit
DN	Dunlin	LB	Lesser Black-backed Gull	RZ	Ring Ouzel	WW	Willow Warbler
D.	Dunnock	LS	Lesser Spotted Woodpecker	RP	Ringed Plover	OD	Wood Sandpiper
EG	Egyptian Goose	LW	Lesser Whitethroat	RI	Ring-necked Parakeet	WO	Wood Warbler
E.	Eider	LI	Linnet	R.	Robin	WK	Woodcock
FP	Feral Pigeon	ET	Little Egret	DV	Rock Dove (not feral)	WL	Woodlark
ZL	Feral/hybrid goose	LG	Little Grebe	RC	Rock Pipit	WP	Woodpigeon
ZF	Feral/hybrid mallard type	LU	Little Gull	RO	Rook	WR	Wren
FF	Fieldfare	LO	Little Owl	RS	Roseate Tern	WY	Wryneck
FC	Firecrest	LP	Little Ringed Plover	RY	Ruddy Duck	YW	Yellow Wagtail
F.	Fulmar	AF	Little Tern	RU	Ruff	Y.	Yellowhammer

Appendix 2 - Full results from disturbance survey

Date	Time	Tide	Species and number present	Disturbance Event	Severity
22/10/219	10:20	M-L falling	260 BH, 4 CA, 6 HG, 1 OC, 2 TT, 2 RK	Small survey boat passing inside bouy	0
22/10/219	10:36	M-L falling	2 BW, 3 RK, 260 BH, 4 CA, 6 HG, 2 TT	Rib passing inside bouy	0
22/10/219	10:46	M-L falling	2 BW, 3 RK, 260 BH, 4 CA, 6 HG, 2 TT	Rib passing inside bouy	0
22/10/219	10:58	M-L falling	2 BW, 3 RK, 260 BH, 4 CA, 6 HG, 2 TT	Freight Craft "Mistral"	0
22/10/219	11:09	M-L falling	3 RK, 9 BG, 12 HG, 280 BH	Rosbeg workboat passing	0
22/10/219	11:16	M-L falling	3 RK, 9 BG, 12 HG, 280 BH	Ship Irish Ferries "WB Yeats" temporary wake surge	0
22/10/219	11:42	M-L falling	16 HG, 1 GB, 2 BW, 6 TT, 2 RK, 330 BH, 2 CA	Buzzard flying over, being mobbed by 2 Hooded Crows	2
22/10/219	11:46	M-L falling	16 HG, 1 GB, 2 BW, 6 TT, 2 RK, 330 BH, 2 CA	Kestrel flying over	2
22/10/219	12:02	Low	1 RK, 3 CA, 4 HG, 6 TT, 350 BH	Stena Superfast ferry and small rib passing	0
22/10/219	12:11	Low	1 RK, 3 CA, 4 HG, 6 TT, 350 BH	Seatruck	0
22/10/219	13:06	L-M rising	2 CA, 3 TT, 1 RK, 150 BH	Heron flying in	0
22/10/219	13:06	L-M rising	200 BH, 9 HG	Heron flying in	2
22/10/219	13:18	L-M rising	9 HG, 2 CA, 3 TT, 1 RK, 350 BH	Ferry passing	0
22/10/219	13:37	L-M rising	6 HG, 1 RK, 1 TT, 300 BH	Ferry passing	0
22/10/219	13:41	L-M rising	6 HG, 1 RK, 1 TT, 300 BH	Dublin Port pilot boat passing causing small wake	0
23/10/2019	11:41	M-L falling	213 BH, 23 HG, 2 MU, 7 GB, 4 OC, 16 TT, 2 L, 6 RK,	Rosbeg tug 140m from Quay working and making manoeuvres	0
23/10/2019	12:02	M-L falling	236 BH, 15 HG, 3 MU, 4 GB, 2 OC, 22 TT, 9 RK,	Stena Superfast Passenger ferry	0
23/10/2019	12:13	M-L falling	265 BH, 11 HG, 4 MU, 6 GB, 4 OC, 16 TT, 7 RK, 2 CA, 1 H.	Seatruck	0
23/10/2019	12:28	M-L falling	305 BH, 14 HG, 3 MU, 8 GB, 2 OC, 10 TT, 16 RK, 4 CA, 2 H, 1 GG	Celtic Explorer	0
23/10/2019	12:49	M-L falling	360 BH, 10 HG, 2 MU, 7 GB, 5 OC, 19 TT, 6 RK, 13 CA, 3 H, 2 GG	Small Craft Boksalis RIB Escorting Dredger out at	0
23/10/2019	13:23	M-L falling	350 BH, 10 HG, 2 MU, 7 GB, 5 OC, 19 TT, 6 RK, 13 CA, 3 H, 2 GG	Freight Craft "WithDAWN"	0
23/10/2019	13:33	M-L falling	280 BH, 7 HG, 1 MU, 8 GB, 4 OC, 16 TT, 9 RK, 15 CA, 2 H,	Small Craft dublin pilot "liffey"	0
23/10/2019	13:41	Low	As above but around 60 BH took flight, 4 OC, 10 RK & 13 TT allerted and flew briefly before returning to normal	Heron flyover Study area	2
23/10/2019	13:58	Low	265 BH, 7 HG, 1 MU, 8 GB, 4 OC, 16 TT, 9 RK, 15 CA, 2 H,	Small Craft dublin pilot "liffey"	0

23/10/2019	14:06	L-M rising	261 BH, 18 HG, 1 MU, 4 GB, 1 OC, 9 TT, 5 RK, 13 CA, 1 H, 1 GG	Seatruck Small Wake produced caused a small surge in study area which caused a handfull of RK and TT to alert and walk	1
23/10/2019	14:26	L-M rising	250 BH, 16 HG, 8 GB, 1 OC, 14 TT, 8 RK, 1 H, 17 CA, 2 GG	Ship BGFreight "Andromeda"	0
23/10/2019	14:43	L-M rising	236 BH, 9 HG, 1 MU, 6 GB, 2 OC, 24 TT, 7 RK, 2 H, 12 CA, 1 GG	Ship Irish Ferries "WB Yeats" temporary oery wake surge	1
23/10/2019	14:50	L-M rising	225 BH, 15 HG, 2 MU, 6 GB, 4 OC, 17 TT, 9 RK, 3 H, 14 CA, 1 GG.	"Rosbeg" tug 140m from Quay working and making manoeuvres 2 divers in water, 5 deck crew. winch in operation	0
23/10/2019	15:05	L-M rising	203 BH, 21 HG, 3 MU, 8 GB, 2 OC, 19 TT, 13 RK, 2 H, 16 CA, 2 GG.	Stena Superfast Passenger ferry temporary wake surge	1
23/10/2019	15:10	L-M rising	168 BH, 11 HG, 4 MU, 5 GB, 1 OC, 8 TT, 3 RK, 1 H, 10 CA, 2 GG.	"Rosbeg" tug moved to 250m from Quay working and making manoeuvres 5 deck crew.	0
23/10/2019	15:38	L-M rising	175 BH, 12 HG, 6 GB, 2 OC, 12 TT, 5 RK, 2 H, 14 CA, 1 GG.	"Rosbeg" tug moved to 300m from Quay working and making manoeuvres 5 deck crew.	0
24/10/2019	12:10	M-L falling	325 BH, 23 HG, 2 GB, 5 MU, 2 CM, 1 OC, 25 TT, 2 RK, 1 H, 22 CA, 1 CU	Seatruck Westbound	0
24/10/2019	12:14	M-L falling	325 BH, 23 HG, 2 GB, 5 MU, 2 CM, 1 OC, 25 TT, 2 RK, 1 H, 22 CA, 1 CU	Ship Irish Ferries "Epsilon" Westbound	0
24/10/2019	12:31	M-L falling	325 BH, 23 HG, 2 GB, 5 MU, 2 CM, 1 OC, 25 TT, 2 RK, 1 H, 22 CA, 1 CU	Ship Stenna superfast westbound small wake surge up on beach, 15 TT moved up gull also moved a few metres up	1
24/10/2019	13:18	M-L falling	350 BH, 28 HG, 4 GB, 5 MU, 5 CM, 3 OC, 20 TT, 9 RK, 1 H, 18 CA,	kestrel female flew over vp and flushed approximately 60% of the BH and the waders. Disturbance was temporary and all affected returned to area.	2
24/10/2019	13:28	M-L falling	320 BH, 17 HG, 2 GB, 3 MU, 2 CM, 4 OC, 25 TT, 11 RK, 1 H, 16 CA, 1 GG	Seatruck Eastbound very very slow ahead no noticeable wake or bow wave produced	0
24/10/2019	13:35	M-L falling	320 BH, 17 HG, 2 GB, 3 MU, 2 CM, 4 OC, 25 TT, 11 RK, 1 H, 16 CA, 1 GG	Small Craft Boksalis RIB Eastbound	0
24/10/2019	13:38	M-L falling	340 BH, 24 HG, 2 GB, 3 MU, 2 CM, 4 OC, 25 TT, 11 RK, 1 H, 16 CA, 1 GG	Dredger "Freeway" Westbound 350m from vp	0
24/10/2019	13:52	M-L falling	390 BH, 29 HG, 2 GB, 5 MU, 1 CM, 3 OC, 5 TT, 6 RK, 1 H, 13 CA, 2 GG	Ship BGFreight "Andromeda" Westbound small wake surge in study area	1
24/10/2019	14.02	M-L falling	380 BH, 32 HG, 2 GB, 5 MU, 1 CM, 3 OC, 5 TT, 6 RK, 1 H, 13 CA, 2 GG, 2 CU	Ship Celtic Voyager Eastbound	0
24/10/2019	14:15	M-L falling	370 BH, 34 HG, 2 MU, 2 CM, 2 OC, 23 TT, 12 RK, 16 CA,	Dredger "Freeway" Eastbound 210m from vp Actively dredging	0
24/10/2019	14:30	M-L falling	350 BH, 28 HG, 4 GB, 5 MU, 5 CM, 3 OC, 20 TT, 9 RK, 1 H, 18 CA,	Dredger "Freeway" Westbound 210m from vp in Reverse	0
24/10/2019	14:40	Low	310 BH, 36 HG, 5 GB, 4 MU, 3 CM, 4 OC, 13 TT, 4 RK, 12 CA.	Ship Irish Ferries "WB Yeats" temporary wake surge	1
24/10/2019	14:42	Low	310 BH, 36 HG, 5 GB, 4 MU, 3 CM, 4 OC, 13 TT, 4 RK, 12 CA.	small craft brian boru	0
24/10/2019	14:58	L-M rising	300 BH, 27 HG, 5 GB, 3 MU, 4 CM, 2 OC, 8 TT, 6 RK, 5 CA, 1 CU	Ship Stena superfast westbound small wake surge up on beach, 15 TT moved up gull also moved a few metres up	1

24/10/2019	15:09	L-M rising	300 BH, 27 HG, 5 GB, 3 MU, 4 CM, 2 OC, 8 TT, 6 RK, 5 CA, 1 CU	"Rosbeg" tug 250m from Quay working and making manoeuvres 5 deck crew.	0
24/10/2019	15:16	L-M rising	280 BH, 24 HG, 3 GB, 4 MU, 2 CM, 2 OC, 15 TT, 10 RK, 8 CA, 1 CU, z	Ship "Laureline" container vessel	0
24/10/2019	15:29	L-M rising	255 BH, 17 HG, 2 GB, 2 MU, 1 CM, 1 OC, 7 TT, 6 RK, 5 CA, 1 CU	ship Container "Mistral" Eastbound very small wake into survey area with no affect	0
24/10/2019	15.52	L-M rising	205 BH, 22 HG, 5 GB, 3 MU, 2 CM, 4 OC, 23 TT, 12 RK, 18 CA, 2 CU	Seatruck "Clipperpoint" Eastbound fast ahead large noticeable wake causing localised type 1 disturbance to @ 50 BH, 12 TT, 5 RK and 2 CU	1
24/10/2019	16:05	L-M rising	225 BH, 17 HG, 3 GB, 10 MU, 2 OC, 13 TT, 7 RK, 23 CA, 1 CU, 1 GG	Small Craft dublin pilot "liffey" Westbound	0
24/10/2019	16:23	L-M rising	295 BH, 23 HG, 6 GB, 8 MU, 6 OC, 2 BA, 20 TT, 4 RK, 26 CA, 4 CU, 2 GG	large Ship "Hermine" Westbound very slow no wake	0
24/10/2019	16:40	L-M rising	345 BH, 28 HG, 2 GB, 11 MU, 4 OC, 2 BA, 13 TT, 10 RK, 25 CA, 4 CU 2 CM.	"Rosbeg" tug moved 350m from Quay working and making manoeuvres 5 deck crew.	0
25/10/2019	13:53	M-L falling	1 RK, 3 TT, 3 CA, 17 HG, 1 OC, 412 BH	Pilot boat "Liffey" passing	0
25/10/2019	13:54	M-L falling	1 RK, 3 TT, 1 CU, 4 CA, 24 HG, 1 OC, 412 BH	Dredger "Freeway" passing by survey area	0
25/10/2019	14:03	M-L falling	1 RK, 3 TT, 1 CU, 4 CA, 24 HG, 1 OC, 452 BH, 1MU	Ship "Arklow Cape" passing	0
25/10/2019	14:07	M-L falling	6 RK, 3 TT, 1 CU, 4 CA, 24 HG, 1 OC, 551 BH, 1 MU	Dredger "Freeway" slowly passing survey area until 14:17	0
25/10/2019	15:32	Low	1 OC. 10 TT, 5 BW, 3 CA, 4 SS, 3 RK, 1 H., 39 HG, 551 BH	Ship "Mistral" passing	0
25/10/2019	15:50	Low	1 OC. 10 TT, 5 BW, 3 CA, 4 SS, 3 RK, 1 H., 39 HG, 551 BH	Ship "Hermine" passing	0
25/10/2019	16:26	L-M rising	1 OC. 10 TT, 5 BW, 3 CA, 4 SS, 3 RK, 1 H., 39 HG, 551 BH	Pilot boat "Liffey" passing	0
25/10/2019	16:49	L-M rising	c.400 BH, 4 MA, 3 TT, 3 HG	Seatruck "Power" passing	0
25/10/2019	16:57	L-M rising	c.400 BH, 4 MA, 3 TT, 3 HG	Stena "Adventurer" passing	0
25/10/2019	17:05	L-M rising	c.400 BH, 4 MA, 3 TT, 3 HG	P&O "Norbank" passing	0
25/10/2019	17:10	L-M rising	c.400 BH, 4 MA, 3 TT, 3 HG	Irish Ferries "Ulysses" passing	0
25/10/2019	17:19	L-M rising	c.400 BH, 4 MA, 3 TT, 3 HG	Work boat "Rosbeg" passing	0
26/10/2019	14:10	M-L falling	8 TT, 3 CA, 1 OC, 5 HG, 376 BH	Small pleasure craft passing inside of bouy	0
26/10/2019	14:37	M-L falling	18 SS, 4 CA, 9 HG, 1 CU, 360 BH	Pilot boat "Liffey" passing	0
26/10/2019	14:42	M-L falling	18 SS, 4 CA, 9 HG, 1 CU, 360 BH	Small pleasure craft passing inside of bouy	0
26/10/2019	15:00	M-L falling	18 SS, 4 CA, 9 HG, 1 CU, 360 BH	Stena Superfast X	0
26/10/2019	15:22	M-L falling	2 RK, 17 HG, 1 CA, 300 BH	Irish Ferrires "WB Yeats" departing, very slowly. Almost appeared to have stopped off survey area.	0

26/10/2019	15:36	M-L falling	2 RK, 17 HG, 1 CA, 300 BH	Tanker "Sten Nordic" and ship "Peregrine" passing	0
26/10/2019	15:58	M-L falling	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Boskalis survey boat "Smit Leyland" passing	0
26/10/2019	16:10	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Boskalis survey boat "Smit Leyland" passing	0
26/10/2019	16:14	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Pilot boat "Liffey" passing	0
26/10/2019	16:16	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Boskalis survey boat "Smit Leyland" passing back and forth by survey area until 16:25	0
26/10/2019	16:30	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Boskalis survey boat "Smit Leyland" passing	0
26/10/2019	16:37	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Tanker "Thun Genius" passing	0
26/10/2019	16:39	Low	56 HG, 12 SS, 1 CA, 450 BH, 2 RK, 1 OC, 2 BW	Irish Ferries "Epsilon"	0
26/10/2019	17:09	L-M rising	72 HG, 18 SS, 3 CA, 300 BH, 2 RK, 1 OC, 2 BW	Small pleasure craft passing	0
26/10/2019	17:11	L-M rising	72 HG, 18 SS, 3 CA, 300 BH, 2 RK, 1 OC, 2 BW	Norbank	0
26/10/2019	17:16	L-M rising	72 HG, 18 SS, 3 CA, 300 BH, 2 RK, 1 OC, 2 BW	Stena Adventurer	0
26/10/2019	17:23	L-M rising	72 HG, 18 SS, 3 CA, 300 BH, 2 RK, 1 OC, 2 BW	Seatruck "Power" passing	0
26/10/2019	17:29	L-M rising	72 HG, 18 SS, 3 CA, 300 BH, 2 RK, 1 OC, 2 BW	Irish Ferries "Ulysses" passing	0
27/10/2019	14:25	M-L falling	380 BH, 20 HG, 10 GB, 3 MU, 1 OC, 2 BA, 20 TT, 10 RK, 13 CA, 2 CU 8 CM, 4 GG,	small craft 2 men onboard fishing?	0
27/10/2019	14:39	M-L falling	380 BH, 20 HG, 10 GB, 3 MU, 1 OC, 2 BA, 20 TT, 10 RK, 13 CA, 2 CU 8 CM, 4 GG,	Ship Irish Ferries "WB Yeats" heading out Eastbound, temporary wake surge	1
27/10/2019	14:56	M-L falling	400 BH, 20 HG, 10 GB, 9 MU, 4 OC, 8 BA, 20 TT, 10 RK, 20 CA, 6 CU 8 CM, 4 GG,	Small yacht "Bona" Eastbound	0
27/10/2019	15:00	M-L falling	400 BH, 20 HG, 10 GB, 9 MU, 4 OC, 8 BA, 20 TT, 10 RK, 20 CA, 6 CU 8 CM, 4 GG,	Stena Superfast Passenger ferry eastbound wake into survey area temporary disturbance	1
27/10/2019	15.03	M-L falling	430 BH, 20 HG, 10 GB, 9 MU, 16 OC, 18 BA, 30 TT, 15 RK, 20 CA, 7 CU 9 CM, 4 GG, 5 MA,	Dublin Port Authority Pilot Eastbound fast small wake	0
27/10/2019	15.22	M-L falling	450 BH, 80 HG, 16 GB, 7 MU, 16 OC, 18 BA, 30 TT, 15 RK, 20 CA, 12 CU 9 CM, 6 GG, 5 MA,	Ship Freighter "Bit Ecco" Eastbound small wake very slow	0
27/10/2019	15:33	M-L falling	450 BH, 110 HG, 19 GB, 5 MU, 18 OC, 10 BA, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA,	Ship Freighter "MISTRAL" Eastbound small wake	1
27/10/2019	15:51	M-L falling	500 BH, 110 HG, 19 GB, 5 MU, 18 OC, 10 BA, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA, 1 H, 23 SS	small Yacht Westbound very slow no significant wake	0
27/10/2019	15:53	M-L falling	500 BH, 110 HG, 19 GB, 5 MU, 18 OC, 10 BA, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA, 1 H, 45 SS,	Small Craft Boksalis RIB Westbound no significant wake	0
27/10/2019	15:58	M-L falling	500 BH, 110 HG, 19 GB, 5 MU, 18 OC, 18 BA, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA, 2 H, 85 SS	Dublin Port Authority Pilot Westbound fast small wake	0

27/10/2019	16:12	Low	500 BH, 110 HG, 15 GB, 5 MU, 18 OC, 18 BA, 10 BW, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA, 2 H, 65 SS, 30 DN,	Ship Freighter Matthew LPG slow Westbound small wake no significant disturbance	0
27/10/2019	16:15	Low	500 BH, 110 HG, 12 GB, 5 MU, 18 OC, 10 BA, 20 TT, 15 RK, 24 CA, 12 CU 9 CM, 2 GG, 5 MA, 2 H, 50 SS	Small yacht "Celtic Mist IWDG" Westbound	0
27/10/2019	16:40	L-M rising	600 BH, 160 HG, 54 GB, 8 MU, 25 OC, 15 BA, 10 BW, 10 TT, 10 RK, 20 CA, 17 CU 15 CM, 7 GG, 3 H, 50 SS, 30 DN	Dublin Port Authority Pilot Eastbound fast wake flushed approximately 40 SS and 20 DN which as a result flew northwest towards esturine mud south of the Bull wall	3
27/10/2019	17.01	L-M rising	600 BH, 160 HG, 54 GB, 8 MU, 25 OC, 15 BA, 10 BW, 10 TT, 10 RK, 20 CA, 17 CU 15 CM, 7 GG, 3 H, 50 SS, 30 DN	Stena Adventurer passenger ferry Westbound very slow small wake no percieved disturbance.	0
27/10/2019	17:13	L-M rising	600 BH, 190 HG, 50 GB, 8 MU, 30 OC, 15 BA, 10 BW, 10 TT, 10 RK, 20 CA, 12 CU 15 CM, 5 GG, 5 H, 35 SS, 20 DN	Irish Ferries "Ulysses" Westbound slow minimal wake onto survey area.	0
27/10/2019	17:22	L-M rising	520 BH, 130 HG, 40 GB, 6 MU, 13 OC, 8 RK, 26 CA, 6 CU 10 CM, 2 GG, 4 H, 13 SS, 20 DN, 2 TY	Dublin Port Authority Pilot Westbound very fast produced that wake flushed rest of 13 SS & 20 DN which as a result flew northwest towards esturine mud south of the Bull wall	3
27/10/2019	17:28	L-M rising	520 BH, 130 HG, 40 GB, 6 MU, 13 OC, 8 RK, 26 CA, 6 CU 10 CM, 2 GG, 4 H,	Container Freighter ""BG JADE" westbound slow no significant wake	0
27/10/2019	17:44	L-M rising	520 BH, 130 HG, 40 GB, 6 MU, 13 OC, 8 RK, 26 CA, 6 CU 10 CM, 2 GG, 4 H,	Container Freighter "ELB FEEDER" westbound slow	0