NATURA IMPACT STATEMENT

PROVISION OF INFORMATION FOR AN APPROPRIATE ASSESSMENT

FOR A PROPOSED CRUISE TERMINAL,

DÚN LAOGHAIRE, CO. DUBLIN.

PREPARED FOR STEPHEN LITTLE & ASSOCIATES

ON BEHALF OF DÚN LAOGHAIRE CRUISE STAKEHOLDER GROUP

Project Reference:		**130140 Dún Laoghaire Harbour Cruise Liner Berth**			
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1 Introduction

The information in this report forms part of, and should be read in conjunction with the documentation accompanying the application for planning permission for a proposed Cruise Terminal at Dún Laoghaire Harbour, Dún Laoghaire, Co. Dublin.

This report which contains information required for the competent authority (in this instance An Board Pleanála) to undertake an Appropriate Assessment (AA), was prepared by Scott Cawley Ltd. on behalf of the applicant. It provides information on and assesses the potential for the proposed development to significantly affect Natura 2000 sites (hereafter "European sites"[1]).

It is necessary that the proposal has regard to Article 6 of the *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter "the Habitats Directive"). This is transposed in Ireland primarily by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) (as amended) (hereafter the Birds and Habitats Regulations) and the Planning and Development (Amendment) Act, 2010 (as amended).

An AA is required if likely significant effects on European sites arising from a proposed development cannot be ruled out at the screening stage, either alone or in combination with other plans or projects.

2 Methodology

2.1 Statement of Authority

This Natura Impact Statement (NIS) was prepared by Aebhín Cawley and Ashling Cronin of Scott Cawley Ltd.

Aebhín Cawley is Director with Scott Cawley. Aebhín holds an honours degree in Zoology from Trinity College, Dublin and a postgraduate diploma in Physical Planning at Trinity. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Aebhin Cawley is an experienced ecological consultant with extensive experience in public and private sector projects including renewable energy, ports, road, rail and other major infrastructural developments. Aebhín has been undertaking Appropriate Assessment work in Ireland since 2002. She has delivered lectures and training on Appropriate Assessment to a range of local authorities and other public sector organisations, as well as professional institutes. She is an experienced ecologist with skills covering habitat and botanic assessments, specialist mammal (including all bat species) and general bird surveying (including overwintering waterfowl). Aebhín has developed and monitored habitat creation and restoration projects. She regularly carries out on-site ecological monitoring for compliance during construction works and has in-depth understand of the relationship between development and nature conservation.

Ashling Cronin holds an honours degree in Applied Ecology, and a first class honours Master's degree in Ecological Assessment from University College Cork. She is a Graduate Member of the CIEEM. Ashling has experience in the survey and assessment of a range of habitats and species including: Phase I habitat survey and mapping (including Annex I habitats), mammal surveys (including bats, badgers, and otters), bird and ground beetle surveys and impact assessment. She has conducted river corridor habitat surveys including assessment of fisheries potential, and is experienced in biological and physiochemical water quality monitoring. She also has experience of Strategic Environmental Assessment (SEA) and Appropriate Assessment having conducted research in collaboration with the

[1] Natura 2000 sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

Environmental Protection Agency and was involved in the production of the SEA Process Checklist (EPA, 2008).

2.2 Guidance

This NIS has been prepared with regard to the following guidance documents where relevant:

- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.* (Department of Environment, Heritage and Local Government, 2010 revision).
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.* Circular NPW 1/10 & PSSP 2/10.
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission Environment Directorate-General, 2001); hereafter referred to as the EC Article 6 Guidance Document. The guidance within this document provides a non-mandatory methodology for carrying out assessments required under Article 6(3) and (4) of the Habitats Directive.
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (EC Environment Directorate-General, 2000); hereafter referred to as MN2000.
- *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 European Commission (European Commission, January 2007).
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive.* Findings of an international workshop on Appropriate Assessment in Oxford, December 2009[2].

2.3 Screening for Appropriate Assessment

The relevant guidance documents for Appropriate Assessment set out a staged process for carrying out Appropriate Assessment, the first of which is referred to as screening. The screening stage identifies the likely impacts on European sites, if any, which would arise from a proposed plan or project, either alone or in combination with other plans and projects, and further considers whether these impacts are likely to adversely affect the integrity of any European sites.

If it can be concluded during the screening exercise that there is no likelihood of significant impacts occurring on any European sites, as a result of the proposed development either alone or in combination with other plans and projects, then there is no requirement to proceed to subsequent stages of Appropriate Assessment. If it is not possible to conclusively rule out significant impacts upon European sites, the assessment should proceed to production of an NIS to inform an Appropriate Assessment.

An Appropriate Assessment Screening Statement was prepared for the proposed development (see Appendix 5.2.10 of the EIS). This report concluded that a likelihood of significant negative effects on European sites could not be objectively ruled out. Therefore this Natura Impact Statement takes forward the assessment on those European sites which it was concluded could not be screened out, into this NIS to inform the Appropriate Assessment process. These sites are as follows: Rockabill to Dalkey Island SAC, North Dublin Bay SAC, South Dublin Bay SAC, Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA and Ireland's Eye SPA. The findings of the screening exercise are summarised in Figure 1 and Table 1 below.

[2] Available online at http://www.levett-therivel.co.uk/AAguidelines.htm

Figure 1. All European sites within 15km of the proposed development

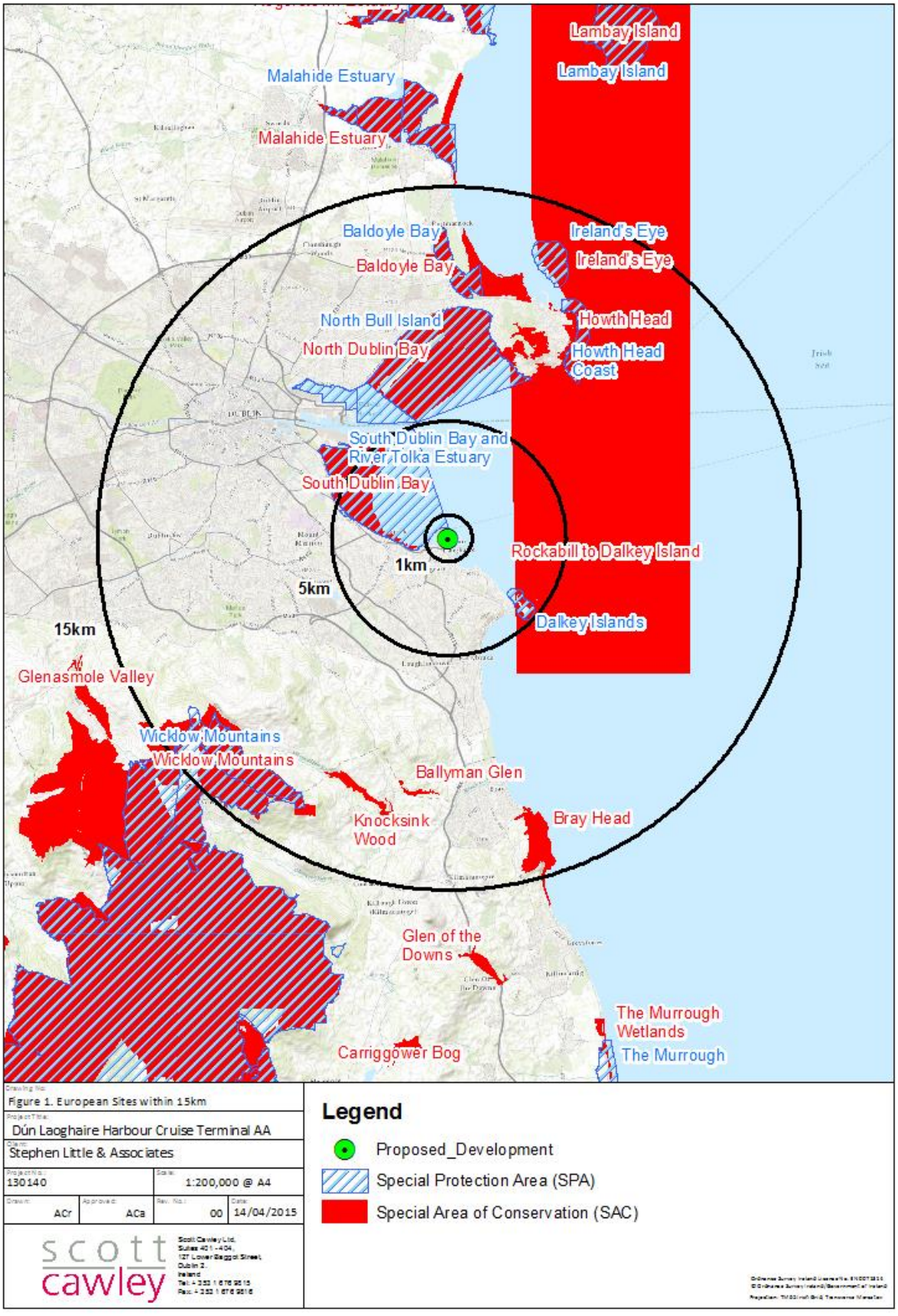

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
Special Areas of Conservation (SAC)		
Rockabill to Dalkey Island SAC [003000], ca. 1km to the east.	**Conservation Objectives Version 1.0 (07/05/13)** **Annex I Habitats:** • Reefs [1170] **Annex II Species:** • Harbour porpoise *Phocoena phocaena* [1351]	Yes. There are a number of linkages between the proposed development and European site. 1. Construction works, including dumping of dredge material at the Burford Bank, have the potential to generate noise impact that could impact on Harbour porpoise and/or could result in direct fatalities of Harbour porpoise e.g. by boat strike. The potential for significant effects on the European site cannot be ruled out in view of the site's conservation objectives; 2. Accidental pollution events during construction or operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects cannot be ruled out in view of the site's conservation objectives; 3. Dumping of dredge material at the Burford Bank, located within this European site, has the potential to result in covering reef communities with sediments.

[3] "Qualifying Interests" for SACs and "Special Conservation Interests" for SPAs based on NPWS Conservation Objectives downloaded from www.npws.ie in April 2015

[4] For significant effects to arise, there must be a risk enabled by having a 'source' (e.g. construction works at a proposed development site), a 'receptor' (e.g. a SAC), and a pathway between the source and the receptor (e.g. a watercourse connecting a proposed development site to a SAC). The identification of a pathway does not automatically mean significant effects will arise. The likelihood for significant effects will depend upon the characteristics of the source (e.g. duration of construction works), the characteristics of the pathway (e.g. water quality status of watercourse receiving run-off from construction) and the characteristics of the receptor (e.g. the ecology including conservation status of the SAC reason for designation). When expert judgment determines, that significant effects are likely to arise, both the pathway, and the European site are considered "Relevant", and an Appropriate Assessment is triggered

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		However, no significant effects are predicted for reasons set out under "Potential for Cumulative effects upon European sites" in the AA Screening Statement (see Appendix 5.2.10 of the EIS) 4. Dredging of the seabed and dumping of dredge spoil could impact on prey abundance of the Harbour porpoise. However no significant impacts are predicted for the reasons set out below: - Harbour porpoise feed on a wide range of fish, cephalopod and crustacean species occurring in the water column and close to the seabed (www.iwdg.ie accessed 19th May 2015). Therefore they are not dependent on demersal fish species as a food source, which could be temporarily impacted by the dredge spoil disposal; - The disposal site occupies a small area within the European site with a large area of alternative foraging grounds available for exploitation by this species; - Foraging habitat of the Harbour Porpoise is usually located in areas of strong tidal currents, often close to shore adjacent to islands or headlands (Dolman *et al*., 2013). 5. Foul waters generated during operation of the landside toilet facilities will be treated at Ringsend WWTW and following treatment will be discharged into Dublin Bay. No significant effects are predicted for the reasons already set out under "Potential for Cumulative effects upon European sites" in the Screening Statement (see Appendix 5.2.10 of the

Table 1 Summary of the AA Screening Exercise		
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		EIS).
South Dublin Bay SAC [000210], ca. 0.4km to the north west.	**Conservation Objectives Version 1.0 (22/08/13)** **Annex I Habitats:** Mudflats and sandflats not covered by seawater at low tide [1140]	Yes, there are a number of linkages between the proposed development and European site. 1. Accidental pollution events during construction or operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives; 2. There is the potential for escape of plant materials, seeds/seedlings from new planting to be introduced to the receiving water environment, via surface water drainage. If any non-native invasive species were to be used in the landscaping proposals this could present a risk of introduction/spread of non-native invasive species to habitats within Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives; 3. Dredging works during construction could lead to re-suspension and settling out of sediments within the European site. However, no significant effects are predicted due to the findings of the dredge plume modelling that any re-suspended sediments would rapidly disperse to negligible levels and that the proposed project would not have any impact on sediment transport and deposition in Dublin Bay (ABP MER Ltd. 2014 included as Appendix 5.4.1 of the EIS); 4. Foul waters generated during operation of the

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		landside toilet facilities will be treated at Ringsend WWTW and following treatment will be discharged into Dublin Bay. No significant effects are predicted for the reasons already set out under "Potential for Cumulative effects upon European sites" (see Appendix 5.2.10 of the EIS).
North Dublin Bay SAC [000206] **ca. 4.2km north west**	**Conservation Objectives Version 1.0 (06/11/13)** **Annex I Habitats:** • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • *Petalophyllum ralfsii* [1395] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") [2120] • *Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130] • Humid dune slacks [2190]	Yes, for the same reasons outlined under South Dublin Bay SAC above.
Howth Head SAC [000202] **ca. 7km north east.**	**Conservation Objectives Generic Version 4.0 (13/02/15)** **Annex I Habitats:** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030]	No significant effects are predicted due to the findings of the dredge plume modelling; that any re-suspended sediments would rapidly disperse to negligible levels and that the proposed project would not have any impact on sediment transport and deposition in Dublin Bay (ABP MER Ltd. 2014, included as Appendix 5.4.1 of the EIS). In

Table 1 Summary of the AA Screening Exercise		
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		the case of European dry heaths this habitat is located above the shoreline and therefore there is no hydrological or other connection to it.
Ireland's Eye SAC [002193] **ca. 11.4km north east.**	**Conservation Objectives Generic Version 4.0 (13/02/15)** **Annex I Habitats:** • Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	No, due to the separation distance and the significant marine open water buffer between the site and the development.
Baldoyle Bay SAC [000199] **ca. 9.5km north**	**Conservation Objectives Version 1.0 (19/11/12)** **Annex I Habitats:** • Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	No, due to the separation distance and significant marine open water between the site and the development.
Bray Head SAC [000714] **ca. 12km south**	**Conservation Objectives Generic Version 4.0 (13/02/15)** **Annex I Habitats:** • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030]	No, due to the separation distance and the combination of there being a significant marine open water buffer between the sites and in the case of European dry heaths the fact that this habitat is located above the shoreline and therefore there is no hydrological or other connection to it.
Ballyman Glen SAC [000713] **ca. 10km south west**	**Conservation Objectives Generic Version 4.0 (13/02/15)** **Annex I Habitats:** • *Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Alkaline fens [7230]	No, due to the separation distance and absence of any hydrological or other connection to it.

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Knocksink Wood SAC [000725] **ca. 10.6km south west**	**Conservation Objectives Generic Version 4.0 (13/02/15)** **Annex I Habitats:** • *Petrifying springs with tufa formation (*Cratoneurion*) [7220] • *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	No, due to the separation distance and absence of any hydrological or other connection to it.

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Wicklow Mountains SAC [002122] **ca. 11.6km south**	**Conservation Objectives Generic Version 4.0 (05/03/15)** **Annex I Habitats:** • Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* [3130] • Natural dystrophic lakes and ponds [3160] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and sub-mountain areas, in Continental Europe) [6230] • Blanket bogs (* if active only) [7130] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous rocky slopes with chasmophytic vegetation [8210] • Siliceous rocky slopes with chasmophytic vegetation [8220] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] **Annex II Species:** • Otter - *Lutra lutra* [1355]	No, due to the separation distance and absence of any hydrological or other connection to it.
Special Protection Areas (SPA)		
Dalkey Islands SPA [004172] **ca. 3km south east**	**Conservation Objectives Generic Version 4.0 (13/02/15)** • Roseate Tern (*Sterna dougallii*) [A192] [passage]	Yes. There are a number of linkages between the proposed development and this European site. Although the European site is not within the footprint of the

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	• Common Tern (*Sterna hirundo*) [A193] [passage] • Arctic Tern (*Sterna paradisaea*) [A194] [passage]	proposed development, mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding. 1. Noise and vibration during construction works, including dredging and pile driving, could disturb or displace SCI species utilising the harbour (which is outside of the SPA) for feeding and/or roosting, into the wider Dublin Bay area. However no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour thus reducing the transmission of noise into the wider water column. The piling programme (estimated to take *ca.* 12 weeks) may overlap with the winter bird season in part (March – September), and the migration period for terns. Common tern were recorded in the proposed development area on a single occasion only during bird surveys for the proposed development undertaken by Scott Cawley in 2015. Given that terns can feed outside of the harbour in the larger Dublin Bay area and the infrequency of their occurrence within the harbour, the impact of noise and vibration from dredging and piling during construction works is not considered significant. Roseate tern and Arctic tern were not recorded within the proposed development area during the survey period. - The dredging programme will overlap with the

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		early winter and late winter bird season, often referred to as the 'shoulder period' when, in general, winter bird numbers would not be at their peak, and also with the breeding bird season. Noise emitted by dredgers is similar to that emitted by regular shipping activity. SCI species in the area are likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane. For this reason, and reasons set out above, the impact of dredging is not considered significant. 2. Accidental pollution events during construction or operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives. 3. Noise during operation, with the cruise vessels sailing up the navigation channel could result in disturbance to the SCIs species at the site. Burger (1998) found that watercraft utilising established channels were less likely to disturb Common Tern colonies, and that a disturbance distance of 100m should be established between colonies and watercraft. No significant effects are predicted due to the distance between the site and the navigation channel, *ca.* 3km, and the fact that the navigation channel is located within existing shipping lanes to Dublin Port and Dún Laoghaire Harbour.

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South Dublin Bay and River Tolka Estuary SPA [004024] **ca. 0.06km north west**	**Conservation Objectives Version 1.0 (09/03/15)** • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] [wintering] • Oystercatcher (*Haematopus ostralegus*) [A130] [wintering] • Ringed Plover (*Charadrius hiaticula*) [A137] [wintering] • Grey Plover (*Pluvialis squatarola*) [A140] [wintering] • Knot (*Calidris canutus*) [A143] [wintering] • Sanderling (*Calidris alba*) [A144] [wintering] • Dunlin (*Calidris alpina*) [A149] [wintering] • Bar-tailed Godwit (*Limosa lapponica*) [A157] [wintering] • Redshank (*Tringa totanus*) [A162] [wintering] • Black-headed Gull (*Croicocephalus ridibundus*) [A179] [wintering] • Roseate Tern (*Sterna dougallii*) [A192] [passage] • Common Tern (*Sterna hirundo*) [A193] [breeding] • Arctic Tern (*Sterna paradisaea*) [A194] [passage] • Wetlands & Waterbirds [A999]	Yes. There are a number of linkages between the proposed development and European site. Although the European site is not within the footprint of the proposed development, mobile SCI species may use the harbour or surrounding areas for roosting and/or feeding. 1. Noise and vibration during construction works, including dredging and pile driving, could disturb SCI species within the SPA (in close proximity to the harbour walls) and could also disturb SCI species utilising the harbour (outside of the SPA) for feeding and/or roosting. However no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour, thus reducing the transmission of noise into the wider water column. - The dredging and piling programme (March – September) may overlap with the winter bird season in part, and the breeding and migration period for terns. Common tern were recorded in the proposed development area on a single occasion only during bird surveys for the proposed development undertaken by Scott Cawley in 2015. Roseate and Arctic Tern were not recorded. Wintering SCI species were recorded within the harbour area in small numbers not exceeding the 1% National Thresholds with the exception of Dunlin and Sanderling that were recorded high

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		tide roosting. Dunlin were recorded regularly in the area with a peak count equating to approximately 17% of the overall Dublin Bay population, and Sanderling recorded on only three occasions with a peak count equating to approximately 35% of the overall Dublin Bay population. Larger flocks of Dunlin and Sanderling that were recorded high tide roosting were located on the outside of the harbour walls, with the harbour walls forming a buffer to potential disturbance from within the confines of the harbour (full details of survey results are included within Chapter 5.2 of the EIS). - The construction works will only overlap with the winter bird season in part. Wintering birds can feed outside the harbour in the larger Dublin Bay area, and were recorded in relatively small numbers in relation to the overall populations in Dublin Bay. Noise emitted by dredgers is similar to that emitted by regular shipping activity and SCI species in the area are likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane. Due to the above and the short term duration of disturbance effects, the impact of noise and vibration from dredging and piling during construction works is not considered significant. 2. Accidental pollution events during construction or

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		operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives. 3. Dredging works during construction could lead to suspension of sediments in the water column which could impact on underwater visibility and hence ability of fish eating waterbirds to hunt and catch prey. However, no significant effects are predicted as high suspended solids levels are common in shallow waters close to the coastline. Also due to the findings of the dredge plume modelling, that suspended solid concentrations from dredging operations will rapidly disperse to negligible levels within 2km (refer to Appendix 5.4.1 of EIS; ABP MER Ltd. 2014). 4. Noise during operation, with the cruise vessels sailing into the harbour *ca.* 68m from the SPA boundary could result in disturbance to the SCIs species at the site. No significant effects are predicted due to the fact that the operation of the facility will be seasonal, April – September, thus largely avoiding the winter bird season, disturbance to SCI species in the overlap period would be limited to shipping movements into and out of the harbour in the early morning and late evening and SCI species utilising the area are likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane. For breeding and passage species, there are no tern

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		colonies located within the harbour itself and any disturbance to terns within the harbour would be limited to small numbers recorded feeding or flying over the area. Given that terns can feed outside of the harbour in the larger Dublin Bay area and the infrequency of their occurrence within the harbour, the impact of disturbance during operation of the cruise vessels is not considered significant.
North Bull Island SPA [004006] **ca. 4.2km north west**	**Conservation Objectives Generic Version 4.0 (13/02/15)** • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] [wintering • Shelduck (*Tadorna tadorna*) [A048] [wintering] • Teal (*Anas crecca*) [A052] [wintering] • Pintail (*Anas acuta*) [A054] [wintering] • Shoveler (*Anas clypeata*) [A056] [wintering] • Oystercatcher (*Haematopus ostralegus*) [A130] [wintering] • Golden Plover (*Pluvialis apricaria*) [A140] [wintering] • Grey Plover (*Pluvialis squatarola*) [A141][wintering] • Knot (*Calidris canutus*) [A143] [wintering] • Sanderling (*Calidris alba*) [A144] [wintering] • Dunlin (*Calidris alpina*) [A149] [wintering] • Black-tailed Godwit (*Limosa limosa*) [A156] [wintering] • Bar-tailed Godwit (*Limosa lapponica*) [A157] [wintering] • Curlew (*Numenius arquata*) [A160] [wintering] • Redshank (*Tringa totanus*) [A162] [wintering] • Turnstone (*Arenaria interpres*) [A169] [wintering]	Yes. There are a number of linkages between the proposed development and European site. Although the European site is not within the footprint of the proposed development, mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding. 1. Noise and vibration during construction works, including dredging and pile driving, could disturb SCI species utilising the harbour (outside of the SPA) for feeding and/or roosting. However, no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour, thus reducing the transmission of noise into the wider water column. - The dredging and piling programme will overlap with the winter bird season in part (March – September). Wintering SCI species were recorded within the harbour area in small numbers not exceeding the 1% National Thresholds with the exception of Dunlin and Sanderling that were recorded high tide roosting. Dunlin were recorded regularly in

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Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
	• Black-headed Gull (*Croicocephalus ridibundus*) [A179] [wintering] • Wetlands & Waterbirds [A999]	the area with a peak count equating to approximately 17% of the overall Dublin Bay population, and Sanderling recorded on only three occasions with a peak count equating to approximately 35% of the overall Dublin Bay population. Larger flocks of Dunlin and Sanderling that were recorded high tide roosting were located on the outside of the harbour walls, with the harbour walls forming a buffer to potential disturbance from within the confines of the harbour (full details of survey results are included within Chapter 5.2 of the EIS). The construction works will only overlap with the winter bird season in part (March – September). Wintering birds can feed outside the harbour in the larger Dublin Bay area, and were recorded in relatively small numbers in relation to the overall populations in Dublin Bay. Noise emitted by dredgers is similar to that emitted by regular shipping activity and SCI species in the area are likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane. Due to the above and the short term duration of disturbance effects, the impact of noise and vibration from dredging and piling during construction works is not considered significant; 2. Accidental pollution events during construction or operation could carry pollutants into the local coastal

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		waters of Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives.

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
Howth Head Coast SPA [004113] **ca. 7km north east**	**Conservation Objectives Generic Version 4.0 (13/02/15)** • Kittiwake (*Rissa tridactyla*) [A188] [breeding]	Yes. There are a number of linkages between the proposed development and European site. Although the European site is not within the footprint of the proposed development, mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding. 1. Noise and vibrations during construction works, including dredging and pile driving (March – September), could disturb SCI species utilising the harbour (outside of the SPA) for feeding and/or roosting. However no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour, thus reducing the transmission of noise into the wider water column. The piling programme may overlap with breeding season. Kittiwake were recorded on six occasions during winter bird surveys for the proposed development, with the peak count of two birds on two occasions (full details of survey results are included within Chapter 5.2 of the EIS). Given that Kittiwake can feed outside of the harbour in the larger Dublin Bay area and the low numbers recorded within the development area, the impact of noise and vibration from dredging and piling during construction works is not considered significant. Roseate tern and Arctic tern were not recorded within the proposed development area during the survey period.

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		2. The dredging programme may overlap with the winter bird season in the shoulder period (early winter, or late winter). Noise emitted by dredgers is similar to that emitted by regular shipping activity. SCI species in the area are likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane. For this reason, and reasons set out above, the impact of dredging is not considered significant. 3. Accidental pollution events during construction or in operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects on European sites cannot be ruled out in view of the site's conservation objectives. 4. Dredging works during construction could lead to suspension of sediments in the water column which could impact on underwater visibility and hence ability of fish eating waterbirds to hunt and catch prey. However, no significant effects are predicted as high suspended solids levels are common in shallow waters close to the coastline. In addition the dredge plume modelling found that suspended solid concentrations from dredging operations will rapidly disperse to negligible levels within 2km (refer to Appendix 5.4.1 in EIS, ABP MER Ltd. 2014).
Baldoyle Bay SPA [004016] **ca. 9.5km north**	**Conservation Objectives Version 1.0 (21/02/13)** • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] [wintering]	Yes. There are a number of linkages between the proposed development and European site. Although the European site is not within the footprint of the proposed

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
	• Shelduck (*Tadorna tadorna*) [A048] [wintering] • Ringed Plover (*Charadrius hiaticula*) [A137] [wintering] • Golden Plover (*Pluvialis apricaria*) [A140] [wintering] • Grey Plover (*Pluvialis squatarola*) [A141] [wintering] • Bar-tailed Godwit (*Limosa lapponica*) [A157] [wintering] • Wetlands & Waterbirds [A999]	development, mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding. 1. Noise and vibration during construction works, including dredging and pile driving (March – September), could disturb SCI species utilising the harbour (outside of the SPA) for feeding and/or roosting. However, no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour, thus reducing the transmission of noise into the wider water column. The dredging and piling programme may overlap with the winter bird season in part during the shoulder period when winter bird numbers are generally not at their peak. Wintering SCI species, Light-bellied Brent Goose, Shelduck, Ringed Plover and Bar-tailed Godwit were recorded within the harbour area in small numbers not exceeding the 1% National Thresholds during surveys carried out for the proposed development by Scott Cawley Ltd. For full details of the surveys see Chapter 5.2 of EIS. Given that the birds can feed outside of the harbour in the larger Dublin Bay area, the relatively small numbers recorded in the development area in relation to the overall populations in Dublin Bay, that noise emitted by dredgers is similar to that emitted by regular shipping activity and SCI species in the area are

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		likely to have become habituated to a high degree of disturbance and background noise given the location within a working harbour and proximity to the Dublin Port shipping lane, and the short term duration of disturbance effects, the impact of noise and vibration from dredging and piling during construction works is not considered significant; 2. Accidental pollution events during construction or operation could carry pollutants into the local coastal waters of Dublin Bay. Potential for significant effects on European sites cannot be ruled out in view of the conservation objectives.
Ireland's Eye SPA [004117] **ca. 10.3km north east**	**Conservation Objectives Generic Version 4.0 (13/02/15)** • Cormorant (*Phalacrocorax carbo*) [A017] [breeding] • Herring Gull (*Larus argentatus*) [A184] [breeding] • Kittiwake (*Rissa tridactyla*) [A188] [breeding] • Guillemot (*Uria aalge*) [A199] [breeding] • Razorbill (*Alca torda*) [A200] [breeding]	Yes. There are a number of linkages between the proposed development and European site. Although the European site is not within the footprint of the proposed development, mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding. 1. Noise and vibrations during construction works, including dredging and pile driving (March – September), could disturb SCI species utilising the harbour (outside of the SPA) for feeding and/or roosting. However no significant impacts are predicted for the reasons set out below: - Piling will be carried out within the confines of the harbour, thus reducing the transmission of noise into the wider water column. The construction programme will overlap with breeding season. Cormorant were recorded

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		regularly (22 occasions) within the harbour area with peak counts equating to approximately 27% of the overall Dublin Bay population, and numbers did not exceed the 1% National Threshold. Herring Gull were recorded regularly (24 occasions) within the harbour area with peak counts equating to approximately 11% of the overall Dublin Bay population. Kittiwake were recorded on six occasions during winter bird surveys for the proposed development, with the peak count of two birds on two occasions. Guillemot were recorded regularly (24 occasions) within the harbour area with a peak count of 62. Razorbill were recorded less frequently (8 occasions) with a peak count of 94. (full details of survey results are included within Chapter 5.2 of the EIS). Given that the SCI species are not breeding within the harbour, can feed outside of the harbour in the larger Dublin Bay area and the relatively low numbers recorded, the impact of noise and vibration from dredging and piling during construction works is not considered significant. 2. Accidental pollution events during construction or operation could carry pollutants into the local coastal waters of Dublin Bay. The potential for significant effects on this site cannot be ruled out in view of the site's conservation objectives. 3. Dredging works during construction could lead to suspension of sediments in the water column which

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		could impact on underwater visibility and hence ability of fish eating waterbirds to hunt and catch prey. However, no significant effects are predicted as high suspended solids levels are common in shallow waters close to the coastline. Also due to the findings of the dredge plume modelling, that suspended solid concentrations from dredging operations will rapidly disperse to negligible levels within 2km (refer to Appendix 5.4.1 of EIS; ABP MER Ltd. 2014).
Wicklow Mountains SPA [004040] **ca. 12km south west**	**Conservation Objectives Generic Version 4.0 (13/02/15)** • Merlin (*Falco columbarius*) [A098] [breeding] • Peregrine (*Falco peregrinus*) [A103] [breeding]	No, although there is a linkage between the proposed development and European site as mobile SCI species may use the harbour and surrounding areas for roosting and/or feeding significant impacts are not predicted for reasons set out below: 1. Noise from construction works, including dredging and pile driving, could disturb SCI species utilising the harbour for feeding. Peregrine can feed on waders, waterfowl, gulls and seabirds, therefore any temporary displacement of birds out of the development area could impact on the Peregrines prey abundance. As Peregrine mainly catch prey mid-air they are unlikely to be impacted in other ways by the construction works. However, a single Peregrine only was recorded on a single occasion in flight over the area (full details of survey results are included within Chapter 5.2 of the EIS). Given the distance to the site, the harbour is unlikely to be the SCI species core foraging area. Given that the birds can feed

Table 1 Summary of the AA Screening Exercise		
Site name and code	**Reasons for designation[3] (*= Priority Habitat)** **(Sourced from NPWS's conservation objectives, versions stated below)**	**Do any potential source-pathway-receptor links exist between the proposed development and the European site?[4]**
		outside of the harbour in the larger Dublin Bay area and other foraging grounds, the infrequency of their occurrence in the harbour and the short term duration of disturbance effects, the impact of noise from dredging and piling during construction works is not considered significant.

2.4 Provision of Information for an Appropriate Assessment

According to MN2000, paragraph 4.6(3)

> *"The integrity of a site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."*

Within this stage of the summary assessment, the potential impact of the proposed development on the integrity of European sites is examined with respect to the European sites' conservation objectives and to their general structure and function.

This report also sets out the specific mitigation measures that will be in place to ensure that any potential effects of the proposed development on the European sites' conservation objectives will not have any adverse effect on the integrity of the European sites. Finally, a conclusion of the assessment is provided in Section 6.

The Appropriate Assessment is focused on the potential for the proposed development to impact on the conservation objectives of European sites, and furthermore, on whether the proposed development would impact on the integrity of European sites. Therefore this stage involves the collection of information which is specifically relevant to determining this, including:-

- A description of the proposed development (outlined in Section 3.2);
- The conservation objectives of the European sites and an understanding of current factors which either maintain or threaten those conservation objectives (included in Table 2 & 3);
- An assessment of aspects of the proposed development which could negatively impact the conservation objectives of the European sites (outlined in Section 4).

Within this stage of the assessment, the potential impact of the proposed development on the integrity of the following European sites is examined with respect to the conservation objectives of the European sites and to their general structure and function:

- Rockabill to Dalkey Island SAC;
- North Dublin Bay SAC;
- South Dublin Bay SAC;
- Dalkey Islands SPA;
- South Dublin Bay and River Tolka Estuary SPA;
- North Bull Island SPA;
- Howth Head Coast SPA;
- Baldoyle Bay SPA; and
- Ireland's Eye SPA.

This report also sets out the specific mitigation measures that will be in place to ensure that the proposed development will not have any adverse effect on the integrity of these European sites in Section 5. Finally, a conclusion of the assessment is provided in Section 6.

This NIS is based on a desktop study and field surveys carried out between February 2014 and May 2015 for the Environmental Impact Assessment study (full details of survey results are included within Chapter 5.2 of the EIS), and an AA Screening Statement carried out for the proposed development (see Appendix 5.2.10 of the EIS). Information relied upon included the following information sources, which included maps, ecological and water quality data:

- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie;
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Information on land-use zoning from the online mapping of the Department of the Environment, Community and Local Government http://www.myplan.ie/en/index.html;
- Information on water quality in the area available from www.epa.ie;
- Information on the Eastern River Basin District from www.wfdireland.ie;
- Information on soils, geology and hydrogeology in the area available from www.gsi.ie;
- Information on the status of EU protected habitats and species in Ireland (National Parks & Wildlife Service, 2013a & 2013b);
- Information on the conservation status of birds in Ireland (Colhoun & Cummins, 2014);
- Information on the location, nature and design of the proposed development supplied by the applicant's design team.
- *Ecological Impact Assessment for a Proposed Cruise Terminal, Dún Laoghaire Harbour, Co. Dublin* (Scott Cawley, 2015).
- *Wave, Tide and Sediment Plume Modelling Report* produced for the proposed development (ABP MER Ltd., 2014);
- *Dun Laoghaire Harbour Sediment Samples and Analysis* (Hydrographic Surveys Ltd., 2015).

The following planning and policy documents were relevant to the subject lands, in particular with regard to the assessment of other plans and projects with potential for cumulative effects:

- *National Biodiversity Plan 2011 – 2016* (Department of Arts, Heritage and the Gaeltacht, 2011);
- *Dún Laoghaire Harbour Master Plan (Dún Laoghaire Harbour Company, 2011);*
- *Dún Laoghaire-Rathdown County Development Plan 2010-2016*;
- *Core Strategy of the Dún Laoghaire-Rathdown County Development Plan 2010-2016;*
- *Eastern River Basin District, River Basin Management Plan 2009-2015*;
- *Alexandra Basin Redevelopment Project Environmental Impact Statement and Natura Impact Statement (date unknown);*
- *Dún Laoghaire Urban Beach and Floating Pool Environmental Report (2013);*
- *Dublin Array – An Offshore Wind Farm on the Kish and Bray Banks Environmental Impact Statement and Natura Impact Statement* (2012).

Guidance which has been followed in determining magnitude and significance of impacts as well as in proposing mitigation measures include:

- *Guidelines for Ecological Impact Assessment in the United Kingdom* (Institute of Ecology and Environmental Assessment, 2006)
- *Guidelines on the Information to be Contained in Environmental Impact Statements* (Environmental Protection Agency, 2002)
- *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (EPA, 2003)

3 Overview of Proposed Development and its Receiving Environment

3.1 Site Description

The subject site is located at Dún Laoghaire Harbour, Dún Laoghaire, Co. Dublin (centred on ING O 24415 29155). Dún Laoghaire is a working Harbour with the Stena Line Ferry operating out of the Harbour seasonally up until Autumn 2014, commercial vessels docking in the Harbour, commercial fishing boats operating out of the Harbour and various recreational boats utilising the Harbour. The area proposed for development is *ca.* 60 hectares and consists mainly of built land, coastal structures and coastal water habitat of the harbour and associated littoral and sublittoral habitats. Harbour related structures within the site boundary include; the Eastern Breakwater (in part), the old HSS Stena Line Ferry Terminal (in part) the existing Motorists building and associated facilities and existing car parks.

3.2 Description of the Proposed Development

The proposed development will consist of the construction of a new quay, cruise ship berth and access causeway to accommodate existing and next generation size cruise ships within Dún Laoghaire Harbour as well as associated landside facilities.

The new berth is to be located in the centre of the harbour, directly south of the existing harbour mouth. The new quay structure will extend approximately 450m northwards from a point just west of the Hobbler Memorial on the Eastern Marina Breakwater. The berth will consist of a 120m long by 20m wide concrete quay supported on tubular steel piles, located 180m north of the breakwater, this quay will be connected to the Eastern Marina Breakwater by an approximately 8.5m wide concrete access causeway, also supported on tubular steel piles. Ships will berth along the eastern side of the quay.

The berthing face of the 120m long quay will be extended to the north and to the south by means of monopoles. To provide a berthing face for a 340m vessel, a total of 8 monopiles will be required, 4 north of the quay and 4 south of the quay. The monopiles will be approximately 3m in diameter and will each support a fender on the berthing side of the pile, and a mooring bollard and lighting on the top of the pile. The mooring piles to the north of the quay will be accessed via a lightweight metal walkway. The mooring piles to the south the quay are located adjacent to the access causeway and will be connected to the causeway for operational access.

The berth will have a connection to the public water mains, to provide fresh water supply to the berthed cruise ships, where necessary, and to provide firefighting capacity. An electricity supply will also be taken to the berth for lighting of the causeway, the quay and the monopiles.

Dredging works will be required as part of the proposed development to ensure access and egress of cruise ships at different states of the tide; a dredged sea access navigation channel into the harbour and a dredged turning circle outside of the harbour walls totalling approximately 2.5km in length. The creation of the navigation channel will require dredging of approximately 710,000m^3 of sand and silt from the seabed. It is proposed that dredged material will be disposed of at the existing spoil grounds at Burford Banks and partly within the harbour itself in a hollow in front of the HSS StenaLine Ferry terminal. Any disposal of dredged materials offshore will be subject to the granting of a Dumping at Sea Permit by the EPA.

To cater for visiting cruise passengers, a corridor linking Harbour Road to the proposed cruise berth will be created along the western edge of the existing HSS StenaLine marshalling area, with a proposed new boardwalk to be added facing the marina. This will require some limited demolition, including the boundary wall between the existing Eastern Breakwater and HSS StenaLine marshalling area, security hut and canopy (in part) at the entrance to the existing ferry terminal. New surfacing, replacement public lighting and surface water drainage will be provided for the new corridor. Some limited landscaping is proposed for these areas. Coach pick up points will be located in the existing HSS StenaLine marshalling area. A new pedestrian footpath is proposed running east-west parallel to

Harbour Road and an overflow coach parking area proposed along Accommodation Walk running parallel to the existing train line.

Existing toilet facilities in the Motorists building will be retained and refurbished. Foul water from here will be pumped to Ringsend WWTW for treatment prior to discharge to Dublin Bay. Foul/waste water from the cruise liners will be treated entirely on board the cruise liner, with any residue discharged outside territorial waters.

Surface water collecting on site will be dealt with using the existing surface water drainage on site which includes treatment by petrol interceptor prior to discharge into the harbour.

3.2.1 Dredging Requirements and Proposed Dredging Plant

The capital dredging works will be undertaken as the first activity of the proposed development. Prior to commencement of any physical work a complete bathymetric survey of the area to be dredged will be undertaken. This will form the baseline of the activities and will be used to establish final volumes on completion.

The capital dredging works consist of a turning circle and approach channel from deep water in Dublin Bay to the proposed cruise terminal to a depth of -10.5m CD. The current seabed shallows to approximately -7m CD outside the existing harbour and to a minimum depth of around -4m CD close to the existing HSS berth. The total dredge volume is approximately 710,000m³, covering an area of approximately 472,000m². The ground investigation shows that the dredge material is almost entirely (approximately 90%) unconsolidated sands with a very small amount of silt close to the HSS berth.

This application seeks to cover two types of dredging plant equipment due to the layout of the harbour, plant constraints and accessibility issues. These are a trailer suction hopper dredger (TSHD) and a small, shallow draft vessel, plough, or barge mounted excavator for use in shallow areas, or areas inaccessible by the TSHD.

The primary item of plant will be a medium sized TSHD, which is likely to have a loaded draft of approximately 7m and a hopper capacity of 5,000m³. The ship will be equipped with one or two suction pipes, designed to hang along the side of the vessel. A draghead is fixed at the lower end of the suction pipe, which is then trailed along the seabed in a controlled manner. Suction is provided by a pump, which lifts the sand off the seabed and discharges the sand/seawater mix into the hopper storage well.

The dredger will be equipped with a GPS navigation system which is interfaced to a dredge computer. This allows the real time position of the vessel to be shown in relation to both the dredging and discharge areas and provides for accurate positioning of the vessel thus mitigating over-excavation.

Once loaded the dredger will sail to the sea disposal site, the Burford Bank in Dublin Bay (see Figure 2), approximately 4 nautical miles distant, where the loaded material will be discharged via its bottom doors. To prevent the formation of significant high spots at the disposal site, the dredger will continue sailing at reduced speed whilst dumping.

The dredging works may be supplemented with a small, shallow draft vessel, plough, or barge mounted excavator for use in shallow areas, or areas inaccessible by the TSHD. This equipment would simply be used to move material from shallow and/or inaccessible areas to an area where it could be dredged by the TSHD.

The dredger is anticipated to work 7 days a week, and the shortest programme would be achieved where the dredger operates 24 hours a day during summer time (March – September). The overall dredging programme will depend on the precise vessel available at

the time of construction. It is anticipated that, based on 24/7 summer time working, the dredge programme would be in the region of 14-17 weeks duration.

Although dependent on the precise vessel used for the dredging activities, sound outputs are likely to be in the region of a minimum 51.5dB and maximum 62dB, dependent on background noise. These figures are based on two noise monitoring reports prepared for two different TSHD's, similar to the vessel being proposed for use for the proposed development, operating in Cardiff Bay and the River Clyde, UK (Acoustic Technology Ltd. (2001) & Enviro Centre Ltd. (2010)).

Sediment Testing

Ground investigations were undertaken to test for the potential presence of contaminants in sediments within the proposed development footprint. These investigations have confirmed that there are no contaminants present in the sediments (see Appendix 5.3.3 of the EIS, Hyrdrographic Surveys Ltd., 2015).

Wave, Tide and Sediment Plume Modelling

Wave, tide and sediment plume modelling was undertaken for the proposed development. The modelling concluded that any re-suspended solids as a result of dredging operations would settle out of the water column within a matter of minutes within and outside the harbour. Silts and fines within the harbour could remain in suspension from between one hour to a day. They may exit from the harbour, but would rapidly disperse to negligible levels within 2km.

The modelling also considered sediment plume modelling at the disposal site, Burford Bank. It concluded that the majority (~90%) of the sediment load would fall directly to the seabed without entering re-suspension. The remaining 10% could enter re-suspension in the water column or near the seabed. Fines may remain in suspension for days or weeks, but the plume would disperse to negligible levels and would not be expected to enter Dublin Bay, based on known tidal movements.

As a worst case scenario, it was predicted that the maximum thickness of silt settling out onto the seabed would be ca. 10mm.

The modelling also concluded that the proposed development would have no impact on sediment transport and deposition in the Harbour or within the study area (see Appendix 5.4.1 of the EIS, ABP MER Ltd., 2014).

3.2.2 Piling Requirements

All piling on the project will be in the form of steel tubes filled with reinforced concrete. The main quay structure and access causeway will be supported on a grid of 750mm-1000mm diameter pile. 3m diameter monopiles will be used to take mooring and breasting loads away from the main quay area.

Piling operations will be undertaken from a heavy duty crane barge moored using spud legs and anchors if required. A multi-purpose support vessel will also be used to transfer crew and materials to the barge. It is anticipated that the same equipment will be used for all pile diameters irrespective of the pile diameter. The steel piles will be manufactured off site and shipped to site.

Piling operations will commence with the installation of a piling frame to guide the piles into the correct position. Piles will be installed using a drive-drill-drive method, whereby the initial installation of the casing is by using a vibrating hammer or hydraulic piling hammer. The soil and rock within the steel tube will be removed by rotary drilling, with a final drive of the tube to achieve the required depth. With this method it is anticipated that

the piles can be founded at the correct design depth without the need for excessive post installation cutting. On commencement of the piling a 'soft start' method will be adopted with the vibrating hammer being used on minimum power being over the initial 20 minute period.

The piles will be constructed from water level through the soil/ water vertical profile consisting mainly of boulder clay underlain by rock at approximately -30.0mCD – the proportion of shallow bed deposits entrained within a pile will be very small. Arisings flushed from the pile may overtop the steel casing and enter the sea but these are likely to take the form of the courser materials considered in the plume analysis for the dredging, which will tend to settle to the bed almost immediately rather than be transported latterly. Hence the impact of discharge from piles will be considerably less than that considered for the dredge activities - all in terms of volume, intermittent occurrence, and dispersed pile locations.

After completion of the installation of the steel tube, the vibrating hammer and piling frame will be removed. A reinforcement cage will be inserted into the steel tube and the whole pile concreted up to the underside of the quay deck level. Appropriate protection measures will be adopted to ensure that concrete is not spilled into the harbour.

The overall piling programme will be approximately 12 weeks with the contractor using extended working hours together with night-time working for quieter activities and deliveries.

3.2.3 Deck Construction

The deck structure is in two parts:

A. the main quay which will be used for berthing operations and for the embarkation/disembarkation of passengers

B. An access causeway which provides access for passengers and light vehicles from the land to the quay.

Both parts of the structure have been designed to maximise the use of precast concrete elements to provide a permanent shutter and a working platform for the *insitu* works. This will minimise the risk of concrete spills into the water as a complete and sealed precast concrete platform will be present before the commencement of *in-situ* concreting work. This approach also minimise the requirements for temporary works over water.

The main quay structure has been designed as a two way spanning slab supported on a grid of precast beams which span approximately 8m in a longitudinal direction and 6m in a transverse direction. The concrete deck will be 500mm thick, with a solid 200mm precast concrete slab forming a permanent shutter and a 300mm reinforced *insitu* concrete slab.

The precast beams could either be manufactured in a yard on site, or alternatively manufactured off site and transported by either road or sea, depending on the preferences of the selected contractor. Space for a casting yard exists within the landside site area and is conveniently placed to receive the normal compliment of deliveries by road, notably readymixed concrete, and reinforcement steel bars. The beams could be lifted into position using a heavy duty barge mounted crane. The beams will be mechanically fixed to the piles as a temporary measure and then the precast permanent shutters will be lifted into place. The whole of the deck structure, including the joints between the precast beam elements, will then then have a reinforcement cage fixed in position. Embedments for bollards and fenders will also be incorporated at this stage. The final operation will be to pour an *insitu* concrete slab over the whole of the deck area. Concrete could be delivered using ready mix trucks travelling on the already available previously constructed deck and pumped into the

final position using a concrete pump similarly situated. This is normal construction practice involving no new or novel features, is well known to contractors, so the likelihood of large grout escape to the receiving Harbour waters is low assuming the normal preventative measures are taken.

After completion and curing of the reinforced concrete slab the bollards, fenders and other furniture will be lifted into position and bolted to the deck. It is envisaged that these elements of the proposed construction will take in the region of approximately 24 to 32 weeks to complete.

3.2.4 Scour Protection

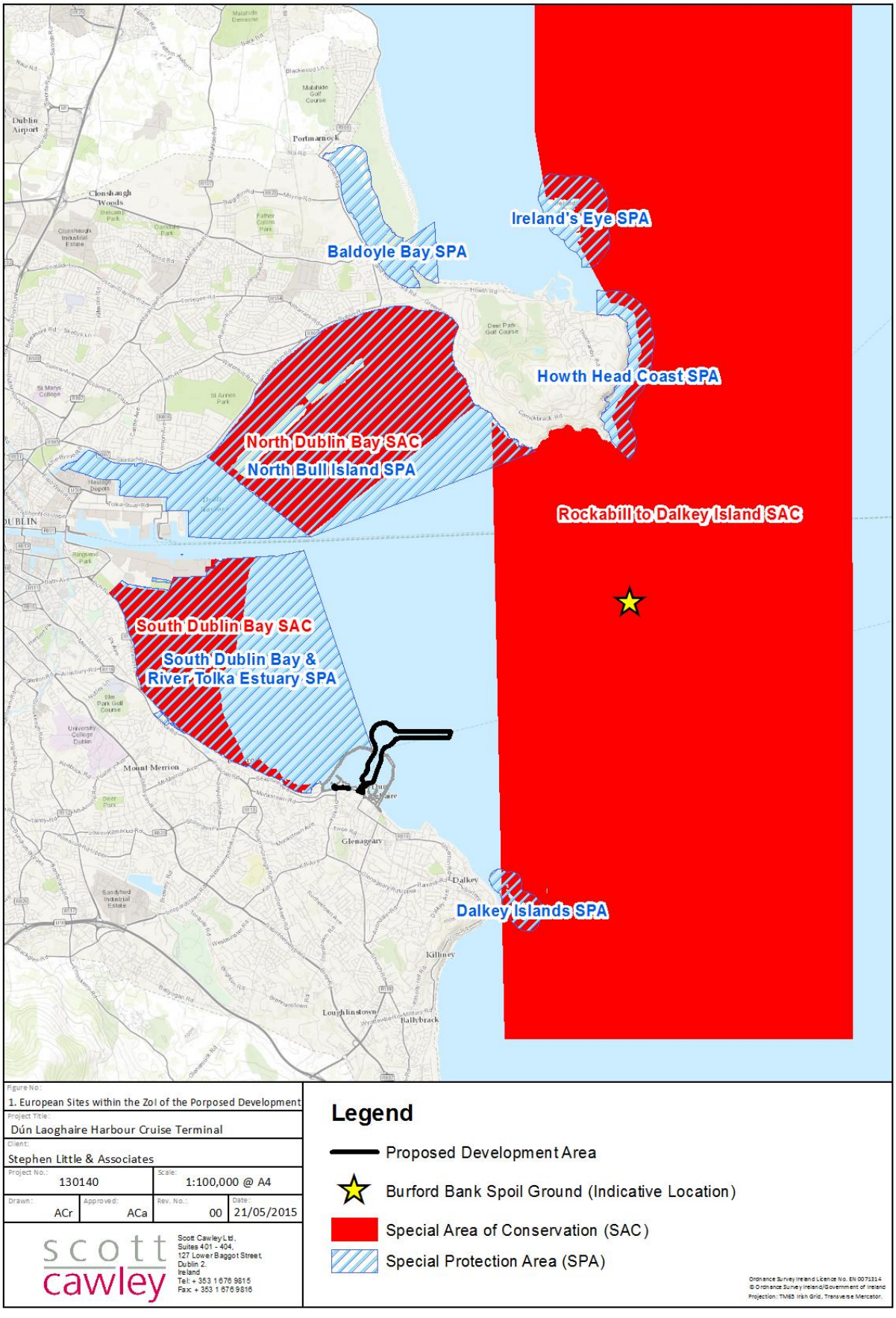
The scour protection at the southern end of the berth when installed will help prevent scour and the undermining of the existing structures when the cruise ship is moving on and off the berth. The scour protection will be in the form of one of the following:

1. A hollow mattress using impermeable closed sock features that is positioned by divers and then temporarily fixed to the floor of the berthing pocket using steel pins inserted using hand tools. The whole of the mattress is then injected with grout from the top to form a permanent concrete protection to the soil slope at the end of the berth. The top, bottom and sides of the mattress will be protected with rock armour to prevent undermining of the mattress once installed. Concrete injection methods will be specified to prevent excessive grout release to the harbour waters;
2. A precast concrete methodology using pre-casted blocks tied laterally and longitudinally into flexible mats which are then lifted bodily in draped segments by crane and manipulated into position by divers on the harbour bed. This method further reduces the use of *in situ* concrete and the attendant (albeit low) risk of leakage to the harbour waters;
3. Hybrid systems combining elements of 1 and 2 above such as precast counterweights and *in situ* mattress of impermeable socks injected with grout.

3.3 Summary of European Sites Considered in this NIS

Figure 2 illustrates the location of the proposed development and the Burford Bank in relation to the European sites considered for this NIS.

Figure 2. Location of the proposed development and the Burford Bank in relation to the European sites within the Zoı (ZoI)



3.3.1 Rockabill to Dalkey Island SAC

Condition of site and management

The Site Synopsis (NPWS, 2014) states that the site includes a range of dynamic inshore and coastal waters. These include sandy and muddy seabed, reefs, sandbanks and islands. The greatest Irish resource of intertidal and subtidal reef habitat is found fringing offshore islands concentrated along the Dublin coast. The reefs are subject to strong tidal currents with an abundant supply of suspended matter, resulting in a good representation of filter feeding species. Intertidal reefs are located on the islands within the site and the south coast of Howth peninsula. Subtidal reefs are recorded off the islands within the site and off the coast between Lambay and Rush village[5]. It is also a key habitat for Harbour porpoise within the Irish Sea, and contains a wide array of habitats believed to be important for the species. Threats to qualifying interests include habitat loss, sedimentation, anthropogenic impacts and barriers to movement.

3.3.2 North Dublin Bay SAC

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) lists the SAC as having an excellent diversity of coastal habitats. The dune system is one of the most important systems on the east coast, one of few in Ireland that is actively accreting. Saltmarsh habitat is well represented at the site with particularly good zonation evident. Of note is the occurrence of Petalwort, a Qualifying Interest (QI), it's only known location away from the western seaboard. Threats to the site include oil pollution from Dublin Port, commercial bait digging, recreational activities and water abstraction by golf clubs.

3.3.3 South Dublin Bay SAC

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) lists the SAC as a fine example of extensive intertidal flats, of predominantly sand with muddy sands in more sheltered areas. It also hosts the largest stand of *Zostera* on the east coast. It provides a supporting role to important populations of wintering bird populations of Dublin Bay. Threats to the site include land reclamation, oil pollution from Dublin Port, commercial bait digging and disturbance walkers and dogs.

3.3.4 Dalkey Islands SPA

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) states that the SPA is an important site for both breeding and staging Sterna terns; Common tern, Roseate tern and Arctic tern. The site, along with other parts of South Dublin Bay is used by the three species as a major post-breeding/pre-migration autumn roost area. The origin of the birds is unknown but is likely to be other breeding sites in County Dublin and other populations outside the State. The main threat to nesting terns include; severe weather events, predation and disturbance.

3.3.5 South Dublin Bay and River Tolka Estuary SPA

Condition of site and management

[5] Rockabill to Dalkey Island SAC Conservation Objectives Supporting Document (www.npws.ie accessed 15/04/15)

The Natura Standard Data Form (2014) states that the SPA possesses extensive intertidal flats, part of which are designated as South Dublin Bay SAC, and which supports wintering waterfowl as part of the wider Dublin Bay population. The site also supports an internationally important population of Light-bellied Brent Geese, feeding on the stands of *Zostera* as noted under South Dublin Bay SAC above. It hosts nationally important numbers of six species, is an important site for wintering gulls and is an autumn roosting site for a significant number of terns. The main threat to the site is land reclamation, with other threats including oil pollution from Dublin Port, commercial bait digging and disturbance by walkers and dogs.

3.3.6 North Bull Island SPA

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) lists the SPA as one of the top ten sites in the country for wintering waterfowl. It provides important feeding and roosting habitat for bird species listed as Special Conservation Interests (SCIs) for the site and supports internationally important populations of Light-bellied Brent Goose and Bar-tailed Godwit. The quality of the estuarine habitats in the SPA are considered to be very good, part of which are designated as North Dublin Bay SAC. There are no serious imminent threats to the wintering birds. Threats to the site include oil pollution from Dublin Port along with localised commercial bait digging, disturbance from activities such as sailing, walkers and dogs.

3.3.7 Howth Head Coast SPA

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) states that the SPA has important colonies of breeding seabirds, with nationally important populations of Kittiwake, Razorbill and Black Guillemot and regionally important populations of Guillemot. The site also supports a breeding pair of Peregrine, although not a QI of the site. Casual visitors to the site do not present a threat to seabird populations, although over-fishing in local waters is a potential threat to prey availability for the birds.

3.3.8 Baldoyle Bay SPA

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) states that the SPA has extensive intertidal sand and mud flats and salt marsh fringes of variable quality, but which are generally good. The site supports a good diversity of wintering waterfowl and an internationally important population of Light-bellied Brent Goose. It also hosts nationally important populations of Shelduck, Pintail, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit. Threats to the site include water pollution, bait digging, disturbance from walkers and dogs and wildfowling as threats.

3.3.9 Ireland's Eye SPA

Condition of site and management

The Natura 2000 Standard Data Form (NPWS, 2014) lists the SPA as an important seabird colony with 11 species breeding regularly. It has nationally important populations of Cormorant, Herring Gull, Great Black-backed Gull, Kittiwake, Guillemot and Razorbill. A colony of Gannet *Sula bassana* has established on the site, one of five in the country. It also has regionally important populations of Fulmar *Fulmar glacialis*, Shag Phalacrocorax aristotelis, Black Guillemot and a small colony of Puffin *Fratercula arctica*. Peregrine also

breed on the site in some years. Any increases in daytrippers to the island could pose a threat to nesting seabirds, as well as predation by rats.

3.4 Conservation Objectives

The E.C. Habitats Directive requires the focus of the assessment at this stage to be on the integrity of the site in light of its conservation objectives.

One of the overall aims of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. Site specific conservation objectives (SSCOs) aim to define favourable conservation condition for particular habitats or species within that site.

Favourable Conservation status/condition for 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”.

Favourable Conservation status/condition for 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 fore seeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

The conservation objectives for the Qualifying Interests (QIs) of Rockabill to Dalkey Island SAC, North Dublin Bay SAC, South Dublin Bay SAC and the Special Conservation Interests (SCIs) of Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA and Ireland’s Eye SPA are summarised in Tables 2 and 3 below.

Where only generic objectives exist for European sites, site specific conservation objectives for the same QIs/SCIs have been adapted from other similar sites and used in the assessment.

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
Special Areas of Conservation				
Rockabill to Dalkey Island SAC (003000)	Annex I habitats: • Reefs [1170] Annex II species: • Harbour porpoise *Phocoena phocaena* [1351]	• Reefs – Bad/Declining • Harbour porpoise - Favourable	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Tidal currents • Water levels • Erosion and deposition rates • Water quality • Foraging Habitat • Food supply • Appropriate levels of disturbance • Air quality
North Dublin Bay SAC (000206)	Annex I habitats: • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows *Glauco-Puccinellietalia maritimae* [1330] • Mediterranean salt meadows *Juncetalia maritimi* [1410]	• Mudflats and sandflats not covered by seawater at low tide – Unfavourable/Inadequate • Annual vegetation of drift lines – Unfavourable/Inadequate • *Salicornia* and other annuals colonizing mud and sand – Unfavourable/Inadequate • Atlantic salt meadows – Unfavourable/Inadequate • Mediterranean salt meadows – Unfavourable/Inadequate	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Water quality including nutrient levels, water clarity, sediment levels • Appropriate agricultural practices including grazing pressures. • Surface and ground water quality • Appropriate levels of disturbance • Water levels • Air quality • Tidal currents • Erosion and deposition rates • Height and frequency of the tides availability of foreshore sand and the average strength of the on-shore winds

[6] Sourced from Status of *EU Protected Habitats and Species in Ireland* (NPWS, 2013a & 2013b) for SACs, and from *Birds of Conservation Concern in Ireland 2014-2019* (Colhoun & Cummins, 2014) for SPAs.
[7] Sourced from Site Conservation Objectives (www.npws.ie accessed 14/04/15)

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
	• Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] • *Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] <u>Annex II species :</u> • Petalwort *Petalophyllum ralfsii* [1395]	• Embryonic shifting dunes – Unfavourable/Inadequate • Shifting dunes along the shoreline – Unfavourable/Inadequate • Fixed coastal dunes – Unfavourable/Bad • Humid dune slacks – Unfavourable/Inadequate <u>Annex II species:</u> • Petalwort - Favourable		
South Dublin Bay SAC (000210)	<u>Annex I habitats:</u> • Mudflats and sandflats not covered by seawater at low tide [1140]	• Mudflats and sandflats not covered by seawater at low tide – Unfavourable/Inadequate	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Water quality including nutrient levels, water clarity, sediment levels • Erosion and deposition rates • Controlling bait digging • Land reclamation for industrial / infrastructure usage • Maintaining appropriate levels of disturbance • Tidal currents
Special Protection Areas				
Dalkey Islands SPA (004172)	• Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna*	• [A192] – Amber • [A193] – Amber • [A194] – Amber	To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA: • The QIs of the European site	• Water quality including nutrient levels, water clarity, sediment levels • Foraging Habitat • Food supply • Appropriate Levels of disturbance

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
	paradisaea) [A194]		as listed in columns to the left	• Water levels • Tidal currents • Erosion / deposition levels • Freshwater influx • Intertidal habitats • Air Quality
North Bull Island SPA (004006)	• Oystercatcher (*Haematopus ostralegus*) [A130] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa*	• [A130] – Amber • [A046] – Amber • [A048] – Amber • [A052] – Amber • [A054] – Red • [A056] – Red • [A140] – Red • [A141] – Amber • [A143] – Amber • [A144] – Green • [A149] – Red • [A156] – Amber • [A157] – Amber • [A160] – Red • [A162] – Red • [A169] – Green • [A179] - Red	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Water quality including nutrient levels, water clarity, sediment levels • Foraging Habitat • Food supply • Appropriate Levels of disturbance • Water levels • Tidal currents • Erosion / deposition levels • Freshwater influx • Intertidal habitats • Air Quality

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
	lapponica) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Turnstone (*Arenaria interpres*) [A169] • Black-headed Gull (*Larus ridibundus*) [A179] • Wetlands & Waterbirds [A999]			
South Dublin Bay and River Tolka Estuary SPA (004024)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A140] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162]	• [A046] – Amber • [A130] – Amber • [A137] – Green • [A140] – Amber • [A143] – Red • [A144] – Green • [A149] – Red • [A157] – Amber • [A162] – Red • [A179] - Red • [A192] – Amber • [A193] – Amber • [A194] – Amber	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Water quality including nutrient levels, water clarity, sediment levels • Foraging Habitat • Food supply • Appropriate Levels of disturbance • Water levels • Tidal currents • Erosion / deposition levels • Freshwater influx • Intertidal habitats • Air Quality

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
	• Black-headed Gull (*Larus ridibundus*) [A179] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194] • Wetlands & Waterbirds [A999]			
Howth Head Coast SPA (004113)	• Kittiwake (*Rissa tridactyla*) [A188]	• [A188] – Amber	To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA: • The QIs of the European site as listed in columns to the left	• Water quality including nutrient levels, water clarity, sediment levels • Foraging Habitat • Food supply • Appropriate Levels of disturbance • Water levels • Tidal currents • Erosion / deposition levels • Freshwater influx • Intertidal habitats • Air Quality
Baldoyle Bay SPA (004016)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Ringed Plover (*Charadrius hiaticula*) [A137] • Golden Plover (*Pluvialis apricaria*) [A140]	• [A046] – Amber • [A048] – Amber • [A137] – Green • [A140] – Red • [A141] – Amber • [A157] – Amber	Detailed conservation objectives are available for this site as outlined in Table 3 below.	• Water quality including nutrient levels, water clarity, sediment levels • Foraging Habitat • Food supply • Appropriate Levels of disturbance • Water levels • Tidal currents • Erosion / deposition levels

Table 2 Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites				
Site Name & Code	**Qualifying Interests**	**Current Conservation Status**[6]	**Conservation Objectives**[7]	**Conditions underpinning site integrity**
	• Grey Plover (*Pluvialis squatarola*) [A141] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Wetlands & Waterbirds [A999]			• Freshwater influx • Intertidal habitats • Air Quality
Ireland's Eye SPA (004117)	• Cormorant (*Phalacrocorax carbo*) [A017] • Herring Gull (*Larus argentatus*) [A184] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200]	• [A017] – Amber • [A184] – Red • [A188] – Amber • [A199] – Amber • [A200] – Amber	To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA: • The QIs of the European site as listed in columns to the left	• Water quality including nutrient levels, water clarity, sediment levels • Foraging habitat • Breeding habitat • Food supply • Appropriate Levels of disturbance • Water levels • Tidal currents • Erosion / deposition levels • Freshwater influx • Intertidal habitats • Air Quality

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
Rockabill to Dalkey Island SAC		
Reefs [1170] (Maintain the favourable conservation condition)		
Habitat area	Hectares	The permanent area is stable or increasing, subject to natural processes
Habitat distribution	Occurrence	Distribution is stable or increasing, subject to natural processes
Community Structure	Biological composition	Conserve the following community types in a natural condition: Intertidal reef community complex; and subtidal reef community complex
Harbour Porpoise *Phocoena phocaena* [1351] (Maintain the favourable conservation condition)		
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the Harbour porpoise community at the site
North Dublin Bay SAC		
Mudflats and sandflats not covered by water at low tide [1140] (Maintain the favourable conservation condition)		
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/m^2	Conserve the high quality of the *Mytilus edulis* dominated 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] (Restore the favourable conservation condition)		
Habitat area	Hectares	Area 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: typical species and sub-	Percentage cover at a representative	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.)

[8] Taken from Conservation Objectives documents, accessed online at www.npws.ie 14/04/15

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
communities	number of monitoring stops	
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover
Salicornia and other annuals colonising mud and sand [1310] (Restore the favourable conservation condition)		
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: sediment supply	Presence/ absence of physical barriers	Maintain, or where necessary restore, natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and subcommunities	Percentage cover	Maintain the presence of species-poor communities listed in SMP (McCorry and Ryle, 2009)
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%
Atlantic salt meadows *(Glauco-Puccinellietalia maritimae* [1330] (Maintain the favourable conservation condition)		
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: sediment	Presence/ absence of	Maintain natural circulation of sediments and organic matter, without any physical obstructions

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
supply	physical barriers	
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 sub-communities	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%
Mediterranean salt meadows (*Juncetalia maritimi*) [1410] (Maintain the favourable conservation condition)		
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: 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 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:	Centimetres	Maintain structural variation within sward

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
vegetation height		
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 sub-communities	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] (Restore the favourable conservation condition)		
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 sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments 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 sub-communities	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] (Restore the favourable conservation condition)		
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

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
Physical structure: functionality sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments 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 sub-communities	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] (Restore the favourable conservation condition)		
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 sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments 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 in the sward
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)
Vegetation composition: negative indicator species (including *Hippophae*	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
rhamnoides)		
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control
Humid dune slacks [2190] (Restore the favourable conservation condition)		
Habitat area	Hectares	Area 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 sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments 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 the sward
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities 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-native species) to represent less than 5% cover
Vegetation composition:	Percentage cover	No more than 5% cover or under control

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
scrub/trees		
Petalwort *Petalophyllum ralfsii* [1395] (Maintain the favourable conservation condition)		
Distribution of populations	Number and geographical spread of populations	No decline
Population size	Number of individuals	No decline
Area of suitable habitat	Hectares	No decline
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
South Dublin Bay SAC		
Mudflats and sandflats not covered by water at low tide [1140] (Maintain the favourable conservation condition)		
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, subject to natural processes
Community Structure: *Zostera* density	Shoots/m^2	Conserve the high quality of the *Zostera* dominated community, subject to natural processes
Community distribution	Hectares	Conserve the following community type in a natural condition: Fine sands with *Angulus tenuis* community complex
North Bull Island SPA		
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Oystercatcher (*Haematopus ostralegus*) [A130], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Dunlin (*Calidris alpina alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Turnstone (*Arenaria interpres*) [A169], Black-headed Gull (*Chroicocephalus ridibundus*) [A179] (Maintain the favourable conservation condition)		
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 and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation
Wetlands [A999] (Maintain the favourable conservation condition)		
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
		1713ha, other than that occurring from natural patterns of variation
South Dublin Bay and River Tolka Estuary SPA		
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Oystercatcher (*Haematopus ostralegus*) [A130], Ringed Plover (*Charadrius hiaticula*) [A137], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Dunlin (*Calidris alpina alpina*) [A149], Bar-tailed Godwit (*Limosa lapponica*) [A157], Redshank (*Tringa totanus*) [A162], Black-headed Gull (*Chroicocephalus ridibundus*) [A179] (Maintain the favourable conservation condition) **Note:** Grey Plover (*Pluvialis squatarola*) [A141] is proposed for removal from the list of SCI's for the site so no site specific conservation objective is included for the species		
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 and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation
Roseate Tern (*Sterna dougallii*) [A192], Arctic Tern (*Sterna paradisaea*) [A194] (Maintain the favourable conservation condition)		
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] (Maintain the favourable conservation condition)		
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;	No significant decline

Table 3 Detailed Conservation Objectives for relevant European sites (where available)[8]		
Attribute	**Measure**	**Target**
	area (Hectares)	
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
Disturbance at roosting site	Level of impact	Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns
Wetlands [A999] (Maintain the favourable conservation condition)		
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2192ha, other than that occurring from natural patterns of variation
Baldoyle Bay SPA		
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Bar-tailed Godwit (*Limosa lapponica*) [A157] (Maintain the favourable conservation condition)		
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 and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation
Wetlands [A999] (Maintain the favourable conservation condition)		
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that occurring from natural patterns of variation

4 Assessment of Potential Impacts on European sites

4.1 Potential Impacts on European sites

4.1.1 Impact 1: Noise and Boat Strike Impact of Construction Works: Dredging (including dumping of dredge material) and Piling Operations

Rockabill to Dalkey Island SAC

Construction works, including dumping of dredge material at Burford Bank, have the potential to generate noise impact that could disturb or create a barrier to movement for the Harbour porpoise and/or could result in direct fatalities of Harbour porpoise e.g. by noise impact or boat strike.

The Marine Mammal Risk Assessment (MMRA) prepared for the proposed development, see Appendix 5.2.4 of the EIS, concludes that it is extremely unlikely that the proposed works would result in death or injury to marine mammals.

Localised, temporary disturbance is likely to be caused to harbour porpoise by dredging, while piling may have a more widespread effect. This effect will be reduced due to the location of the piling within the confines of the harbour and the small diameter of the majority of the piles. All effects will be temporary in nature. The MMRA also concludes that temporary or short-term restrictions of access or range do not affect Target 1 of the Conservation Objectives related to harbour porpoise in the SAC.

In relation to the dumping of dredge spoil at the Burford Bank, the MMRA concludes that harbour porpoises avoid ships at some distance (1-1.5 km) with stronger reaction at 400 m and therefore will move away from the dredger as it arrives on station at the Burford Bank, minimising the possibility of any interaction between the two. This will only lead to a small, temporary disturbance from an area that appears to be of lower importance to harbour porpoises than the areas around Howth Head and Dalkey Island.

Any displacement caused by the proposed development would be expected to cease within hours of cessation of works.

Impact Prediction: Localised temporary locally to internationally significant negative impact

4.1.2 Impact 2: Accidental Pollution Incident during construction and/or operation

Accidental pollution events during construction or in operation could carry pollutants into the local coastal waters of Dublin Bay.

Construction

There will be three temporary site compounds located on the landside element of the proposed development. These will facilitate both construction access for landside and marine construction works including a precasting plant. Construction works will involve temporary lifting and reinstating of some surfaces within the development footprint, as well as some demolitions. Surface water run-off from the proposed development will drain to the existing surface water drainage and discharge via petrol interceptor to Dún Laoghaire Harbour.

The operation of plant, machinery and vessels has the potential to release pollutants such as diesel and hydraulic fluid into the water column. These substances can have toxic effects on marine organisms including marine mammals and their prey. Surface water discharges from the landside construction site have the potential to release silt laden surface water discharges, contaminated water discharges such as hydrocarbons or an accidental pollution incident into the harbour and environs. Dependent on the nature of the contamination and volume of water involved, this has the potential to negatively impact the QIs and SCIs habitats and species of the designated sites.

Marine grade concrete will be used to fill monopoles once they are installed rather than being exposed to the water column thus there will be minimal risk to the aquatic environment. The quay deck structure has been designed to maximize the use of precast concrete, thus minimizing potential for concrete spills. The scour protection feature may involve pumping of grout through a closed impermeable sock.

Although construction methods have the potential to result in an accidental pollution incident, all construction methods proposed, including those involving pouring of concrete, are normal construction practice involving no new or novel features.

Operation

The proposed development will provide a similar quantum of hard surface areas, with negligible change in quantities of surface water run-off from the existing site. Furthermore surface water will be treated via petrol interceptor to remove contaminants prior to discharge.

Cruise vessels operate under the International Convention for the Prevention of Pollution from Ships (MARPOL), which sets out the minimum standards ships must adhere to in order to protect water quality. The operation of cruise liners has the potential to lead to accidental pollution incidents through spillages of fuel, oil or other polluting chemicals.

Rockabill to Dalkey Island SAC

Both of the QIs of Rockabill to Dalkey Island SAC, Reefs [1170] and Harbour porpoise [1351], would be potentially at risk from an accidental pollution incident during construction and operation of the proposed development, if it was of a sufficient magnitude and duration to affect water quality in Dublin Bay.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

South Dublin Bay SAC and North Dublin Bay SAC

The following QI habitats of South Dublin Bay SAC and North Dublin Bay SAC would be potentially at risk from an accidental pollution incident during construction and operation of the proposed development, if it was of a sufficient magnitude and duration to affect water quality in Dublin Bay.

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Annual vegetation of drift lines [1210]
- *Salicornia* and other annuals colonizing mud and sand [1310]
- Atlantic salt meadows *Glauco-Puccinellietalia maritimae* [1330]
- Mediterranean salt meadows *Juncetalia maritimi* [1410]
- Embryonic shifting dunes [2110]

Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120], fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], humid dune slacks [2190] and Petalwort *Petalophyllum ralfsii* [1395] are found above the high tide line and would therefore not be impacted by an accidental pollution incident in Dublin Bay.

Many bird species for which SPAs are designated are also dependent on the above habitats for feeding and roosting, therefore any impact to the habitats would lead to indirect impacts on SPA SCIs bird species utilising Dublin Bay

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

Dalkey Island SPA

SCI species could utilise the intertidal and estuarine habitats in Dublin Bay for feeding and/or roosting. Common Tern have been recorded utilizing Dún Laoghaire Harbour and surrounding areas (Scott Cawley, 2015). Therefore they would be vulnerable to the effects of an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and/or roosting.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

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

SCI species could utilise the intertidal and estuarine habitats in Dublin Bay for feeding and/or roosting. The following SCIs have been recorded utilizing Dún Laoghaire Harbour and surrounding areas (see full survey details in Chapter 5.2 of EIS, Scott Cawley, 2015):

- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] [wintering]
- Oystercatcher (*Haematopus ostralegus*) [A130] [wintering]
- Ringed Plover (*Charadrius hiaticula*) [A137] [wintering]
- Sanderling (*Calidris alba*) [A144] [wintering]
- Dunlin (*Calidris alpina*) [A149] [wintering]
- Bar-tailed Godwit (*Limosa lapponica*) [A157] [wintering]
- Redshank (*Tringa totanus*) [A162] [wintering]
- Black-headed Gull (*Croicocephalus ridibundus*) [A179] [wintering]
- Common Tern (*Sterna hirundo*) [A193] [breeding]
- Shelduck (*Tadorna tadorna*) [A048] [wintering]
- Curlew (*Numenius arquata*) [A160] [wintering]
- Turnstone (*Arenaria interpres*) [A169] [wintering]

These species and other SCI species for the SPAs would be vulnerable to the effects of an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and/or roosting within Dún Laoghaire Harbour, surrounding area and the wider Dublin Bay area.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

Howth Head Coast SPA

SCI species, Kittiwake could utilise the intertidal and estuarine habitats in Dublin Bay for feeding and/or roosting. Kittiwake were recorded in utilizing Dún Laoghaire Harbour and surrounding areas (see full survey details in Chapter 5.2 of EIS, Scott Cawley, 2015).

Kittiwake would be vulnerable to the effects of an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and/or roosting within Dún Laoghaire Harbour, surrounding area and the wider Dublin Bay area.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

Baldoyle Bay SPA

SCI species could utilise the intertidal and estuarine habitats in Dublin Bay for feeding and/or roosting. The following SCIs have been recorded utilizing Dún Laoghaire Harbour and surrounding areas (see full survey details in Chapter 5.2 of EIS, Scott Cawley, 2015):

- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] [wintering]
- Shelduck (*Tadorna tadorna*) [A048] [wintering]
- Ringed Plover (*Charadrius hiaticula*) [A137] [wintering]
- Bar-tailed Godwit (*Limosa lapponica*) [A157] [wintering]

These species and other SCI species for the SPAs would be vulnerable to the effects of an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and/or roosting within Dún Laoghaire Harbour, surrounding area and the wider Dublin Bay area.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

Ireland's Eye SPA

SCI species could utilise the intertidal and estuarine habitats in Dublin Bay for feeding and/or roosting. The following SCIs have been recorded utilizing Dún Laoghaire Harbour and surrounding areas (see full survey details in Chapter 5.2 of EIS, Scott Cawley, 2015):

- Cormorant (*Phalacrocorax carbo*) [A017] [breeding]
- Herring Gull (*Larus argentatus*) [A184] [breeding]
- Kittiwake (*Rissa tridactyla*) [A188] [breeding]
- Guillemot (*Uria aalge*) [A199] [breeding]
- Razorbill (*Alca torda*) [A200] [breeding]

These SCI species would be vulnerable to the effects of an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and/or roosting within Dún Laoghaire Harbour, surrounding area and the wider Dublin Bay area.

Impact Prediction: **Unlikely, medium term locally to internationally significant negative impact from fuel, oil or concrete spills, dependent on the magnitude of the spill.**

4.1.3 Impact 3: Release of non-native invasive species into the receiving water environment

There is the potential for escape of plant materials, seeds/seedlings from new planting to be introduced to the receiving water environment via surface water drainage. If any non-native invasive species were to be used in the landscaping proposals this could present a risk of introduction/spread of non-native invasive species to habitats within Dublin Bay.

Discharge of ballast waters from cruise ships also has the potential to release non-native invasive species into the receiving coastal waters of Dún Laoghaire Harbour and the wider Dublin Bay. However, all waste from cruise ships will be discharged outside international waters.

Rockabill to Dalkey Island SAC

Reefs [1170], a QI of Rockabill to Dalkey Island SAC would be potentially at risk from release of non-native invasive species, either waterborne or those that could spread to land as the reefs are intertidal and subtidal.

Impact Prediction: Unlikely long term locally to internationally significant impact.

South Dublin Bay SAC and North Dublin Bay SAC

The following QI habitats of South Dublin Bay SAC and North Dublin Bay SAC would be potentially at risk from release of non-native invasive species, either waterborne or those that could spread to land.

- Mudflats and sandflats not covered by seawater at low tide [1140]
- Annual vegetation of drift lines [1210]
- *Salicornia* and other annuals colonizing mud and sand [1310]
- Atlantic salt meadows *Glauco-Puccinellietalia maritimae* [1330]
- Mediterranean salt meadows *Juncetalia maritimi* [1410]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Humid dune slacks [2190]
- Petalwort *Petalophyllum ralfsii* [1395]

Impact Prediction: Unlikely long term locally to internationally significant impact.

4.2 Summary of potential in-combination impacts

Other plans and projects in the wider area that may act in combination with the proposed Dún Laoghaire Harbour cruise berth include maintenance dredging carried out by Dublin Port on a regular basis, the Alexandra Basin Redevelopment (Dublin Port), Dublin Array wind farm and Dún Laoghaire Urban Beach. It is difficult to assess the potential for cumulative effects owing to a lack of certainty around the timeframe for any of these projects. The current timeline for the Dublin Array is for construction to commence in 2018 (Dublin Array, 2015); however, this development has not yet received consent. Similarly, the Alexandra Basin Redevelopment is proposed to commence piling works in October 2015 and continue to March 2018, with dredging to extend for a minimum of six years and up to ten years (RPS, 2015).

Sound generated by impact piling on all projects will result in some level of disturbance to harbour porpoises within, and inshore of, the Rockabill to Dalkey Island SAC. The Alexandra Basin Redevelopment will involve a 38 month piling programme and it was concluded that it would not have any significant effect on marine mammals (RPS, 2015). The principally small diameter piles used in the works proposed for Dún Laoghaire Harbour and the very short piling period (12 weeks) means that this project would have the lowest impact on the sound environment of the area of the three considered, and a negligible in-combination effect. Based on the current timelines, it is not expected that the Dublin Array will have commenced construction works before the piling works are completed for the Dún Laoghaire Harbour cruise berth, meaning there will be no cumulative effect through overlapping works. The distance between the three projects also means that the likelihood of a measureable negative effect is low, with the sound levels attenuating with distance. All three projects will involve

the use of Marine Mammal Observers to minimise the risk of injury or hearing loss for marine mammals.

Sound generated by impact piling on the Alexandra Basin Redevelopment and the proposed development could result in noise disturbance to wintering and breeding bird species, though the principally small diameter piles used in the works proposed for Dún Laoghaire harbour and the much shorter construction period means that this project would have the lowest impact on the sound environment of the area.

The Alexandra Basin Redevelopment will also involve dredging, with some of the dredge spoil disposed of on land due to the levels of contamination, but with the remainder dumped at the Burford Bank spoil dump site. The Alexandra Basin Redevelopment is expected to dispose of 5,900,000 m^3 of spoil in the course of the development works (RPS, 2014), as compared to approximately 710,000 m^3 for the proposed project at Dún Laoghaire. The volume of dredge spoil disposed by the Dún Laoghaire Harbour cruise berth project will comprise 11% of the two projects combined. It is proposed that dredging will be carried out for the Alexandra Basin Redevelopment in the period October – March over a six year period (up to a maximum of 10), due to the presence of out-migrating salmon smolts and so it will not overlap with the Dún Laoghaire Harbour dredging, which is proposed to take place over one summer period (March – September), with a planned duration of 14-17 weeks. Given the scale of the Alexandra Basin Redevelopment in comparison to the proposed development at Dún Laoghaire in terms of time and quantity of dredging, that noise generated by the operation of dredging plant is similar to that emitted by regular shipping activity, that Harbour porpoise and birds in the Dublin Bay area are likely to have become habituated to a high degree of disturbance and background noise given the location with working ports, harbours and operation of the Dublin port shipping lane in through the Bay, no cumulative impacts are predicted. Maintenance dredging is carried out on a regular basis in Dublin Port to maintain the navigation channel depth. Once operational, the maintenance dredging of Dublin Port will be of similar magnitude to the existing situation, and so will not lead to a deviation from the existing environment in Dublin Bay.

The Dún Laoghaire Urban Beach will be moored off the East Pier in Dún Laoghaire Harbour. Construction works will be mainly landside, with some pile driving expected to last in the region of 4 to 10 days. It is difficult to assess the potential impact due to lack of uncertainty around the timing of the construction works. Although noise generated from construction and piling works could cause disturbance to Harbour Porpoise and wintering and/or breeding bird species, construction works will be relatively limited and piling works of very short duration. The project is expected to be completed by spring/summer 2016 therefore the works involved will not lead to any cumulative impacts, as they will be completed before Dún Laoghaire Harbour cruise berth commences and will not result in any significant effects on Harbour Porpoise breeding or wintering birds in-combination. The facility will operate seasonally, in spring and summer months, overlapping with the operation of the proposed cruise terminal development in the harbour, thus potentially causing disturbance to breeding birds or wintering birds if operation overlaps with the wintering bird season in part. However, the Urban Beach will be permanently moored in the harbour, the East Pier is already heavily used as a recreation area, there is frequent shipping activity in the harbour and birds in the area are likely to have become habituated to a high degree of disturbance from human presence, shipping activity and background noise.

5 Mitigation Measures to Ensure No Significant Effects on the Integrity of the European Sites

Upon establishing the impact that the proposed development may have upon the conservation objectives of the SACs and SPAs, wherever a potential impact is identified, mitigation measures need to be proposed to counteract this impact. Detailed mitigation measures have been proposed in relation to the proposed development as detailed below.

Mitigation Measure 1

The MMRA carried out for the proposed development proposes mitigation in relation to impacts on marine mammals (including Harbour Porpoise) to eliminate risk to marine mammals from the proposed development, see Appendix 5.2.4 of the EIS. This is as follows:

In-keeping with best practice, it is proposed that the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (DAHG, 2014) will be implemented in full for the protection of marine mammals from potential injury due to the noise generated during piling operations.

It is proposed that dredging will be carried out with a slight deviation from the guidance in that dredging be carried out 24/7 during summer time (March – September) and will therefore a number of dredging cycles will commence outside of daylight hours in order to minimise the duration of the dredging. With 24/7 dredging in the summer, where daylight hours are long, the work programme is expected to be completed in 14-17 weeks. If dredging is only carried out during daylight hours, this would be expected to increase to 32 weeks. The proposed dredging programme balances the very low risk of injury or disturbance to marine mammals of commencing some dredging cycles outside daylight hours with minimising the overall duration of the disturbance. The following was considered in proposing this course of action:

- Sound generated by dredging is predominantly low frequency and below levels that would cause temporary or permanent injury to marine mammals (Richardson *et al*., 1995, Southall *et al*., 2007). The soft sediment within the footprint of the works would mean the sound levels generated would be at the lower end of the range for dredging.
- Berrow *et al*. (2008) recorded peak harbour porpoise activity at Howth Head & Dalkey Island, with few sightings close to Dún Laoghaire Harbour limit. Numerous harbour porpoise sighting have been made by members of the public outside Dún Laoghaire Harbour (IWDG, 2015); however, the number of records here is reflective of the large number of people using the piers. The majority of sightings occur in the period October-December (IWDG, 2015), thus the proposed dredging programme will avoid the peak sightings period.
- It is thought that harbour porpoises move offshore in the period March – June to calving/breeding areas (IWDG, 2014), which would reduce the level of interaction between the proposed works and breeding individuals, as the dredging programme would overlap with this period.
- Harbour porpoises avoid ships at some distance (1-1.5 km) with stronger reaction at 400 m (Richardson *et al*., 1995) and therefore will move away from the dredger as it arrives on station at the harbour or the Burford Bank.

Where impact piling is used, mitigation measures such as bubble curtains or cofferdams will be used to reduce the sound levels transmitted to the wider aquatic environment.

Mitigation Measure 2

Construction methods proposed are normal construction practice involving no new or novel features, including those in relation to pouring of concrete. Although the risk of any significant impact on water quality on coastal waters is considered to be low, best practice will be implemented at all times in relation to all construction activities to maintain water quality standards in Dublin Bay.

Prior to commencement of construction, a project-specific Construction and Environmental Management Plan (CEMP) will be established by the contractor and maintained by the contractors during the construction phase of the proposed development to prevent release of hydrocarbons, polluting chemicals and sediments. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the

implementation of the procedures. As a minimum, the manual will be formulated in consideration of the standard best international practice including but not limited to:

- *CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors,*
- *Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005,*
- *BPGCS005, Oil Storage Guidelines,*
- *CIRIA 697, The SUDS Manual, 2007,*
- *UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.*
- *Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006)*
- *CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006)*
- *ERFB (2005). Inland Fisheries Ireland's Requirements for the protection of fisheries and habitats during construction and development works at river sites*

The contractor will implement the following mitigation measures, via the CEMP, for release of hydrocarbons, polluting chemicals and sediment control:

- Provision of measures to prevent the release of sediment over baseline conditions to Dublin Bay during the construction work. These measures may include but not be limited to the use of silt traps, silt fences, silt curtains, settlement lagoons, filter materials. This is particularly important when undertaking any constructing/upgrading to the surface water drainage network on the development site;
- Provision of exclusion zones and barriers (sediment fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the receiving water environment;
- Temporary construction surface drainage and sediment control measures will be in place before earthworks commence;
- Weather conditions will be taken into account when planning construction activities to minimise risk of run off from the site,
- Pouring of cementitious materials for the works adjacent to surface water drainage features, or drainage features connected to same, will be carried out in the dry. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to surface water. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to watercourses;
- No storage of hydrocarbons or any polluting chemicals will occur within 50 m of the surface water network or receiving coastal water. Fuel storage tanks will be bunded to a capacity at least 110% of the volume of the storage tank (plus an allowance of 30 mm for rainwater ingress). Re-fuelling of plant or the addition of hydraulic oil or lubricant will not occur within 50 m of the receiving water network and only in bunded refuelling areas;
- All construction and demolition waste should be stored above the high water mark prior to removal from the site.
- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures;
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt);
- Response measures to potential pollution incidents;
- Foul drainage from site offices and compounds, where not directed to the existing waste water network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses.

Cruise vessels will operate under the International Convention for the Prevention of Pollution from Ships (MARPOL), which sets out the minimum standards ships must adhere to in order to protect water quality.

The operation of the cruise ships, specifically with regard to diesel storage and usage, will be subject to an Environmental Management Plan (EMP) and relevant operational guidelines for cruise ships at port, including entering and exiting of the port. Specific adherence should be given to the following:

- Usage of diesel when in port including potential refuelling processes
- Foul/waste water will be disposed of outside of territorial water;
- Hazardous chemicals on-board should be stored in sealed drums with relevant labels in locked chemical storage cabinets;
- Spillages on deck should be controlled with absorbent materials or 'Spill Kits'.

Surface water run-off from the landside element of the proposed development will be treated via petrol interceptor to remove contaminants prior to discharging into the harbour.

Mitigation Measure 3

Non-native invasive species will not be planted on the site in accordance with the *Bird & Natural Habitats Regulations 2011*, under which it is an offence to "cause to disperse, spread or otherwise cause to grow …" the range of invasive species listed in Schedule 3 of the regulations. Planting will also have regard to the 'Most Wanted' list on the Invasive Species Ireland (ISI) National Invasive Species Database http://invasivespeciesireland.com/ and will ensure no such species are planted on the site.

Cruise ships will dispose of waste waters outside of territorial waters.

5.1.1 In-combination effects of the Proposed Development with other Potential Sources

There is no likelihood of significant effects on any European sites, and there will be no adverse effects on European site integrity during the construction of the proposed development in combination with other plans or projects. This judgement was reached on the basis that;

- Any potential in-combination effects in relation to foul water were ruled out in the Screening Report (see Appendix 5.2.10 of the EIS);
- Potential in-combination effects of the proposed development with the Alexandra Basin Redevelopment project, Dublin Port maintenance dredging, Dublin Array wind farm and Dún Laoghaire Urban Beach have been ruled out , see section 4.2 above "Summary of potential in-combination impacts";
- Mitigation has been provided for any potential impacts of the proposed development in section 5 above.

6 Conclusions of the Assessment Process

This Natura Impact Statement was prepared as part of the Appropriate Assessment process to identify any potential impacts from the proposed development at Dún Laoghaire Harbour, Dún Laoghaire, Co. Dublin, upon Rockabill to Dalkey Island SAC, North Dublin Bay SAC, South Dublin Bay SAC, Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA and Ireland's Eye SPA.

The only potentially significant risks to these European sites relates to;

- Potential for noise impacts generated during construction works from dredging and piling activities to result in disturbance to and/or result in direct fatalities to Harbour Porpoise;

- Potential for an accidental pollution incident during construction and/or operation being released into the receiving water environment and the potential effects such incidents/discharges could have on the Qualifying Interests/SCIs and conservation objectives of these European sites;
- Potential for the release of non-native invasive species into the receiving water environment .

Mitigation measures have been proposed in Section 5 to ensure that this risk is avoided during the construction and operation of the proposed development.

To conclude, there is no risk of the proposed development with mitigation measures in place, to result in adverse effects on Rockabill to Dalkey Island SAC, North Dublin Bay SAC, South Dublin Bay SAC, Dalkey Islands SPA, South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head Coast SPA, Baldoyle Bay SPA and Ireland's Eye SPA, their Qualifying Interests/Special Conservation Interests or their conservation objectives, either alone or in-combination with other impact sources.

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