

# Hartley Anderson Limited

Marine Environmental Science and Consultancy

## Article 12 Risk Assessment

Dublin Port Company MP2 Project Foreshore  
Lease, Licence and Consent Application Ref.  
No. FS006893

Report to  
Department of Housing, Local Government  
and Heritage



February 2022

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## TABLE OF CONTENTS

SECTION 1 - INTRODUCTION.....	2
1.1 Background.....	2
1.2 Relevant consultation responses .....	2
1.3 Legislative context.....	13
SECTION 2 - DESCRIPTION OF PROPOSED WORKS.....	14
2.1 Site Location .....	14
2.2 Summary of MP2 Project .....	14
2.3 Project elements requiring Foreshore Consent Under Section 10 .....	15
2.4 Project elements requiring a Foreshore Consent Under Section 3 .....	21
2.5 Landside Elements of the MP2 Project .....	22
2.6 Construction.....	23
2.7 Operational Phase .....	28
SECTION 3 - BASELINE ENVIRONMENT .....	33
3.1 Ambient noise levels .....	33
3.2 Relevant Annex IV species .....	33
SECTION 4 - RISK ASSESSMENT .....	40
4.1 Potential impacts associated with the proposed works .....	40
4.2 Mitigation measures .....	43
4.3 Monitoring measures.....	44
4.4 Conclusion .....	45
BIBLIOGRAPHY .....	46

## **SECTION 1 - INTRODUCTION**

### **1.1 Background**

Arup with Hartley Anderson Limited have been commissioned by the Department of Housing, Local Government and Heritage (DHLGH) to conduct an Article 12<sup>1</sup> Risk Assessment of an application by Dublin Port Company (DPC) for a Foreshore Lease, Licence and Consent (hereafter Consent) for the MP2 Project which is the second Strategic Infrastructure Development (SID) at Dublin Port to be brought forward to planning stage from the Dublin Port Masterplan 2040. The purpose of the proposed development is to provide for the redevelopment of existing port lands and complement the previously permitted Alexandra Basin Redevelopment (ABR) Project in providing capacity for growth in the Ro-Ro and Lo-Lo modes on the north side of the Port in accordance with the Port Masterplan. The project will involve the placement of permanent structures on the foreshore.

DPC submitted an application for planning permission to An Bord Pleanála on 11<sup>th</sup> July 2019 for the MP2 Project. An Oral Hearing was held on 16<sup>th</sup> December 2019 and the planning permission was granted by An Bord Pleanála on 1<sup>st</sup> July 2020.

DPC applied to the Environmental Protection Agency (EPA) for a dumping at sea permit on 4<sup>th</sup> August 2020 for loading and dumping at sea activities associated with capital dredging within Dublin Harbour as part of the MP2 Project. The permit application proposes that all capital dredging activities to be undertaken for the duration of the activities (15 years) will be restricted to the winter months only (October to March), commencing October 2021.

The application is currently under assessment by the EPA in accordance with the requirements of the Dumping at Sea Act 1996 as amended. The EPA issued three requests for additional information, most recently in October 2021, and the applicant submitted a revised AA Screening and NIS in September 2021. The EPA will issue a determination in due course.

### **1.2 Relevant consultation responses**

The licence application was open for public consultation between 25<sup>th</sup> November 2020 to 3<sup>rd</sup> February 2021. Responses relevant to this Article 12 Risk Assessment are provided in Table 1.1.

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<sup>1</sup> Article 12 of the Habitats Directive addresses the protection of species listed in Annex IV(a). The article applies throughout the natural range of the species within the EU and aims to address their direct threats, rather than those of their habitats.

Table 1.1: Relevant responses from prescribed bodies to the consultation

Statutory Body	Applicant's Response
<p><b>Environmental Protection Agency (EPA)</b> The EPA advised:</p> <ol style="list-style-type: none"> <li>1. Dublin Port Company currently holds a Dumping at Sea Permit, Reg. No. S0024-01, which authorises loading and dumping activities associated with capital dredging activities as part of the Alexandra Basin Redevelopment Project until 31st March 2021. Condition 3.2 of this permit restricts the timing of loading and dumping activities to the winter months (1st October to 31st March), to reduce interference with amenity and other users and to avoid any impacts on the foraging activity of birds during the breeding season and the calving and breeding season for Harbour Porpoise.</li> <li>2. Dublin Port Company also holds a Dumping at Sea Permit, Reg. No. S0004-02, which authorises loading and dumping activities associated with maintenance dredging activities within Dublin Harbour over the period July 2020 - September 2021. Schedule A.3 Closed Periods of this permit provides for the temporal separation of activities associated with ongoing capital dredging (Alexandra Basin Redevelopment Project) and loading and dumping activities associated with maintenance dredging, to ensure that there is no overlap between these activities and no cumulative impact on the receiving waters. Thus, loading and dumping activities associated with maintenance dredging are confined to the months April to September, with the exception of activities in the loading areas in the inner Liffey channel upstream of Berth 49, including the main channel and channel-side berths but not including basins, where a further closed period (1st April – 14th May) applies, to protect migrating Atlantic salmon smolts and River lamprey.</li> <li>3. Dublin Port Company applied to the EPA for a dumping at sea permit on 4th August 2020 for loading and dumping at sea activities associated with capital dredging within Dublin Harbour as part of the MP2 Project in the following areas: <ul style="list-style-type: none"> <li>• Berthing pocket and approach to new riverside Berth 53.</li> <li>• Lengthening of existing Berth 50A.</li> <li>• Deepening and widening of existing Oil Berth 3.</li> </ul> </li> </ol>	<p>The Applicant noted that the EPA did not request further information or seek clarification on any matters.</p> <p>Dumping at Sea Permit S0024-01 for the Alexandra Basin Redevelopment Project will have expired prior to the proposed capital dredging as part of the MP2 Project.</p> <p>Dumping at Sea Permit S0004-02 for maintenance dredging at Dublin Port and is valid to 30th September 2021. This permit will have expired prior to the proposed capital dredging as part of the MP2 Project.</p> <p>The Applicant intends to apply for Foreshore licence and Dumping at Sea permit S004-03 for an eight-year maintenance dredging programme 2022-2029 to be undertaken during the summer months (1st April to 30 September) with the same seasonal constraints as in permit S0004-02.</p> <p>It is proposed that the capital dredging as part of the MP2 Project will be restricted to the winter months (October to 31st March). This is to ensure there is no overlap between the proposed MP2 Project capital dredging activities and future maintenance dredging activities and no cumulative impact on the receiving waters.</p> <p>Cumulative impact is addressed in Chapter 18 of the MP2 Project Environmental Impact Assessment Report (EIAR).</p> <p>Dumping at Sea Permit S0024-02 for the for the MP2 Project: The Applicant applied to the EPA for a Dumping at Sea Permit on 4th August 2020 for loading and dumping at sea activities associated with capital dredging as part of the MP2 Project. The application is currently under assessment by the EPA in accordance with the requirements of the Dumping at Sea Act 1996 as amended and a determination will issue in due course.</p>

Statutory Body	Applicant's Response
<ul style="list-style-type: none"> <li>• Localised widening of the main navigation channel, along its southern margin.</li> </ul> <p>The permit application proposes that all capital dredging activities to be undertaken for the duration of the activities (15 years) will be restricted to the winter months only (October to March), commencing October 2021. The full application, Reg. No. S0024-02, including Natura Impact Statement (July 2019) may be viewed on the Agency's website. The application is currently under assessment by the EPA in accordance with the requirements of the Dumping at Sea Act 1996 as amended and a determination will issue in due course.</p> <p>4. Each of the authorised and proposed loading and dumping activities involve dumping of dredged material at an established offshore disposal site located at the entrance to Dublin Bay to the west of the Burford Bank.</p> <p>The Agency advised that the proposed activity shall not result in a contravention of the Water Framework Directive 2000/60/EC, Habitats Directive 92/43/EEC, Birds Directive 2009/147/EC, Marine Strategy Framework Directive 2008/56/EC, Bathing Water Directive 73/160/EEC or Environmental Liabilities Directive 2004/35/EC.</p>	<p>The Applicant would be pleased to accept a Foreshore Licence Condition that capital dredging cannot proceed without a Dumping at Sea Permit being granted by the EPA.</p> <p>Licensed disposal site: This site has been licensed since 1996 and has been subject to a number of benthic and fisheries surveys which have demonstrated that there has been no long-term impact at the dump site from repeated dumping activity.</p> <p>The MP2 Project requires the capital dredging of 700,663 Tonnes (wet weight) equivalent to 424,644m<sup>3</sup> over a 15-year period to suit the construction programme. The total quantity of material to be dredged per winter season is therefore relatively small compared to the ABR Project. The marine sediments have also been classified as Class 1 - Uncontaminated: no biological effects likely.</p> <p>No significant impact on marine biodiversity is expected from proposed loading and dumping activity under the MP2 Project, with mitigation measures in place, as set out in Chapter 7 of the MP2 Project EIAR.</p> <p>Compliance with European Directives: The MP2 Project, with mitigation measures in place, will not result in a contravention of the Water Framework Directive 2000/60/EC, Habitats Directive 92/43/EEC, Birds Directive 2009/147/EC, Marine Strategy Framework Directive 2008/56/EC, Bathing Water Directive 73/160/EEC or Environmental Liabilities Directive 2004/35/EC.</p> <p>Compliance with the following Directives is addressed in Chapter 9 of the MP2 Project EIAR: Water Framework Directive 2000/60/EC, Marine Strategy Framework Directive 2008/56/EC and Bathing Water Directive 73/160/EEC.</p> <p>Compliance with the following Directives is addressed in the MP2 Project AA Screening and NIS: Habitats Directive 92/43/EEC and Birds Directive 2009/147/EC.</p>

Statutory Body	Applicant's Response
	<p>The Environmental Liabilities Directive 2004/35/EC was transposed into Irish Law through the European Communities (Environmental liability) Regulations 2008. The objective of the Directive and Regulations is the prevention and remediation of environmental damage, which is defined as water damage that has significant adverse effects on water status under the Water Framework Directive, land damage that creates a significant risk to human health as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms, and damage to protected species and natural habitats. The MP2 Project has been designed to prevent the risk of environmental damage as set out throughout the supporting EIAR.</p> <p>The Applicant's current Dumping at Sea Permits set out specific conditions to address environmental incidents, for example, Condition 5 (Incident Prevention and Emergency Response) and Condition 6 (Notification, Records and Reports) of S0004-02. No environmental incidents have occurred under the Applicant's current Dumping at Sea Permits. The Applicant's would be pleased to accept similar conditions for the proposed MP2 Project Dumping at Sea Permit and linked to the Foreshore Licence, if granted.</p>
<p><b>National Parks and Wildlife Service (NPWS)</b> <i>Impact on European (Natura 2000) Sites</i></p> <p>The NPWS noted that an AA screening report and NIS were submitted in the application. The AA Screening identified the possibility that the proposed project might have significant effects on the Qualifying Interests (QIs) or Special Conservation Interests (SCIs) of six European sites. The application boundary of the MP2 Project is located outside of any European site, and as such no direct habitat loss from any European site is anticipated as a result of any aspect of the MP2 Project within the application boundary. However, the proposed development is located very close to the boundary of South Dublin Bay and River Tolka Estuary Special Protection Area (SPA). The main impacts associated with the development would centre on the construction activities associated with the development and these could variously result in water quality issues and potential habitat deterioration. Due to its proximity these would be most likely to occur mainly within the adjacent SPA, but it was considered that there was also the potential for effects on three other Dublin</p>	<p>The Applicant noted that NPWS did not seek further information or clarification on any of the application material.</p> <p>NPWS propose that four conditions be applied to the Foreshore Consent. The Applicant believes these conditions to be consistent and/or complementary to the planning conditions set by An Bord Pleanála in the MP2 Project Planning Decision ABP: 304888-19. The Applicant confirmed its acceptance of the four conditions proposed by NPWS.</p>

Statutory Body	Applicant's Response
<p>Bay Natura sites, namely the North Bull Island SPA and the South Dublin Bay candidate Special Area of Conservation (cSAC) and the North Dublin Bay cSAC. The possibility of pollution arising during the construction phase affecting water quality was therefore considered in the NIS. The potential for the contamination of water with sedimentary material mobilised by dredging and demolition works or by contact with wet cement or concrete or the accidental discharge of oils as the result of the operation and refuelling of machinery was recognised, and measures to avoid such pollution occurring during construction were proposed.</p> <p><i>Changes in Tidal Patterns, Currents, Wave Action</i>                      The possibility that the construction and operation of the Berth 53 jetty could result in changes in tidal pattern, currents and wave action leading to the deterioration in the value of the adjacent section of the South Dublin Bay and River Tolka Estuary SPA as a resource for breeding and non-migratory birds was recognised. The modelling of such possible changes using MIKE 3 Hydrodynamic and Sediment Transport model software suggested that scour from the operation of ship propellers and in particular bow thrusters by vessels manoeuvring to dock in or depart from Berth 53 could result in the removal of sediments from the part of the SPA near the jetty. A wave protection structure composed of concrete mattresses to be laid on the dredged slope along the length of the jetty was therefore designed. With this scour protection structure in place along the Berth 53 jetty the modelling suggests operation of the berth should cause negligible effects to wetland habitat within the adjacent SPA.</p> <p><i>Noise and Disturbance of Special Conservation Interest Bird Species</i>                      The AA Screening identified the possibility that aerial noise and visual disturbance during the construction and operation of Berth 53 might affect the usage of this nearby part of the SPA by bird species which are SCIs for the South Dublin Bay and River Tolka Estuary SPA and/or the North Bull Island SPA. The seabed of the SPA near the proposed Berth 53 jetty site is only exposed at for an hour at low tides 23 times a year, some of which exposures occur at night. To attempt to assess the potential significance of noise and visual disturbance affecting the usage of this area by non-wintering birds, surveys of this area were carried out on eight occasions in 2018 and 2019 in</p>	

Statutory Body	Applicant's Response
<p>the months from October to March. Only a relatively small usage of the adjacent section of the SPA by birds was revealed by these surveys, especially by SCI species for the SPAs, with 400 black-headed gulls recorded on one occasion, and during other counts, 43 black-tailed godwits and 15 oystercatchers. Nevertheless, it was considered the range, timing, and intensity of use of this part of the South Dublin Bay and River Tolka Estuary SPA by the six 'feature' bird species for this SPA which use it might decrease as a result of the construction or operation of Berth 53. To address such possible impacts the implementation of a bird management plan is proposed. The principal elements of this plan are that construction works on the Berth 53 jetty will be suspended during the extreme low spring tides when the seabed of the SPA near the jetty becomes exposed. Also to minimise the potential for disturbance to birds during the operation of Berth 53, gates will be installed on the nearby stretch of Greenway and closed to prevent public access during extreme low spring tide events.</p> <p><i>Effects of Disposal at Sea of Dredged Material on Reef Habitats</i></p> <p>The construction and operation of the proposed development would also require dredging and disposal of the dredged material from the Liffey channel. This material would be disposed of at an established site at the Burford Bank. The NIS examines the potential interaction with the qualifying interest habitats Reef for Rockabill to Dalkey Island SAC. It notes that the intertidal reef community complex is recorded on the south coast of Howth, where the exposure regime of the complex ranges from exposed to moderately exposed reef. Exposed reef is also recorded on the east side of Dalkey Island, on the east and southern shores of Ireland's Eye and on all shores of Rockabill and the Muglins. Moderately exposed reef occurs on the western shores of Dalkey and at Howth and Ireland's Eye. The subtidal reef community complex is recorded off the islands within the site and also off the coast between Lambay Island and Rush Village. The exposure regime here ranges from moderately exposed reef at the Muglins to exposed reef over the remainder of the site. The coastlines of Howth Head, Dalkey Island and Ireland's Eye are 3.3km, 5.1km and 7.5km respectively from the proposed disposal site. Lambay Island is 16km north of the proposed disposal site and Rockabill is approximately 30km to the north. The closest qualifying reef habitat is located 3.3km north of the proposed disposal site and 5km from the</p>	

Statutory Body	Applicant's Response
<p>MP2 Project in Dublin Port. The NIS considered whether elevated concentrations of suspended sediments or pollutants could result in likely significant effects on the qualifying reef habitat. The potential interaction is considered in the context of the conservation objectives of the site. Extensive water quality monitoring using real time turbidity measurements during previous dredging campaigns has shown that during disposal of dredged fine sands at the licensed disposal site, the fine sand falls rapidly to the bottom and any sediment plume is short lived and is not dispersed widely. However, sediments to be dredged in the MP2 Project are finer and contain a substantial silt fraction. Modelling of the dispersal of the various fractions from the sediment showed that the plume was fairly concentrated and would not have an impact on reef habitat.</p> <p><i>Underwater Noise and Disturbance Effects on Marine Mammals Qualifying Interests</i></p> <p>The harbour porpoise is a qualifying interest for the Rockabill to Dalkey Island SAC. Grey seal and harbour seal are qualifying interests of the Lambay Island SAC. The AA Screening determined that the possibility of underwater noise and disturbance effects on these species during the construction phase of the MP2 project could not be excluded. These possibilities were assessed in the NIS in the context of marine mammal surveying already in progress as part of the monitoring of the impacts on the previously permitted port ABR Project. The NIS proposed the implementation of a Marine Mammal Management Plan to avoid any ill effects to harbour porpoise, grey seals or harbour seals during the construction phase of MP2. This plan envisages the continued employment of Marine Mammal Observers during construction and dredging operations, the carrying out of noise producing activities only during daylight hours, the gradual 'ramping up' of piling operations and the suspension of works if marine mammals are identified in proximity to them.</p> <p><i>Conclusion of NIS</i></p> <p>The port development and associated works have been evaluated in the NIS and the conclusion of this document is that the proposed works are unlikely to pose a significant likely risk to Natura sites in the vicinity with the application of appropriate mitigation. The National Parks and Wildlife Service concur with this conclusion in relation to marine Annex I habitats provided</p>	

Statutory Body	Applicant's Response
<p>that all mitigation outlined in relation to the Water Quality Management Plan, Construction Phase Best Practice Measures and Dredging Management Plan outlined in Section 5.7 of the NIS and set out as draft plans in the supporting Construction Environment Management Plan (CEMP) are implemented in full.</p> <p>The NPWS accepts that if the mitigation measures set out in the Draft Birds and Marine Ecology Plan and the Draft Marine Mammal Management Plan included in the CEMP and referred to in Section 5.7 of the NIS are implemented in full, carrying out the MP2 Project should not result in any detrimental effects on the special conservation interests for the South Dublin Bay and River Tolka Estuary SPA or the North Bull Island SPA, or on the harbour porpoise or the grey seal and harbour seal, which are qualifying interests for the Rockabill to Dalkey Island SAC and Lambay Island SAC, respectively.</p> <p><i>Effects on all Biodiversity, Flora and Fauna</i>                      Chapter 7 Biodiversity, flora and fauna of the EIAR considers the potential overall effects of the MP2 Project on plants and animals and not just the species which are qualifying interests / special conservation interests for Natura 2000 sites. In particular it assesses the possible impacts of the project on river lamprey, salmon and eel, which migrate through the Liffey Estuary, and black guillemot, the only bird species identified as nesting within the foot print of the proposed development.</p> <p><i>Black Guillemot</i>                      The black guillemot, unlike other auk species, does not nest in large colonies, but breeds in small dispersed colonies or as individual pairs, spread out around the Irish coast. Its nest sites are under rocks at the foot of cliffs or in artificial structures. The black guillemot has colonised Dublin Port in the last forty years, nesting in the quay walls and loading ramps up as far as the Matt Talbot Bridge, but the number of nesting birds has declined in recent years. Surveys of the numbers of black guillemots occurring in the breeding season in Dublin Port from 2013 to 2019 presented in the EIAR show the number of individuals recorded dropped from 82 in 2013 to 48 in 2019. The EIAR suggests this decline may be due to an increase in the frequency of winter</p>	

Statutory Body	Applicant's Response
<p>storms in the Irish Sea affecting the survival of black guillemots after the breeding season when they disperse out to sea. The population nesting in the port must still be considered of county importance. The black guillemot also constitutes something of a tourist asset, because due to its north-western distribution in Ireland, Great Britain and Europe as whole most visitors will not be familiar with this bird.</p> <p>The EIAR estimates the nesting sites of possibly three pairs of black guillemots are likely to be removed as a result of the MP2 Project. When black guillemot nest sites were similarly lost in the port due to the ABR Project, suitable nest boxes were provided in adjacent areas, and some were successfully used by nesting pairs. It is proposed to install additional nest boxes for black guillemots in nearby sections of Dublin Port to substitute for the nest sites to be destroyed by the MP2 Project. The NPWS considers that in order to maintain and if possible increase the population of black guillemots in Dublin Port existing nesting sites of these birds elsewhere in the port should also be secured and nest boxes suitable for these birds provided in areas from which they have recently disappeared, such as the Custom House Quay downstream of Séan O'Casey Bridge, in case a loss of nest sites in these areas has contributed to the observed decline in the port population.</p> <p><i>NPWS Recommended Conditions</i>                      In the light of the above the NPWS recommends that any Foreshore Licence issued in response to the present application shall be subject to the following conditions:</p> <p>1. That all the measures to mitigate the potential detrimental effects of the MP2 Project on flora and fauna set out in Section 5.7 of the supporting NIS, the CEMP and Chapter 7 of the EIAR including the QIs/SCIs for nearby Natura 2000 sites shall be implemented in full, including all those set in the draft plans incorporated in the CEMP, namely the Draft Water Quality Plan, The Draft Dredging Plan, Draft Construction Waste Management Plan, Draft Pollution Incident Response Plan, Draft Birds and Aquatic Ecology Plan and the Draft Marine Mammal Management Plan.                      Reason: To conserve biodiversity.</p>	

<b>Statutory Body</b>	<b>Applicant's Response</b>
<p>2. That the finalised Bird and Aquatic Ecology Management Plan to be submitted to the planning authority prior to commencement of the MP2 Project shall include:</p> <p>(a) Details of the locations of the gates to be installed in the Greenway adjacent to the section of the South Dublin Bay and River Tolka Estuary SPA and a schedule of the dates of the extreme low spring tides over the 15 year timespan of the planning permission granted when works on the construction works of Berth 53 will cease and/ or the gates on the Greenway will be closed to exclude the public to avoid disturbance to birds utilising the SPA; at the end of this 15 year period a schedule of the dates the Greenway gates are to be closed over the following five years to be submitted to the planning authority, and a similar schedule to be submitted every subsequent five years.</p> <p>(b) A Dublin Port Black Guillemot Conservation Plan incorporating a schedule and map or diagram of the recently known black guillemot nesting sites within the port, the current status of these nesting sites, their potential to be retained into the future and any measures required to secure or repair them; this plan also to include the location of nest boxes to be installed in the port area to compensate for any recent losses of black guillemot nest sites in the port or to be lost as a result of the proposed MP2 Project.</p> <p>Reason: To conserve populations of bird species occurring in Dublin Port and adjacent areas.</p> <p>3. That the finalised Marine Mammal Management Plan to be submitted to the planning authority before the commencement of the MP2 Project shall include:</p> <p>(a) All measures to mitigate the effects of noise during development works set out in the document 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' published by the Department of Arts, Heritage and the Gaeltacht.</p> <p>(b) Details of all monitoring of marine mammals to undertaken in the course of the dredging, piling and other construction works to be carried out as part of the MP2 Project by suitably qualified Marine Mammal Observers (MMOs), and the monitoring of seal and harbour porpoise populations in Dublin Bay by both MMOs and static acoustic monitoring as proposed in the NIS; this</p>	

**Article 12 Risk Assessment**

<b>Statutory Body</b>	<b>Applicant's Response</b>
<p>monitoring to be continued for two years subsequent to the completion of this project. Reason: To conserve harbour seal, grey seal and harbour porpoise populations occurring in Dublin Port and the Dublin Bay area.</p> <p>4. That copies of the proposed Dublin Port Black Guillemot Conservation Plan to be included in the Bird and Aquatic Ecology Plan to be submitted to the planning authority and the annual results of the monitoring of bird species to be carried out as part of the latter plan, and the annual results of the monitoring of marine mammals to be carried out under the Marine Mammal Management Plan, both sets of which results are to also to be submitted to the planning authority, shall be forwarded to NPWS. Reason: So as to inform the NPWS as the body with primary responsibility for the conservation of biodiversity of the current status of species of birds and marine mammals in Dublin Port and Dublin Bay.</p>	

### 1.3 Legislative context

The *Foreshore Act 1933* (as amended), requires that a lease or licence must be obtained from the Minister for Housing, Local Government and Heritage for the carrying out of works or placing structures or material on, or for the occupation of or removal of material from, State-owned foreshore.

The 1992 EU Habitats Directive (Council Directive 92/43/EC) and Birds Directive (2009/147/EC) are transposed into Irish law by Part XAB of the *Planning and Development Act 2000* (as amended) and the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended).

In addition to the requirement to consider potential effects of a plan or project on European Sites under Article 6(3) of the Habitats Directive, the Directive requires consideration of the potential effects on species listed under Annex IV of the Directive (termed Annex IV species). Under Article 12, Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas. All cetaceans are included in Annex IV of the Directive.

## **SECTION 2 - DESCRIPTION OF PROPOSED WORKS**

### **2.1 Site Location**

The application site is located in the north-eastern part of the Dublin Port Estate, on the northern side of the River Liffey navigation channel. The Port is bounded to the north and east by the Tolka Estuary, with the North Bull Wall to the northwest. To the south of the site, other Port uses are located on the southern banks of the River Liffey navigation channel. The Great South Wall is located to the southeast of the site boundary. The North Bull Wall and the Great South Wall are the eastern limits of Dublin harbour.

The Foreshore boundary of the proposed works is indicated on Figure 2.1, with those elements requiring consent under Section 10 and Section 3 identified in Figure 2.2.

### **2.2 Summary of MP2 Project**

The proposed development is called the MP2 Project which comprises a number of elements outlined below. In the description below, the term “consented” indicates that the element has received planning permission. It is noted that not all the elements of the MP2 Project require a Foreshore consent:

- Construction of a new Ro-Ro jetty, Berth 53, for ferries up to 240m in length on an alignment north of the Port’s fairway and south and parallel to the boundary of the South Dublin Bay and River Tolka Special Protection Area.
- A reorientation of the already consented Berth 52. Berth 52 is also designed to accommodate ferries up to 240m in length. The works will also comprise an amendment to the consented open dolphin structure to create a closed berthing face at the eastern end of Berth 49. The extension of the existing Berth 49, part of the ABR Project, will make this berth also capable of accommodating ferries up to 240m in length. The combination of the ABR Project with the MP2 Project will therefore deliver three river berths all capable of accommodating ferries up to 240m in length.
- A lengthening of an existing river Berth 50A to provide the DFT Container Freight Terminal with additional capacity to handle larger container ships. These works will include the infilling of the basin east of the now virtually redundant Oil Berth 4 on the Eastern Oil Jetty. These works will also include dredging to a standard depth of -11.0m Chart Datum (CD) which is a proposed amendment to the channel dredging as permitted under the ABR Project.
- As part of the infilling of Oil Berth 4, it is proposed to redevelop Oil Berth 3 as a future deep-water container berth (standard depth of -13.0m CD) for the DFT Container Freight Terminal. This will facilitate the change of use of the berth from petroleum importation to container handling when the throughput of petroleum products through Dublin Port declines as a result of national policies to decarbonise the economy.
- The dredging of a berthing pocket to a standard depth of -13.0m CD at Oil Berth 3 will require stabilisation of the existing quay wall at Jetty Road. It is not proposed to use this quay wall for the berthing of vessels.
- Dredging at the proposed Berth 53 and channel widening to a standard depth of -10.0m CD which is a proposed amendment to the channel dredging as permitted under the ABR Project.
- Consolidation of passenger terminal buildings, demolition of redundant structures and buildings, and removal of connecting roads to increase the area of land for the transit storage of Ro-Ro freight units as a Unified Ferry Terminal (UFT). Works include reorganisation of access roads; two proposed check-in areas comprising a total of 14 check-in lanes; proposed set down and parking area for the existing Terminal 1

building; proposed pedestrian underpass to access the existing Terminal 1 building; three proposed toilet blocks and a proposed ESB Substation. These works will comprise amendments to consented developments including the ABR Project.

- A heritage zone adjacent to Berth 53 and the Unified Ferry Terminal set down area. This will comprise an alteration to consented development planning.

## 2.3 Project elements requiring Foreshore Consent Under Section 10

Consent is required under Section 10 of the Foreshore Act 1933, as amended, for the erection of structures on tidal lands not belonging to the State. The applicant has applied for consent under Section 10 of the Foreshore Act 1933, as amended, for the following elements of the MP2 Project (see Figures 2.1 and 2.2).

In response to a 5(2) notice with respect to their Dumping at Sea Application (S0024-02), the applicant has submitted a supplement application to increase both the loading area and volume of dredged material in the vicinity of the proposed riverside Berths 52 & 53. This change is required to advance the construction of Berth 52, Berth 53 and the Unified Ferry Terminal ahead of programme in order to meet the post Brexit priority demands of national port infrastructure. A DPC letter clarifying the revised capital dredging requirements was sent to the Foreshore Consenting Unit (22 November). The increased loading area is shown on Figure 2.3 and appears to fall within the existing Section 10 consent Area A (shown on Figures 2.1 and 2.2).

### 2.3.1 Berth 52

Permission was obtained under the ABR project to fill in the basin between the existing Berths 52 and 53 and to construct a new Berth 52 on the southern face of the infilled area. Under the MP2 project, it is proposed that the Berth 52 jetty structure, ca. 288m in length, will be rotated onto a west-north-west – east-south-east alignment. The structure will comprise a combination of a steel pile cellular wall, steel sheet pile combi wall, and an open piled structure at its eastern end, adjacent to the western end of Berth 53. The proposed combi wall will be comprised of circular piles of ca. 1.6m diameter with sheet pile infill panels. These piles will be driven to a depth of ca. -30m CD. The open pile structure will comprise pairs of tubular steel piles supporting reinforced concrete cross beams, which in turn support a reinforced concrete deck.

The proposed linkspan for Berth 52, located at the eastern end of Berth 49, will be rotated to align with the new orientation of Berth 52 and will provide two-tier access to the Ro-Ro ferries. A reinforced concrete bank seat will be constructed at the eastern end of Berth 52 to support the linkspan to give access to Berth 53.

Jetty furniture including fenders, mooring bollards, handrails and an automated mooring system will be installed at Berth 52.

Construction of a new sheet pile quay wall structure approximately 52m in length, at 90° to Berth 52, at its western end, to accommodate the linkspan structure and to provide additional operational quayside space at Berth 49. The 52m sheet pile wall connected to the 40m extension to Berth 49, described below, and will be backfilled with granular fill material.

### 2.3.2 Berth 49

The construction of Berth 52 requires changes to existing Berth 49 which sits immediately east of Berth 52. The eastern mooring dolphins associated with Berth 49 will be encapsulated in a

new sheet pile quay wall structure, approximately 40m in length, extending eastwards from the eastern end of Berth 49. The 40m long sheet pile wall will connect to the 52m sheet pile wall at the western end of Berth 52. The area behind the 40m and 52m sheet pile walls will be backfilled with granular fill material.

### 2.3.3 Berth 53

The proposed works at Berth 53 will comprise:

- The construction of a new Ro-Ro jetty structure approximately 406m in length overall.
- The construction of eight reinforced concrete mooring dolphins on tubular steel piles of ca. 1.0m to 1.2m diameter to provide a new berthing face approximately 284m in length. The dolphins are at 34m centres, apart from the easternmost dolphins which are 40m apart. The dolphins are linked by a reinforced concrete deck.
- Dredging of a berthing pocket to a standard depth of -10.0m CD. The estimated volume of material to be dredged, as stated in the Foreshore consent application, is 159,595m<sup>3</sup>. It is noted that in response to a request for information from the EPA, in relation to the Dumping at Sea permit application reference S0024-02, DPC indicated that the volume of material to be dredged at Berth 53 will be 403,268m<sup>3</sup>.
- Installation of scour protection mattresses, 27m in width, on the dredged side slope under the mooring dolphins and eastwards for 237m to the east of the easternmost dolphin. The scour mattress will provide slope stabilisation and scour protection on the northern face of the berth to the dredged berthing pocket.
- Installation of a propellor wash protection structure on the north side of the 406m jetty structure,
- Installation of jetty furniture including visual screening barriers, fenders, mooring bollards, handrails, emergency ladders and an automated mooring system.
- The mooring dolphins will be supported on a system of tubular steel piles constructed in a vertical and raking alignment. The access structures to the linkspan will be constructed of tubular steel vertical piles.

Figure 2.1: Dublin Port Foreshore boundary (red) showing proposed works (taken from Dublin Port MP2 Drawing MA 0010-01)

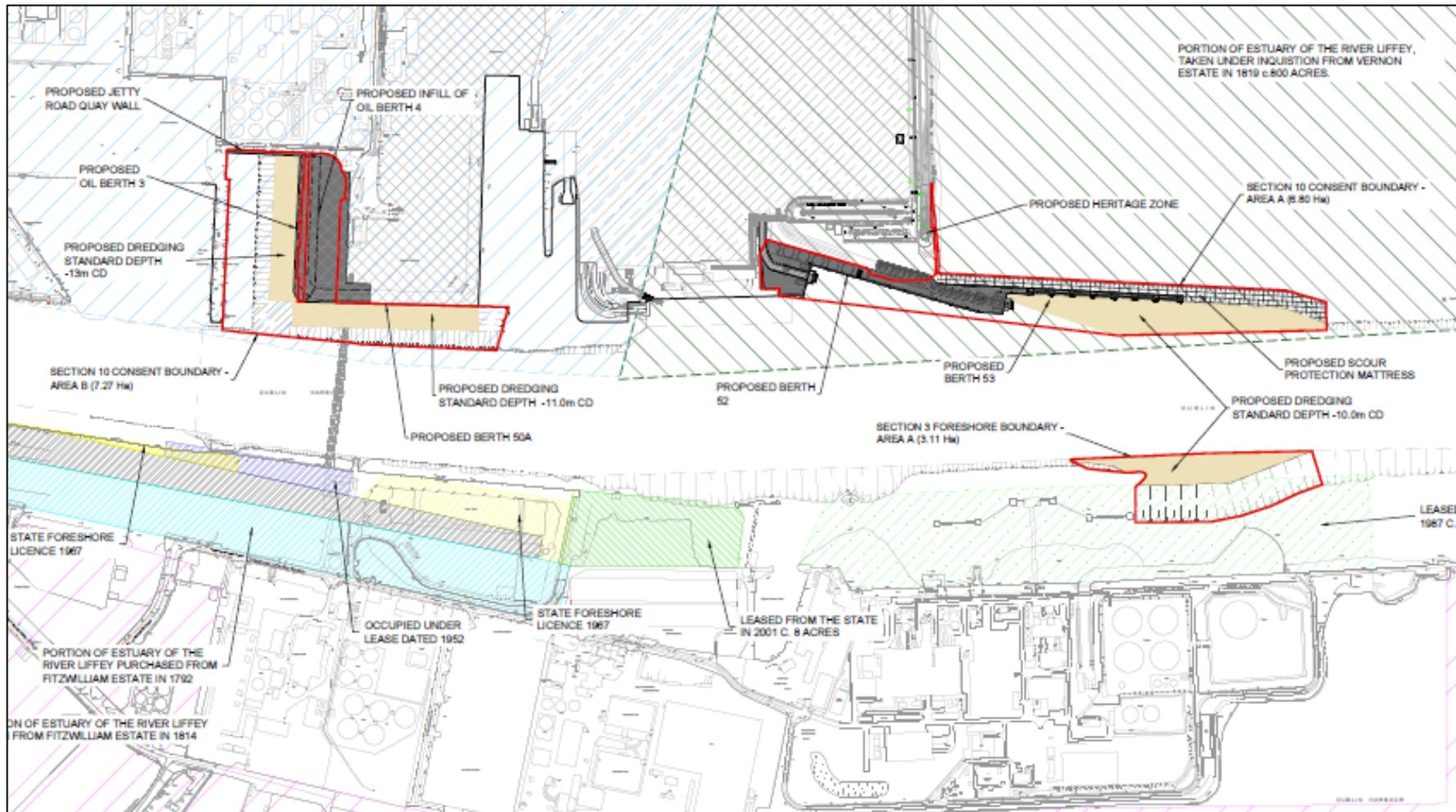


Figure 2.2: Foreshore Consent Maps (Section 10 and Section 3 areas)

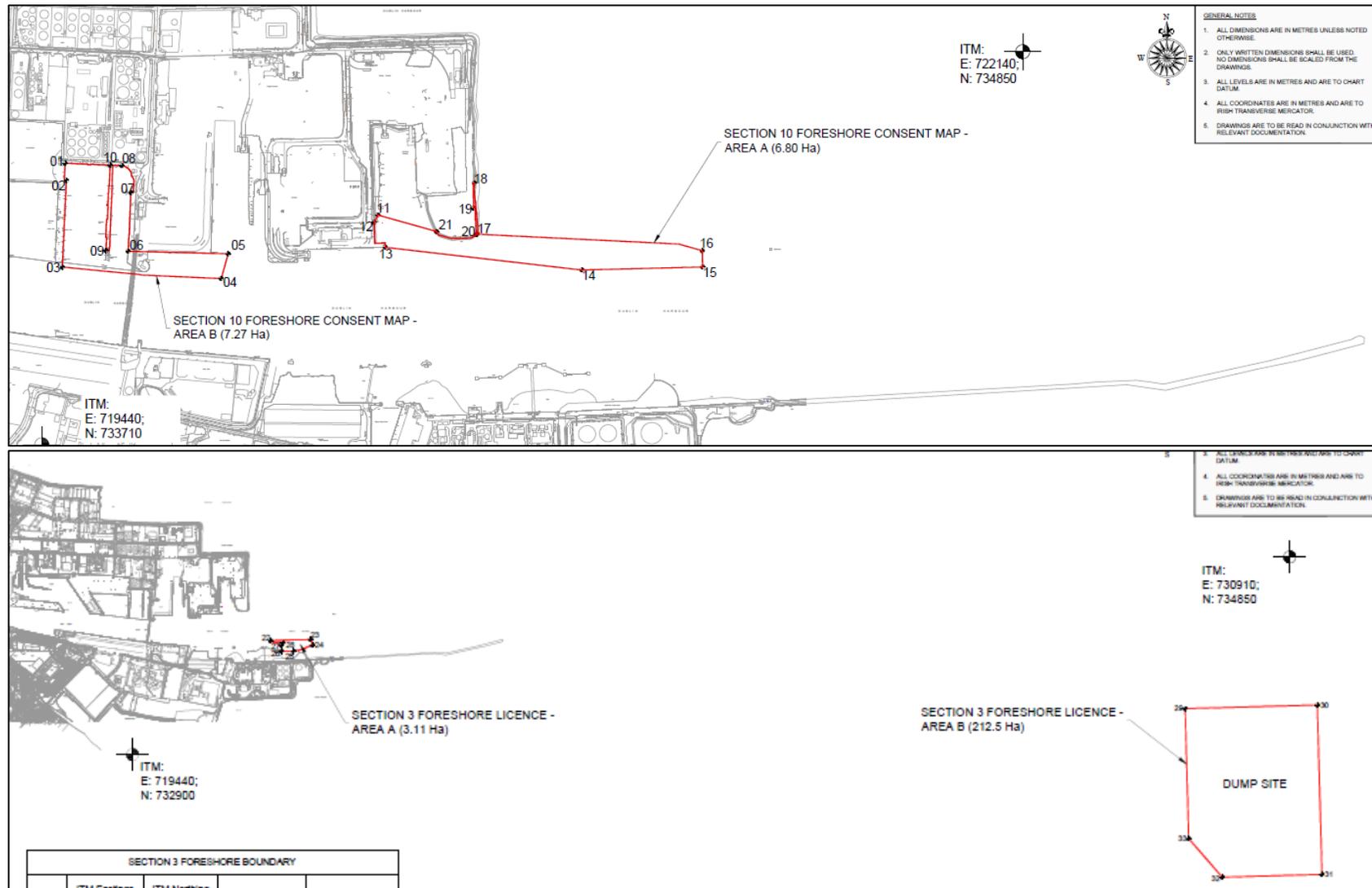
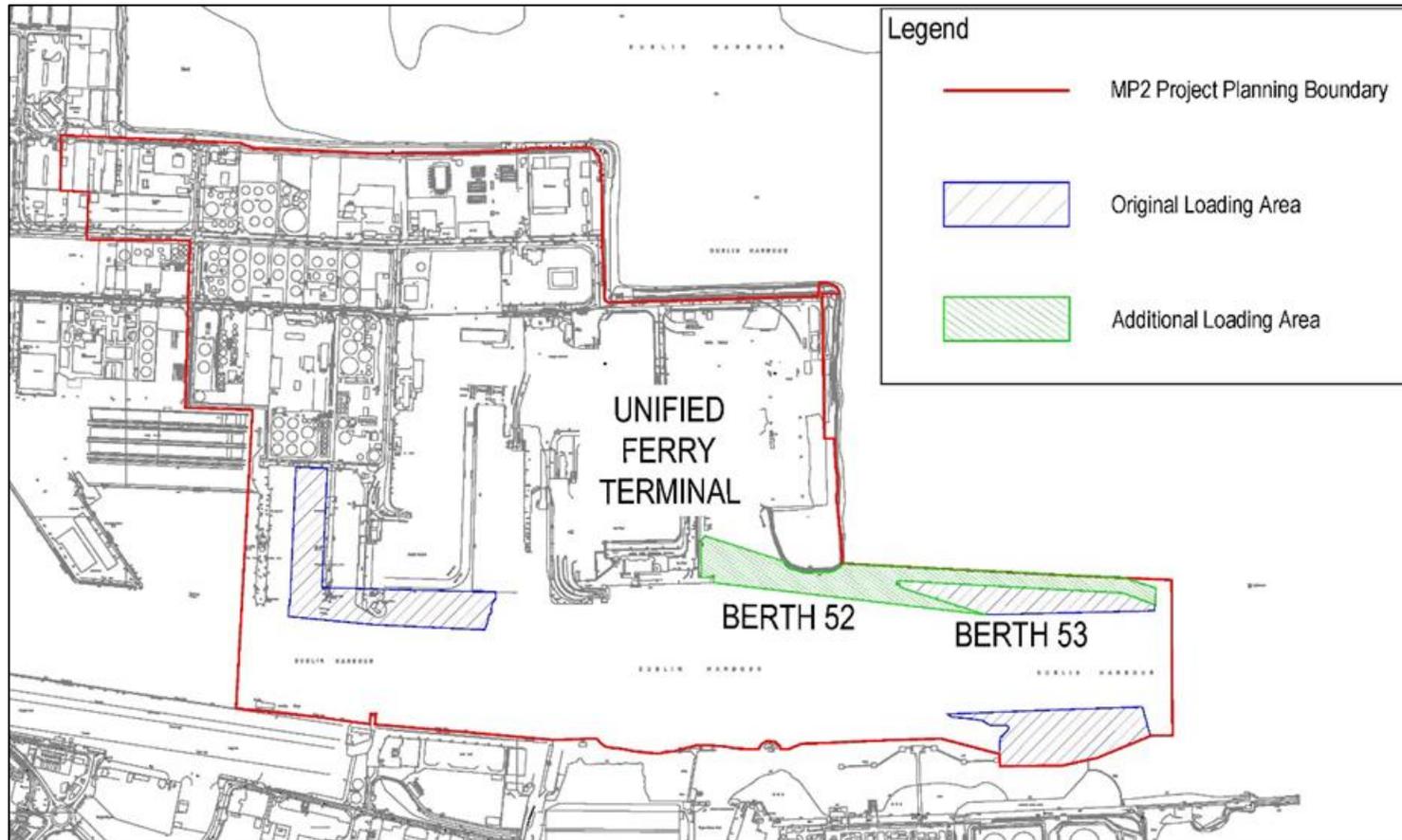


Figure 2.3: Proposed increase to the loading area under the Supplement application



### 2.3.4 Berth 50A

It is proposed to extend the existing Berth 50A to provide a multi-purpose predominately Lo-Lo Container Vessel berth. The existing berth is 180m and the extension will be 125m. The proposed works at Berth 50A will comprise the following:

- Demolition of the Pier Head to the west of the existing Berth 50A. The footprint of the area to be demolished is 2,950m<sup>2</sup>. The Pier Head was the seaward end of the 19<sup>th</sup> century Eastern Breakwater for the Port. The works will include the salvage and storage of masonry units for future use in heritage gain projects,
- Demolition of the southern end of the Eastern Oil Jetty. The footprint of the area to be demolished is 275m<sup>2</sup>.
- Construction of a new steel sheet pile combi-wall which will act as the berthing face. The proposed combi wall will be comprised of circular piles of ca. 1.4m diameter with sheet pile infill panels. The new section of quay wall will be approximately 125m in length, providing an overall quay length of approximately 305m,
- Installation of a sheet pile anchor wall and ties to support the combi-wall,
- Construction of a bridging structure to avoid disruption to existing 220KV High Voltage ESB Cables which cross the channel and run through the site on an approximately north-south alignment, to include for temporary protection works;
- Backfilling of the new sheet pile combi-wall with engineering fill material and construction and demolition waste (as part of Oil Berth 3 works),
- Construction of a new reinforced concrete deck over the infilled area,
- Installation of new tubular steel piles to support the extension of the existing crane rails on the concrete deck,
- Dredging of a berthing pocket to a standard depth of -11.0m CD. The estimated volume of material to be dredged is 69,640m<sup>3</sup>.
- Installation of jetty furniture including crane rails, fenders, mooring bollards and emergency ladders.

### 2.3.5 Oil Berth 3

The Eastern Oil Jetty comprises Oil Berth 3 to the west and Oil Berth 4 to the east. The proposed development will involve the removal of Oil Berth 4 and consolidating operations to Oil Berth 3. The berth will be designed as a multi-purpose structure, initially for oil tanker berthing, with a future potential use as a container vessel berth.

The basin at Oil Berth 4 will be infilled to provide an additional storage area for the DFT Container Freight Terminal.

The works will comprise the following elements:

- Temporary support of the oil berth gantry (framework) and equipment,
- Demolition of the existing pilot boat pontoon and gangway, with a total footprint of 198m<sup>2</sup>,
- Construction of a new steel sheet pile combi-wall between 5m and 7m west of the face of the existing Oil Berth 3,
- The proposed combi wall will be comprised of circular piles of ca. 1.4m diameter with sheet pile infill panels. The new quay wall will be approximately 239m long,
- Retention of the Eastern Oil Jetty structure,
- Infilling of the basin east of Oil Berth 4 with engineered fill material and suitable recycled construction and demolition waste arising from proposed demolition works within the footprint of the MP2 Project development area.

- Infilling the void between the existing Oil Berth 3 and the proposed new sheet pile wall with engineered fill material. The quantity of fill material required will be approximately 145,000m<sup>3</sup>,
- Installation of a sheet pile anchor wall and ties to support the combi-wall,
- Installation of new tubular steel piles to support the potential future extension of the crane rails in the concrete deck of the infilled area,
- Construction of a new reinforced concrete deck. The new deck will have a plan area of 20,000m<sup>2</sup> which will be an increase of 17,500m<sup>2</sup> over the existing deck area,
- Installation of jetty furniture including Fenders (panel and corner roller fenders), mooring bollards and emergency ladders, and
- Dredging of a berthing pocket to a standard depth of -13.0m CD. The estimated volume of material to be dredged is 83,414m<sup>3</sup>.

### 2.3.6 Jetty Road Quay Wall

The dredging of the berthing pocket to a standard depth of -13.0m CD at Oil Berth 3 will require the stabilisation of the existing quay wall at Jetty Road. It is not proposed to use this quay wall for the berthing of vessels. The works will comprise the following elements:

- Construction of a new steel sheet pile combi-wall 5m in front of the face of the existing Jetty Road quay wall. The proposed combi wall will be comprised of circular piles of ca. 1.4m diameter with sheet pile infill panels. It is proposed to retain the existing structure in position throughout the works. The new quay wall will be approximately 120m long,
- Installation of ground anchors to stabilise the new sheet pile combi-wall. These anchors will be fixed into bedrock. This system negates the need for a sheet pile anchor wall,
- Installation of fill material behind the new wall,
- Construction of a new reinforced concrete capping beam,
- Re-decking the existing Jetty Road, and
- Installation of furniture including emergency ladders and handrails.

## 2.4 Project elements requiring a Foreshore Consent Under Section 3

### 2.4.1 Channel Widening Works

The applicant has applied for a licence under Section 3 of the Foreshore Act 1933, as amended, for channel widening works on the southern side of the main navigation channel and the disposal of dredge spoil in the Dublin Port Company's dump site in Dublin Bay Channel. The widening works will be required to facilitate the safe navigation and turning of vessels of up to 240m in length and the expected increased frequency of sailings.

Widening will be carried out via dredging works. The standard depth of the channel will be -10.0m CD.

The existing navigation channel has consent to be deepened from -7.8m CD to -10.0m CD under the ABR Project. The capital dredging scheme for the ABR Project commenced in October 2017 with dredging activity taking place within the navigation channel and fairway within Dublin Bay. The ABR Project capital dredging of the section of navigation channel adjacent to the proposed MP2 Project channel widening was scheduled for the winter season October 2020 March 2021.

The estimated volume of material to be dredged is 111,995m<sup>3</sup>.

## 2.4.2 Disposal of Dredge Spoil

The volume of capital dredging required for each element of the works, as described in the previous sections, is tabulated in Table 2.1.

Table 2.1: Dredging summary in Foreshore Consent Application

Element	Standard depth	Volume	Revised volume <sup>1</sup>
Berth 53	-10.0m CD	159,595m <sup>3</sup>	403,268m <sup>3</sup>
Channel Widening	-10.0m CD	111,995m <sup>3</sup>	111,995m <sup>3</sup>
Oil Berth 3	-13.0m CD	83,414m <sup>3</sup>	83,414m <sup>3</sup>
Berth 50A	-11.0m CD	69,640m <sup>3</sup>	69,640m <sup>3</sup>
Total volume to be dredged		424,644m <sup>3</sup> (note 1)	668,317m <sup>3</sup>

*Note: <sup>1</sup>In response to a request for information from the EPA, in relation to the Dumping at Sea permit application S0024-02, Dublin Port Company provided a supplement application to increase the volume of material to be dredged at Berth 53 by 243,673m<sup>3</sup> to 403,268m<sup>3</sup>.*

It is proposed to dispose of the dredged material at sea at the Dublin Port Company's dump site to the west of the Burford Bank in Dublin Bay. Dublin Port Company has obtained Dumping at Sea Permits for the use of this site previously. A Dumping at Sea Permit will be required for the disposal of the MP2 dredged material at this site.

The disposal site is located approximately 7 km east of the Great South Wall. The nearest shore is Baily at Howth which is approximately 3 km from the dump site. Water depths at the disposal site range from -12m CD to -24m CD. The dump site covers an area of 2.27 km<sup>2</sup>.

Dredge spoil has been dumped in the general area of the dump site going back 100 years or more as this is the closest point where a north-south current is encountered to take dredged silts away to the open sea.

The site was first licensed in 1996 after the previous disposal site, located nearby, closed. The area has been subjected to regular dredge spoil disposal since it was first licensed.

The licensed disposal site has been selected to keep the fine sands deposited at the site within the natural Dublin Bay sediment cell. Over time the fine sands will migrate from the site, particularly as a result of storm action and will remain part of the natural coastal processes regime of Dublin Bay. Silts disposed of at the offshore disposal site will also be dispersed in a north-south direction to the wider Irish Sea.

## 2.5 Landside Elements of the MP2 Project

The landside elements of the MP2 Project (see Section 3.28 of the applicant's AA Screening and NIS) are the elements which do not require a Foreshore consent of licence and are therefore not described further.

## 2.6 Construction

### 2.6.1 Construct Sequence Summary

The construction sequence indicated in the Foreshore Consent application is summarised in Table 2.2 below.

Table 2.2: Construction sequence in the Foreshore Consent Application

Phase	Duration	Commencement date	Comment
Phase L1 – Northern Access Road	6 months	Quarter 1 of 2022	Phase L1 will include demolition and construction work at the north-eastern corner of the United Ferry Terminal. These works will be outside the Foreshore application area.
Phase M1 – Berth 52	33 months	Quarter 1 of 2022	Phase M1 will include completion of the filling of the basin between existing Berths 52 and 53, construction of Berth 52, commencement of piling for Berth 53
Phase M2 – Berth 53	24 months	Quarter 1 2025	Phase M2 will commence after Phase M1 is completed. Dredging of berth pocket and construction of Berth 53
Phase L2 – Eastern Access Road	6 months	Quarter 1 of 2027	Works in Phase L2 will commence and after the completion of Phase M2. It will include demolition of buildings, installation of services and construction of access routes. All the works will be outside the Foreshore application area.
Phase L3 – Unified Ferry Terminal Yard	12 months	Quarter 3 of 2027	Phase L3 will be the final phase of works at the Unified Ferry Terminal Yard. It will include demolition, installation of underground services, connection to the L1 and L2 road networks, internal upgrade works to the existing Terminal 1 Building and erection of above ground structures
Phase M3 – Channel Widening Works	1 month	Quarter 1 of 2027	Phase M3 will comprise the dredging and disposal at sea of seabed from the Liffey Channel. The works will be carried out after the dredging in Phase M2, but during the M2 primary jetty construction works.
Phase M4 – Jetty Road	12 months	Quarter 1 of 2027	Phase M4 will commence after the completion of Phase M3. Phase M4 will include the construction of a new sheet pile combi wall at the jetty road and filling the void between the new wall and the existing Jetty Road wall.
Phase M5 – Oil Berth 3	12 months	Quarter 1 of 2030	Phase M5 will occur after Phase M4 is completed. Phase M5 will include the construction of the new steel combi sheet pile wall at Oil Berth 3, filling the voids between the existing wall at Oil

Phase	Duration	Commencement date	Comment
			Berth 3 and the proposed new wall, the dredging of the berth pocket to a standard depth of -13.0m CD.
Phase M6 – Berth 50A	15 months	Quarter 1 of 2031	Phase M6 will commence after Phase M5 is completed. Phase M6 will include the removal of the eastern Breakwater pier head, construction of a new sheet pile wall at the west end of Berth 50A, filling the voids between the existing wall at Oil Berth 3 and the proposed new wall, and other works.
Phase L4 – Heritage Installation	9 months	Quarter 3 of 2031	Phase L4 will commence mid-way through Phase M6. The works will comprise the construction of the heritage zone incorporating the masonry blocks recovered during Phase M6 and the installation of the heritage structures.
Phase M7 – Dredging of Berth 50A	1 month	Quarter 1 of 2032	Phase M7 will commence upon completion of Phase M6. Phase M7 will comprise the dredging in front of the existing Berth 50A to a standard depth of -11.0m CD.

In response to a request for information from the EPA, in relation to the Dumping at Sea permit application S0024-02, Dublin Port Company indicated that the construction programme would be altered. The programme changes are required to advance the construction of Berth 52, Berth 53 and the Unified Ferry Terminal ahead of the original programme in order to meet the post Brexit priority demands of national port infrastructure.

The revised sequence would deliver the MP2 Project in two main phases:

- Construction of Berth 52, Berth 53, the Unified Ferry Terminal and Channel Widening commencing in either Q1 2022 or Q3 2022 depending on the timing of the grant of a Foreshore Consent and Dumping at Sea Permit; and
- Construction of Oil Berth 3, infill of Oil Berth 4 and Berth 50A commencing in Q3 2028.

The updated MP2 Project programme from that envisaged at the time of the application originally being made is described below and presented in Table 2.3.

Table 2.3: Revised MP2 Project construction programme (September 2021)

Item	Works	Start	Finish	Duration
1	Berth 52	Q1 2022 or Q3 2022	Q4 2027	63 months
1a	Channel Widening	Q1 2022 or Q3 2022	Q1 2024	24 months
2	Berth 53	Q1 2022 or Q3 2022	Q3 2025	36 months
2a	B52/ B53 Landside works	Q3 2022	Q4 2029	87 months
3	Oil Berth 3 and infill of Oil Berth 4	Q3 2028	Q1 2031	30 months
4	Berth 50A	Q1 2031	Q2 2032	18 Months

## 2.6.2 Construction Methods

### Berth 52 (Phase M1)

The construction of Berth 52 will commence after the filling of the basin between the existing Berths 52 and 53. It is proposed that a causeway constructed from clean, inert, rock will be used to seal the basin during the filling works. The causeway will then be used as a platform to commence the construction of Berth 52.

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

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

Piling in the River Liffey Channel will not take place between March and May to avoid the main salmon smolt run.

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

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

### Berth 53 (Phase M2)

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

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

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

Piling works for the jetty structure at Berth 53 will commence at the west end, after the completion of Berth 52. The first number of piles will be installed from Berth 52. Most of the piles will require installation from barges.

Three barges will be required to install the piles comprising:

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

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

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

The spud-leg barge will be used to crane the hollow precast concrete upper structures of the dolphins into position on the piles. When positioned on the piles, the precast superstructures will be filled with reinforced concrete.

Precast concrete bridge beams will be installed by the crane on the spud-leg barge. These will span between the dolphins. The precast bridge beams will also be filled with reinforced concrete, with voids being maintained for services. The spud-leg barge will also be used for the installation of fenders and ladders.

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

### Channel Widening (Phase M3)

Channel widening via dredging will take place to the south of the Liffey Channel. The materials to be dredged will comprise clays, sands and gravels. Most of the material will be dredged using a trailer suction hopper dredge. The dredged material will be loaded into barges and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank. There will also be a requirement for a back-hoe dredger on site to carry out the finer elements of the dredging works. This material will be loaded into a hopper barge and disposed of at the licenced sea disposal site. The dredging will proceed from north to south, with the dredger working in a west to east direction. Ancillary dredging vessels such as a survey vessel, work boats and a bed leveller shall be required throughout the dredging activities. These vessels will be similar to vessels currently operating day-to-day at the port.

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

### Jetty Road (Phase M4)

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

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

### Oil Berth 3 (Phase M5)

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

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

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

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

### Berth 50A (Phase M6)

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

To limit the works in the water, it is proposed to install the steel sheet pile combi wall from the existing Eastern Breakwater. The fill material to Oil Berth 3 will also be used as a working platform. Piles will be driven through the existing overburden and into the seabed to an approximate level of -30m CD. The combi-wall will comprise ca. 1.4m diameter tubular steel

piles, with sheet piles driven between adjacent tubular piles. The driving of the deadman anchor wall will also be undertaken from the land.

When the piles are driven, excavation of the existing Eastern Breakwater will commence. The existing granite structure will be recorded and moved to the proposed heritage installation location. The existing fill material will be excavated and disposed of at the licensed offshore disposal site located at the approaches to Dublin Bay to the west of the Burford Bank.

Five ESB 220kV feeder cable ducts pass under the existing Eastern Breakwater. It is proposed to keep these cables in position during the works. Before the Eastern Breakwater is removed, a steel sheet pile cofferdam, approximately 50m long x 15m wide, will be constructed in the proximity of the ducts. Temporary works will be employed to brace the cofferdam and support excavations. When the cofferdam is installed, the overburden above the ducts will be excavated, exposing the ducts. They will then be encased in concrete at the location of the proposed new quay wall. The cofferdam will remain part of the permanent works where it intersects the proposed new quay wall. The void between the cofferdam, at the intersection of the new quay wall will be filled with reinforced concrete to deck level. A concrete mattress will be placed over the southern side of the ducts to act as protection from future dredging campaigns.

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

### Berth 50A Dredging (Phase M7)

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

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

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

## 2.7 Operational Phase

The key objective of the MP2 Project is to increase the throughput of cargo and passengers by providing the infrastructure required to maximise the efficient use of existing port lands. A description of the existing port operations forms part of the application for consent. There will be no significant changes to the existing types of operations, processes and activities (regular and occasional) when the MP2 Project is operational, however, there will be associated capacity increases which are described below (from applicant's Appendix A MP2 Project: Project rationale document).

### 2.7.1 Additional Ro-Ro and Lo-Lo Capacity

#### General

The MP2 Project will provide additional capacity for Ro-Ro ferry operations in the Unified Ferry Terminal by providing a total of five berths, three long river berths (49, 52 and 53), all with

double tier ramps, in addition to the existing Berth 51, which has a double-tiered ramp, and the existing Berth 51A, which has a single tiered ramp.

The MP2 Project will also provide additional capacity for Lo-Lo operations in the DFT container freight yard. There will be additional yard area, created by infilling Oil Berth 4, a longer and deeper Berth 50A replacing existing Berth 50, and a deeper Oil Berth 3, which will be suitable for Lo-Lo operations. These will operate in addition to the existing Berth 50.

### Ro-Ro Capacity Increase

Table 2.4 indicates the Ro-Ro and Lo-Lo capacity increases which will result from the MP2 project. Table 2.5 indicates the increase in Ro-Ro throughput in the Unified Ferry Terminal from 2018 to 2040.

Table 2.4: Contribution of the MP2 Project to increasing Dublin Port's throughput

	Units /TEU <sup>2</sup>	Gross Tonnes
Unified Ferry Terminal increased Ro-Ro capacity above 2018 throughput	439,000 units	10.6m
DFT container freight yard increased Lo-Lo capacity above 2018 throughput	409,000 TEU	4.0m
MP2 Project increased tonnes		14.6m
Masterplan increased tonnes		48.3m
MP2 Project increased capacity as % of Masterplan increase		30.2%

Table 2.5: Increase in Ro-Ro throughput from 2018 to 2040

	2018	2040	% Increase
Volume (units) (land capacity)	725,000	1,164,000	61%
Average units per day	1,986	3,189	61%
Average sailings per day	13	18	38%
Average units per sailing	153	177	16%

The Ro-Ro berth capacity for the five berths will be 1,280,000 units, whereas the land capacity, shown in Table 2.5 is 1,164,000 units. A margin of surplus berth capacity over land capacity is required to provide contingency capacity for berth downtime for a range of reasons including planned maintenance, equipment failure and impact of adverse weather on ship schedules.

The layout of the land area of Unified Ferry Terminal will be capable of being adapted to the requirements of the trade.

In general, the higher the proportion of accompanied Ro-Ro units, the greater will be the throughput capacity of the Unified Ferry Terminal. Should there be a higher proportion of unaccompanied Ro-Ro in 2040 than is envisaged in Table 2.4, then it will be necessary for Dublin Port Company to implement measures to increase the utilisation of the capacity of the

<sup>2</sup> The twenty-foot equivalent unit (TEU) is an inexact unit of cargo capacity, often used for container ships and container ports, [https://en.wikipedia.org/wiki/Twenty-foot\\_equivalent\\_unit](https://en.wikipedia.org/wiki/Twenty-foot_equivalent_unit)

Unified Ferry Terminal, such as moving trailer units to back areas within Dublin Port and implementing pricing initiatives which financially penalise trailers with long dwell times.

### Lo-Lo Capacity Increase

The Lo-Lo developments entail the immediate loss of Oil Berth 4 and the planned cessation of petroleum imports through Oil Berth 3 at some point in the future as petroleum imports decline. The loss of Oil Berth 4 will have no impact on the Port's overall throughput capacity. Although both the throughput and utilisation of OB3 are also low, it provides essential back-up capacity in the event of an outage on OB1 or OB2.

The MP2 Project will significantly increase both the berthage and the land area of the Container Terminal. Table 2.6 shows the increase in shipping activity and throughput by 2040.

Table 2.6: Indicative increase in Lo-Lo throughput and utilisation levels in Container Terminal from 2018 to 2040

	2018	2040	% Increase
Berthage	560 metres	927 metres	65%
Berth usage (TEU per metre p.a.)	590	798	35.0%
Land area	12.7 ha	18.5 ha (note 1)	46%
Land usage (TEU per hectare p.a.)	26,027	40,000	54%
Capacity (TEU p.a.)	508,000	740,000	147%
Capacity utilisation	65%	100%	
Average TEU per week	6,357	14,231	124%
Ships per week	8.3	11.0	33%
Average TEU per ship	766	1,294	69%

Note 1: includes a 2.8ha site on Tolka Quay Road and MP2 project 3ha

### 2.7.2 Ferry Passenger Traffic

Table 2.7 indicates the Passenger numbers passing through the Port in 2018.

Table 2.7: Dublin Port Passenger Numbers in 2018

Mode	Number	Percentage
Ferries	1,827,674	90.3%
Cruise	196,899	9.7%
Total	2,024,573	100.0%

While the focus of the MP2 Project is to increase cargo capacity, the numbers of passengers are expected to grow as a result of the MP2 Project and the Masterplan's other developments.

### 2.7.3 Increase in Ship Size

The future growth in Ro-Ro and Lo-Lo will be accompanied by increases in ship sizes and the MP2 Project will provide longer and deeper berths both for Ro-Ro ferries and for Lo-Lo container ships.

Under the ABR Project Dublin Port is being deepened to -10.0m CD. Table 2.8 shows the draught handling capabilities at -10.0m CD.

Table 2.8: Draught handling capabilities at -10.0m CD

	Mean high water	Channel depth	Max draught	Mean low water	Channel depth	Max draught
Spring tides	4.1m	14.1m	13.1m	0.7m	10.7m	9.7m
Neap tides	3.4m	13.4m	12.4m	1.5m	11.4m	10.4m

*Note: max draughts assume an under-keel clearance of 1.0m*

To maintain set schedules, Ro-Ro ferries need to be able to access Dublin Port at all stages of the tide. Table 2.8 above indicates that ferries with draughts up to about 9.7 metres will be able to access the port. The proposed draught at Berth 52 and at Berth 53 is -10.0m CD. This will be sufficient for any conceivable size of Ro-Ro ferry that might be deployed by operators in the future.

Currently the Port handles Ro-Ro ferries up to 234m in length and 8.2m draught. A 240m ship is in operation in the UK and two ships of 240m length are under construction for an existing ferry operator.

For Lo-Lo container ships, the maximum size which can currently be handled in Dublin Port is limited by a combination of constraints, including berth depths and channel depth to give a practical maximum draught in the region of 9.0m. In 2018 432 container ships were handled at the DFT Container Terminal. The median ship nominal capacity was 864 TEU. The maximum size of container ship which has called to the Port in recent years is in the order of 1,400 TEU.

The deepening of the Port to -10.0m CD as part of the ABR Project will remove the channel constraint. The lengthening of Berth 50A and the redevelopment of Oil Berth 3 will lessen the existing berth constraints and allow large container ships to operate at the DFT Container Terminal.

Worldwide, container ships in the 1,000 to 3,500 TEU range, vary in size from 100m with 8m draught to 300m with 14m draught. The greatest number of ships vary in length from 200m to 250m and draught from 9m to 12m. The MP2 Project will enable a large proportion of the world fleet of container ships in the capacity range from 1,000 TEU to 3,500 TEU to be handled at the DFT Container Terminal.

#### 2.7.4 Maintenance

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

There will be a requirement for maintenance dredging to be carried out within the berthing pockets and the navigation channel area. Future maintenance dredging will be subject to consents from the EPA and the Department of Housing, Local Government and Heritage.

## 2.7.5 Pollution Control

### Storm Water

There will be limited additional hardstanding area developed as part of the project. At Berth 53 it is proposed to collect storm water from the new hardstanding areas in a closed system and discharge via a new silt trap and oil interceptor/separator to the local storm water drainage network (which is consented under the ABR Project).

The storm drainage network ultimately discharges to the sea at Berth 52 via a flap valve (or similar) in the quay wall. Minor modifications will be made to the drainage consented under the ABR Project to facilitate the Berth 52 realignment.

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

The methodology above was discussed and agreed in principle with Dublin City Council Drainage Department.

### Wastewater

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

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

### Waste Disposal from Vessels

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

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

### Ship to Shore Power

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

## SECTION 3 - BASELINE ENVIRONMENT

Section 7.4 of the applicant's EIAR assessed the potential impacts of the MP2 Project on marine mammals and their habitats. A Marine Mammal Risk Assessment prepared by IWDG (Irish Whale and Dolphin Group) Consulting submitted as part of an application by DPC for a Foreshore Licence for their proposed maintenance dredging programme for 2022-2029<sup>3</sup> also provided relevant information.

### 3.1 Ambient noise levels

Ambient, or background noise, is defined as any sound other than the sound being monitored (primary sound) and, in the marine environment, is a combination of naturally occurring biological and physical sound sources including sediment transfer, waves and rain and that of a biological origin including fish, crustaceans and from marine mammals. The impact of noise from human activity is strongly influenced by background or ambient noise, the impact is less in a noisy environment compared to a quiet environment and it is the intensity and frequency of this increased noise compared to the ambient levels at a site, which defines its impact. As ambient noise levels increase, the ability to detect a biologically important sound decreases. The point at which a sound is no longer detectable over ambient noise is known as acoustic masking. The range at which an animal is able to detect these signals reduces with increasing levels of ambient noise (Richardson *et al.* 1995). This is important when considering the impact of sound sources on marine mammals by the proposed works.

Ambient noise levels worldwide have been on the rise in recent decades with developments in industry and, in particular, in commercial shipping. In the North Pacific, low frequency background noise has approximately doubled in each of the past four decades (Andrew *et al.* 2002), resulting in at least a 15 to 20 dB increase in ambient noise. In recent years, interest has grown in the effects of anthropogenic noise on marine life. Ambient noise in Dublin Bay has been estimated at around 113 dB by Beck *et al.* (2013) and by McKeown (2014). This level is higher than that reported for example from Galway Bay and the Shannon Estuary and reflects the greater vessel traffic at this site.

### 3.2 Relevant Annex IV species

#### 3.2.1 Harbour porpoise

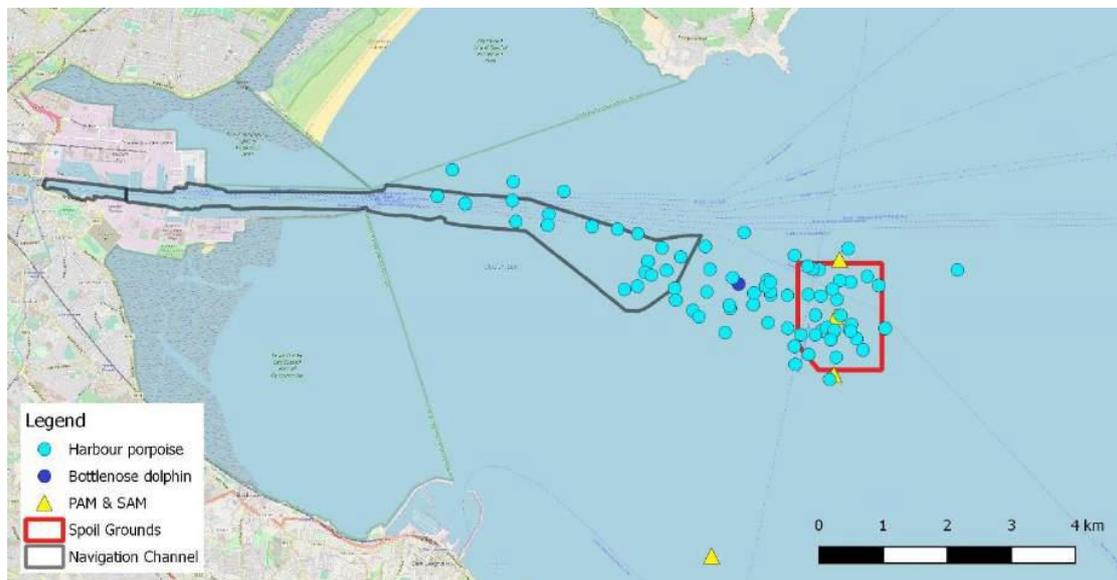
Dedicated porpoise surveys off Co Dublin were first carried out in 2008, when density estimates of 2.03 porpoises per km<sup>2</sup> were recorded in North County Dublin and 1.19 porpoises per km<sup>2</sup> in Dublin Bay (Berrow *et al.* 2008). The densities off North County Dublin ranged from 0.54 to 6.93 and were the highest recorded at any of the eight sites surveyed by Berrow *et al.* (2014). A survey of the Rockabill to Dalkey Island SAC in 2013 resulted in density estimates ranging from 1.13-2.61, with an overall density of 1.44 porpoises per km<sup>2</sup> which was similar to an overall density of 1.61 for the two sites combined in 2008. A second survey was carried out in 2016 which reported densities between 1.37 and 1.87 porpoises per km<sup>2</sup> and with an overall density of 1.55 porpoises per km<sup>2</sup>. All these density estimates are very consistent and high compared to other sites in Ireland supporting the conclusion that Dublin Bay, and especially North County Dublin, provide some of the most important habitats for harbour porpoise in Ireland. Calves consistently accounted for around 7% of the porpoises surveyed and porpoise are thought to move offshore to calve in April-May before moving back inshore. The diet of harbour porpoise is poorly known but thought to consist of small benthic or

<sup>3</sup> <https://assets.gov.ie/136536/246cbca0-7855-4d5a-9011-288d1ceb1c30.pdf>

demersal fish such as gobies, sandeels, whiting and other gadoids and pelagic species such as herring and sprat when available (Rogan 2008).

There were 77 sightings (26% of total marine mammal sightings) of harbour porpoise during the first season of the ABR Project capital dredging campaign (2017-2018) and one sighting of a single bottlenose dolphin. All sightings were outside Dublin Harbour with sightings increasing further east and on the spoil ground (Figure 3.1).

Figure 3.1: Harbour porpoise and bottlenose dolphin sightings during the 2017-2018 Capital Dredging Campaign



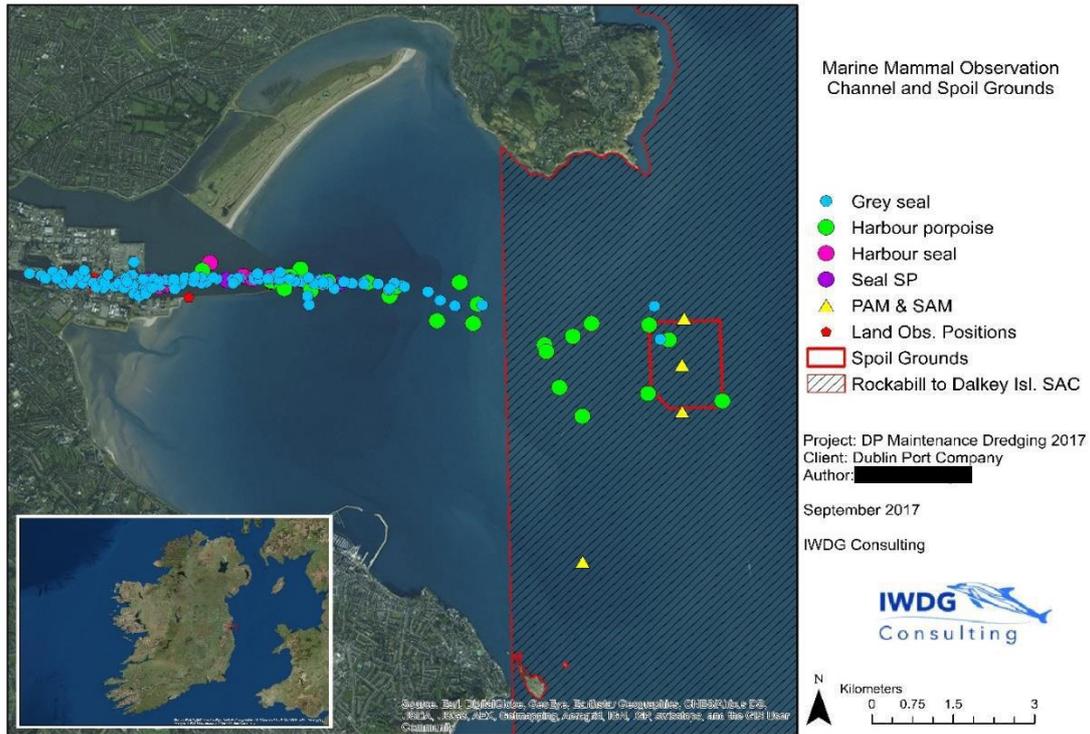
A similar pattern was recorded during two maintenance dredging campaigns from 14 to 30 September 2017 and 9 to 22 April 2018 with 29 (16%) and 35 sightings (32%) of harbour porpoise (Figures 3.2 and 3.3).

As part of the ABR Project in Dublin Port, static acoustic monitoring (SAM) has been ongoing at the offshore disposal site and at a control site since 2016 (Russell *et al.* 2018, 2020). SAM is particularly effective at logging the presence of harbour porpoise but can detect dolphins too, although not to species level. The results from SAM show harbour porpoise to be present on most days (98-100%), with highest detections per day typically recorded at the control site to the south (SAM 4) (Figure 3.4).

#### Modelling of 2017-2018 SAM data

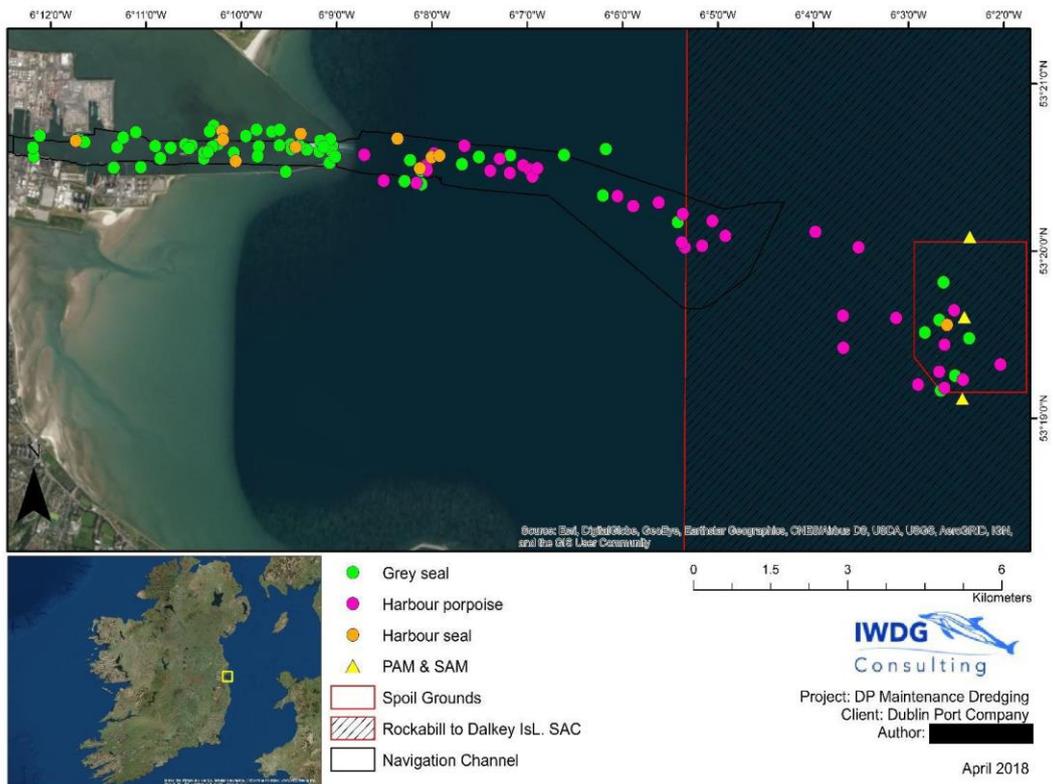
Generalized linear mixed-effect models (GLMM) were carried out by Russell *et al.* (2018) using tide, time of day and tidal phase as factors to explore the fine scale use of the spoil site by harbour porpoises. Most detections were recorded at the control site (SAM 4) outside the spoil ground, but of the three locations monitored at the spoil ground, more detections were recorded in the middle (SAM 2), with significantly more detections during winter, and during the hours of darkness. The neap phase had the greatest number of detections in comparison with spring and transitional, as well as during times of high tide. The site north of the spoil ground (SAM 1) had the second highest number of detections with significant trends similar to SAM 2; more detections during winter and during the hours of darkness. Additionally, more detections were recorded during neap and transitional tidal phases and at high tides (Russell *et al.* 2018).

Figure 3.2: All marine mammal sightings during the 2017 maintenance dredging campaign



Source: Keogh et al. 2017

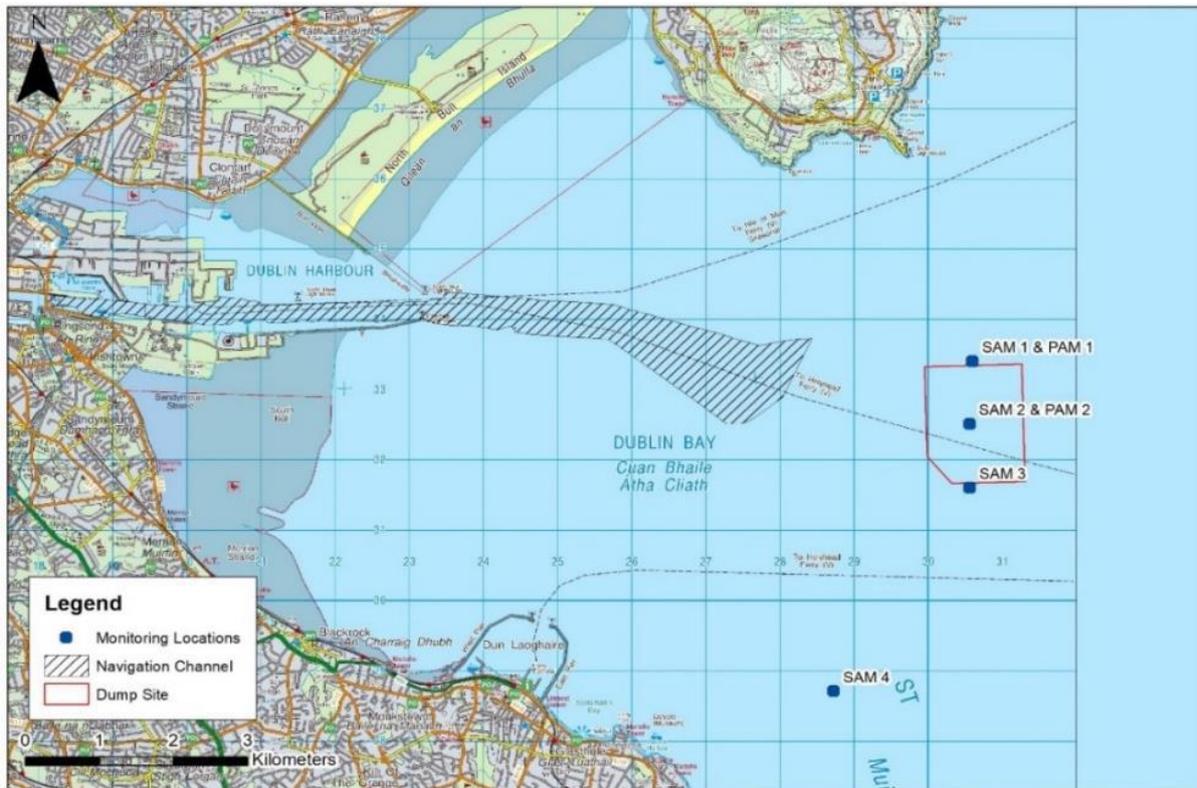
Figure 3.3: Marine mammal sightings during the 2018 maintenance dredging programme



Source: Keogh et al. 2018

In summary, results across all days monitored at each of the sites showed porpoises to be present on average 97-100% of days monitored. Presence was highest inside the spoil ground during autumn at SAM 3 and during the winter months at SAM 1 and SAM 2 and during the hours of darkness (including dawn and dusk) and a range of tidal cycles and phases.

Figure 3.4: PAM and SAM positions within the spoil grounds and Dublin Bay



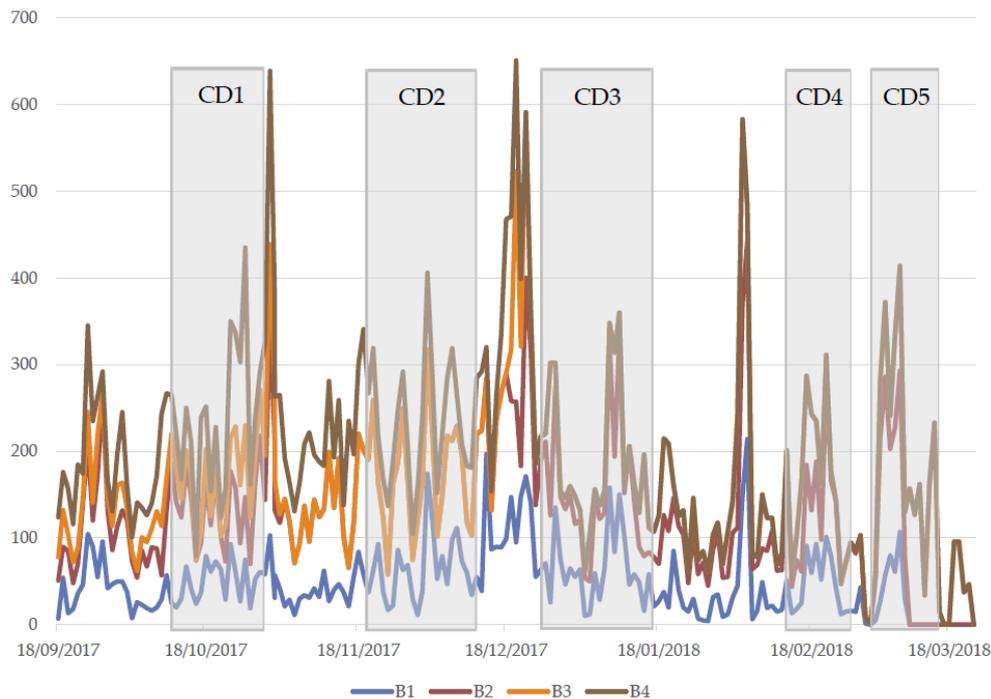
Source: from Russell et al. 2018

### Modelling of 2018-2019 SAM data

In summary, results across all days monitored at each of the sites showed harbour porpoises to be present on an average 99% of days monitored. The highest presence was detected at all locations during the winter months, during hours of darkness (including dusk) and across a range of tidal cycles and phases (Russell et al. 2019).

The number of harbour porpoise detections per day on the spoil ground peaked during dumping activity suggesting that, in some instances, harbour porpoise were more active in the spoil ground during dumping and did not appear to perceive the activity as a threat or disturbance. This may be due to a new feeding opportunity associated with dumping, that outweighed any potential negative impacts.

Figure 3.5: Number of harbour porpoise detections per day recorded across all locations and during periods of capital dredging



Note: (B1=SAM 1, B2=SAM 2, B3=SAM 3, B4=SAM 4, see Figure 3.4) with the grey transparency box indicating the dates of the first (22-31 Oct), second (23 Nov- 09 Dec 2017), third (06-17 Jan 2018), fourth (15-23 Feb) and fifth (04-14 Mar) capital dredging (CD) campaign.

Source: Russell *et al.* 2018, 2019

Harbour porpoise do not use the immediate port area and are rarely recorded inside the harbour. Thus harbour porpoise in Dublin Bay will only be affected by dredging and dumping of spoil and shipping traffic and not construction activities or site investigations within the Liffey channel.

### 3.2.2 Bottlenose dolphin

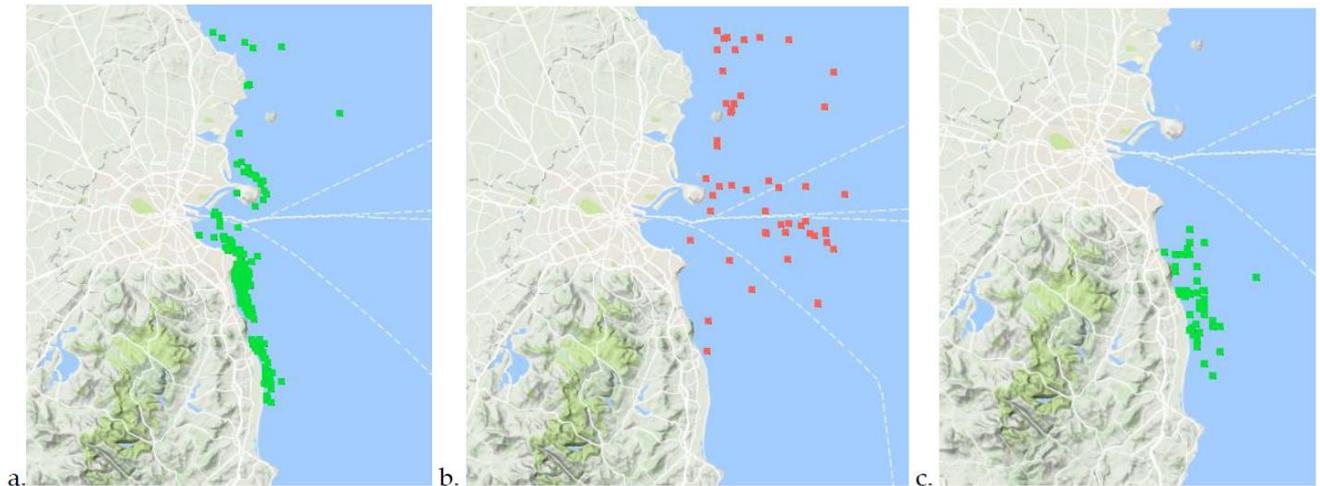
Bottlenose dolphins are widespread and relatively abundant off the Irish coast with most sightings along the western seaboard (Berrow *et al.* 2010). Bottlenose dolphins have been reported throughout the year, though mainly in the summer and from all along the coast, but mainly off Howth Head and especially from Dún Laoghaire and south to Wicklow. Most sightings are of small groups though occasionally large groups of greater than 20 dolphins occur but usually only for short periods. A small group of 3 individual bottlenose dolphins frequented Killiney Bay from August 2010 to August 2012.

Bottlenose dolphins off Dublin are part of the highly mobile coastal population which has been recorded all around the Irish coast and some individuals reported off Scotland (O'Brien *et al.* 2009). Surprisingly, there was no evidence of movement between the east coast of Ireland and Wales, which holds a large number of this species. Recent genetic evidence (Mirimin *et al.* 2011) suggests the existence of three discrete populations of bottlenose dolphins in Ireland: the Shannon Estuary, an inshore population and an offshore population that ranges from the Bay of Biscay and the Azores (Louis *et al.* 2014). The inshore population is highly mobile and photo-identification has shown individuals recorded off Co Dublin to be part of this population

(O'Brien *et al.* 2009). This highly mobile Irish coastal population is thought to number between 200-400 individuals. No dolphins have been observed at or near the dredge or dump site by marine mammal observers during dredging operations.

Dolphins were occasionally detected by SAM especially during summer months. No detections were logged between October to December 2018, some from December 2018 to August 2019, mainly at SAM3. These were most likely bottlenose dolphins.

Figure 3.6: Sightings of a) bottlenose dolphin b) minke whale and c) Risso's dolphin off Dublin Bay



Source: IWDG

### 3.2.3 Minke whale

Minke whales are widespread and abundant in inshore Irish waters from May to October. They occur seasonally, especially off north County Dublin from Howth Head to Lambay Island and on the Kish Bank. They are usually solitary but up to five have been seen foraging in the same area at any one time. They have not been recorded in, or adjacent to, the dredging or dump site.

### 3.2.4 Risso's dolphin

Risso's dolphins were regularly recorded to the south of Dublin Bay, in the spring and early summer for a number of consecutive years from 1999 to 2006 but have not been recorded regularly since 2013. They were likely part of a wider Irish Sea population whose occurrence is associated with the presence of squid, which may be an unpredictable food source.

### 3.2.5 Common dolphin and humpback whale

Common dolphins and humpback whales have also been recorded in the western Irish Sea. Common dolphins are thought to be more abundant in the summer and autumn and tend to occur further offshore than bottlenose or Risso's dolphins. They have been recorded from Rockabill to Dun Laoghaire. Single humpback whales were recorded in July for two consecutive years in 2010 and 2011 off north Dublin and are thought to be increasing in number in Irish coastal waters, suggesting they are likely to be more frequently observed off Dublin in future years.

### 3.2.6 Other Annex IV species

#### Otter

Otters are widespread in Ireland, found in a variety of aquatic habitats, both freshwater and marine. However, they always require access to fresh water.

The MP2 site is extensively developed with no semi-natural habitats. Vegetated areas either comprise early successional plant communities or landscape planting. No otter prints, spraints or prey remains were recorded on site during surveys conducted in 2018 and 2019, and it was considered that the terrestrial component of the MP2 Project was of negligible value to local populations of otter.

The Dublin City otter survey conducted over 2018 and 2019 (Macklin *et al.* 2019) indicated that most of Dublin Port featured very high levels of human activity (industrial zone) and was largely unsuitable for otter. The causeway to Poolbeg lighthouse, whilst featuring very high overall levels of human disturbance, supported two regular otter spraint sites at the top of concrete steps. Three otter holts were recorded (two active, one inactive), located in largely inaccessible areas of habitat on the north side of Dublin Port.

#### Marine turtles

Five species of marine turtle have been recorded in the seas around Ireland and the UK: leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*) and hawksbill turtle (*Eretmochelys imbricata*). The leatherback turtle is the largest of the marine turtles and is the only species of turtle to have developed adaptations to cold water (Goff & Stenson 1988).

A significant majority of turtle sightings recorded in Irish waters are leatherback turtles (King & Berrow 2009), which migrates into the waters of the Celtic and Irish Seas in response to the distribution of the gelatinous zooplankton which make up their favoured diet (Doyle *et al.* 2008, Fossette *et al.* 2010). Tagging studies show that they migrate across the Atlantic from the eastern American mainland and the Caribbean (Hays *et al.* 2004, Doyle *et al.* 2008). Sightings in the wider region are concentrated off the south and west of Ireland, the southwest of England and the west coast of Wales and also in the Irish Sea. Most sightings are in summer, peaking in August (Penrose & Gander 2016, Botterell *et al.* 2020). The decadal trend of records in the UK and Ireland for leatherback turtles generally increased, peaking in the 1990s from which it has since decreased. Data from the National Biodiversity Data Centre<sup>4</sup> reflects these patterns with the predominance of sightings in the south and west of Ireland, and relatively few sightings in the Irish Sea, the latest of which was recorded in 2004. Aerial surveys for the ObSERVE project from 2015-2016 recorded a handful of leatherback turtle sightings at the southern limits of Irish offshore waters in summer; none were observed in the Irish Sea (Rogan *et al.* 2018).

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<sup>4</sup> <https://maps.biodiversityireland.ie/Species/128443>

## SECTION 4 - RISK ASSESSMENT

### 4.1 Potential impacts associated with the proposed works

Section 7.4.5 of the applicant's EIAR described potential impacts on marine mammals. This was supplemented with information from Section 5.2 of the Marine Mammal Risk Assessment of the proposed Dublin Port maintenance dredging programme.

#### 4.1.1 Underwater noise disturbance during construction

##### **Piling**

Noise measurements were taken during pile driving activities at Alexandra Basin East in June 2014 to determine the acoustic noise generated during piling operations (McKeown 2014). The measurements took place while H-section piles with a cross sectional area of 333 cm<sup>2</sup> were being driven to depths of 35m. Peak sound energy occurred at below 1 kHz but there was substantial energy up to 10 kHz, with high frequencies rapidly attenuated. The study concluded that noise level attenuated rapidly so that at 500m the levels are at background noise levels.

Noise disturbance during activities such as demolition, piling and dredging and dumping could potentially lead to disturbance and displacement. However harbour porpoise have not been recorded in the Liffey Channel and only very rarely inside the harbour, thus with the implementation of mitigation measures (Section 4.2), the potential impact is negligible.

The Dublin City otter survey conducted over 2018 and 2019 (Macklin *et al.* 2019) indicated that most of Dublin Port featured very high levels of human activity and was largely unsuitable for otter. No otter were recorded at the site of the MP2 Project in either 2018 or 2019 and it was considered that the terrestrial component of the MP2 Project was of negligible value to local populations of otter. There is the potential for disturbance and displacement of otter which may be transiting through or foraging within the Inner Liffey channel. However, with the implementation of mitigation measures (Section 4.2), the potential for significant impact is minimal.

Available information on potential effects of underwater sound on marine turtles is very limited (Nelms *et al.* 2016). The hearing range of cheloniid species has been estimated as between 50-2,000Hz, with highest sensitivity below 400Hz (Popper *et al.* 2014). For leatherback turtles, measurements made on hatchlings suggested a similar low frequency sensitivity, with sound detection ranging between 50 and 1,200Hz when in water and between 50 and 1,600Hz in air (Dow Piniak *et al.* 2012). Underwater noise generated by dredging may be detectable by leatherback turtles, although their low density and limited seasonal presence in the area dictates that very few individuals are likely to be exposed to noise levels beyond that of the background for the region.

##### **Dredging and dumping**

Dredging has been shown to displace bottlenose dolphins from a busy shipping port in Scotland over a prolonged dredging campaign (Pirotta *et al.* 2013). Diederichs *et al.* (2010), through the use of acoustic monitoring with click detectors, showed that harbour porpoises temporarily avoided an area where sand extraction took place off the Island of Sylt, Germany. When the dredger was closer than 600m to the monitoring location, it took three times longer before a porpoise was detected again compared with times without sand extraction.

The dredging and disposal operations for the MP2 Project will span at least four winter seasons, between 2024 and 2031, with no more than 272,000m<sup>3</sup> of spoil being disposed of in

any given winter season. Dredging will be carried out by a Trailing Suction Hopper Dredger (TSHD). Previous studies on sound production by TSHD in silt/mud substrates have found that maximum source levels from the various activities associated with TSHD dredging (including the dredging process, transit to the disposal site, placement, pumping and rainbowing) to be very similar with dredging itself and not producing sounds louder than those produced by the dredger during transit (De Jong *et al.* 2010). This study was carried out on the sound production by seven TSHDs during construction of a harbour extension of the Port of Rotterdam. More recently, Robinson *et al.* (2011), found that emitted sound levels from TSHDs at frequencies below 500 Hz were similar to a deep-draft cargo ship travelling at a moderate speed.

RPS (2016) made underwater noise measurements during the 2016 maintenance dredging campaign. The PSD plots of the dredging operation showed some lower frequency tonal components between 200 Hz and 2 kHz which were attributed to the pump. The dredging operation had a higher frequency signal in comparison to the dumping operation. Sound levels for the dredging operations at ranges of 213 and 268 m were below the disturbance threshold for harbour porpoise of 140 dB re 1  $\mu$ Pa SPL (RMS) and 140 dB re 1  $\mu$ Pa<sup>2</sup> s SEL. The sound level of 142.7 dB re 1  $\mu$ Pa SPL (RMS) for the dumping operation at a range of 90 m were 2.7 dB re 1  $\mu$ Pa SPL (RMS) above the disturbance threshold for harbour porpoise, suggesting porpoise may react <100m of the dredger during dumping. However, this level is still below the NOAA general behavioural threshold for marine mammals of 160 dB re 1  $\mu$ Pa SPL (RMS).

As noted in Section 3.2, static acoustic monitoring of harbour porpoises recorded a significant increase in acoustic detections during dumping. Whether this is due to increased occurrence, increased click rate due to increased foraging opportunities or a decrease in visibility due to increased turbidity is unclear (Russell *et al.* 2018) and requires further exploration but clearly there is no evidence of an aversive reaction.

### Shipping traffic

Low frequency continuous sound such as that generated by shipping has been reported as the dominant source of anthropogenic sound in a broad-band range from 5 to 300 Hz. The main cause of noise emitted from shipping is though propeller cavitation (Richardson *et al.* 1995). Characteristics of shipping noise including frequency and source level are roughly related to vessel size and speed although this relationship is further complicated by vessel design and advances in ship technology (Richardson *et al.* 1995). Generally it has been found that larger vessels emit lower frequency and louder noises (Richardson *et al.* 1995) with source levels from vessels in excess of 300m length, reported as approximately 190 dB re 1  $\mu$ Pa at 1m (Richardson *et al.* 1995).

The presence of a large dredger transiting Dublin Bay will lead to increased vessel traffic and associated noise. However, given the busy nature of Dublin Port and shipping lane and the ambient noise already experienced at this site (Section 3.1), the presence of an additional vessel and its associated noise, is extremely unlikely to be significant.

Noise disturbance, through increased vessel traffic as a result of the MP2 project could cause a long-term effect, where the low frequency component overlaps with the vocalisations and estimated hearing range of marine mammals.

Baleen whales, which are more sensitive to low frequencies are thought to be more at risk than odontocetes. However, Wisniewska *et al.* (2016) suggested harbour porpoise can be sensitive to even modest exposures to anthropogenic sound due to their high metabolic life-style.

Table 2.5 estimates that as a result of the MP2 project, the average number of Ro-Ro sailings per day will increase from 13 in 2018 to 18 in 2040. Similarly, Table 2.6 indicates that the average number of Lo-Lo ships per week will increase from 8.3 in 2018 to 11.0 in 2040.

This modest anticipated increase in vessel numbers using the shipping channel in Dublin Bay and the approach to Dublin Port within the Bull walls will occur in an underwater noise environment which has been subject to significant shipping traffic for more than half a century. Shipping is one of the dominant background noise sources in Dublin Bay and will continue to be throughout the Masterplan period. The shipbuilding industry is not however anticipated to construct noisier ships in the future with IMO 2014 guidelines advising how to reduce underwater noise<sup>5</sup>.

Shipping traffic currently generates underwater noise in Dublin Bay and on approach to Dublin Port throughout the daytime and night time periods every day of the year. Shipping noise in the outer bay occurs as momentary/brief increases in underwater noise levels that revert to background once the vessel has passed. This localised noise event currently occurs throughout the year in the outer bay and the predicted increase in shipping traffic will not result in a significant change in noise levels outside of the port berthing area. Noise levels in the berthing area will increase due to the increased berthing activity. The underwater noise level due to increased berthing activity will result in noise levels similar to those arising at present but occurring more frequently. Whilst Tables 2.5 and 2.6 predict modest increases in shipping frequency for Ro-Ro and Lo-Lo traffic, this does not represent any meaningful intensification of use of the shipping channel. Shipping noise occurs 24/7, 365 days a year and will continue to do so. The magnitude of the shipping noise source is not anticipated to increase. Future shipping noise as a result of the operation of the MP2 Project will not result in a significant environmental effect on the harbour porpoise of Dublin Bay.

#### 4.1.2 Physical disturbance and collision risk

The risk of injury or mortality is considered extremely low as marine mammals are exposed to considerable vessel traffic on a daily basis and would be aware of their presence. The dredge vessel is slow moving and not able to turn quickly thus any animals in the area would have sufficient time to avoid any collisions and thus injury or mortality. The chance of actually releasing dredged material on top of a marine mammal is extremely unlikely. The duration of the release of dredged material last around 10-20 minutes and the vessel slows down during spoil release.

#### 4.1.3 Turbidity

Turbidity levels at the disposal site are monitored during and outside of disposal activities (CEMP). The data indicates that there is no sustained or widespread impact on turbidity due to dumping. The short term increase in turbidity caused during the dumping process will have a local impact of short duration and will have no impact on marine mammals or their preferred prey.

#### 4.1.4 Indirect impacts on preferred prey

No adverse effects on fish species is expected from dredging and disposal operations. SAM data from the ABR project (Russell *et al.* 2019, 2020) has recorded an increase in acoustic detections of harbour porpoise during disposal operations. Increased click detections are

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<https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/833%20Guidance%20on%20reducing%20underwater%20noise%20from%20commercial%20shipping..pdf>

concurrent with increased foraging clicks suggesting harbour porpoises may be taking advantage of increased foraging opportunities presented during disposal at Burford Bank.

#### 4.1.5 Cumulative effects

Dredging activity for the MP2 Project has been programmed to ensure that there will be no overlap with either the ABR Project capital dredging programme or DPC maintenance dredging campaigns. Consequently there will be no cumulative impacts on marine mammals.

Howth Yacht Club (HYC) is proposing to extend the marina at Howth within the confines of the existing breakwater. A Dumping at Sea (DAS) Permit was granted in August 2011 (Reg No. S0010-01) for the disposal of 120,000 tonnes of dredged material at the licensed offshore disposal site located to the west of the Burford Bank, the same offshore site proposed for the dredge spoil for the MP2 Project. The cumulative impact of the MP2 disposal is expected to be negligible considering the volumes of sandy silt to be disposed of from HYC.

## 4.2 Mitigation measures

### 4.2.1 Piling

The following precautionary measures will be undertaken to minimise the risk of injury or disturbance to marine mammals in the area of operations in line with National Parks and Wildlife Service (NPWS) Guidelines (2014):

- A trained and experienced Marine Mammal Observer (MMO) will be put in place during piling, dredging, demolition and dumping operations. The MMO will scan the surrounding area to ensure no marine mammals (including otter) are in a pre-determined exclusion zone in the 30-minute period prior to operations. The NPWS exclusion zone is 500m for dredging and demolition works and 1,000m for piling activities.
- Noise-producing activities will only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring is not possible, the sound-producing activities will be postponed until effective visual monitoring is possible. Visual scanning for marine mammals (in particular harbour porpoise) will only be effective during daylight hours and if the sea state is WMO Sea State 4 (Beaufort Force 4 conditions) or less.
- For piling activities, where the output peak sound pressure level (in water) exceeds 170 dB re: 1µPa @ 1m, a ramp-up procedure will be employed following the pre-start monitoring. Underwater acoustic energy output will commence from a lower energy start-up and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.
- If there is a break in piling / dredging activity for a period greater than 30 minutes then all pre-activity monitoring measures and ramp-up (where this is possible) will recommence as for start-up.
- Once normal operations commence (including appropriate ramp-up procedures), there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate, nor if marine mammals occur within a radial distance of the sound source that is 500m for dredging and demolition works, and 1,000m for piling activities.
- Any approach by marine mammals into the immediate (<50m) works area will be reported to the NPWS.

- The MMO will keep a record of the monitoring using a 'MMO form location and effort (coastal works)' available from the NPWS and submit to the NPWS on completion of the works.

### 4.3 Monitoring measures

#### 4.3.1 Static acoustic monitoring

As an additional mitigation measure for harbour porpoises, it is proposed to maintain the static acoustic monitoring (SAM) programme established during the ABR Project for the duration of the MP2 Project. CPODs are self-contained click detectors which log the echolocation clicks of dolphins and porpoises. They can be deployed on a mooring for 4-6 months before recovery and downloading of data. These data can be analysed as detection positive minutes (DPM) to generate an acoustic index of activity. This technique provides large datasets to enable changes in activity to be identified at high resolutions. CPODs are spatially constrained having detection distances of around 250m for harbour porpoise and 800m for bottlenose dolphins (O'Brien *et al.* 2013). O'Brien *et al.* (2013) recommended a minimum of four units should be deployed in small inshore study areas to ensure that statistically robust data can be collected. The number of CPODs required should reflect the parameters or factors to be tested (e.g. fine scale diel or larger scales such as seasonal trends). Using an even number design for replication purposes can allow for parameters such as inshore and offshore trends to be explored in larger areas. The more units that can be deployed in an area, the more an informed evaluation of a site and successful monitoring indices will be generated. Hence we recommend four stations are established for SAM.

Four stations will be monitored, including three at the disposal site to the west of the Burford Bank and one control site within Dublin Bay. These stations will be monitored pre-construction, during construction and for a minimum of two years post-construction in line with best international practice.

#### 4.3.2 Underwater noise monitoring

Underwater noise surveys will be undertaken during the construction phase of the works. The underwater noise surveys will complement the existing underwater noise level measurements which have been recorded during the impact piling carried out inside Alexandra Basin West for the ABR Project. This will provide additional validation of the underwater noise modelling and to ensure the underwater noise levels are contained within the operations area of the port.

Underwater noise surveys will be undertaken during the construction period at a minimum of 2 locations upriver and two locations downstream of the works when being carried out in the navigation channel. Monitoring will be carried out at the commencement of the piling activity.

#### 4.3.3 Noise associated with increased shipping traffic

Monitoring noise during the operational phase will be undertaken by DPC. The Dublin Bay area is subject to commercial traffic from Dublin Port, Dun Laoghaire Port, Howth Port and leisure and commercial traffic from numerous marinas around the bay. In order to monitor Dublin Port traffic related noise it is proposed to install a hydrophone at the eastern end of the port linked to a vessel identification system. Monitoring will provide information on background (absence of shipping) and ambient (shipping noise included) noise levels along with linking noise events to specific vessels. This approach ensures that particularly noisy vessels can be identified and appropriate measures outlined in the IMO (2014) guidelines are taken to control noise emissions from those vessels.

#### **4.4 Conclusion**

With implementation of the above mitigation measures, it is very unlikely that there will be negative residual impacts from the proposed works on marine mammals in the area. It is also very unlikely that any animals will be injured or killed as a result of the proposed works.

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