

Department of Housing, Local
Government and Heritage

**Foreshore Licence Application for
Drogheda Port Maintenance
Dredging**

Environmental Report

Issue 1 | 22 March 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Introduction

Arup has been appointed by the Department of Housing, Local Government and Heritage (the Department) to prepare an environmental report on the foreshore licence application, reference number FS007028, by Drogheda Port Company for maintenance dredging at the Port. The Department's brief requires the report to consider the potential impact of the proposed dredging project on relevant aspects of the environment, having regard to the applicant's supporting documents on environmental matters and the observations of the prescribed bodies.

The environmental report should include recommendations for mitigation measures.

This report responds to the Department's requirements.

2 Methodology

2.1 Information Made Available for Arup

The information about the proposed maintenance dredging project, which formed the basis for the Arup environmental report, was the information contained in the application file on the Department's website: <https://www.gov.ie/en/foreshore-notice/38923-drogheda-port-company-dredging-of-river-boyne/?referrer=http://www.gov.ie/en/publication/a2f98-drogheda-port-company-dredging-of-river-boyne/> which was accessed on 08 March 2021.

The information comprised:

- Application form and supporting documents
 - Application form
 - Attachment A – Description of Works
 - Attachment B – Hydraulic Modelling
 - Attachment C – Dredging History 2001 to 2019
 - Attachment D – Dredging after Weather Events
 - Attachment E – Dredging Extent Map
 - Attachment F – Loading Area
 - Attachment G – Loading Area Co-ordinates
 - Attachment H – Trailer Suction Dredging Illustration
 - Attachment I – Location of Dumpsites
 - Attachment J – Hydrographic Survey Dumpsite A1
 - Attachment K – Hydrographic Survey Dumpsite A2
 - Attachment L – Report on Drogue Release at Offshore Dumpsite
 - Attachment M – EPA and SFPA Correspondence
 - Attachment N – Environmental Report (AWN 2019)
 - Attachment O – Marine Institute Sampling and Analysis Plan
 - Attachment P - Sediment Sampling and Analysis Report
 - Attachment Q-A - Approaches to the River Boyne
 - Attachment Q-B - River Boyne to Drogheda
 - Attachment R - Natura Impact Statement (Scott Cawley 2019)
 - Attachment S - Previous Dredging Licence
 - Attachment T- Dumping at Sea Permit S0015-02
 - Attachment U - BSM Letter re Planning
 - Attachment V - Longitudinal Section
 - Attachment Y - 2003 Correspondence with DEHLG
 - Attachment Z-1 - Options for Disposal
- Prescribed Body Consultation
 - Prescribed Body Observations
 - Drogheda Port's Response to Prescribed Body Observations.

2.2 Methodology

2.2.1 Information Sources

In preparing this report, Arup relied on the information from the applicants and the statutory bodies contained in the application file on the Department's website. In particular, Arup relied on the description of the baseline environment and the proposed works, and the commitments with regard to mitigation measures which would be implemented, provided by the applicant.

2.2.2 Guidance

Arup had general regard to the following guidance in preparing this report:

- Environmental Protection Agency (2017) *Revised Guidelines on the Information to be contained in Environmental Impact Statements (Draft August 2017)*

While this environmental report is not obliged to meet the statutory requirements of an environmental impact assessment report, it follows the general grouped structure and covers the main topics of an environmental impact assessment report. The characterisation of effects on the environment, in terms of quality, significance, extent, probability and duration, is based on the EPA (2017) guidance.

2.2.3 Structure of the Report

The environment report follows a grouped format structure. Typically, for each environmental aspect, the report chapter is structured as follows:

- Introduction
- Baseline environment
- Potential effects
- Mitigation measures
- Residual effects

The environmental aspects, of most relevance to the proposed dredging project, are addressed. If an environmental aspect is screened out, the reasons for doing so are explained.

3 Description of Project

3.1 Background

3.1.1 Drogheda Port Company

Drogheda Port Company is a semi state Port company where the primary shareholder is the Chief Executive of Louth County Council. Drogheda Port, as a semi state company, is charged with the management and control of the Port of Drogheda as defined in the Harbours Act 1996 and amendments. The Port is an open public port for all i.e. commercial ships, trawlers, local fishing vessels, yachts and small marine leisure craft. The proposed works provide for public use. Maintenance dredging ensures the provision of the safe navigational water depths for the enjoyment for all that avail of the Port facilities.

3.1.2 Dredging at Drogheda Port

Drogheda Port has a long history of dredging. The current application is for the continuation of maintenance dredging at the Port, which has been carried out in recent years under a Foreshore Licence, Ref. No. FS005747, issued by the Minister for the Environment, Community and Local Government in 2013 and a Dumping at Sea permit, Ref. No. S0015-02, issued by the EPA in 2013. Drogheda Port has also carried out capital dredging and has undertaken two major capital dredging campaigns in the past 20 years.

The Foreshore Licence permit is sought for a period of 8 years to cover maintenance dredging requirements from 2021 to 2029. Other than the licence start and finish date, there is no date, time constraint or time limit sought for the maintenance dredging. Dredging at the river mouth and port approaches is generally driven by weather events that cannot be predicted or scheduled. Analysis of the Drogheda Port Company dredging history (presented in Attachment C of the application, Dredging History 2000 – 2019) clearly illustrates the unpredictability over any twelve-month period. If the entrance or seaward approaches silt up due to a weather event resulting in impaired navigational safe depths, then dredging is immediately required. If depths are not impaired then no dredging takes place.

The extent of the dredge area is the commercial estuary including all berths and ship swing basins, the river channel and river mouth and seaward approaches, a total area of 73Ha.

3.1.3 Requirement for Maintenance Dredging

Maintenance dredging works are essential for the ongoing safe operations of Drogheda Port. A safe navigation channel must be maintained from sea to berth. Water depths particularly at the river entrance and seaward approaches are reduced due to natural accretion from the coastal processes and accelerated accretion due to storm events particularly southeast and northeast gales.

To maintain safe marine navigational water depths, timely dredging is required to mitigate against the natural accretion and immediate response dredging is required to respond to accelerated accretion due to storm events to which Drogheda Port is very susceptible given its location on a shallow shoaling horseshoe coastline. Maintenance dredging is only engaged once water depths are reduced below a safe navigation value relative to Chart Datum.

Within the waterway under the jurisdiction of the Drogheda Port Company, maintenance dredging takes place primarily and most frequently at the river mouth and seaward approaches. Thereafter, maintenance dredging takes place at any location within the commercial estuary as determined by the Port Company, in order of priority after the entrance and seaward approaches, i.e. the berths, artificial berth dredged pockets, ship swing basins and the general commercial estuary over its length from town to sea as determined by the Port Company as the navigational authority for the purpose of ensuring safe navigation.

Dredging locations and quantities are determined following hydrographical surveys. Drogheda Port Company has its own in-house hydrographical survey unit. The entrance and seaward approaches are surveyed monthly or at a greater frequency depending on the weather i.e. north east to south east winds and following storm events. The berths, artificial berth pockets and ship swing basins are surveyed quarterly and the complete commercial channel is surveyed at least annually. Additional surveys are carried out following reported issues by the port pilots, and/or ships' masters or where a deterioration occurs in the river polder retaining walls.

Drogheda Port Company maintains a dredging contract with commercial dredging contractors for immediate plant response availability. These contractors are updated on each hydrographical survey so that they are aware at any point in time of the current depth condition of the Drogheda Port entrance and seaward approaches and the likelihood of a call up following a weather event. Drogheda Port has visibility of the contractor's plant location and contracted planned works programme. This allows for a rapid mobilisation following a weather event where Drogheda Port safe navigation depths become impaired.

Good management, prudent planning and experience informs a degree of dredge forecasting i.e. Q3/4 and Q2/3 of each year. However, this is primarily to inform and plan in the absolute knowledge that the forces of nature will ultimately dictate the number of dredge events annually.

3.2 Description of Drogheda Port

The section of the River Boyne under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Mary Bridge in the town of Drogheda to the river mouth at Mornington, in County Louth.

In the town on the river's north side there are four commercial working berths numbered 1- 4. These are indicated on the charts which accompanied the licence application. On the south side, there is one berth and two ship swing basins, one for ships of 90m and one for ships of 95m length overall respectively, from west to east on the west side of the Boyne Viaduct.

Immediately east of the Viaduct there is a ship swinging basin of 100m in width. The town quay berths are maintained generally to a depth of -2.0m at Chart Datum (CD) while the channel depth is maintained at -1.6m CD. At low water, vessels on these berths take the bottom in soft mud on level ground, thus complying with the port and charter party expression NAABSA (not always afloat but safe aground).

From the town at Drogheda, the river narrows to the point of Donors Green. Immediately east of this point on the south side of the river is the Flogas Hydrocarbon terminal. This berth is maintained at -3.0m CD within a dredged pocket of 100m x 25m. Vessels at this berth are required to remain afloat at low water.

From this location, the river is maintained at -2.2m CD over the full length of the navigation to the sea at Mornington.

The berths of RHI Magnesita (formally Premier Periclase Ltd) are on the north shore. Depths are maintained at -1.6m CD over the 180m quay immediately adjacent to the deeper navigation channel at -2.2m CD. At low water, vessels on this berth take the bottom in soft sand/gravels (NAABSA).

The Tom Roes Point berths to the north side of the channel lie within a deep water dredged pocket of a length of 210 metres, width of 25 metres excluding side slopes, and maintained to a depth of -5.5m CD. This dredged pocket is essential, as large vessels nominated to these berths are required to remain always afloat. Immediately west of the Tom Roes Point multi modal terminal is the Port's main ship swing basin where vessels up to 130m length overall can be swung.

To the east of this facility and 2km from the sea is the Fish Meal Quay. This berth is in state ownership and is used primarily for local fishing vessels and for the discharge of Class 1 cargoes, classified under the International Maritime Dangerous Goods Code. The berth has a depth of -2.5m CD.

From the Flogas Hydrocarbon terminal, the channel has been dredged to a uniform width of 50 metres with side slopes of a general 1:5 gradient. At the South Point beacon (53 43'.89N, 06 16'.14W) the channel width increases to 60 metres to the Carrick beacon (53 43'.76N, 06 15'.42W). From this point the channel width is maintained at 50 metres to the Bull beacon (53 43'.30N, 06 14'.62W) where the channel width is increased to 100 metres with side slopes 1:10 and extends to a point 700 metres east of Lyons Light (53 43.24N, 06 14'.26W).

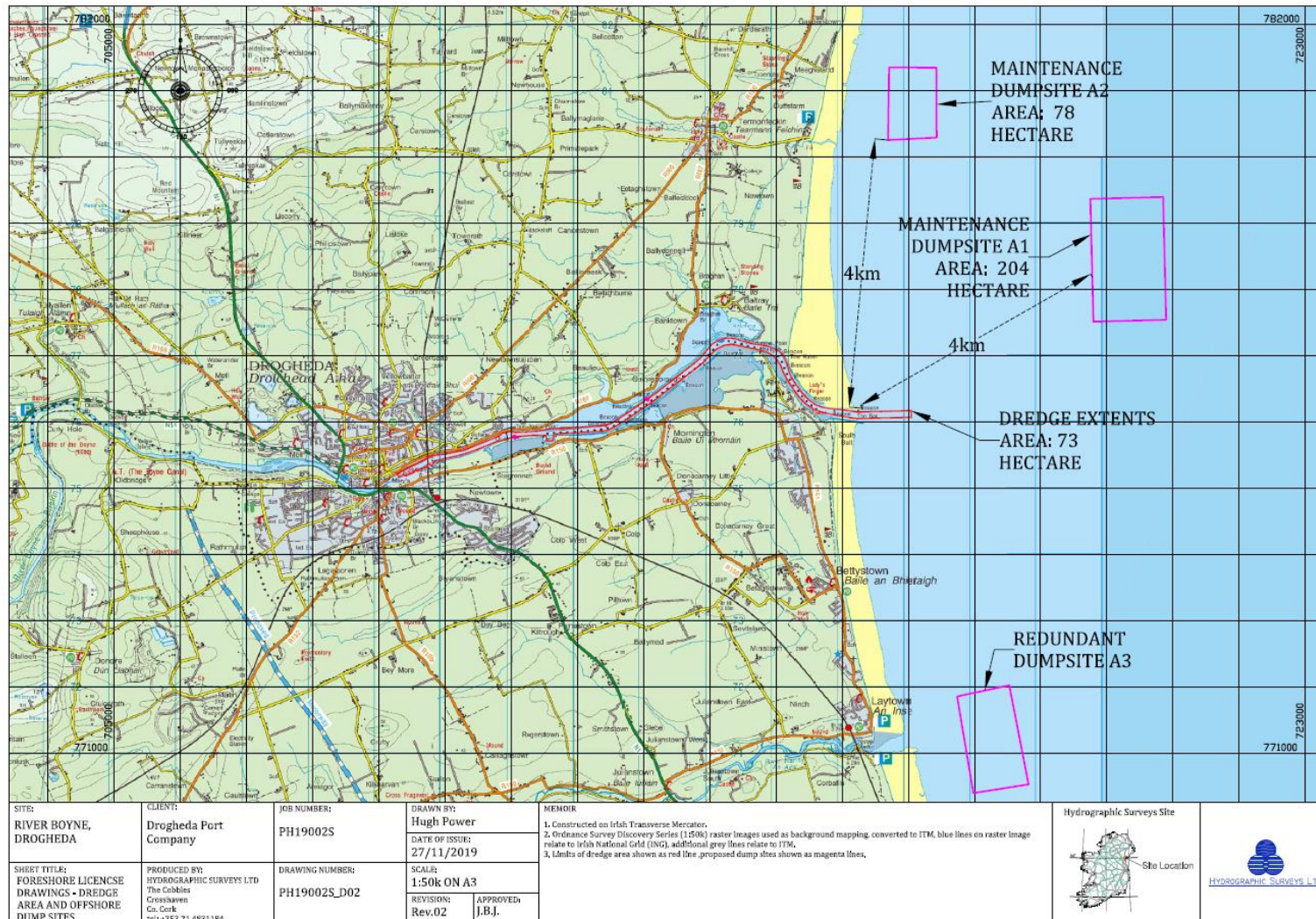


Figure 1: Map of Application Area (red line) and Dumpsites (Source: Licence Application)

3.3 Loading Operation

3.3.1 Estimated Annual Dredging Requirements

Over the decades but in particular since the Capital Dredging Port Development campaign 1999 – 2000, the port has accumulated a good deal of data and experience on the performance of the river, entrance and seaward approaches and the effects of weather. This coupled with mathematical modelling (Attachment B of application: RPS - Drogheda Port Company Maintenance Dredging Licence Application Hydraulic Modelling Study, 25 May 2019) now allows realistic figures to be placed on the maintenance dredging quantity predictions going forward over the next permit application period 2021 - 2029.

Hydrographical monitoring of the entrance and seaward approaches, berths, artificial berth pockets, ship swing basins and the main river channel, carried out by the port internal hydrographic unit, maintains an almost real time check on depths particularly after easterly windstorm events.

Estimated annual quantities for maintenance dredging of the berths, artificial berth pockets, ship swing basins, channel, river mouth and seaward approaches are shown below in **Table 1**.

These estimates are averages, based on the last 18 years of data on actual quantities dredged (see Attachment C Dredging History 2000 – 2019). Annual requirements may increase or decrease on this average estimate depending on the severity of wind weather events. The estimated annual quantity is the same as that permitted in the existing Foreshore Licence granted in 2013.

Table 1: Estimated Annual Quantities

Location	Estimated Annual Quantities
Channel from town to sea, including all berths and ship swing areas	30,000m ³
Entrance & Seaward approaches	90,000m ³
Contingency	100,000m ³
Estimated Annual Quantities	220,000m ³

An annual contingency of an additional 100,000m³ is to allow for the unexpected and unplanned events that may impair the safe navigational depth at the entrance and seaward approaches and/or within the navigation channel. This is becoming more of a reality with changing weather patterns and increased severity of certain storm events.

This is to cover an unexpected weather event, seaward breakwater damage (as occurred in 2018 from storm Eleanor) or collapse, or where the river estuarine polder retaining walls that created the estuarine polders breach (as occurred in 2000) and the sand/silt material contained within a polder flows out into the main navigation channel. This can occur due to a differential in the water pressure between the retained waters in the polder and the river falling tidal levels. The river walls were constructed in the 1850s and their construction and deteriorating condition leaves them very susceptible to the effects of modern large ship wash and hydrodynamic action.

The contingency also allows for unexpected weather events at the river mouth and seaward approaches.

3.3.2 Dredging Plant

A range of dredging plant is suitable for maintenance dredging in the River Boyne. A contractor's selection of preferred plant utilisation will be dependent on plant availability, location of dredging (i.e. bar, channel, berths or ship swinging areas), type of dredging required and unit rate per m³. Typical plant which may be utilised on the River Boyne estuary, berths, artificial dredged pockets, ship swing basins, entrance and seaward approaches are:

- **Trailer Suction Dredger (TSD):** this is where the dredging vessel while underway drags a pipe on the riverbed and material is sucked up into the hold of the vessel. The material settles in the hold and excess water from the suction operation is returned to the sea as the hold reaches capacity. Once the hold is full, the vessel proceeds to the approved spoil dump site and discharges the material through bottom doors in her hull that open to release the hold contents. The vessel continuously passes over the area to be dredged gradually increasing the depths to the required levels. Trailer suction dredging gives minimal release with low sediment in suspension. When occurring, typical maintenance dredging is tidal, twice daily usually commencing 3 hours before high water to one hour after. Campaigns are usually twice yearly depending on weather. The channel at the primary dredge site is 100m wide. Therefore, the extent of and spread of sediment run off is minimal considering the scale of the dredge, dredge timing, duration, site location and duration of the run-off. The typical vessel used is circa 80m in length, with 12m - 14m beam, and can manoeuvre with ease at the entrance and seaward approaches, linear berths, town quay berths, Flogas LPG terminal, RHI berth, TRP berths and the general estuary. As the plant must be underway to dredge, its efficiency and productivity is reduced when engaged to dredge the swing basins.
- **Backhoe dredger:** this is a stationary dredger similar to a flat top barge with an excavator attached. The vessel is maintained in position by spud legs that anchor it to the ground and the excavator digs the area to be dredged. The material is loaded into a self-propelled barge that moors alongside the backhoe. As each area is dredged to the required depth, the spud legs are raised, the backhoe re-positions itself and the anchoring/digging process is repeated. Some backhoes are self-propelled with a fitted excavator, hold and dumping capability.

This equipment is ideally suitable to Drogheda for dredging of the ship swing basins and berths. Generally, this equipment tends to have a very high commercial mobilisation cost and rate per m³.

- **Split barge:** this is a purpose-built barge for receiving dredged material from a dredging vessel such as the backhoe. Once the hold of the vessel is filled, she sails to the approved dumpsite and through bottom doors in her hull that open, releases the material.
- **Grab dredger:** this is a vessel with a grabbing crane on board which dredges using a clam shell bucket. The material is generally deposited into the vessel's hold for later sea disposal via bottom doors. This is a coarse dredger method, dredging holes to create the required depth. On occasions, bed levelling may be required following the dredging where the material does not naturally slump.
- **Bed levelling:** this is where a small tug or similar vessel tows a cage or plough and removes material to the required level. It is particularly useful after the work of the trailer suction dredger or backhoe to level out high spots remaining to obtain the required dredge level.
- **Plough:** similar to bed levelling, this is where a cage or plough is towed behind a small tug or similar vessel. The water is agitated with the material being placed in suspension and then carried away by strong currents to be recovered by the trailer suction dredger some distance downstream of the plough operations where the sediments settle out. Such plant would be used where larger vessels, due to the size and manoeuvring characteristics, cannot operate.

3.3.3 Productivity and Duration of Dredging Operations

Daily, weekly or monthly dredge quantities are difficult to define in the absence of a contract where the contractor can advise on the dredge plant's production capacity. Production capacity is also dependant on the dredge material type, location in the dredge zone, location of the spoil ground for disposal, initial depth restriction for which the plant is engaged or contracted, tidal heights vis a vis the dredger ballast and loaded draft at the dredge site.

Experience to date at Drogheda Port, with the range of suitable TSD dredge vessels for maintenance dredging at the entrance and seaward approaches in a shallow water, would have a per tide range of between 4,500 – 5,500m³.

With continuous running over two tides per day the optimal performance/production for a TDS per day is 9,000m³ – 11,000m³, and per week is 77,000m³. However, these figures are never achieved due to a myriad of vessel operational constraints.

Following a weather event where the TSD dredger has been tasked to respond to impaired depths at the entrance and seaward approaches, a contract duration of twelve to fourteen days, dredging twice daily would not be un-typical.

Initially dredging is slow with low productivity as the TSD dredger must work its way over the created shoal dredge area with productivity increasing as the contract progresses and depths increase. Spring or neap tide may also impact the dredger progress and the depth over the shoal will vary.

Dredging within the commercial estuary i.e. channel, berths, artificial dredged pockets and ship swing basins, the daily production and duration is dependent on the location, material quantity and the operational constraints of the particular vessels contracted, dredge area accessibility and steaming time to/from the seaward spoil disposal site and constraints by other vessels operating in the channel. Productivity with the TSD is less than that achieved at the entrance and seaward approaches.

3.3.4 Analysis of Dredge Materials

Sediment samples were taken from the two dumpsites and the dredging area and analysed for parameters stipulated in the Sampling and Analysis Plan provided by the Marine Institute. Refer to Attachment O of the licence application. The material consists of silt with varying proportions of sand and gravel. It is not likely to contain any viruses, bacteria, yeasts, parasites of concern. The Office of Radiological Protection has stated that the dumping of these dredge materials at sea will not result in a radiological hazard. As the results of the suite of analyses on the range of analytes examined showed that none of them exceeded the upper limits, measurable physical, chemical or biological persistence is considered very unlikely. Accumulation and biotransformation in biological materials or sediments is also considered very unlikely. Refer to Attachment P of the licence application Sediment Sampling and Analysis Report.

3.4 Dumping Sites

Drogheda Port Company has two sea disposal sites or dumpsites, A1 the seaward site and A2 the northern inshore site. **Refer to Figure 1.** The licence application is seeking to continue the use of these two historical and established sites as per the existing EPA Dumping at Sea (DAS) operational conditions attached to Dumping at Sea Permit S0015-02. There is a third historic dumpsite, marked A3 on **Figure 1.** This site, located to the south of the Boyne River mouth, is redundant.

3.4.1 Dumpsite A1

Dumpsite A1 is considered as the primary all weather and all material (sand, silts, muds and gravels) site and has been used in the past for both port maintenance and capital dredging. The use of this site stretches back to pre-1990s, having been designated by the then Department of the Marine. Drogheda Port Company is the only permit holder in respect of the A1 dump site.

Site A1 is the proposed primary site for disposal of the future maintenance dredge material from the berths, artificial berth dredge pockets, ship swinging basins and overall channel i.e. from town to the river entrance, and catering for the full range of dredge material i.e. muds, silts, sand and gravels.

Additionally, this site is also sought for the sand material disposal from the river mouth and seaward approaches when dumpsite A2 is not available.

Despite the long historical use of the site there have been no changes to the depths at the site and dredge material migration is minimal as determined by the Hydrographic Survey Drogue Survey Nov 2006, Reviewed 2019. Refer to Attachment J of the licence application, Hydrographic Survey Dumpsite A1 and Attachment L, Survey Report on Drogue Release at Drogheda Offshore Dumpsite.

Dumpsite A1 is contained within the defined port limits of the Drogheda Port Company and is regulated as such from a navigational and control of shipping perspective. The site is located within the designated anchorage of Drogheda Port, approximately 3.5km from the shore. The minimum depth of the water is 10.7m, the maximum depth is 16.2m and the average depth is 13.45m at Chart Datum. The site is also within the designated ship quarantine area for the implementation of the International Ship and Port Facility Security Codes (ISPS) and EU Security Directive 65/2005.

The site is not used for fishing.

As stated above, dredge material has been disposed of at the site over the last three decades including the capital dredge schemes of 1999-2000 and 2006. There has been no significant impact or reduction on navigational depths or impact to the overall site hydrodynamics.

3.4.2 Dumpsite A2

A2 is the second dumpsite sought for the sands from the entrance and seaward approaches. This northern in-shore dumpsite is located within the defined pilotage limits of the Drogheda Port Company and regulated as such from a navigational and control of shipping perspective. The site is located within the nearshore surf zone. The minimum depth of the water is 2.3m, the maximum depth is 6.6m and the average depth is 4.5m at Chart Datum. The site is circa 0.7km from the shore, 4km north northeast of the River mouth. Refer to Attachment K Hydrographic Survey Dumpsite A2.

This dumpsite has been determined by hydraulic and hydrodynamic mathematic computer modelling to be advantageous to aid the coastal process and beach re-nourishment. This site is only suitable for sand material from the channel entrance and seaward approaches. The sand, being part of the coastal sediment transport regime and as part of a beneficial re-use process, is deposited at the dump site to aid the coastal process and beach nourishment. The current Dump at Sea Permit S0015-02 prohibits the use of this site in the months of July and August. This does not create any operational difficulty for Drogheda Port Company. Refer to Attachment B RPS Drogheda Port Company Maintenance Dredging Licence Application Hydraulic Modelling Study, 25 May 2019.

The site is used by local fishing vessels for razor clam fishing but vacated when Drogheda Port Company dredging operations are in progress i.e. the site's primary purpose, which is recognised by the Sea Fisheries Protection Authority. Refer to Attachment M EPA and SFPA Correspondence on the use of the 'A2' site.

The depth at this site is shallow with only 4 metres of water at Chart Datum. TSD dredgers use bottom doors to release their payload of DM and as such increase their draft immediately prior to DM release. Therefore, dredger access for safe material dumping is conditional on weather, wind directions and strength, state of the tide, sea conditions, dredger manoeuvrability etc and the use of the site instead of site A1 is at the sole discretion of the dredger master and the operationally safe condition to facilitate its use.

3.5 Uses of Dredge Material

In order to investigate alternative means of disposal or reuse of the material dredged from the River Boyne estuary and seaward approaches, a STRIVE report commissioned by the EPA and compiled by the Cork Institute of Technology entitled '*Guidance on the Beneficial Use of Dredge Material in Ireland*' was consulted by Drogheda Port Company. This document examines a wide range of beneficial uses of dredge material. These may generally be categorised as:

- **Engineering uses:** Involves beneficially using dredged material typically as an alternative to land-based resources (for example quarry aggregate) and is common in many engineering projects, e.g. land reclamation, beach nourishment and coastal protection works.
- **Environmental Enhancement:** Involves using dredged material as a resource with the potential for environmental enhancement when managed in a sustainable manner, e.g. habitat creation or sediment cell maintenance.
- **Agricultural and Product uses:** Suitable dredged material may be used to form useful products or in the agricultural sector once the appropriate physical, chemical and biological properties comply with the appropriate industry standards, e.g. manufactured topsoil, landfill cover or production of ceramics/bricks/concrete.

Over the last two decades the Drogheda Port Company has, through its previous Dump at Sea Permits issued by the Department of the Marine/Marine Licence Vetting Committee (two capital dredging campaigns and three maintenance dredging campaigns) and latterly the EPA (maintenance dredging), examined and exhaustively studied the feasibility of the alternatives and beneficial reuse of the dredge material from the River Boyne estuary and seaward approaches. The dredge material is of two distinct types, silt/mud and sand/gravel.

The constraints to the use of the material with respect to maintenance dredging are wide and varied, i.e. suitability, environmental constraints, impact on the coastal process, plant suitability, sustainability of beneficial re-use activity, material demand and/or market conditions and material quantity. In the case of Drogheda, sustainability, alternative and beneficial use of the dredge material must be considered against the findings of the RPS Hydraulic Modelling reports 2012 – updated 2019 (see Attachment B RPS - Drogheda Port Maintenance Dredging Licence Application Hydraulic Modelling Study 2019). The conclusion of the Report, in consideration of the coastal cell dynamic sediment transport regime, validates the allowed use of the material for considered alternatives and beneficial re-use.

The above options were originally investigated by Kirk McClure Morton and presented in an Environmental Statement for the capital dredging scheme in 1999 - 2000, refer to Attachment Z- 1 Options for Disposal. The findings of this investigation are summarised below. The conclusions drawn then remain valid given the intensification of environmental legislation and controls, now coupled with additional concerns of coastal flooding, water quality etc.

Engineering Uses

(i) Beach Nourishment: As described above, in relation to dumpsite A2, sands dredged from the entrance and seaward approaches to the River Boyne are deposited at the dump site to aid the coastal process and beach nourishment. No other engineering uses of the dredge material were considered suitable.

Environmental Enhancement

No uses of the dredge material for environmental enhancement were considered suitable.

Agricultural/Product Uses

(i) Concrete Manufacture (already engaged by Drogheda Port)

60,000m³ of the material, which is dredged from the Boyne estuary and seaward approaches, is brought ashore for use as a raw material in the construction industry. Sand is offloaded from the dredger using a clamshell grab bucket and placed in stockpiles on the quay. The material is left on the quay for 24 hours before being loaded using a front-end loader onto forty tonne articulated haulage trucks. Each load of sand is sheeted before it leaves the docks. Every load is weighed on the weighbridge before the sand is tipped in designated stockpiles at the Kilsaran Concrete facility. Once delivered to the concrete works, the sand requires no further processing to be suitable as a raw material for concrete manufacturing.

The sand is most suitable as a raw material for the preparation of concrete for use in buildings, roads and other civil engineering works.

The dredge material is inspected before and after unloading onto the quay side, any material deemed not to be suitable for concrete production can be used for pipe bedding, haunching and surrounding of pipes as it conforms with the specification IS EN 13242 i.e. fine and all-in aggregate. To date, no material has been deemed unsuitable for either use. Furthermore, less than 1% of the sand that was not used for concrete was instead used as pipe bedding material.

(ii) Road Sub-base Construction (already engaged by Drogheda Port)

Coarse and fine dredge material can be used in different aspects of road construction, including both as a structural material and as a general fill for the construction of road embankments and roadworks. Road and infrastructure projects in Ireland may potentially provide a destination for recycled dredge material; either coarse grained or potentially fine grained where the mechanical characteristics would need to adequately spread wheel loads. In general, coarse dredge material is more easily integrated into road construction than fine grained sediment. For fine-grained dredge material, it is important to determine the saline and organic content of the dredge material as these components impact on the viability of using dredge material in road construction due to their negative impact on mechanical strength when the dredge material is stabilised with cement.

The dredge material (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry.

(iii) Landfill Liner

Dredge material can be used as a secondary protection mineral liner in conjunction with another stabilising material. Precise quality control of the dredge material and the stabilising material mix is essential as the strength, landfill stability, permeability and durability of the lining system are important factors. The EPA has developed requirements for the properties of compacted clay liner which may be applicable when assessing the suitability of dredge material as a landfill liner.

Sediment samples were taken from both dumpsites and the dredging area and analysed for parameters stipulated in the Sampling and Analysis Plan provided by the Marine Institute, refer to Section B of the licence application. The material was found to consist of silt with varying proportions of sand and gravel. The gravel and the fines percentages exceeded the requirement outlined by the EPA. The moisture content of the dredge material also exceeded the requirement outlined by the EPA. The dredge material was also found to have a widely ranging clay content which would make it unsuitable for landfill cover, which requires a low clay content. For these reasons, the dredge material may not be suitable as a landfill cover.

However, dredge material (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry. It has been used previously as a capping.

(iv) Manufactured Topsoil

Dredge material may be directly used as topsoil material depending on its properties and the presence of organic material. However, the use of engineered manufactured topsoil allows the use of dredge material combined with recycled organic waste material to produce a manufactured topsoil that can improve soil growth characteristics.

It is suited to a location where a continuous supply of dredge material is available to supply a manufactured topsoil facility; an on-going and periodic maintenance dredging project is appropriate. In addition, a source of organic material is required with a local demand in evidence for the topsoil produced.

A mix of coarse and fine-grained material should be used but this needs to be determined on a site specific basis. Transport logistics are complex (dewatering and desalination required) but are crucial to treatment processes and economic feasibility. Dredge (sand) material brought ashore is available through the Drogheda Port contractor if sought by the industry. It has been used previously as a cover for equestrian centres etc.

(v) Production of Bricks/Ceramics

Fine grained dredge material can be used as a substitute for sand or clay to produce bricks. Physical and chemical analysis of the dredge material is necessary to assess suitability of dredge material. Dredge material is considered a suitable raw material for brick manufacture if the sand content does not exceed 30%. The physical analysis carried out on sediment samples taken from the dumpsites and the dredging area has shown that the sand content ranges from 12% to 99.2%, which exceeds the requirement for brick manufacture. For this reason, the dredge material may not be suitable for use in brick manufacture.

Proximity of brick manufacturing facility to the DM recovery area is also a major factor as the cost of DM transport may be significant.

4 Prescribed Body Consultation

4.1 Prescribed Body Observations

The Department requested observations on the Foreshore Licence application from a number of prescribed bodies. **Table 2** provides a summary of the prescribed bodies observations and the Drogheda Port Company's responses.

Table 2: Summary of Observations made by Prescribed Bodies and Drogheda Port Company's Response

Statutory Body	Drogheda Port Company (DPC) Response
<p>Department of Housing Planning and Local Government Water Marine Advisor: Environmental issues:</p> <p>Fisheries:</p> <p>The Water Marine Advisor summarised the available information on fisheries and concluded that there is no commercial or recreational fishing at the offshore dumpsite given that it is a spoil ground, port anchorages and quarantine area etc. There is no commercial fishing at the inshore dump site given the shallow water and proximity to the low water mark.</p> <p>Therefore, it can be concluded that there should be minimal impact on fisheries interest from the proposed maintenance dredging operations.</p> <p>Navigation:</p> <p>The Water Marine Advisor summarised the available information on navigation and concluded that the proposed maintenance dredging operation will have a positive and beneficial impact in relation to ongoing navigational activities in Boyne channel and seaward approaches thereto.</p> <p>Ecology:</p> <p>The Water Marine Advisor summarised the Natura 2000 sites in the River Boyne and the surrounding area and referred to the findings of the NIS that <i>“the operations will not adversely affect (either directly or indirectly) the integrity of any European site either alone or in combination with other plans and projects”</i>.</p> <p>This report concludes that with the correct implementation of mitigation measures (as set out in Section 6 of the said NIS) negative impacts on these European sites will be avoided.</p>	<p>In relation to the proposed conditions:</p> <ol style="list-style-type: none"> 1. No issue with the annual dredge quantities as per application. 2. Dumping at Sea permit application is in process. 3. No issue with Foreshore Licence term as long as it is for 8 years. 4. 30,000m³ will be retained within the coastal cell as per application. 5. No issue with exclusion of the A2 site in July/August. 6. Mitigation measures as described in Section 6.1.3.1 of NIS will be followed. 7. Agreed that notification of dredging shall be made to Directorate and vessel/plant will have appropriate certification.

Statutory Body	Drogheda Port Company (DPC) Response
<p>Water Quality:</p> <p>The Water Marine Advisor referred to the findings of the modelling of the sediment plume from the proposed dredging:</p> <p>The mobilisation of contaminants is not expected at concentrations likely to cause significant impacts given that most are at typical or expected background levels within the sediment. The potential for oil or fuel spills during the operation of dredging machinery is considered extremely unlikely (probability estimated at less than 5%).</p> <p>Therefore, it can be concluded that the potential impact from the Maintenance Dredging operations on water quality should be minimal.</p> <p>Coastal processes and sediment regimes within coastal sub cell:</p> <p>The Water Marine Advisor referred to the findings of the hydraulic modelling study of the coastal process in the area of the River mouth and dump sites:</p> <p>“The works undertaken for this study indicate that there is only a small movement of the dredge sand which has been deposited in the offshore dumpsite area back towards the beaches around the Boyne entrance. Consequently, dredged material dumped at this offshore site contributes very little to the inshore coastal processes along the Co Meath and Co Louth beaches adjacent to the Boyne Estuary. Beneficial re use of this material is wholly appropriate in lieu of disposal at the offshore dumpsite given the insignificant movement of this material.”</p> <p>The analysis of the results of the modelling undertaken for the IMAGIN project indicates a net annual bed sediment transport into Co Meath and Co Louth beach system from the SE is app 60,000m³ per year. This figure is consistent with historical dredging practices and changes observed on the beaches around the entrance to the Boyne Estuary. The study concluded that in order to ensure that there are no impacts on the overall coastal cell from the dredging operations, not more than an average annual quantity of 60,000m³ of dredged sand should be brought ashore for beneficial reuse. The remaining 30,000m³ of material that is on average required to be dredged from the Boyne Estuary entrance is equivalent to app 0.6mm sand depth over the active beach area which is considered to be minor and insignificant. Nonetheless Drogheda PC have given an undertaking that the 30,000m³ (average) of additional material to be dredged will be retained within the coastal cell either within the active system (i.e. dumped at Dump Site A2, depending on operating conditions) or placed in the offshore dump site (A1).</p>	

Statutory Body	Drogheda Port Company (DPC) Response
<p>Therefore, it can be concluded that subject to the retention of at least 30,000m³ of the dredged material within the coastal cells (A2 or A1) there should be minimal impact on the coastal processes and sediment regimes within the coastal sub cell within which the operation is located.”</p> <p>Dump Sites</p> <p>The Water Marine Advisor notes the descriptions of the dumpsites and the alternative uses examined for the dredge material in the application supporting documents.</p> <p>Water Marine Advisor’s Conclusions/Recommendations</p> <p>The Water Marine Advisor’s conclusions and recommendations were as follows:</p> <p>“Engineering is satisfied that the proposed maintenance dredging campaign will have minimal impact on fishing, navigation and subject to the mitigation measures on the environment. In particular Drogheda Port Co have demonstrated that the commercial reuse option (trials previously with the construction industry) is not an aggregate dredging or winning of sand operation being primarily driven by the necessity to dredge the mouth and seaward approaches resulting from accretion and weather related events. The Consultants have demonstrated that subject to retention of at least 30,000m³ of dredged material within the coastal cells (A2 or A1) there should be minimal impact on the coastal processes and sediment regimes within the coastal sub cell within which the operation is located.</p> <p>The current Dumping at Sea Permit S0015-02 prohibits the use of site A2 in the months of July and August. This does not create any operational difficulty for Drogheda PC and so can also be included as a Condition in the Foreshore Licence when/if granted.</p> <p>In conclusion Engineering has no objection to the granting of a Foreshore Licence subject to the following conditions:</p> <ol style="list-style-type: none"> 1. Annual dredged volumes not to exceed those quantities as set out in Table on Page 6 of Attachment A “Description of Proposed Works” i.e. 220,000m³ 2. A companion DAS Permit being obtained from the EPA to cover the disposal of dredged material to Disposal Sites A1, A2 as appropriate when the current Dumping at Sea Permit S0015-02 expires. 3. Further to 2 above the foreshore licence to run from 2021 to a date in tandem with the EPA DAS Permit period (a provisional final date of 10/04/2029 is set but this will be subject to adjustment if the EPA sets down a different DAS period with a different end date) 4. The retention of at least 30,000m³ of dredged material per annum within the coastal sells (A1, A2) in accordance with the recommendations as set out at 4.0 “Conclusions” in the RPS Report entitled 	

Statutory Body	Drogheda Port Company (DPC) Response
<p>‘Maintenance Dredging Licence Application Hydraulic Modelling Study’ – dated 25th May 2019 (ref Attachment B)</p> <p>5. Dredged material shall not be disposed of at Dump site A2 during the months of July and August in any year for which this Foreshore Licence remains valid</p> <p>6. Mitigation Measures as set out at Section 6 of the Natura Impact Statement (NIS) dated 22/11/2019 (ref Attachment R) inclusive of those as set out at S 6.1.3.1 of the said NIS to be adopted where relevant unless otherwise varied by or directed by other condition in this Licence</p> <p>7. Where appropriate Marine notice, lighting and markings to be carried out in consultation with the Maritime Safety Directorate, Department of Transport, Leeson Lane, Dublin 2 and all vessels/plant used in association with the proposed dredging campaigns to have appropriate certification from the Marine Survey Office.”</p>	
<p>Marine Institute:</p> <p>The Marine Institute notes the estimated annual quantity of material to be dredged, at 220,000m³, is the same that permitted in the existing licence.</p> <p>The Marine Institute notes “The actual quantity of material to be dredged in any one year will vary depending on a number of factors including river flow rates, storm events and wind direction (accelerated accretion of material occurs, particularly in the seaward approaches and the entrance channel, during periods with sustained winds with a strong easterly component). The estimated volume of material to be dredged seems justified based on quantities dredged in past dredging campaigns. Based on the data on actual quantities dredged over the period 2001 to 2019 provided by the applicant, the quantity of material dredged in any one year ranged from a minimum of 74,070m³ in 2008 to a maximum of 185,708m³ in 2018. The annual average over this period was 108,856m³.”</p> <p>In relation to the chemistry of the sediments to be dredged, the Marine Institute notes “The results of the chemical analysis of these sediment samples are, for the most part, below Action 1 level, as set out in the 2006 Guidelines for Assessment of Dredged Materials for Disposal in Irish Waters.”</p> <p>“The results showed that none of the analysed samples exceeded the upper limits set out in Guidelines. On the basis of these data the Marine Institute is of the view that, from a sediment chemistry perspective, the material to be dredged can be considered to be clean and the dredging, as proposed, is not likely to have a negative impact on the marine environment.”</p>	

Statutory Body	Drogheda Port Company (DPC) Response
<p>The Marine Institute notes that “the current Foreshore Licence application includes the proposal by Drogheda Port Company to bring ashore an annual maximum of 60,000m³ of sand dredged from the entrance channel and its subsequent commercial re-use. This activity was permitted under the previous Foreshore Licence (Ref. No. FS005747) granted in April 2013. The Marine Institute has no object in principle to this activity but, as previously stated, the Marine Institute is not aware of any clear national policy statement or policy guidelines on this activity and would recommend that these be developed without further delay.</p> <p>There are no aquaculture production sites or significant sea-fishing locations within, or adjacent to, this area to be dredged and therefore there will be no impacts on these activities.</p> <p>On the basis of the above the Marine Institute has no objections to a licence being granted.”</p>	
<p>Marine Survey Office:</p> <p>The conclusion of the Marine Survey Office is “that following careful consideration of section 6 of the application, this office is satisfied that there will be little or no adverse impact on navigational safety.”</p> <p>The Marine Survey Office proposed a condition:</p> <p>In addition to the proposed mitigating measures and public notice regime, the applicant is required to advise the U.K. Hydrographic Office of any dredging activity in order for charts to be kept up to date.</p>	
<p>Department of Agriculture, Food and the Marine (DAFM):</p> <p>The Department of Agriculture, Food and the Marine proposed three conditions to be attached to any dumping at sea permit (sic).</p> <p>The Department has no objections to the proposed dredging campaign, however due to the long duration of the permit sought and location within and in close proximity to SACs and Natura 2000 sites, best practice must be followed rigorously during the campaign to ensure the dredging, recovery and dumping at sea operations, as potentially disruptive activities do not adversely impact the local environment, flora and fauna as well as safe navigation and operations.</p> <p>The Department is aware of a historical mussel fishery in the area directly adjacent to the shipping channel and have no data on the current status of the sub tidal <i>Mystiques delis</i> population in the area. The applicant should consult directly with any active local fishers on their proposed maintenance dredging programme.</p> <p>It is recommended that the applicant consult with the local angling clubs. The Boyne is also one of the largest salmon producing catchments however the salmon area currently below the conservation limit for the catchment and all</p>	<p>The DAFM has requested that DPC consult directly with any active local fishers, particularly a historical closed mussel fishery, on their proposed maintenance dredging programme and that DPC consult with the local angling clubs.</p> <p>DPC responds by reiterating that a meeting was held with IFI and SFPA who have direct responsibility for the closed mussel fishery. The IFI and SFPA raised no issues at this meeting and did not provide any objection to the Foreshore licence application.</p> <p>DPC responds that it will not be consulting with any angling clubs due to the fact that advertisements for both the Dump at Sea Permit application and Foreshore licence application were placed in local and national newspapers and no</p>

Statutory Body	Drogheda Port Company (DPC) Response
<p>effort must be made to minimise the impact on the fish species and habitat in this SAC system.</p>	<p>responses were received from any angling clubs. DPC also wishes to state that it has not received any complaints or representation of any fishery clubs on any issues with respect to the port operations during the time served by the Harbour Master, Captain Martin Donnelly.</p>
<p>Department of Culture, Heritage and the Gaeltacht (DCHG)</p> <p>Department of Culture, Heritage and the Gaeltacht's comments were as follows:</p> <p>Nature Conservation</p> <p>The proposed seabed dredging operations within Drogheda Port has been evaluated by a Natura Impact Statement and other documentation. The conclusion of the Natura Impact Statement document is that the proposed works are unlikely to pose a significant likely risk to nature conservation interests in the vicinity provided appropriate mitigation is implemented. The Department concur with this conclusion.</p> <p>The proponent should also ensure that other activities not covered by the Foreshore Consent application take account of requirements for assessment under European and National legislation for nature conservation.</p> <p>Underwater Archaeology</p> <ul style="list-style-type: none"> • No dredging shall take place within 10m of the wreck known as the "Boyne Boat" (53.72443N, 6.28670W) located in close proximity to the Queensborough navigational beacon. • No dredging shall take place within 10m of the wrecks of the four barges (053 43 09.14N, 006 18 30.22W) located adjacent to the turning area at Harbourville, Stagreenan. • Drogheda Port shall forward a chart to the National Monuments Service showing the above exclusions in relation to the proposed dredging area in advance of any dredging taking place. 	<p>The DCHG have made the following requests:</p> <ul style="list-style-type: none"> • No dredging shall take place within 10m of the wreck known as the "Boyne Boat" (53.72443N, 6.28670W) located in close proximity to the Queensborough navigational beacon. • No dredging shall take place within 10m of the wrecks of the four barges (053 43 09.14N, 006 18 30.22W) located adjacent to the turning area at Harbourville, Stagreenan. • Drogheda Port shall forward a chart to the National Monuments Service showing the above exclusions in relation to the proposed dredging area in advance of any dredging taking place. • DPC agrees to adhere these requests and has no further comment.
<p>Sea Fisheries Protection Authority</p> <p>The Inspector's comments were as follows:</p> <p>"1 Wild Fisheries</p> <p>Historically the lower stretches of the River Boyne were commercially fished for the blue mussel, <i>Mytilus edulis</i>. Following a settlement to the Mornington fisherman's group the classified mussel beds were declassified and no fishing currently take place. The area is no longer part of the routine shellfish sampling programme in the river.</p>	

Statutory Body	Drogheda Port Company (DPC) Response
<p>“An extensive classified shellfish bed for razor clams <i>Ensis siliqua</i> occur north and south of the mouth of the River Boyne. The razor clams fishery is prosecuted by dedicated vessels from the ports of Dundalk, Clogherhead, Skerries and Balbriggan on a regular basis. There has been no issue in the past with the SFPA conduction control activities in the area.</p> <p>“2. Shellfish Production Areas</p> <p>The foreshore application area is adjacent to the classified production area of Gormanstown. The depth and type of water within the applied area is such that fishing for razor clams cannot be undertaken by the razor fleet and should therefore be of little concern. The razor fleet is fully aware of annual operations of the DPC dredging operations and knows the locations of the licenced dumpsites for dredged spoil.</p> <p>There is no issue with the SFPA conducting official control activities during the dredging/dumping campaign.</p> <p>“3. Seafood Safety</p> <p>The dredging operations have in the past caused no concern regarding both the removal and deposition of spoil on the licenced dumpsites which area adjacent to the Gormanstown shellfish production area. The current application does not differ from the methodology employed in previous campaigns and therefore should not cause any issue with the quality of harvested razor clam or any microbiological contamination. The operators regularly liaise with the SFPA Eastern region regarding operations and are also aware the need for immediate contact should a pollution event occur while the dredger is operating both in the river and at sea.”</p>	
<p>Inland Fisheries Ireland</p> <p>IFI comments were as follows:</p> <p>“The application contained a number of detailed reports on natura and environmental assessments. The Drogheda Port Company has a 5 yearly sediment monitoring programme with the Marine Institute to assess the long-term effects of dredging on sediment in the area. This is very important to determine the impact that the disturbance of silt has especially on sea trout who can migrate along the coast and visit different estuaries.</p> <p>On Pg 95 of the nature impact report there is a detailed list of fish species that are found in the estuary. IFI would request that where possible the scheduling of works takes into account the migratory window for salmon, sea trout, eel and sea lamprey. We recommend scheduling works outside the March – May period when salmon and sea trout smolts are travelling through the estuary and when shad are spawning. If works need to be undertaken in this window following extreme weather events we would request that work does not take place on a low tide as this reduces the dilution of suspended sediment in the water column.</p>	<p>The IFI have requested the scheduling of the works outside the March- May migratory period. The IFI further qualify if works are needed then to be undertaken outside of the low water period.</p> <p>DPC responds that unfortunately the March - May exclusion period is not possible as it is not possible to predict or schedule the storm events that generate the navigation restrictions due to accretion at the entrance of the channel.</p> <p>However, DPC can commit to no dredging over the low water period as indeed is currently the practice. The beneficial re-use dredging with the current contracted plant does take place from 1st April onward. However, currently that's only 1 load per day, on a rising tide, generally</p>

Statutory Body	Drogheda Port Company (DPC) Response
<p>The application states (page 116 Environmental report for dredging) that</p> <p>“Fish</p> <p>Assuming the full and successful implementation of the mitigations measures, there will be no significant residual impacts on the fish populations at any geographical scale”</p> <p>The effect of dredging on the habitat and the noise generated during the operation while potentially significant the temporary nature of the work coupled with the occasional timings of the dredging operations (as shown in the dredging history) spread out across different months per year will mitigate the effects of the dredging. The amount of dredging can vary from 1 operation to 5 but averages at 2.5 operations per year.</p> <p>There is a detailed pollution plan in place as outlined in the Natura impact statement report.</p> <p>The Boyne Estuary is a well renowned angling location with particular emphasis on sea trout and bass. IFI would recommend liaising with the local angling clubs. The Boyne is also one of the largest salmon producing catchments however the salmon are currently below the conservation limit for the catchment and all effort must be made to minimise the impact on the fish species and habitat in this SAC system.</p>	<p>daylight, Mon-Fri. This current TS Dredger is small in its physical dimensions and capacity, therefore its impact within the scale of the 100m wide channel at the breakwaters is minimal and diminishes further as the dredger operates out into the open sea to the</p> <p>700m channel outer extremity. Additionally, beneficial re-use dredging only takes place at the entrance and seaward approaches, not within the enclosed estuary, berths and swing basins.</p> <p>This may be subject to change/frequently with a change of contractor or plant.</p>

5 Environmental Considerations

5.1 Population and Human Health

5.1.1 Introduction

Aspects of population and human health which are addressed in this chapter are:

- Human Health
- Aquaculture and Shellfish Fishery
- Commercial Fishing
- Shipping and Navigational Safety
- Employment
- Recreational Amenity

The baseline information provided in the application for each of these topics is examined and the potential effects of the proposed dredging project are identified. The proposed mitigation measures considered and the likely residual effects are described.

5.1.2 Baseline Environment

Drogheda Port

Drogheda Port is an open public port for all i.e. commercial ships, trawlers, local fishing vessels, yachts and small marine leisure craft.

The marine activities of the Port are as follows:

- The primary marine activity on the River Boyne is the commercial shipping to and from Drogheda Port and its associated facilities, five in number.
- A small number of seagoing trawlers use the Port occasionally for repairs particularly if the adjacent Clogherhead Harbour is at capacity.
- A small number of inshore shell fishing boats are based within the river sailing and berthing on a daily basis.
- In the summer months a small number of tourist yachts visit Drogheda.
- Local day boats, fast power craft, rescue boats, rowers and canoes use the River.
- Maritime Festival events and other marine tourism related events supporting local and regional tourism development.

Drogheda Port Company and its operators are major employers within the northeast region both in terms of direct and indirect employment. Additionally, there are three private import/export facilities located on the commercial estuary that depend on the river access for seagoing vessels to conduct their business.

Coastal Area to North and South

The soft shallow entrance to the Boyne estuary lies roughly midway within the coastal cell between the hard rock outcrops of Clogherhead in the north and Bremore to the south. The coastline characteristic is one of a shallow shoaling sandy horseshoe bay where there is net annual nearshore sediment transport movement of material from south to north. The sandy beaches stretching northwards and southwards from the Boyne estuary are important recreational and tourist amenities in the area.

Aquaculture and Shellfish Fishery

There are no aquaculture production sites or significant sea-fishing locations within, or adjacent to, the area to be dredged.

Historically the lower stretches of the River Boyne were commercially fished for the blue mussel, *Mytilus edulis*. Following a settlement to the Mornington fisherman's group the classified mussel beds were declassified and no fishing currently take place. The area is no longer part of the routine shellfish sampling programme in the river.

An extensive classified shellfish bed for razor clams *Ensis siliqua* occurs north and south of the mouth of the River Boyne. The razor clam fishery is operated by dedicated vessels from the ports of Dundalk, Clogherhead, Skerries and Balbriggan on a regular basis. There has been no issue in the past with the SFPA conduction control activities in the area.

The foreshore application area is adjacent to the classified shellfish production area of Gormanstown. The depth and type of water within the licence application area is such that fishing for razor clams cannot be undertaken by the razor fleet and should therefore be of little concern.

Commercial Fishing

There are no significant sea-fishing locations within, or adjacent to, the area to be dredged. There is no commercial or recreational fishing at the offshore dumpsite given that it is a spoil ground port anchorage and quarantine area. There is no commercial fishing at the inshore dump sites given the shallow water and proximity to the low water mark.

Angling

The Boyne Estuary is a well renowned angling location with particular emphasis on sea trout and bass. The Boyne is also one of the largest salmon producing catchments. However, the salmon are currently below the conservation limit for the catchment. There is a government ban on all licensed salmon fishing on the river Boyne.

Characteristics of Dredge Material

Analysis of the dredge material determined that it consists of silt with varying proportions of sand and gravel and that it is not likely to contain any viruses, bacteria, yeasts, parasites of concern. The Office of Radiological Protection has stated that the dumping of these dredge materials at sea will not result in a radiological hazard. As the results of the suite of analyses on the range of analytes examined showed that none of them exceeded the upper limits, measurable physical, chemical or biological persistence is considered very unlikely. Accumulation and biotransformation in biological materials or sediments is also considered very unlikely.

Samples of sediment from the area to be dredged were collected in February 2019 at the locations shown in Figure 5.8 in the document entitled “*Environmental Report for maintenance dredging at Drogheda Port, Drogheda, Co. Meath*” dated 6th December 2019, prepared by AWN Consulting (AWN 2019) and submitted by the applicant.

The results of the chemical analysis of these sediment samples are, for the most part, below Action 1 level, as set out in the 2006 *Guidelines for Assessment of Dredged Materials for Disposal in Irish Waters*. Mercury, Aluminium, Chromium, Lithium and Manganese were all below the lower level guidance value. Arsenic was above the lower action level at stations DP 3-6 and 8-15. Cadmium was above the lower action limit for stations DP 6 and 11. Copper was above the lower action limit for stations DP 3 and 8. Lead was above the lower action limit for station DP 11. Nickel was above the lower action limit for stations DP 3-9 and 11-15. Zinc was above the lower action limit for station DP 11. All stations were below the lower action limit for all organochlorines including γ -HCH (Lindane). Six of the PCBs plus the sum of the 7 PCBs were above the lower action limit at station DP 16. Total extractable hydrocarbons ranged from 0.003 to 0.56 g/kg and all stations were below the lower guidance level. Tributyltin (TBT) and dibutyltin (DBT) were below the lower action limit for all stations. The sum of the 16 PAHs was below the lower action limit for all stations except DP 16. The results showed that none of the analysed samples exceeded the upper limits set out in Guidelines.

5.1.3 Potential Impacts

Human Health

The dredging operation has the potential to affect the health of the recreational users of the beaches north and south of the estuary. There is also the potential to affect the health of the consumers of the razor clams and any fish from the vicinity of the dredging operation or the spoil dumping operation.

Aquaculture and Shellfish Fishery

There are no aquaculture production sites or significant sea-fishing locations within, or adjacent to, the area to be dredged. Therefore, there will be no impacts on these activities.

However, the dredging activity has the potential to disrupt the razor clam fishery in the vicinity of dumpsite A2, for the duration of the dredging operation.

Commercial Fishing

The dredging activity has the potential to disrupt any commercial fishing in the general vicinity of the dumpsites, for the duration of the dredging operation.

Shipping and Navigational Safety

The dredging activity has the potential to disrupt the commercial shipping in the estuary and coastal area in the vicinity of dumpsite A1, for the duration of the dredging operation. The dredging operation will ensure safe navigation for shipping using the approaches and channel to Drogheda Port.

Employment

Any disruption to the water depths for safe navigation of seagoing vessels to access the port will immediately impact on Drogheda Port Company and its operators' ability to maintain business and employment. The same applies to the private facilities, their business and employment. The dredging operation will ensure the continuation of direct and indirect employment in the Port and in the three private companies import/export facilities located on the commercial estuary that depend on the river access for seagoing vessels to conduct their business.

Angling Recreational Amenity

The dredging activity has the potential to disrupt angling and the recreational use of the estuary and coastal area in the vicinity of the dumpsites, for the duration of the dredging operation.

5.1.4 Mitigation Measures

Local Notices to Mariners will be issued and posted on the Drogheda Port Company website www.droghedaport.ie. Port and marine related interest parties will be circulated on the Port's daily shipping programme. The dredging plant will operate to a defined programme. The dredging plant will comply with the International Collision Regulations and will exhibit the appropriate daytime and night-time navigational signals for a vessel of its size and operation. The dredging plant will comply with the Port byelaws and directions of the Harbourmaster.

5.1.5 Likely Significant Effects

Human Health

On the basis of the analyses of the dredge material, the Marine Institute concluded that, from a sediment chemistry perspective, the material to be dredged can be considered to be clean and the dredging, as proposed, is not likely to have a negative impact on the marine environment. The dredging operation is considered unlikely to have an impact on human health.

Aquaculture and Shellfish Fishery

The razor clam fleet is fully aware of annual Drogheda Port Company dredging operations and knows the locations of the licensed dumpsites for dredged spoil.

The SFPA, in its observations, noted that the dredging operations have in the past caused no concern regarding both the removal and deposition of spoil on the licensed dumpsites which are adjacent to the Gormanstown shellfish production area. The dredging methodology proposed in the current application does not differ from the methodology employed in previous campaigns. The SFPA considered that therefore it should not cause any issue with the quality of harvested razor clam or any microbiological contamination. The dredging operators regularly liaise with the SFPA Eastern Region regarding operations and are also aware of the need for immediate contact should a pollution event occur while the dredger is operating both in the river and at sea.

The proposed dredging operation is not expected to have a significant effect on aquaculture and shellfish fishery.

Commercial Fishing

The proposed dredging operation will be a continuation of long-established dredging operations, using long-established dumpsites. The proposed dredging operation is not expected to have a significant effect on commercial fishing.

Shipping and Navigational Safety

Drogheda Port has a long history of dredging without impact or recorded incident on adjacent landowners. Drogheda Port Company within the past twenty years has carried out two major capital dredging campaigns whereby a large number of dredging plant items were located within the estuary on a 24/7 operational basis without incident or disruption to adjacent landowners or the commercial or leisure activities of the wider community.

The dredging operation will have a positive significant effect on shipping and navigational safety in that it will ensure safe navigation for shipping using the approaches and channel to Drogheda Port.

Employment

The dredging operation will have a positive significant effect on employment in that it will ensure the continuation of direct and indirect employment in the Port and in the three private companies import/export facilities located on the commercial estuary that depend on the river access for seagoing vessels to conduct their business.

Angling and Recreational Amenity

The proposed dredging operation will be a continuation of long-established dredging operations, using long-established dumpsites. The proposed dredging operation is not expected to have a significant effect on angling and recreational amenity.

5.2 Biodiversity

5.2.1 Introduction

The aspects of biodiversity which are addressed in this chapter are:

- Habitats
- Mammals, Birds, Fish, Invertebrates and Reptiles
- Species of Conservation Concern
- Designated Natura 2000 Sites

The baseline information provided in the application for each of these topics is examined and the potential effects of the proposed dredging project are identified. The proposed mitigation measures considered and the likely residual effects are described.

5.2.2 Environmental Baseline

Table 3 summarises the areas designated for nature conservation in the wider area. **Table 4** summarises the biodiversity baseline and identifies the key ecological receptors in the vicinity of the proposed maintenance dredging project.

Table 3: Designated Areas for Nature Conservation

Biodiversity Receptor	Relevance to Project	Valuation	Key Ecological Receptor?
Boyne Coast and Estuary SAC	Dredging operation within site	International	Yes
River Boyne and River Blackwater SAC	Dredging operation within site	International	Yes
Rockabill to Dalkey Island SAC	Site circa 15km south of Boyne estuary	International	Yes

Biodiversity Receptor	Relevance to Project	Valuation	Key Ecological Receptor?
Boyne Estuary SPA	Dredging operation within site	International	Yes
River Boyne and River Blackwater SPA	Site circa 3.5km upstream of westernmost part of dredging area	International	Yes
River Nanny and Estuary SPA	Site circa 3.7km south of Boyne estuary	International	Yes
Dundalk Bay SPA	Site circa 10km north of Boyne estuary	International	Yes
Rockabill SPA	Site circa 13km south of Boyne estuary	International	Yes
Laytown Dunes/Nanny Estuary pNHA	Site circa 3.7km south of Boyne estuary	National	Yes
Boyne Coast and Estuary pNHA	Dredging operation within site	National	Yes
Dowth Wetland pNHA	Site circa 6.1km upstream of westernmost part of dredging area	National	Yes
Boyne River Islands pNHA	Site circa 4.2km upstream of westernmost part of dredging area	National	Yes
Other European sites (SACs and SPAs)	Sites more than 15km from the dredging area	International	No
Other NHAs and pNHAs	Sites more than 15km from the dredging area	National	No

Table 4: Summary of Biodiversity Receptors

Biodiversity Receptor	Relevance to Project	Valuation	Key Ecological Receptor?
Habitats			
Estuarine	Boyne Estuary encompasses two Annex I habitats: Estuaries [1130] and Mudflats and sandflats not covered by seawater at low tide [1140].	International	Yes
Fauna species			
Wintering waterbirds	Wintering bird populations that occur within the Boyne Estuary use mudflats in the polders which are contained behind navigation walls that define the river channel. These polders become exposed at low tide and are used for feeding and roosting by wintering bird species. The 2018 - 2019 wintering bird surveys recorded 34 wintering waterbird species across 13 count areas. 20 of these were SCI species associated with the Boyne Estuary SPA, Nanny River and Estuary	International	Yes

Biodiversity Receptor	Relevance to Project	Valuation	Key Ecological Receptor?
	SPA and Dundalk Bay SPA. 14 non-SCI wintering bird species also recorded.		
Little tern	Internationally important numbers of breeding Little tern occur at a shingle beach at Baltray, on northern side of estuary mouth. During the 2018 surveys, a maximum count of 32 Little tern were recorded at colony, and a total of 7 chicks fledged	International	Yes
Other terns	Roseate tern, Common tern and Sandwich tern were recorded during the breeding bird surveys	International	Yes
Otter	Otter can be found throughout the River Boyne and are known to occur within the main channel and estuary within which the dredging operation occurs. It is likely that there are breeding sites on the River Boyne, although no holts were identified during surveys. It is unlikely that holts would be located either within or immediately adjacent to the maintenance dredging works as there is a lack of suitable habitat for holts along the river channel which is enclosed by training walls.	International	Yes
Harbour porpoise	The Harbour porpoise is the most commonly recorded cetacean species in Irish waters and is present all around the coast, predominately in inshore waters. In a 2011 hydro-acoustic survey, of 51 sightings of 83 animals, only a small number of sightings were made north of Skerries, with no sightings recorded directly offshore from the Boyne Estuary. 3 sightings of an individual animal were made in 2019 survey for the Environmental Report (AWN 2019)	International	Yes
Harbour seals	The 2019 review of the NBDC database returned four records for Harbour seal within the Boyne Estuary in the period 2014-2018, totalling 19 individuals. Outside of the estuary, the nearest record was at Clogherhead, Co. Louth. In the course of the current survey (AWN 2019), Harbour seals were observed swimming in the Boyne Estuary on three occasions as part of the constant effort watch. Harbour seals were also observed hauled out on the mudflats to the north and south of the channel.	International	Yes

Biodiversity Receptor	Relevance to Project	Valuation	Key Ecological Receptor?
	A particularly notable haul-out was within Baltray Bay, where up to 15 individuals were recorded.		
Other marine mammals	The data collected in the course of the desk study and the field survey for the application suggests that the Boyne Estuary and adjacent marine waters are of low importance for marine mammals, with the exception of Common seals which use the estuary for hauling out.	Local importance (higher value)	Yes
Atlantic salmon	Atlantic salmon have been recorded in the Boyne River system and they are a Qualifying Interest in the River Boyne and River Blackwater SAC (site code: 002299) upstream of the Boyne Estuary.	International	Yes
River lamprey	River lamprey have been recorded in the Boyne River system.	International	Yes

5.2.3 Potential Impacts

Based on the baseline ecological environment and the extent and characteristics of the proposed activity the following potential impacts on biodiversity have been identified:

- Habitat loss and disturbance impacts
- Effects from siltation
- Fauna disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability
- Mortality as a result of entrapment
- Mortality as a result of collision.

The potential impacts of the maintenance dredging operation on designated sites are summarised in **Table 5**.

Table 5: potential impacts of the maintenance dredging operation on designated sites

Designated Site	Potential Impact	Discussion
Boyne Coast and Estuary SAC	<ul style="list-style-type: none"> • Habitat loss or disturbance • Effects of siltation 	A limited area of Estuaries [1130] will be disturbed and there will be no permanent loss of the habitat, which is resilient to disturbance due to the dynamic nature of the estuarine and marine system. The sediment plume created by dredging operations has been modelled and is shown to be localised to the dredger, to be of low concentration and to disperse

Designated Site	Potential Impact	Discussion
		relatively quickly in the tidal conditions. An accidental pollution event is unlikely to occur, however if it occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats and integrity of the Boyne Coast and Estuary SAC at international to local geographical scale.
River Boyne and River Blackwater SAC	<ul style="list-style-type: none"> • Disturbance and displacement impacts • Mortality as a result of a pollution event • Reduced prey availability • Mortality as a result of entrapment 	There will be no impact on spawning habitat of QI fish species, the temporary nature of the works means that there is limited potential for effects on fish migrating through the Boyne Estuary, and the risk of entrainment by the suction dredger is negligible. An accidental pollution event is unlikely to occur, however if it occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats within which Otter occur and the integrity of the River Boyne and River Blackwater SAC at international to local geographical scale.
Rockabill to Dalkey Island SAC	<ul style="list-style-type: none"> • Disturbance and displacement impacts • Mortality as a result of collision • Effects of siltation 	<p>There will be no impact on QI reef habitat as it is too distant from the area of dredging operations for there to be any adverse effect. Low usage of the coast in the vicinity of the operation by Harbour porpoise and slow speeds at which the dredger travels, along with the avoidance behaviour of Harbour porpoise, means that the risk of collision is negligible to individuals travelling outside the site beyond minor avoidance.</p> <p>Spawning habitat of QI fish species, the temporary nature of the works means that there is limited potential for effects on fish migrating through the Boyne Estuary, and the risk of entrainment by the suction dredger is negligible. An accidental pollution event is unlikely to occur, however if it occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which Otter occur and the integrity of the Rockabill to Dalkey Island SAC at local geographical scale.</p> <p>The dredging operation will not affect the integrity of the Rockabill to Dalkey Island SAC at any geographic scale.</p>
Boyne Estuary SPA	<ul style="list-style-type: none"> • Disturbance and displacement impacts • Mortality as a result of a pollution event 	The wintering SCI species are not at risk to disturbance from the dredging works as there will be no dredging activity within the polders where roosting and feeding occurs, in addition the river channel is regularly frequented by commercial shipping and fishing activity associated with Drogheda Port, this baseline condition will not change as a result of the

Designated Site	Potential Impact	Discussion
	<ul style="list-style-type: none"> Reduced prey availability 	<p>application. Breeding Little terns at Baltray did not show any disturbance at the colony towards dredging activity during 2018 surveys. Breeding tern colonies at Rockabill are a significant distance, c.20km, from the dredging operations and are not at risk to disturbance impacts.</p> <p>SCI tern species are shallow diving feeders, their feeding efficacy and prey item abundance could be impacted by the dredging operation. The hydraulic modelling carried out has shown that the total suspended sediment concentrations are very low and disperse relatively quickly with the tidal flow (RPS, 2019). There is some overlap of the sediment plume and area used by feeding terns, however suspended sediments will not impede tern feeding by way of reduced visibility. The dredging operation will not result in the removal of any perceptible numbers of prey items to cause any reduction of prey biomass available to feeding terns.</p> <p>An accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which roosting and feeding wintering and/or breeding SCI species occur and could affect the integrity of the Boyne Estuary SPA, at an international to local geographical scale.</p>
<p>River Boyne and River Blackwater SPA</p>		<p>Alkaline fens occur a significant distance upstream of the dredge site in the Blackwater catchment, and there is no risk of connectivity between the zone of influence of the maintenance dredging operation and the QI habitat. The nearest alluvial woodland is c.5.6km upstream of the dredging works, hydraulic modelling of the dredging works shows the sediment plume does not extend more than 600m upstream (RPS, 2019).</p> <p>There will be no impact on the habitat of Atlantic salmon within the SAC as a result of the works. The temporary nature of the works and the avoidance behaviour of salmonids from sediment plumes, means that there is limited potential for effects on fish migrating through the Boyne Estuary. The risk of entrainment by the suction head is negligible.</p> <p>There will be no impact on the habitat of River lamprey within the SAC as a result of the works. The temporary nature of the works means that there is limited potential for</p>

Designated Site	Potential Impact	Discussion
		<p>effects on fish migrating through the Boyne Estuary. The risk of entrainment by the suction head is negligible.</p> <p>An accidental pollution i.e. hydro-carbon leak or spill during the dredging operation could affect water quality in the tidal reaches of the River Boyne, Boyne Estuary and Irish Sea. An accidental pollution event of a sufficient magnitude, either along or cumulatively with other pollution sources, could potentially affect the quality the of aquatic and marine habitats that support the qualifying interest species of the SAC and could potentially result in mortality of qualifying interest species.</p>
<p>River Nanny and Estuary SPA, Dundalk Bay SPA, Rockabill SPA</p>	<ul style="list-style-type: none"> ● Disturbance and displacement impacts ● Mortality as a result of a pollution event 	<p>The wintering SCI species are not at risk to disturbance from the dredging works as there will be no dredging activity within the polders where roosting and feeding occurs, in addition the river channel is regularly frequented by commercial shipping and fishing activity associated with Drogheda Port, this baseline condition will not change as a result of the application.</p> <p>An accidental pollution event is unlikely to occur, however if it occurs at a sufficient magnitude it could affect the quality of the intertidal habitats within which roosting and feeding wintering and/or breeding SCI species occur and could affect the integrity of the Nanny River and Estuary SPA, Dundalk Bay SPA, Rockabill SPA, at an international to local geographical scale.</p>
<p>Laytown Dunes/Nanny Estuary pNHA</p>		<p>See Nanny River and Estuary SPA, above. In the absence of mitigation, an accidental pollution event is unlikely to occur, however if occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats used by wintering bird species which are associated with this pNHA, and therefore, the integrity of the Laytown Dunes/Nanny Estuary pNHA which could result in a likely significant effect at a national to local geographic scale.</p>
<p>Boyne Coast and Estuary pNHA</p>		<p>See Boyne Coast and Estuary SAC, above. In the absence of mitigation, an accidental pollution event is unlikely to occur, however if it occurs at a sufficient magnitude, and in the absence of mitigation, it could affect the quality of the intertidal habitats and associated fauna, and therefore, the integrity of the Boyne Coast and Estuary pNHA which</p>

Designated Site	Potential Impact	Discussion
		could result in a likely significant effect at a national to local geographic scale.
Dowth Wetland pNHA		This designated site is located beyond the extent of the tidal influence of the Boyne Estuary, and therefore the dredging operation is not at risk of affecting the integrity of the Dowth Wetland pNHA.
Boyne River Islands pNHA		This designated site is c.4.2km upstream of the dredging works. Hydraulic modelling of the dredging works shows the sediment plume does not extend more than 600m upstream (RPS, 2019), and therefore the dredging operation is not at risk of affecting the integrity of the Boyne River Islands pNHA.

5.2.4 Mitigation Measures

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed activity on biodiversity. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

Mitigation measures to protect water quality in the receiving environment which includes the tidal reach of the River Boyne, Boyne Estuary and the Irish Sea during the dredging operation include:

- Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise. Drogheda Port Company is the Harbour Authority for Drogheda Port as defined in the Harbour Act 1996 and Harbours (Amendment) Act 2009. Drogheda Port through the powers of the Harbourmaster is the Local Competent Authority for pollution response as per the Sea Pollution Act 1991, Sea Pollution (Amendment) Act 2009 and the Merchant Shipping (Salvage and Wreck) Act 1993. Under the provisions of the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990, Harbour Authorities must have a contingency plan and requirements for a Tier 1 response in the event of a pollution incident. Drogheda Port has an Emergency Plan (updated June 2014) that includes its Pollution Response Plan. The plan was attached in Appendix 8.4 of the Environmental Report (AWN 2019) submitted with the licence application. A Tier 1 level equipment stock is retained on site in a fixed and mobile unit for immediate deployment. Drogheda Port also maintains a contract with a pollution contractor for expertise, labour and equipment response if and when required, supplementing its internal resources.

The Emergency Plan (including Pollution Response Plan) is the port's generic document for all activities within the port including dredging vessels, these being subject to the same risks as commercially trading vessels.

- Dredging vessels also have their own approved Pollution Plans with retained pollution response equipment on board.
- An emergency spill kit and oil spill containment equipment will be held on board by dredging operators to be able to deal with potential oil spills during dredging operation.
- An Environmental Liabilities Risk Assessment (2015) was prepared by Aquafact International Services Ltd and is in-use for existing dredging and disposal operations (S00015-02) at Drogheda Port. This document identifies potential risks, e.g. a pollution event, likelihood of risks and mitigation measures to be taken if an event occurs and is contained in Appendix 8.4 of the Environmental Report (AWN 2019).

5.2.5 Potential Cumulative Impacts

Maintenance dredging operations are currently regularly undertaken at the dredging site. The renewal licence application does not propose to change the operations in any way. The purpose of the maintenance dredging operations at Drogheda Port is to maintain the safe navigation depths for the commercial traffic, fishing and leisure users of the River Boyne, Drogheda Port Company and its facilities and the town of Drogheda. Continuation of maintenance dredging operations will not increase the level of traffic in the River Boyne estuary and Irish Sea. Existing baseline conditions in the main channel and estuary, the intermittent and transient nature of noise generated by routine traffic into and out of Drogheda Port, combined with the sporadic and time-limited nature of the dredging operations are not predicted to change as a result of renewed maintenance dredging.

Razor clam fishing occurs off the coast of Drogheda under licence from the Sea Fisheries Protection Authority. The razor clam fishers are discouraged from fishing within the shipping fairway to and from Drogheda Port. These fishing methods create suspended solids and turbidity in the water column which are part of the current baseline.

There will be no significant cumulative impacts on water quality in the receiving environment, as a consequence of the proposed activity acting in-combination with other plans and projects, assuming the mitigation measures outlined in **Section 5.2.5** above will be implemented in full.

There is potential for cumulative impacts as a consequence of the proposed activity acting in-combination with other plans and projects, on nearby European sites and pNHAs. In light of the above cumulative impact assessment, there is no risk of cumulative habitat loss as the proposed activity does not overlap with any designated site, or potential impacts on water quality in the downstream surface water environment and designated sites in the receiving environment considering mitigation measures outlined above.

5.2.6 Likely Significant Effects

Residual likely effects on biodiversity are summarised in **Table 6**, below. It is noted that a Natura Impact statement was submitted by the applicant and this has been the subject of a technical review, Hartley Anderson *Appropriate Assessment Screening and Appropriate Assessment Drogheda Port Foreshore Licence Application Report to Department of Housing, Local Government and Heritage*, (March 2021).

Table 6: Residual Effects On Biodiversity

Designated sites	None of the potential impacts associated with the proposed activity will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, the Rockabill to Dalkey Island SAC, the Boyne Estuary SPA, the River Nanny and Estuary SPA, the River Boyne and River Blackwater SPA, Rockabill SPA and Dundalk Bay SPA. Therefore, there will not be any residual impacts associated with the proposed activity that will adversely affect the conservation objectives supporting the conservation condition of the qualifying interests/special conservation interests of those European sites, or integrity of nationally designated pNHAs in the River Boyne, Boyne Estuary or receiving Irish Sea.
Estuary Habitats	The residual impact on the proposed dredging on the estuarine intertidal and subtidal habitats is considered in the context of the benthic fauna below.
Intertidal Benthic Fauna	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on intertidal benthic fauna at any geographical scale.
Subtidal Benthic Fauna	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on subtidal benthic fauna at any geographical scale.
Fish	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on the fish populations at any geographical scale.
Marine Mammals	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on marine mammals at any geographical scale.
Otter	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Otter at any geographical scale.
Little tern	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Little tern at any geographical scale.
Other terns	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on Roseate tern, Common tern and Sandwich tern at any geographical scale.
Wintering waterbirds	Assuming the full and successful implementation of the mitigation measures, there will be no significant residual impacts on wintering waterbirds at any geographical scale.

5.3 Land and Soil

5.3.1 Introduction

The dredging operation will not have a significant impact on land and terrestrial soils and these aspects will not be considered further.

The dredging operation has the potential to have an effect on coastal processes and this aspect is addressed in this chapter.

The baseline information provided in the application on coastal processes is examined and the potential effects of the proposed dredging project are identified. The proposed mitigation measures considered and the likely residual effects are described.

5.3.2 Baseline Environment

The River Boyne rises in the north midlands and exits to the sea at Mornington, Co. Meath. The river flows through the towns of Kells, Trim, Navan, Slane and Drogheda and flows into the Irish Sea at Mornington.

From Drogheda town to the sea at Mornington, the river has been hard engineered by means of training walls constructed around the 1850s by the then Drogheda Harbour Commissioners. The purpose of these training walls was to create estuarine polders either side of the main river channel. On the rising tide these estuarine polders fill up and retain the incoming water. On the ebb tide, the retained water is released through designated “guts”.

The creation of the estuarine polders had two important effects i.e. through the release of water on the ebb tide it increased the tidal exit velocity thus producing a scouring or dredge effect. Following the immediate creation of the estuarine polder, the natural channel depth increased. In recent times, the original river walls have fallen into dis-repair and the designed engineering effects of the polders have considerably diminished as the polders have largely silted up. Their effectiveness to cater for the modern freight vessel has long passed.

The freshwater flow and tidal exit velocities from the River Boyne were further enhanced in the late 1960s by the Boyne Drainage Scheme on the upper reaches between Kells, Trim and Navan.

In 1970 the Drogheda Harbour Commissioner constructed the training walls both north and south at the river mouth. At that time, it was forecasted that the reserve capacity of the south training wall to retain sand would have a time frame or life span of circa 30-40 years, before full sediment bypassing would take place across the river entrance.

The river maintains high ebb tide exit velocities during winter fresh flows supplemented with spring tides. However, these exit velocities quickly fall off at the river mouth where the river exit flow meets the sea at Mornington.

The high velocities experienced allows the Boyne to carry a very substantial quantity of sediment and fluvial material out to the river mouth providing a natural scour to the estuary. However, while the river through engineering has an increased scour effect this does not eliminate the need for maintenance dredging particularly at the berths, artificial berth pockets, ship turning basins, river bends and locations where river flow ebb/exit velocities drop due to increased channel width.

Maintenance dredging at the berths, ship swing basins, artificial dredged pockets, etc, would be at a higher frequency than the maintenance dredging within the defined navigation channel due in part to the localised effects of ships' propeller wash and bow thruster wash, where the river silts are agitated and displaced locally within the ship manoeuvring radius. The manoeuvring of ships is a twice daily activity.

The high ebb/exit velocities have little or no effect at the river mouth or port approaches, where the exit stream meets the sea, hence maintenance dredging is required and at a higher frequency than within the main estuary, berth, artificial berth pockets and swing basins. This is primarily due to silt deposition where the exit velocities very quickly fall to zero.

The soft shallow entrance to the Boyne estuary lies roughly midway within the coastal cell between the hard rock outcrops of Clogherhead in the north and Bremore to the south. The coastline characteristic is one of a shallow shoaling sandy horseshoe bay where there is net annual nearshore sediment transport movement of material from south to north.

Since the late 1960s, the Drogheda Port Company and formerly the Drogheda Harbour Commissioners have carried out a considerable amount of coastal process and sediment movement analysis, studies and elevations around the Boyne Estuary and the adjoining beaches of Counties Meath and Louth. These included a full physical river entrance simulation model (HR Wallingford 1969) and numerous modern-day mathematical models with the latest modelling software led by HR Wallingford (UK) Delft Hydraulics (Belgium) and KMM/RPS (Northern Ireland). A deep and detailed understanding of the coastal process and sediment transport regime of the shallow shoaling coastline within the coastal cell from Bremore in the south to Clogherhead in the north has been garnered. Numerous studies of the coastal processes have been undertaken previously.

As part of the 2006 Foreshore Licence and Dumping at Sea Permit Applications Hydrographic Surveys Ltd undertook a Drogue release survey in relation to the offshore dump site A1. The results of this survey are also still valid due to the fact that no significant change in coastline has occurred and the tidal regime is likely to be unchanged as a result. This drogue Release survey dated 22nd November 2006 is included with the current Application documents (refer to Attachment L). The key conclusion from this Drogue survey was as follows:

'In general the drogues travelled parallel to the coast in either a North-South or South-North direction, at no time did they travel in a direction that would indicate any shoreward direction of travel.'

From this it would be reasonable to assume that no sediment would come ashore when released from the designated dump site. If this exercise was to be carried out at Neap Tides the velocities would be lower and therefore even less possibility of shoreward movement.’

RPS prepared a report in 2012, “*Boyne Entrance Channel Dredging-Impact on Sediment Cell*”, on the impact of the entrance channel maintenance dredging on the sediment balance of the coastal sediment cell. This 2012 report was submitted as part of the 2013-2021 Licence Application and is still relevant to this Licence Application.

The RPS 2012 report stated “*The works undertaken for this study indicate that there is only a small movement of the dredge sand which has been deposited in the offshore dumpsite area back towards the beaches around the Boyne entrance. Consequently, dredged material dumped at this offshore site contributes very little to the inshore coastal processes along the Co Meath and Co Louth beaches adjacent to the Boyne Estuary. Beneficial re use of this material is wholly appropriate in lieu of disposal at the offshore dumpsite given the insignificant movement of this material.*

“The analysis of the results of the modelling undertaken for the IMAGIN project indicates a net annual bed sediment transport into Co Meath and Co Louth beach system from the SE is app 60,000m³ per year. This figure is consistent with historical dredging practices and changes observed on the beaches around the entrance to the Boyne Estuary.”

The RPS Report *Maintenance Dredging License Application Hydraulic Modelling Study*” dated 25th May 2019 (refer to Attachment B of the application) also considered the impacts of the loading and dumping operations on coastal processes and sediment regime within the coastal sub cell.

In 2018 the OPW requested RPS to undertake studies to review the extreme water levels occurring along the east coast of Ireland to see if any changes had taken place in the extreme water levels since 2010. The results of the 2018 study showed that there had been no change in the extreme water levels (due to combinations of high tides and storm surge) established in 2010. The sediment transport rates along the beaches on either side of the entrance to the Boyne are driven by inshore wave climate and it is the inshore wave conditions that affect the movement of sediment along the coast. It is the occurrence of extreme water levels that are most important in determining the changes in the sediment transport rates along the shoreline.

The Water and Marine Advisor of the Department of Housing Planning and Local Government noted that: “*As there has been no change in the extreme water levels, the sediment transport rates along the beach are unlikely to have changed significantly over the 7-8 years since the 2012 report. This conclusion is also confirmed by the fact that there has been no increasing trend in the amount of maintenance dredging required since the 1990s to keep the Boyne entrance maintained to its navigational depth, thus the key conclusions to the 2012 report “Boyne Entrance Channel Dredging-Impact on Sediment Cell”, are still relevant to this Maintenance Dredging Licence Application.*”

5.3.3 Potential Impacts

The dredging operation, in particular at the estuary mouth and approach channel, has the potential to cause erosion of, or accretion, on the beaches in the vicinity of the estuary mouth and further north. The removal of 60,000m³ of dredge material from the coastal cell, for beneficial use ashore, has the potential to cause erosion along the coast. The deposition of material at the two dump sites has the potential to alter the coastal processes by causing significant changes in water depth.

5.3.4 Mitigation Measures

Following the existing practice, a minimum of 30,000m³ of dredge material will be retained annually in the coastal cell by dumping it in one of the two offshore dumpsites. No more than 60,000m³ annually will be taken ashore for beneficial reuse.

5.3.5 Likely Significant Effects

The RPS 2012 report, prepared for the 2013 - 2021 licence application, concluded that the quantities of material, which it is proposed to dredge and either dump or remove for beneficial reuse, were sustainable in terms of the coastal processes and sediment regimes. In relation to the effects of the dredging operation on the coastal processes, the conclusion of the 2012 study was:

“The study concluded that in order to ensure that there are no impacts on the overall coastal cell from the dredging operations, not more than an average annual quantity of 60,000m³ of dredged sand should be brought ashore for beneficial reuse. The remaining 30,000m³ of material that is on average required to be dredged from the Boyne Estuary entrance is equivalent to app 0.6mm sand depth over the active beach area which is considered to be minor and insignificant. Nonetheless Drogheda PC have given an undertaking that the 30,000m³ (average) of additional material to be dredged will be retained within the coastal cell either within the active system (i.e. dumped at Dump Site A2, depending on operating conditions) or placed in the offshore dump site (A1).

Therefore, it can be concluded that subject to the retention of at least 30,000m³ of the dredged material within the coastal cells (A2 or A1) there should be minimal impact on the coastal processes and sediment regimes within the coastal sub cell within which the operation is located.”

The availability of up to 60,000m³ annually of dredge material, sand and gravel, for beneficial use ashore will avoid the need to extract this quantity of material from quarries. This will have a slight beneficial effect on the sand and gravel resource.

There is not likely to be a significant negative impact on the relevant aspects of land and soils.

5.4 Water

5.4.1 Introduction

The dredging operation will not have a significant impact on groundwater or wastewater and these aspects will not be considered further.

The dredging operation has the potential to have an effect on the estuary and marine water quality and this aspect is addressed in this chapter.

The baseline information provided in the application on estuary and marine water quality is examined and the potential effects of the proposed dredging project are identified. The proposed mitigation measures considered and the likely residual effects are described.

5.4.2 Baseline Environment

The River Boyne rises in the north midlands and exits to the sea at Mornington, Co. Meath. The river flows through the towns of Kells, Trim, Navan, Slane and Drogheda and flows into the Irish Sea at Mornington.

The proposed dredging is located within the former the Irish River Basin District, as defined under the *European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy* (the Water Framework Directive, WFD). The dredge area is situated in Hydrometric Area No. 07 of the Irish River Network. It is located within the Boyne Catchment.

Surface water quality is monitored periodically by the EPA. The nearest EPA monitoring stations are situated upstream of Drogheda Port. The EPA assesses the water quality using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality. There are two water quality monitoring stations located upstream of the Boyne Estuary, The Old Bridge (RS07B042200) and the New Bridge (RS07M010300). Both obtained a Q4- Good WFD status (in 2018 and 2006 respectively).

Currently, the EPA classifies the WFD status of the Boyne Estuary as ‘At Risk’ (of not meeting WFD objectives). Upstream of the estuary, the River Boyne is listed as ‘not at risk’ (of not meeting WFD objectives). Most of the tributaries which feed directly into the Boyne Estuary are currently under review in regards their WFD status, meaning there is insufficient information to determine the risk, or there have been measures implemented but some additional monitoring is required to confirm expected improvements have been achieved.

The current WFD coastal waterbody approved risk for the Louth Coast Body (HA 06) (location of site A2) is ‘Not at Risk’. The Boyne Estuary Plume Zone and the Northwestern Irish Sea (HA 08) (Locations of site A1) are both currently ‘Under Review’.

The water quality of the Boyne Estuary was classified as moderate according to the Eastern River Basin District Management Plan (ERBD, 2010). Classified as a 'heavily modified waterbody,' the pressures upon the system were identified as wastewater/industrial discharges (70%), dangerous substances (20%) and agricultural inflows (10%). A wastewater treatment plant at Drogheda, several points of wastewater discharge and the adjacent urban area of Drogheda all contribute. Coastal waters were classified as high quality (Boyne estuary plume) (ERBD, 2010).

5.4.3 Potential Impacts

The proposed dredging works have the potential to impact on surface water quality through increasing the concentration of suspended sediment in the water column within the length of the channel to be dredged. Dredging will result in localised increased concentrations of suspended solids in the water column. However, the works will take place over a short time period and will have no lasting impact on water quality.

As the Water and Marine Advisor of the Department of Housing Planning and Local Government noted, *“advanced computer modelling simulations have been undertaken of the suspended sediment plumes for the maintenance dredging at the bar, Tom Roe’s terminal berth and swing basin as well as the river navigation channel. The work was undertaken by using RPS existing Mike 21 models of the Boyne River estuary and adjoining sea area.*

The results of the simulations of the maintenance dredging at the bar, showed that away from the immediate area around the dredger, the total suspended sediment concentrations are very low at less than 80mg/l and the plume does not approach the area where the little terns nest on the northern side of the training walls. The area around the adjoining beaches is subject to regular storm wave events which lift sediment into suspension with concentrations up to 360mg/l which is much higher than the levels of suspended sediment that occurs during the maintenance dredging at the bar.

The simulation of the maintenance dredging of the fine silt deposits from Tom Roe’s terminal berth, the swing basin and the river channel has shown that, apart from the area around the dredger, the suspended sediment plume concentrations are generally low with values typically less than 80mg/l and they further disperse relatively quickly.” Consequently, it is concluded that the suspended sediment resulting from the dredging operation is unlikely to have a significant effect on water quality.

If the sediment to be dredged was contaminated, the dredging operation could have an effect on water quality. However, on the basis of the analyses of the dredge material, the Marine Institute concluded that, from a sediment chemistry perspective, the material to be dredged can be considered to be clean and the dredging, as proposed, is not likely to have a negative impact on the marine environment.

There will be no planned discharges of deleterious material from the dredging plant in the course of the operation. However, there is the potential for a spill or accidental release of fuel or lubricants from the dredging plant.

5.4.4 Mitigation Measures

Drogheda Port Company Emergency Plan

Drogheda Port Company has an Emergency Plan (updated October 2019) including a pollution response plan. The plan incorporates procedures for proactive management of environmental issues and liabilities. Through this system, the port company operates a formal structure for environmental management, ongoing assessment of environmental performance and continual improvement of all its activities.

Fuel and Chemical Storage and Handling

All dredger refuelling operations are carried out while moored at Drogheda Port. Bunker (fuel) transfers are only allowed by permission of the Harbourmaster and standard operating procedures must be followed by the vessel and bunker supply contractor. The vessel's bunker tanks are located in the engine room of the dredger within the integral hull. In the unlikely event of a collision, given the relative speeds of the vessel, collision impact penetration to an internal bunker tank is not likely. All the dredgers engaged at Drogheda port will use light diesel marine gas oil. If a release did occur this fuel would be left to degrade naturally and this is consistent with the Drogheda Port Company Pollution Response Plan. Emergency oil spill kits and oil spill containment equipment will be held on board by the dredging operator. Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise in the event of a spill.

Surface Water Runoff

In the event that dredged material is brought ashore for beneficial reuse by the construction industry, the sediment would be stored at No. 1 berth on the Town Quays for a duration of 24 hours. As the dredged material is dewatered on the dredging plant before it is deposited on the Town Quays, there would be minimal surface water run-off from the stored material. The only possibility of surface water run-off from the stored material would be due to overnight rainfall. In this event, the rainwater would drain from the stored material from the Town Quay into the River Boyne. Although there would be a direct hydrological link between the River Boyne and the run-off, there is a low likelihood of contamination as the sediment analysis results conclude that no evidence of contamination was detected in the sediment sampled at the dredging locations.

Suspended Solids

Measures will be taken during loading to limit the generation and release of suspended solids to water. No loading will be carried out at periods of low tide. The annual contingency quantity can only be dredged if required to maintain navigable depths, as evidenced by pre-dredge and post-dredge bathymetric surveys. Dumping activities will be conducted to ensure uniform spread of material throughout the dumping sites.

5.4.5 Likely Significant Effects

With the implementation of the mitigation measures described above, the dredging operation is not expected to result in a significant effect on water quality and the marine environment.

5.5 Air

The aspects of air which were considered for inclusion in this assessment were emissions of pollutants and dust, odour, noise and vibration.

Given the location and nature of the dredging operation, and the fact that it will be undertaken circa twice per year for a duration of circa two to three weeks, the emissions are not expected to be significant. It is not expected to have a significant effect on air quality. Air is not be considered further.

5.6 Climate

The aspects of climate which were considered for inclusion in this assessment were greenhouse gas emissions and climate change trends.

Given the nature of the dredging operation, and the fact that it will be undertaken circa twice per year for a duration of circa two to three weeks, the emissions of greenhouse gases are not expected to be significant. Given the eight-year duration, the dredging operation is not expected to have a significant effect on climate change trends. Climate is not be considered further.

5.7 Material Assets

5.7.1 Introduction

The aspects of material assets which were considered for inclusion in this assessment are built services, specifically the Drogheda Port infrastructure, and waste management.

5.7.2 Baseline Environment

Water depths at the River Boyne entrance to Drogheda Port and in the seaward approach channel are reduced due to natural accretion from the coastal processes and accelerated accretion due to storm events particularly southeast and northeast gales. To maintain safe marine navigational water depths, timely dredging is required to mitigate against the natural accretion. Immediate response dredging is required to respond to accelerated accretion due to storm events to which Drogheda Port is very susceptible given its location on a shallow shoaling horseshoe coastline. Maintenance dredging is also required due to natural accretion and the action of ships propellers and bow thrusters within the commercial estuary at the berths, artificial berth dredged pockets, ship swing basins and the general commercial estuary over its length from town to sea. Maintenance dredging is only engaged once water depths are reduced below a safe navigation value relative to Chart Datum.

Based on previous experience, the estimated annual quantity which will be required to be dredged will be 120,000m³, and a contingency of 100,000m³ for unexpected events. A minimum of 30,000m³ of dredge material will be retained annually in the coastal cell by dumping it in one of two offshore dumpsites. Up to 60,000m³ annually is to be taken ashore for beneficial reuse. Any surplus will be disposed of in the offshore dump sites.

Dredge material has been disposed of at the A1 offshore dumpsite over the last three decades including the capital dredge schemes of 1999-2000 and 2006. There has been no significant impact or reduction of navigational depths or impact to the overall site hydrodynamics. Material dumped at the A2 dumpsite is dispersed naturally to aid the coastal process and beach re-nourishment.

5.7.3 Potential Impacts

The dredging operation will ensure the continued operation of the berths and shoreside facilities of the Port and the three private companies with import/export facilities located on the commercial estuary, all of which depend on the river access for seagoing vessels.

If the offshore dump sites could not be used, the dredging operation would have the potential to result in a significant effect on waste management facilities ashore.

5.7.4 Mitigation Measures

Frequent surveys of the river entrance and seaward approaches, commercial channel, berths, artificial berth pockets and ship swing basins will be undertaken to monitor water depths.

Experience over many years has demonstrated that mitigation measures are not required in relation to the capacity of the offshore dumpsites.

5.7.5 Likely Significant effects

The dredging operation, by ensuring the continued operation of the berths and shoreside facilities of the Drogheda Port Company and the three private companies, which have facilities in the Port, will have a significant positive effect on material assets.

5.8 Cultural Heritage

5.8.1 Introduction

The aspect of cultural heritage which was considered for inclusion in this assessment was underwater archaeology.

5.8.2 Baseline Environment

From Drogheda town to the sea at Mornington, the river has been hard engineered by means of training walls constructed around the 1850s. In 1970 the Drogheda Harbour Commissioner constructed training walls on both northern and southern sides at the river mouth. Maintenance dredging has been carried out for many years at the berths, artificial berth pockets and ship swing basins, commercial channel, the river entrance and seaward approaches. Two campaigns of capital dredging have been carried out.

No wrecks are indicated on the Admiralty charts of the Approaches to the River Boyne and River Boyne to Drogheda in the areas where maintenance dredging will take place. No wrecks are indicated at the two dumpsites on the Admiralty charts of the Approaches to the River Boyne. The National Monuments Service, Department of Culture, Heritage and the Gaeltacht, noted the following wrecks in the estuary:

- The “Boyne Boat” (53.72443N, 6.28670W) located in close proximity to the Queensborough navigational beacon, and
- The wrecks of the four barges (053 43 09.14N, 006 18 30.22W) located adjacent to the turning area at Harbourville, Stagreenan.

5.8.3 Potential Impacts

The dredging operation has the potential to impact on the known wrecks.

5.8.4 Mitigation Measures

No dredging will take place within 10m of the “Boyne Boat” located in close proximity to the Queensborough navigational beacon or the wrecks of the four barges located adjacent to the turning area at Harbourville, Stagreenan. Drogheda Port will forward a chart to the National Monuments Service showing the above exclusions in relation to the proposed dredging area in advance of any dredging taking place.

5.8.5 Likely Significant Effect

The dredging operation is not likely to have a significant effect on cultural heritage.

5.9 The Landscape

Given the nature of the dredging operation, is not expected to have a significant effect on the landscape. Landscape is not be considered further.

5.10 Major Accidents and Disasters

The area of the proposed dredging operation is not susceptible to earthquakes, subsidence, landslides, erosion or flooding. The location is susceptible to fog and severe weather conditions.

The dredging plant will be appropriate for the weather conditions likely to be experienced. The mitigation measures proposed for safe navigation, refer to **Section 5.1.4** above, including adherence to strict maritime regulations, and normal vessel operating standards and precautions will ensure the risk from severe weather or fog will not result is a significant effect on the environment.

5.11 Interaction Between These Factors

5.11.1 Introduction

Interactive effects occur when an effect in one environmental medium has a consequent effect in a different environmental medium. The following potential interactive effects were identified and considered:

Water Quality And Biodiversity

Potential negative effects on water quality, arising from the maintenance dredging, have the potential to have a consequential negative effect on aquatic biodiversity. The effects of water quality on biodiversity are considered in **Section 5.2**.

Water Quality And Human Health

Potential negative effects on water quality, arising from the maintenance dredging, have the potential to have a consequential negative effect on human health. The effects of water quality impacts on human health are considered in Section 5.1.5.

Material Assets and Population

Potential negative effects on material assets have the potential to have a consequential negative effect on employment. The effects of impacts on material assets on human health are considered in Section 5.1.5.

6 Summary and Conclusion

Arup examined the environmental effects of Drogheda Port's maintenance dredging operation. The aspects of the environment, which would be included in a statutory environmental impact assessment report, were considered. A number of environmental aspects were screened out and the environmental aspects of most relevance to the proposed dredging project were addressed.

In preparing this report, Arup relied on the information from the applicants and the statutory bodies contained in the application file on the Department's website. In particular, Arup relied on the description of the baseline environment and the proposed works, and the commitments with regard to mitigation measures which would be implemented, provided by the applicant.

The conclusion of Arup's consideration of the environmental effects of the proposed dredging operation is based on the following:

- the information provided in the licence application, including supporting documents,
- implementation of the mitigation measures proposed in the licence application and supporting documents,
- the observations of the statutory consultees, and
- imposition of and compliance with the licence conditions proposed by the Prescribed Bodies in their observations.

Arup's conclusion is that the nature, scale and location of the proposed development is such that there is no real likelihood of significant effects on the environment arising from the proposed development.

7 References

Department of Housing, Planning, Community and Local Government (2018)
*Guidelines for Planning Authorities and An Bord Pleanála on carrying out
Environmental Impact Assessment (August 2018)*

Environmental Protection Agency *Revised Guidelines on the Information to be
contained in Environmental Impact Statements (Draft August 2017)*

European Commission *Directive 2014/52/EU of the European Parliament and of
the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment
of the effects of certain public and private projects on the environment (2014)*

8 Appendix 1

8.1 Licence Conditions Proposed by the Prescribed Bodies:

8.1.1 Department of Housing Planning and Local Government Water Marine Advisor

1. Annual dredged volumes not to exceed those quantities as set out in Table on Page 6 of Attachment A “Description of Proposed Works” i.e. 220,000m³
2. A companion DAS Permit being obtained from the EPA to cover the disposal of dredged material to Disposal Sites A1, A2 as appropriate when the current Dumping at Sea Permit S0015-02 expires.
3. Further to 2 above the foreshore licence to run from 2021 to a date in tandem with the EPA DAS Permit period (a provisional final date of 10/04/2029 is set but this will be subject to adjustment if the EPA sets down a different DAS period with a different end date)
4. The retention of at least 30,000m³ of dredged material per annum within the coastal sells (A1, A2) in accordance with the recommendations as set out at 4.0 “Conclusions” in the RPS Report entitled ‘Maintenance Dredging Licence Application Hydraulic Modelling Study’ – dated 25th May 2019 (ref Attachment B)
5. Dredged material shall not be disposed of at Dump site A2 during the months of July and August in any year for which this Foreshore Licence remains valid
6. Mitigation Measures as set out at Section 6 of the Natura Impact Statement (NIS) dated 22/11/2019 (ref Attachment R) inclusive of those as set out at Section 6.1.3.1 of the said NIS to be adopted where relevant unless otherwise varied by or directed by other condition in this Licence
7. Where appropriate Marine notice, lighting and markings to be carried out in consultation with the Maritime Safety Directorate, Department of Transport, Leeson Lane, Dublin 2 and all vessels/plant used in association with the proposed dredging campaigns to have appropriate certification from the Marine Survey Office.

8.1.2 Marine Survey Office

In addition to the proposed mitigating measures and public notice regime, the applicant is required to advise the U.K. Hydrographic Office of any dredging activity in order for charts to be kept up to date.

8.1.3 Department of Agriculture, Food and the Marine (DAFM):

The Department has no objections to the proposed dredging campaign, however due to the long duration of the permit sought and location within and in close proximity to SACs and Natura 2000 sites, best practice must be followed rigorously during the campaign to ensure the dredging, recovery and dumping at sea operations, as potentially disruptive activities do not adversely impact the local environment, flora and fauna as well as safe navigation and operations.

The Department is aware of a historical mussel fishery in the area directly adjacent to the shipping channel and have no data on the current status of the sub tidal *Mystiques delis* population in the area. The applicant should consult directly with any active local fishers on their proposed maintenance dredging programme.

It is recommended that the applicant consult with the local angling clubs. The Boyne is also one of the largest salmon producing catchments however the salmon area currently below the conservation limit for the catchment and all effort must be made to minimise the impact on the fish species and habitat in this SAC system.

8.1.4 Department of Culture, Heritage and the Gaeltacht (DCHG)

Underwater Archaeology:

No dredging shall take place within 10m of the wreck known as the “Boyne Boat” (53.72443N, 6.28670W) located in close proximity to the Queensborough navigational beacon.

No dredging shall take place within 10m of the wrecks of the four barges (053 43 09.14N, 006 18 30.22W) located adjacent to the turning area at Harbourville, Stagreenan.

Drogheda Port shall forward a chart to the National Monuments Service showing the above exclusions in relation to the proposed dredging area in advance of any dredging taking place.

8.1.5 Inland Fisheries Ireland

If possible, works should be scheduled outside the March – May period when salmon and sea trout smolts are travelling through the estuary and when shad are spawning. If works need to be undertaken in this window following extreme weather events, the work should not take place on a low tide as this reduces the dilution of suspended sediment in the water column.

The applicant should liaise with the local angling clubs.

8.2 Mitigation Measures Proposed in Section 6 of the NIS

“6.1.3. Mitigation Measures

This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the works on the River Boyne and River Blackwater SAC. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.

6.1.3.1. Measures to protect water quality

Mitigation measures to protect water quality in the receiving environment which includes the tidal reach of the River Boyne, Boyne Estuary and the Irish Sea during the dredging operation include:

- Drogheda Port Company will maintain its Tier 1 pollution response unit and equipment for immediate deployment. Drogheda Port Company as part of its pollution plan has a contract call up facility for additional resources and expertise. Drogheda Port Company is the Harbour Authority for Drogheda Port as defined in the Harbour Act 1996 and Harbours (Amendment) Act 2009. Drogheda Port through the powers of the Harbourmaster is the Local Competent Authority for pollution response as per the Sea Pollution Act 1991, Sea Pollution (Amendment) Act 2009 and the Merchant Shipping (Salvage and Wreck) Act 1993. Under the provisions of the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 Harbour Authorities must have a contingency plan and requirements for a Tier 1 response in the event of a pollution incident. Drogheda Port has an Emergency Plan that includes its Pollution Response Plan (attached in Appendix 4). A Tier 1 level equipment stock is retained on site in a fixed and mobile unit for immediate deployment. Drogheda Port also maintains a contract with a pollution contractor for expertise, labour and equipment response if and when required, supplementing its internal resources. The Emergency Plan (including Pollution Response Plan) is the port's generic document for all activities within the port including dredging vessels (these being subject to the same risks as commercially trading vessels).
- Dredging vessels also have their own approved Pollution Plans with retained pollution response equipment on board.
- An emergency spill kit and oil spill containment equipment will be held on board by dredging operators to be able to deal with potential oil spills during dredging operation.
- An Environmental Liabilities Risk Assessment (2015) has been prepared by Aquafact International Services Ltd and is in-use for dredging and disposal operations (S00015-02) at Drogheda Port. This document is contained in Appendix 5 of this NIS.”