NATURA IMPACT STATEMENT

Provision of Information for Appropriate Assessment for Dump at Sea Permit and Foreshore Licence Application at Drogheda, Co. Louth

prepared for Drogheda Port Company

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Scott Cawley, College House, 71 – 73 Rock Road, Blackrock, Co. Dublin, A94 F9X9, Ireland

Tel+353(1)676-9815 Fax +353(1) 676-9816

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1. Introduction

This report has been prepared by Scott Cawley Ltd. for the applicant, Drogheda Port Company (hereafter referred to as DPC). DPC wish to renew their Foreshore Licence with the Department of Housing, Planning and Local Government to continue maintenance dredging between the period 2021 and 2029 within the commercial estuary of the River Boyne and seaward approaches and to land ashore a portion of the dredge material for beneficial reuse with the remainder of the material going to sea disposal. For the latter, DPC wish to renew their Dump at Sea Permit with the EPA for the period 2021 and 2029. Hereafter these activities, briefly described here and in more detail in Section 3 of the NIS, are referred to as 'the operation'.

This NIS has been prepared in accordance with the provisions of Part XAB of the Planning and Development Act, 2000 (as amended) and in accordance with the requirements of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).

It considers the implications of the works, on its own and in combination with other plans or projects, for European sites[1] in view of the conservation objectives of those sites. It includes a scientific examination of evidence and data to identify and assess the implications of the operation for any European sites in view of the conservation objectives of those sites. It considers whether the operation, by itself and in combination with other plans or projects, would adversely affect the integrity of any European sites. In reaching a conclusion in this regard consideration is given to any mitigation measures necessary to avoid or reduce any potential negative impacts.

The purpose of this NIS is to provide an examination, analysis and evaluation of the potential impacts of the operation on European sites and to present findings and conclusions with respect to the operation in light of the best scientific knowledge in the field. This NIS will inform and assist the competent authority, in this case the Department of Housing, Planning and Local Government, in carrying out its Appropriate Assessment as to whether or not the operation will adversely affect the integrity of European sites, either alone or in combination with other plans and projects, taking into account their conservation objectives.

1.1. Legislative Context

The Birds and Habitats Directives - Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) – require Ireland to establish protected sites as part of a European wide network of sites (the Natura 2000 network which are known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SACs are selected for habitats listed on Annex I of the Habitats Directive (including priority Annex I habitat types which are in danger of disappearance) and species listed on Annex II. SPAs are selected for bird species (listed on Annex I of the Birds Directive), regularly-occurring populations of migratory bird species (such as ducks, geese and waders), and areas of international importance for migratory birds. The specified habitats and species for which each SAC and SPA is selected, correspond to the qualifying interests (in the case of SACs)

[1] The Natura 2000 network of sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and species listed in Annex II, and special protection areas classified pursuant to the Birds Directive (2009/147/EC). The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland, these sites are designed as *European sites* – as defined under the Planning and Development Acts and/or Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

or special conservation interest species (in the case of SPAs) for the sites, for which conservation objectives are prepared.

Article 6(3) of the Habitats Directive states that:

'*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*.'

This provision is transposed into Irish law by Part XAB of the Planning and Development Acts, 2000-2017. Section 177U(4) of the said Acts provides for screening for Appropriate Assessment as follows:

'*The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site*.'

Section 177U(5) provides as follows:

'*The competent authority shall determine that an appropriate assessment of a […] proposed development, […], is not required if it can be excluded, on the basis of objective information, that the […] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site*.'

Section 177T(1) and (2) provide that a NIS is '*a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites' and specifies that it 'shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites'*.

The Court of Justice of the European Union (CJEU) has made a number of rulings in relation to Appropriate Assessment, regarding when it is required, its purpose and the standards it should meet. Two of the key rulings include, Case C-127/02 Waddenzee where the CJEU found that '*Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects*' and that the plan or project may only be authorised '*where no reasonable scientific doubt remains as to the absence of such effects*', and Case C-258/11 where the CJEU found that *'[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned*'.

Consideration has been given in the preparation of this report, to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

1.2. Guidance and Approach

This NIS has been prepared having regard to the following documents.

1.2.1. European Commission Guidance

- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2001)
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2018)

- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC. Clarification of the Concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence.* Opinion of the European Commission (European Commission January 2007, updated 2012)
- *Communication from the Commission on the Precautionary Principle* (European Commission 2000)[2]
- *Nature and Biodiversity Cases – Ruling of the European Court of Justice* (European Commission 2006)
- *Article 6 of the Habitats Directive – Rulings of the European Court of Justice* (European Commission Final Draft September 2014)

1.2.2. Irish Guidance

- *Applications for Approval for Local Authority Developments made to An Bord Pleanála under 177AE of the Planning and Development Act, 2000, as amended (Appropriate Assessment) – Guidelines for Local Authorities* (An Bord Pleanála 2013)
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government 2010 revision)
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10* (NPWS, 2010)

In addition, regard has been had to the following guidance in characterising impacts, including determining magnitude and significance of impacts, as relevant in the application to Appropriate Assessment and European sites:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Assessment, 2018)

[2] [2] The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

This guidance document notes that the precautionary principle "*covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection*".

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are likely and AA must be carried out.

2. Methodology

2.1. Scientific and Technical Competence Relied Upon

The background and experience of the contributors to this report are set out below.

Aebhin Cawley CEnv, MCIEEM

Aebhín Cawley is the Director of Scott Cawley. She holds an honours degree in Zoology from Trinity College, Dublin and a postgraduate diploma in Physical Planning at Trinity. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Aebhin Cawley is an experienced ecological consultant with extensive experience in public and private sector projects including renewable energy, ports and other major infrastructural developments. Aebhín has been undertaking Ecological Impact and Appropriate Assessment work in Ireland since 2002 and regularly provides Appropriate Assessment training to local authorities and other public sector organisations. She authored guidelines on Appropriate Assessment for the EPA and delivered training on its application to its inspectorate. Aebhín was responsible for checking and approval of this report and provided additional text where required.

Maeve Maher-McWilliams ACIEEM

Maeve Maher-McWilliams is a Senior Ecologist at Scott Cawley. Maeve holds an honours degree in Biological Sciences from Queens University Belfast and attained a distinction in her Masters in Evolutionary and Behavioural Ecology from University of Exeter. She is an Associate member of CIEEM. She has worked in ecological consultancy for over seven years and has worked on a range of large to small scale projects across Ireland and the UK. Maeve's primary technical specialism is ornithology, however her skills extend to protected mammal and habitat surveys. Her involvement extends from inception to post planning compliance, survey completion, project and survey management, carrying out of Ecological Impact Assessment, and authoring of EIAR Chapters, Appropriate Assessment Screening reports and Natura Impact Statements. She regularly undertakes surveys and prepares AA Screening, NIS and EcIA reports. Maeve was the primary author of this report and undertook the ornithological field surveys.

John Brophy CEcol, MCIEEM

John Brophy is a Principal Ecologist with BEC Consultants Ltd. John holds an honours degree in Natural Sciences (Zoology) from Trinity College Dublin and a Masters in Fisheries Management, Development and Conservation from University College Cork. He is a Chartered Ecologist (CEcol) and a Full member of CIEEM. John has worked in ecological consultancy for over 13 years and has worked on a range of small- to large-scale projects around Ireland across a range of habitats. John's primary technical specialism is aquatic ecology, covering marine, estuarine and freshwater habitats and species. John's project work includes tender preparation, project management, field survey, carrying out of Ecological Impact Assessment, and authoring of EIAR Chapters, Appropriate Assessment Screening reports and Natura Impact Statements. John regularly undertakes surveys and prepares AA Screening, NIS and EcIA reports. John was responsible for the marine ecological elements of this report and undertook the marine field surveys.

2.2. Desktop Study

The desktop data sources used to inform the assessment presented in this report are as follows:

- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie, including conservation objectives documents
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie
- Information on the fish population of the Boyne Estuary from Inland Fisheries Ireland (IFI) available from www.fisheriesireland.ie
- A data request was submitted to the Irish Whale and Dolphin Group (IWDG) for records of marine mammal sightings within the study area
- Information on the surface water network and surface water quality in the area available from www.epa.ie

- Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie
- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie
- Information on the location and nature of the operation supplied by the applicant's team
- Specialist technical information provided by the applicant's team

2.3. Consultation

The following bodies were consulted in the preparation of this application:

- The Environmental Protection Agency (EPA);
- Inland Fisheries Ireland (IFI);
- Sea Fisheries Protection Authority (SFPA);
- Department of Housing, Planning and Local Government (DoHPLG) (Foreshore Section);
- The National Parks and Wildlife Service (NPWS); and
- The Environmental Pillar.

Responses were received from the following members of the Environmental Pillar:

- The Irish Whale and Dolphin Group;
- Department of Agriculture, Food and the Marine;
- Birdwatch Ireland;
- Irish Seed Savers Association; and,
- Louth Nature Trust.

Consultation meetings were held with the EPA, IFI and SFPA. All comments, suggestions and written responses provided, and relevant to Appropriate Assessment, were taken into account in the preparation of this NIS.

2.4. Assessment Methodology

The operation of maintenance dredging and dump at sea was analysed and assessed to identify the potential impacts associated with the operation that could affect the ecological environment.

From this, the zone of influence of the operation was defined. Based on the identified impacts, and their zone of influence, the European sites potentially at risk of any direct or indirect impacts were identified.

In establishing which European sites are potentially at risk (in the absence of mitigation) from the operation, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

The identification of source-pathway-receptor connection(s) between the operation and European sites essentially is the process of identifying which European sites are within the zone of influence of the operation, and therefore potentially at risk of significant effects. The zone of influence is defined as the area within which the operation could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood of significant effects will depend upon the characteristics of the source (e.g. extent and

duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where there is uncertainty, the precautionary principle has been applied.

This assessment has been undertaken in consideration of all potential impact sources and pathways connecting the operation to European sites, in view of the conservation objectives supporting the conservation condition of the sites' QIs/SCIs.

The conservation objectives relating to each European site and its QIs/SCIs are expressed generally for SACs as "to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

Following on from this, and as defined in the Habitats Directive, favourable conservation status (or condition, at a site level) of a habitat is achieved when:

- *its natural range, and area it covers within that range, are stable or increasing, and*
- *the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and*
- *the conservation status of its typical species is favourable*

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

- *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis*

Where site-specific conservation objectives have been prepared for a given European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured, i.e. an impact which affects the achievement of favourable conservation condition, as measured by the attributes and targets, is an impact on site integrity.

In the case of some QIs/SCIs in certain European sites, the conservation objective is to restore rather than maintain conservation condition and this distinction is taken into account in the assessment; as is any legacy damage to European sites that has occurred since their designation, insofar as possible.

2.5. Baseline Surveys

This section describes the ecological surveys carried out that are relevant to the consideration of the potential for the operation to affect the conservation objectives of the European sites in the vicinity of the operation site: namely the habitat surveys, estuarine and marine intertidal and subtidal benthic fauna surveys, marine benthic flora surveys, marine mammal surveys, fish surveys, little tern surveys and wintering waterbird surveys.

2.5.1. Habitat Surveys

Specific habitat surveys were not undertaken. However, the ecology of benthic marine habitats is described through a combination of the substratum and the fauna living within or on it. A more detailed description of the biotopes (habitat plus faunal community) is presented in Section 2.5.2 and 2.5.3.

2.5.2. Intertidal Benthic Flora Surveys

An intertidal field survey was carried out by BEC Consultants on 8th - 9th April 2019 during low water spring tides. Intertidal core samples were taken along three transects using a 0.01m^2 core to a depth of 25cm. The methodology for the survey generally followed that of the Marine Monitoring Handbook (Davies *et al*., 2001).

Sample sites were chosen provide a spread of sites from the upper estuary out onto the beaches north and south of the Boyne Estuary mouth (Figure 1).

Figure 1: Map showing location of intertidal sample sites within the Boyne Estuary and surrounds

Three replicate cores were taken at each sample site. Each replicate was sieved through a 1mm sieve and the residue retained for macroinvertebrate analysis. The samples were fixed in 10% formalin and placed in containers labelled inside and out, before being returned to the laboratory for sorting, identification and enumeration. One small core was taken for sediment analysis, placed in a labelled container and stored in a cooler box before being returned to the laboratory where the samples were frozen prior to analysis for Particle Size Analysis (PSA) and Total Organic Carbon (TOC). On arrival in the laboratory, all samples, both macroinvertebrate and sediment, were logged on appropriate log sheets.

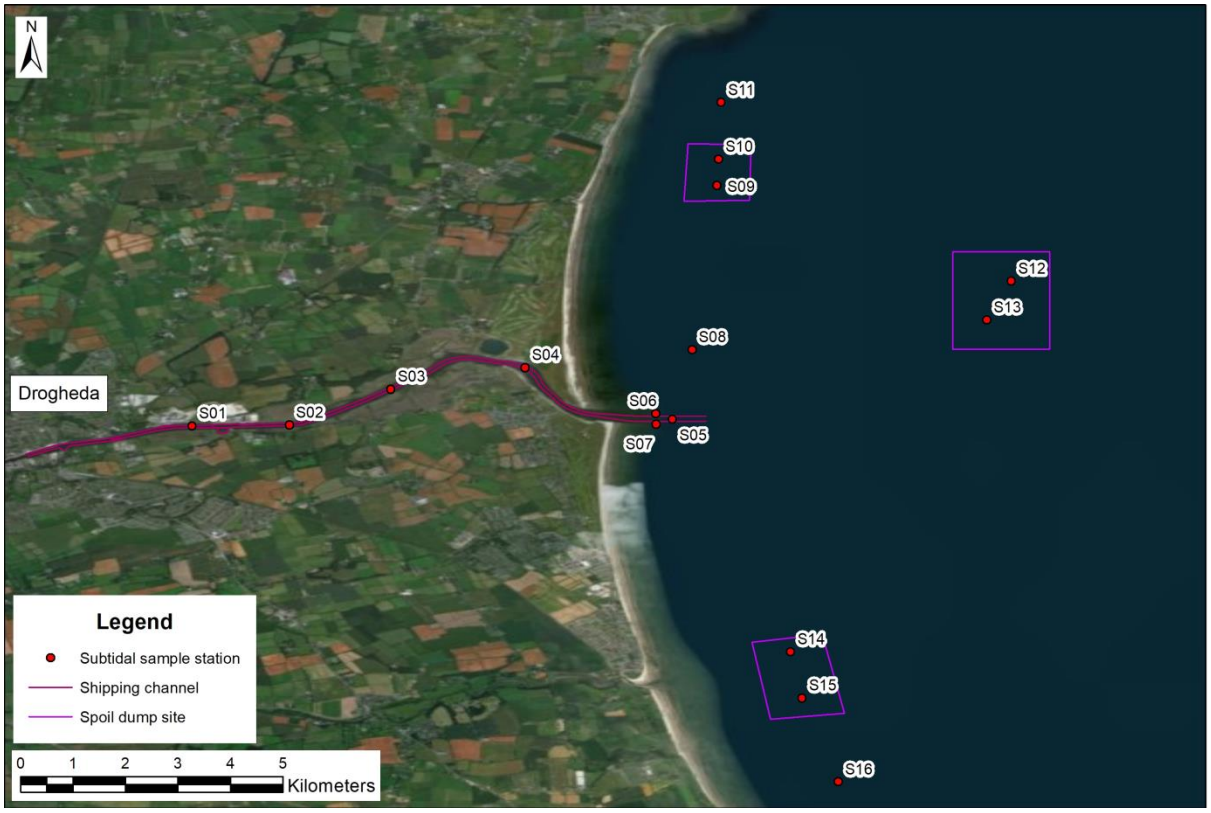
Data collected on standard field sheets at each sample side comprised the following:

- Location
- Surveyors
- Sampler type
- Weather
- Date
- Time
- Station
- Irish Grid Reference
- Exposure
- Sieve size (mm)
- Core depth (cm)
- Sediment description
- Photo reference numbers

2.5.3. Subtidal Benthic Fauna Survey

A subtidal field survey was carried out by BEC Consultants on 25 - 26th April 2019 using a 0.1m^2 Day grab deployed from the M.V. Sharpshooter. A total of 16 stations were sampled for macroinvertebrate and sediment analysis (PSA and TOC) (Figure 2). Four sample stations were situated within the Boyne River estuary, while the remaining 12 were located outside the breakwaters. Of these, two stations were located within each of the three dredge spoil dump sites, while a further two were located to the north and south to act as control sites. Sample stations were located using the Sharpshooter's on-board GPS system, onto which preselected sample station locations were loaded.

Figure 2: Map showing location of subtidal sample sites within the Boyne Estuary and surrounds, including the spoil dump sites



The Day grab was deployed from an A-frame on the survey boat. Sediment samples were taken as a core into the retrieved sediment, labelled and placed in a cooler box. These were subsequently frozen on return to shore. Macroinvertebrate samples were washed through a 1mm mesh sieve. The residue was transferred to labelled sample containers and fixed with 10% Formalin before being transported back to the laboratory for processing. On arrival in the laboratory, all samples, both macroinvertebrate and sediment, were logged on appropriate log sheets.

In addition to the sample, the following data was recorded on prepared forms at each grab sample station:

- Site name
- Date
- Time
- Co-ordinates
- Sample code
- Sampler type
- Ship anchored (Y/N)
- Weather & sea state
- Exposure
- Depth (m)

- Penetration depth (cm)
- Approximate sediment classification (mud/sand/gravel)
- Sediment colour
- Odour (presence of anoxic matter)
- Sample photograph

2.5.4. Marine Mammal Survey

A dedicated land-based marine mammal survey was carried out by BEC Consultants to collect site specific data to supplement the data obtained from the Irish Whale and Dolphin Group (IWDG). Monthly constant effort watches were carried out following the IWDG guidelines. Each watch lasted 90 minutes and were made from the same location (the northern breakwater of the Boyne Estuary). The distance and bearing to any marine mammal sighted were recorded and used to calculate the sighting location. A spotting scope and binoculars were used to assist with sightings. Constant effort watches were carried out on the following dates:

- 20th March 2019
- 20th April 2019
- 12th May 2019
- 14th June 2019

In addition to sightings made during the constant effort watches, other sightings made while on-site were recorded. This included sightings during the subtidal survey and sightings of hauled-out seals within the estuary.

A log of sea craft activity during marine mammal surveys was recorded and is contained in Appendix 3 of the NIS.

2.5.5. Little Tern Surveys

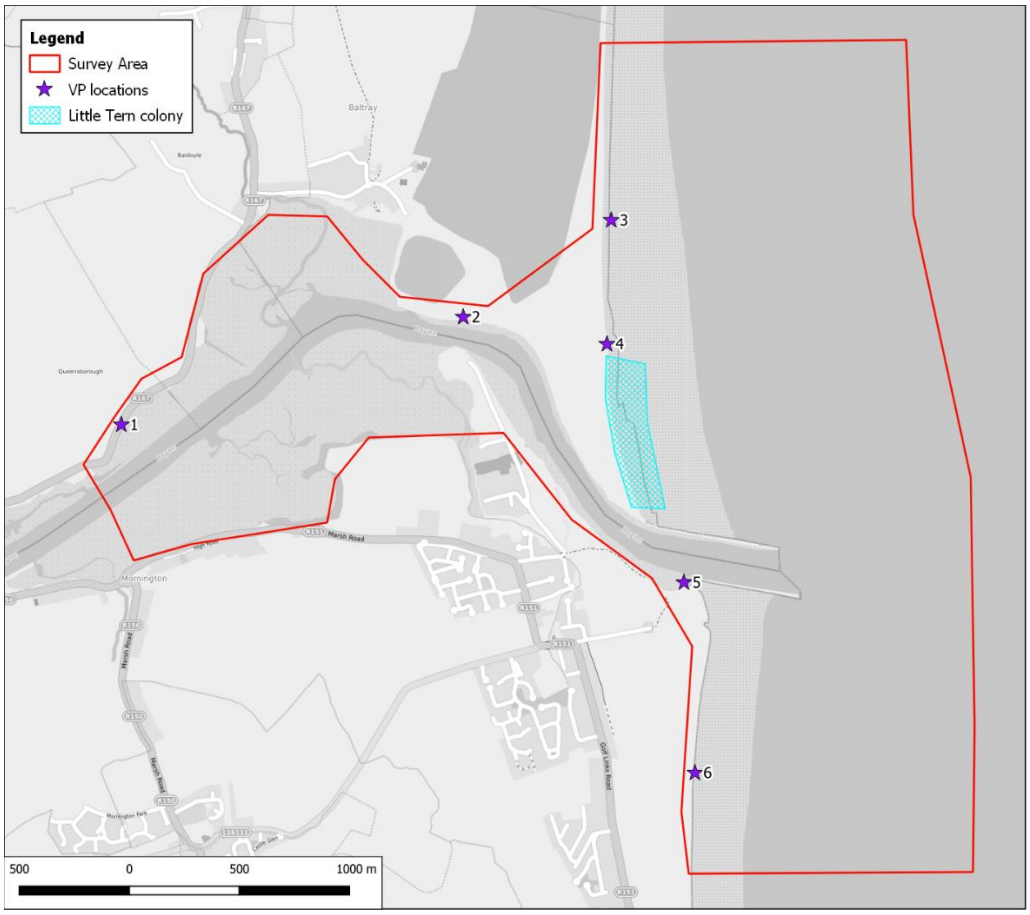
Little tern surveys were carried out at the known breeding colony at Baltray. Ten weekly visits were made to the survey area between 30th May and 9th August 2018. Surveys focussed on feeding behaviour of terns within the survey area which encompassed the Boyne Estuary and the breakwaters, *c.* 3km upstream of the estuary mouth, up to 2km north and south of the breakwaters along the beach shoreline, and *c.* 1km seaward of the beach shoreline. Within this survey area 6 vantage point locations were selected which were considered adequate to provide views of the entire survey area. Locations of these are illustrated in Figure 3. Appendix 1 provides details of the survey dates, times, tides and weather conditions. Surveys were carried out by Maeve Maher-McWilliams ACIEEM of Scott Cawley, an experienced ornithologist.

An hour watch from each of these vantage point (VP) locations was undertaken during each weekly visit. Observations were made using binoculars and a telescope. Terns were the target species, with Little tern being the priority species, however observations were also made of Roseate tern *Sterna dougallii*, Common tern *S. hirundo*, Arctic tern *S. paradisaea* and Sandwich tern *Thalasseus sandvicensis*. The surveyor observed a *c.* 1km viewshed from each VP location recording tern species, number of birds, location and behaviour/activity. This information was tabulated, and location and flight lines of terns was drawn onto suitably scaled aerial maps, which would later be digitised.

The tide cycle and any disturbance events that occurred during the observations were recorded. In addition, every 15 minutes of each VP watch, all other seabirds and waders within the *c.* 1km VP viewshed was recorded. The results of these 15 minute activity surveys were tabulated by seabird/wader species, number of birds, behaviour/activity and location.

The presence or absence of a dredger within the estuary channel was also noted, if within the viewshed of the VP being undertaken. The operational zone of the dredger is within the navigable channel which is the area from VP5 east to the end of the breakwaters.

Figure 3: Survey Area extent and Vantage Point (VP) locations

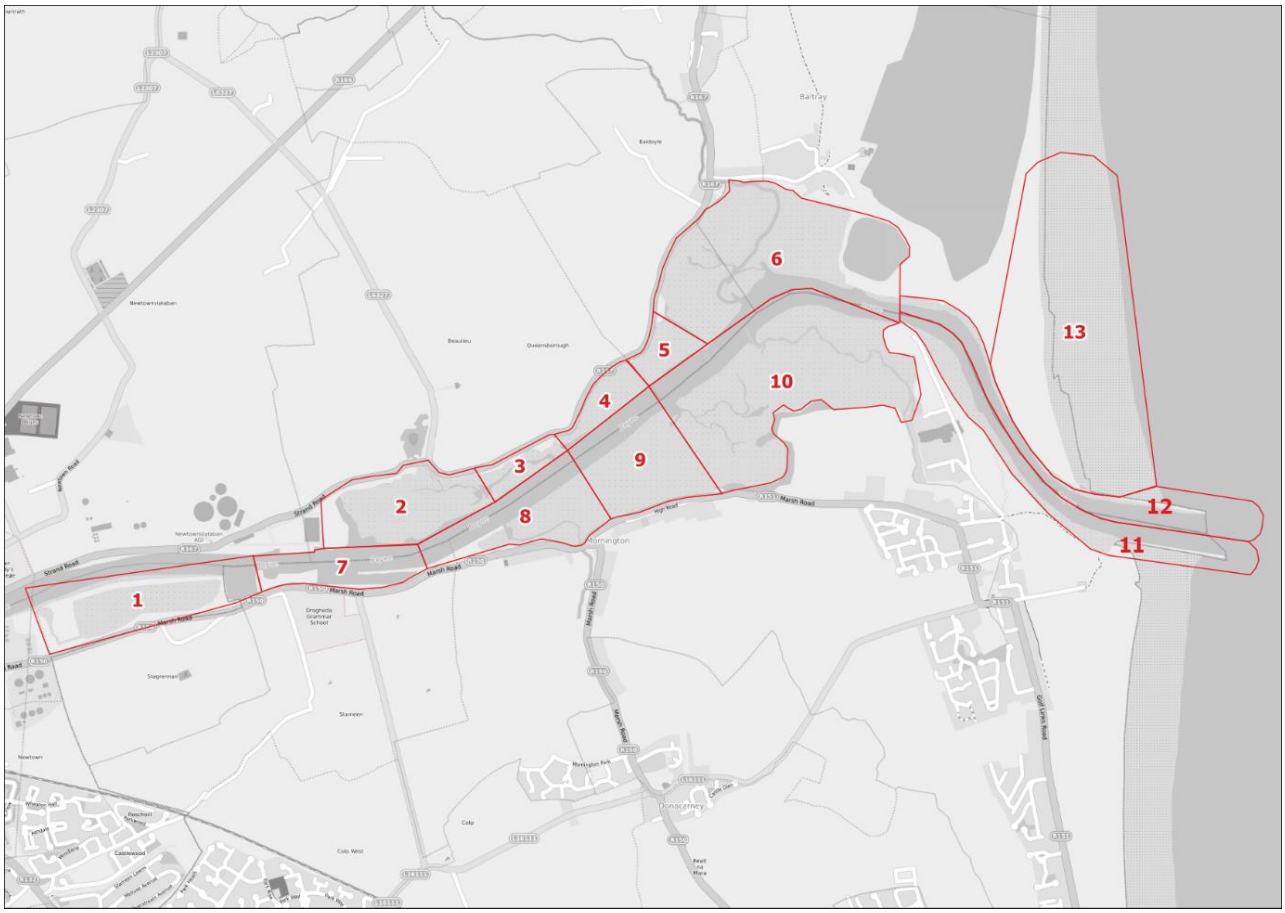


2.5.6. Wintering Waterbird Surveys

2018-2019 winter waterbird surveys were carried out monthly between September 2018 and April 2019. A high tide count and low tide count of the entire estuary at 13 pre-defined count areas, marked on Figure 4, were carried out during monthly visits. Appendix 2 provides details of the survey dates, times, tides and weather conditions.

Methodology was consistent with that used during previous winter bird surveys in 2007-2008 and 2008-2009, and which had been agreed with Bird Watch Ireland at the time. Wintering waterbird monitoring for DPC was undertaken between years 2002 and 2009 in connection with the Capital Dredging Programme.

Figure 4: Winter bird survey count areas



Morning tide counts commenced at Mornington (count area 11) on the south side of the estuary and worked clockwise finishing at Baltray (count area 13) on the north of the estuary. Afternoon tide counts worked anti-clockwise from Baltray towards Mornington.

Low tide counts were carried out 1.5-2 hours either side of low tide. High tide counts will be carried out 1.5-1 hour either side of high tide. As much as possible survey start and finish times avoided 1 hour after sunrise and 1 hour to avoid low light levels which may hinder visibility, however during winter daylight hours this was often not possible.

Surveys were carried out using a telescope and binoculars. Species, numbers and location of birds were recorded on suitably scaled maps in the field. Some count areas were viewed from multiple locations to get full visual coverage of the area. Detailed bird usage maps of Stagrennan Polder and Tom Roes Point Polder were later analysed to provide detail constraints mapping of these areas to inform future development of the Drogheda Port Masterplan.

3. Description, Context and Purpose of the Operation

The commercial estuary of the River Boyne and seaward approaches is located at Drogheda Port and extends along the coastline of counties Louth and Meath. The river under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Mary's Bridge in the town of Drogheda to the river mouth at Mornington. The ongoing dredging of the estuary and the seaward approaches will be carried out to maintain the navigability of the channel.

Drogheda Port Company currently holds a Dumping at Sea Permit S0015-02 for the period 2013 – 2021 and is applying for a Dumping at Sea permit for the period 2021 – 2029 for the sea disposal of the dredged material. A portion of the dredged material will be disposed of at a dump site close to the surf zone in 4m of water. A portion of the dredged material will also be dumped 2.5km from the shore in 14m of water. There is also a third dump site which is now a redundant inactive site. Drogheda Port Company will also be engaging in a beneficial re-use option whereby a portion of the dredged material of up to 60,000 m^3 may be beneficially reused within the construction industry. The dredging works are necessitated by the need to dredge the river entrance, seaward approaches, navigation channel, berths and swing basins to restore safe navigational water depths. Beneficial reuse is employed to meet the requirements of the OSPAR Convention.

3.1.1. Dredging Operation

The Dumping at Sea permit is sought for a period of 8 years to cover maintenance dredging requirements from 2021 to 2029. Dredging at the river mouth and port approaches is generally driven by weather events that cannot be predicted or scheduled. If the entrance or seaward approaches silts up due to a weather event resulting in impaired navigational safe depths, then dredging is immediately required. If depths are not impaired, no dredging takes place.

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.

The primary locations for maintenance dredging are the entrance and seaward approaches, all berths, artificial berth dredged pockets, berths, ship swing basins and the main navigation channel. While some areas are dredged more than others, all areas will be dredged at some point over the duration of the permit.

Drogheda Port Company employs its own internal hydrographical unit to maintain an ongoing monitoring programme of the entrance and seaward approaches, berths, swing basins and channel. Some pre-planning of maintenance dredging at the river mouth and seaward approaches is possible given the historical database of information over the previous decade and knowledge of the sediment transport taking into account weather and on-going monitoring. However, given the weather sensitive nature and effects of storm events, unplanned maintenance dredging also takes places to maintain safe navigation. For that reason, Drogheda Port maintains an open 24/7/365 days per year maintenance dredging policy for the river mouth and seaward approaches without any encumbrances. This is essential to maintain the viability of port operations.

Over the decades the port has accumulated data and experience on the performance of the river, entrance and seaward approaches and the effects of weather. This coupled with mathematical modelling allows realistic figures to be placed on the maintenance dredging quantity predictions going forward over the next permit application period 2021 - 2029.

Estimated annual quantities of 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. Annual requirements may increase or decrease on this estimated average depending on the severity of wind weather events.

Table 1: Estimated annual quantities of maintenance dredging

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

An annual contingency of an additional 100,000m^3 is to allow for the unexpected and unplanned events, weather or otherwise, that may impair the safe navigational depth.

3.1.1.1. Appropriate Plant

A range of dredging plant is suitable for maintenance dredging in the River Boyne. A contractor's selection of preferred plant utilization 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 m^3. For this maintenance dredging permit application, typical plant to include for utilisation on the river Boyne estuary, berths, artificial dredged pockets, ship swing basins, entrance and seaward approaches are:

1. Trailer Suction Dredger (TSD): the dredging vessel while underway drags a pipe on the river bed 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 the 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.

   This is the primary method of dredging contracted at Drogheda Port. The typical vessel used is circa 80m in length and can manoeuvre with ease at the entrance and seaward approaches, linear berths town quay berths, Flogas LPG terminal, Premier Periclase berth, Tom Roes Point berths and the general estuary. By virtue that the plant must be underway to dredge its efficiency and productivity is reduced when engaged to dredge the swing basins.

2. 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 plant is ideally suitable to Drogheda for dredging of the ship swing basins and berth. The backhoe dredger generally tends to have a very high commercial mobilisation cost and rate per m^3.

3. 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, it sails to the approved dumpsite and through bottom doors in the hull that opens and releases the material.

4. Grab dredger: a vessel with a grabbing crane on board and dredges using a cam 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.

5. 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.

6. 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

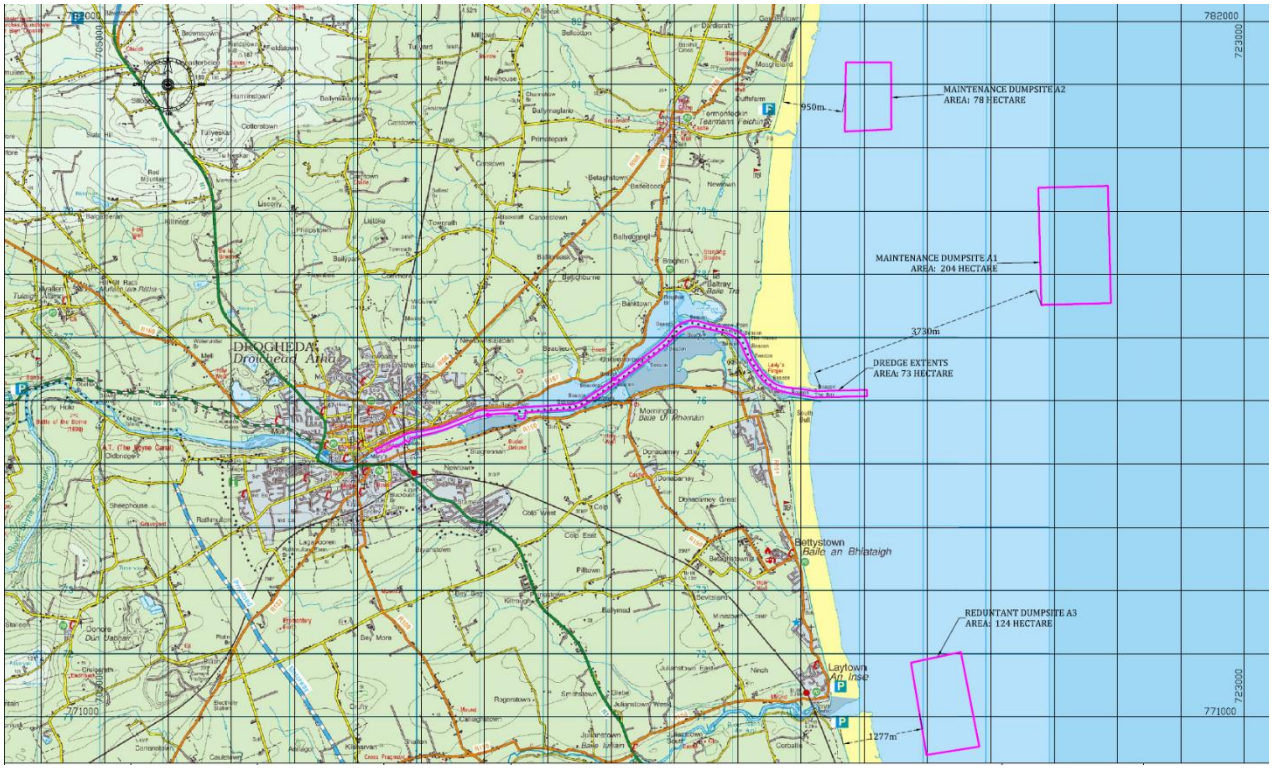
strong currents to be recovered by the trailer suction dredger some distance downstream of the plough operations where the sediments settle out. Such plant would be used where larger vessels due to the size and manoeuvring characteristics cannot operate.

Photos of each of these types of plant can be found the licence application.

3.1.2. Dumping Operation

See Figure 5 below for the location of the two dumpsites and the redundant dumpsite.

Figure 5: Location of Dumpsites



The seaward Dumpsite 'A1' has been used as the primary all material dumpsite for over the past three decades by Drogheda Port Company for maintenance and capital dredging material disposal. Drogheda Port Company is the only permit holder in respect of the 'A1' dump site. The site is located within the designated anchorage of Drogheda Port approximately 2.5km from the shore in a depth of 13-15 metres of water at Chart Datum.

The near shore Dumpsite 'A2' is used only for sand dredged at the channel entrance and seaward approaches. The site is close to the surf zone and the depth at this site is shallow with only 4 metres of water at Chart Datum.

Dredging and dumping is carried out by the same plant, which is usually a trailer suction dredger. This dredging vessel, while underway, drags a pipe on the river bed 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 the hull that open to release the hold contents.

The A3 site is redundant and is not for consideration in this application.

4. OVERVIEW OF THE RECEIVING ENVIRONMENT

4.1. European Sites

The maintenance dredging operation site lies within three European sites; the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, and the Boyne Estuary SPA.

There are two other European sites in the vicinity. The next closest European sites to the operation are the River Boyne and River Blackwater SPA c.3.5km upstream and west of the closest extent of the operation in Drogheda town, and the River Nanny and Estuary SPA c.3.7km south of the breakwaters in the estuary mouth.

The QIs/SCIs of the European sites within, or downstream of, the operation are provided in Table 2. All of the European sites present in the vicinity of the operation are shown on Table 2.

Table 2: European sites in the vicinity of the operation

Site name and code	Distance from Operation	Reasons for designation[3] (*= Priority Annex I Habitat)[4] (Sourced from NPWS online Conservation Objectives)
Special Areas of Conservation (SACs)		
Boyne Coast and Estuary SAC [001957]	The operation overlaps with the European site boundary	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1310] *Salicornia* and other annuals colonizing mud and sand [1320] *Spartina* swards (*Spartinion maritimae*) [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2130] *Fixed coastal dunes with herbaceous vegetation (grey dunes) NPWS (2012) *Conservation Objectives for Boyne Coast and Estuary SAC [001957].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
River Boyne and River Blackwater SAC [002299]	The operation overlaps with the European site boundary	[7230] Alkaline fens [7230] [91E0] *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [1106] Atlantic Salmon *Salmo salar* [1099] River Lamprey *Lampetra fluviatilis* [1355] Otter *Lutra lutra* NPWS (2018) *Conservation objectives for River Boyne and River Blackwater SAC [002299].* Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
Clogher Head SAC [001459]	c.8.2km north	[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [4030] European dry heaths NPWS (2017) *Conservation Objectives for Clogher Head SAC [001459].* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

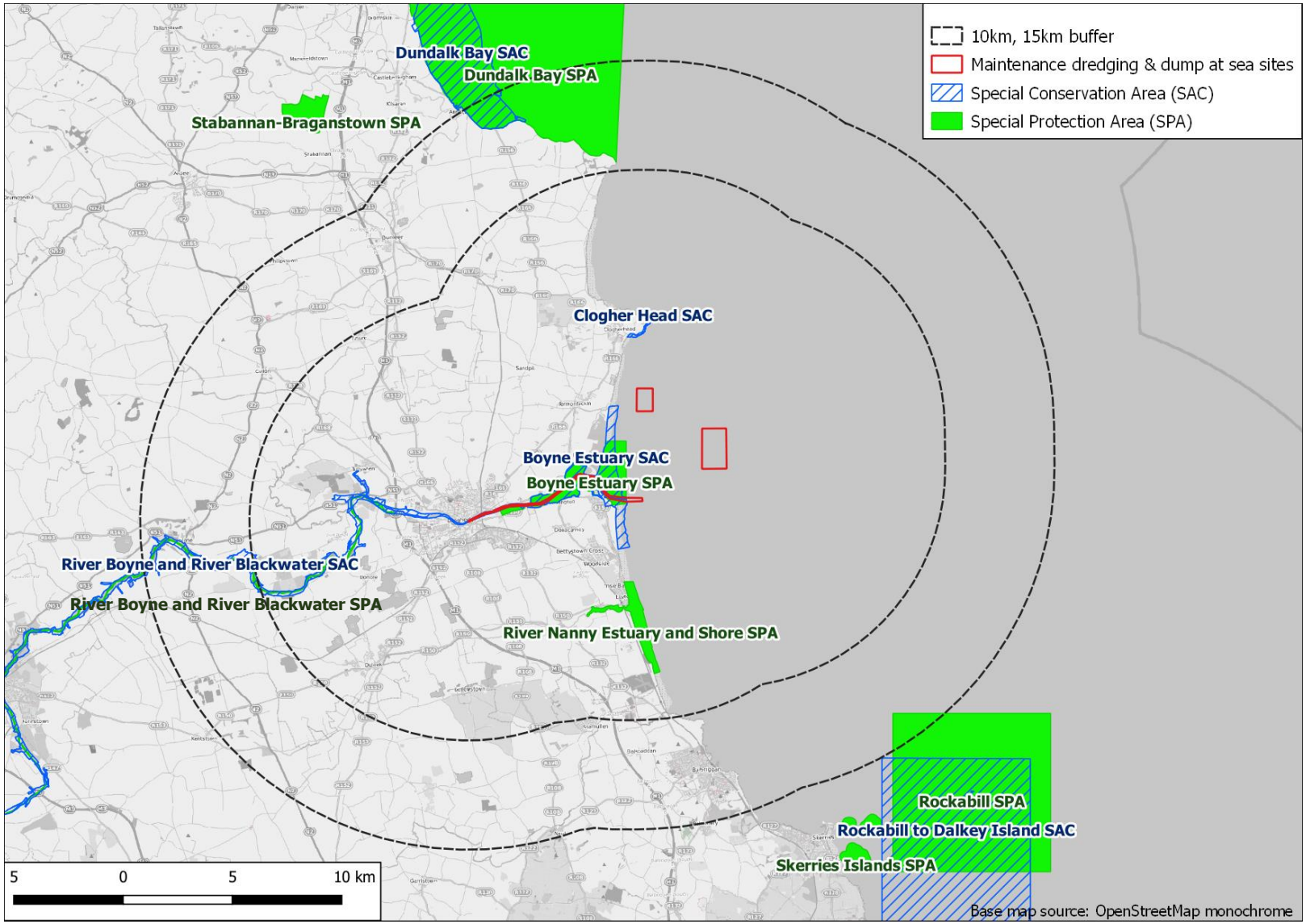
[3] "Qualifying Interests" for SACs and "Special Conservation Interests" for SPAs based on relevant Statutory Instruments for each SPA, and NPWS Conservation Objectives for SACs downloaded from www.npws.ie in September 2018. Data on NHA/pNHA sites from the site synopsis documents published by the NPWS (where available).

[4] Priority Annex I habitat types are denoted with an "*" and are habitat types which are in danger of disappearance at a European level – from the definition of "priority natural habitat types" in Article 1(d) of the Habitats Directive

Site name and code	Distance from Operation	Reasons for designation[3] (*= Priority Annex I Habitat)[4] (Sourced from NPWS online Conservation Objectives)
Dundalk Bay SAC [000455]	c.13.5km northwest	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1220] Perennial vegetation of stony banks [1310] Salicornia and other annuals colonizing mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) NPWS (2011) *Conservation Objectives for Dundalk Bay SAC [000455] and Dundalk Bay SPA [004026].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Rockabill to Dalkey Island SAC [003000]	c.15km southeast	[1170] Reefs [1351] Harbour porpoise *Phocoena phocoena* NPWS (2013) *Conservation Objectives for Rockabill to Dalkey Island SAC [003000]*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Special Protections Areas (SPAs)		
Boyne Estuary SPA [004080]	The operation overlaps with the European site boundary	[A048] Shelduck (*Tadorna tadorna*) [A130] Oystercatcher (*Haematopus ostralegus*) [A140] Golden Plover (*Pluvialis apricaria*) [A141] Grey Plover (*Pluvialis squatarola*) [A142] Lapwing (*Vanellus vanellus*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A156] Black-tailed Godwit (*Limosa limosa*) [A162] Redshank (*Tringa totanus*) [A169] Turnstone (*Arenaria interpres*) [A195] Little Tern (*Sterna albifrons*) [A999] Wetland and Waterbirds NPWS (2013) *Conservation Objectives for Boyne Estuary SPA [004080].* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
River Boyne and River Blackwater SPA [004232]	c.3.5km upstream and west	[A229] Kingfisher (*Alcedo atthis*) NPWS (2018) *Conservation Objectives for River Boyne and River Blackwater SPA [004232].* Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.
River Nanny and Estuary SPA [004158]	c.3.7km south	[A130] Oystercatcher (*Haematopus ostralegus*) [A137] Ringed Plover (*Charadrius hiaticula*) [A140] Golden Plover (*Pluvialis apricaria*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A184] Herring Gull (*Larus argentatus*) [A999] Wetland and Waterbirds NPWS (2012) *Conservation Objectives for River Nanny Estuary and Shore SPA [004158].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Dundalk Bay SPA [004026]	c.11km north	[A005] Great Crested Grebe *Podiceps cristatus* [A043] Greylag Goose *Anser anser* [A046] Light-bellied Brent Goose *Branta bernicla hrota*

Site name and code	Distance from Operation	Reasons for designation[3] (*= Priority Annex I Habitat)[4] (Sourced from NPWS online Conservation Objectives)
		[A048] Shelduck *Tadorna tadorna* [A052] Teal *Anas crecca* [A053] Mallard *Anas platyrhynchos* [A054] Pintail *Anas acuta* [A065] Common Scoter *Melanitta nigra* [A069] Red-breasted Merganser *Mergus serrator* [A130] Oystercatcher *Haematopus ostralegus* [A137] Ringed Plover *Charadrius hiaticula* [A140] Golden Plover *Pluvialis apricaria* [A141] Grey Plover *Pluvialis squatarola* [A142] Lapwing *Vanellus vanellus* [A143] Knot *Calidris canutus* [A149] Dunlin *Calidris alpina* [A156] Black-tailed Godwit *Limosa limosa* [A157] Bar-tailed Godwit *Limosa lapponica* [A160] Curlew *Numenius arquata* [A162] Redshank *Tringa totanus* [A179] Black-headed Gull *Chroicocephalus ridibundus* [A182] Common Gull *Larus canus* [A184] Herring Gull *Larus argentatus* [A999] Wetlands & Waterbirds NPWS (2011) *Conservation Objectives for Dundalk Bay SAC [000455] and Dundalk Bay SPA [004026].* Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
Rockabill SPA [004014]	c.13.5km southeast	[A148] Purple Sandpiper *Calidris maritima* [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea* NPWS (2013) *Conservation Objectives for Rockabill SPA [004014]*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Figure 6: European sites within the vicinity of the operation site



4.2. Habitats

The estuarine habitat of the Boyne Estuary encompasses two Annex I habitats: Estuaries [1130] and Mudflats and sandflats not covered by seawater at low tide [1140]. The site comprises mainly a river channel that supports subtidal habitat, and the mudflats and sandflats to the north and south within the estuary and the beaches outside the breakwaters. The site is dominated by sedimentary habitats, with muddier sediment found upstream within the estuary, becoming more sand-dominated close to the river mouth and outside the breakwaters.

4.2.1. Intertidal Benthic Fauna

The intertidal zone comprises the sea shore between the highest and lowest astronomical tides. It is a variable habitat, depending on factors such as substratum type, salinity and exposure. In low energy areas, the intertidal zone tends to consist of mud, while in high energy zones the substratum is one of bedrock and boulders. The intertidal zone of the Boyne Coast and Estuary SAC supports the Annex I habitat [1140] Mudflats and sandflats not covered by seawater at low tide.

The intertidal zone of the Boyne Estuary and adjacent waters were surveyed by ASU (2011). The data collected were used to develop the Conservation Objectives for the Boyne Coast and Estuary SAC (NPWS, 2012a; 2012b). Following the classification of Connor *et al.* (2004), six biotopes were recorded across the mudflats and sandflats of the study area, with Stagrennan Polder classified only to Level 4 as Polychaete/bivalve dominated mid-estuarine mud shores (LS.LMu.MEst), and progressing downstream to *Hediste diversicolor*, *Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (LS.LMu.MEst.HedMacScr), *Hediste diversicolor* and *Corophium volutator* in littoral gravelly sandy mud (LS.LMx.GvMu.HedMX.Cvol), Polychaete/bivalve dominated muddy sand shores (LS.LSa.MuSa) and *Hediste diversicolor*, *Macoma balthica* and *Eteone longa* in littoral muddy sand (LS.LSa.MuSa.HedMacEte) within the estuary, while the beaches to the north and south were classified as Polychaetes and *Angulus tenuis* in littoral fine sand (LS.LSa.FiSa.Po.Aten). The intertidal core survey recorded a total of 42 species or higher taxa from the phyla Annelida (19), Crustacea (13), Mollusca (9), and Nemertea (1). Polychaete worms were the most species-rich group with 16 species recorded.

The benthic survey carried out as part of the current study recorded a total of 532 individuals represented by 21 species or higher taxa. See Figure 1 for intertidal sample station locations. Macroinvertebrate groups recorded were Annelida (9 taxa), Mollusca (6 taxa) and Crustacea (6 taxa). The ragworm (*Nereis diversicolor*) was the most frequently occurring species, being present at eight sample locations within the estuary and absent from those taken outside. The peppery furrow shell (*Scrobicularia plana*) was the next most frequently occurring species, with a very similar distribution to that of the ragworm; however, it was not recorded at sample station IT02. The oligochaete worm *Tubificoides benedii* was the most common species, with 139 individuals recorded; however 134 of these were recorded at one site (IT08). Sample station IT10 was the most species-rich of the stations sampled with eight species, while IT02 and IT03 were the least species-rich with two species. Higher species diversity was recorded outside the estuary on the sandy beaches (IT09-IT12).

The three groups of sample stations, based on the statistical analysis of the macroinvertebrate species present, were stations IT01 & IT02, stations IT03 – IT08 and stations IT09 – IT12. Stations IT01 and IT02 were within Stragrennan Polder and so are likely to be still recovering from the effects of historical spoil dumping, which has since been reversed. IT03 – IT08 were all within the mudflats of the Boyne Estuary, while IT09 – IT12 were located on the sandy beaches outside the estuary.

The intertidal benthic macroinvertebrate community of the Boyne Estuary and the surrounding waters is largely dependent on the salinity, sediment type and height on the shore. Within the upper estuary (IT01 & IT02), where the salinity would be lowest and where the sediment was classed as muddy sand, the community was quite different from the remaining stations within the estuary (IT03-IT08), where the salinity would gradually increase and the sediment was mostly sandy mud. Those sites outside the estuary (IT09-IT12) where sandy sediment was recorded and salinity would be closer to fully marine were different again. The sediment analysis revealed a pattern broadly similar to the macroinvertebrates, as would be expected, with three grouping: stations IT09-IT10 & IT12, stations IT01-IT02, IT04, IT06 & IT08, stations IT03, IT05 & IT07, with Station IT11 separated out by itself. The first group is predominantly sand, the second predominantly sandy mud and the third mainly muddy sand. The changes to the grouping as compared to the macroinvertebrates relates to height on the shore, which is enough to change the sediment profile, but not to change the macroinvertebrates community.

The *Hediste diversicolor* and *Corophium volutator*-dominated community present at the most upstream sample sites IT01 and IT02 within Stagrennan Polder were classified as *Hediste diversicolor* and *Corophium volutator* in littoral mud (LS.LMu.UEst.Hed.CVol) (Connor *et al*., 2004). Sample sites IT03-IT08, all within the Boyne Estuary, which were dominated by *Hediste diversicolor* and *Scrobicularia plana*, were classified as *Hediste diversicolor*, *Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (LS.LMu.MEst.HedMacScr). Of the remaining four intertidal sites, located outside the estuary on the sandy beaches, IT09 was classified as *Eurydice pulchra* in littoral mobile sand (LS.LSa.MoSa.AmSco.Eur), while IT10-IT12 were classified as Polychaetes and *Angulus tenuis* in littoral fine sand (LS.LSa.FiSa.Po.Aten). In this instance, the macroinvertebrate cluster analysis coincided very closely with the pattern of assigned biotopes.

The biotopes recorded fall within the community types defined for the Annex I habitat [1140] Mudflats and sandflats not covered by seawater at low tide within the Boyne Coast and Estuary SAC (NPWS, 2012b).

Further details of the results of the intertidal survey can be found in Appendix 3.

4.2.2. Subtidal Benthic Fauna

The subtidal zone is the area of the seabed below the lowest astronomical tide and so is permanently covered in water. The habitats and species (biotopes) present depend on a range of biotic and abiotic factors, including current speeds, sediment type, freshwater inputs and occurrence of species. In an estuary, the interaction between the river and the sea creates a gradient of subtidal biotopes, with varying communities and sediment types. The subtidal zone of the Boyne Coast and Estuary SAC forms part of the Annex I habitat [1130] Estuaries.

The subtidal zone of the Boyne Estuary and adjacent waters were previously surveyed by EcoServe (2011), by means of a 0.1 m^2 Day grab and a Rallier-du-Baty dredge. The data collected were used to develop the Conservation Objectives for the Boyne Coast and Estuary SAC (NPWS, 2012a; 2012b). Following the classification of Connor *et al.* (2004), EcoServe (2011) recorded four biotopes within the study area, ranging from low energy, variable salinity mud at the most upstream site (SS.SMu.SMuVS), through moderate energy, variable salinity sand (SS.SSa.SSaVS.NcirMac) to high energy mixed sediment (SS.SCS.ICS.Slan) in the lower estuary and moderate energy slightly gravelly sand (SS.SSa.IMuSa.FfabMag) found at the estuary mouth and beyond. The survey recorded a total of 45 species of macroinvertebrate from the phyla Annelida, Mollusca, Crustacea and Echinodermata. Polychaete worms were the most species-rich group with 23 species recorded. The grab samples contained 31 species, while the dredge samples had 26 species.

ASU (2006) presents the results of a subtidal grab survey undertaken as part of a capital dredging application in the upper part of the Boyne Estuary. This survey did not identify the biotopes present, but the most common species recorded were *Nereis diversicolor*, *Nephtys hombergii*, *Streblospio benedicti* and Oligochaeta.

The subtidal survey carried out as part of the current study recorded a total of 1201 individuals represented by 65 species or higher taxa. Major invertebrate groups present included Annelida (22 taxa), Mollusca (20 taxa), Crustacea (18 taxa) and Echinodermata (3 taxa), with Nemertea, also present. Of the stations sampled, three were within the boundary of the Boyne Coast and Estuary SAC: S02-S04. Station S02 was the least species-rich of the three stations, with only two species recorded, while S04 was the most-species rich with seven species.

Station S02 represents the mid-upper estuarine communities, with its variable salinity and muddy substratum. Station S03 represents conditions closer to the river mouth, with a sandier substratum and stronger current. Station S04 is different from the rest of the sites owing to the stony substratum, with a related epifauna. This is due to the higher current velocities at this location at the bend in the estuary.

The subtidal macroinvertebrate community of the Boyne Coast and Estuary SAC is largely dependent on the salinity, sediment type and current. Within the upper estuary (S02), where the salinity was lowest and where the sediment was classed as muddy sand, the community was quite different from the remaining stations within the estuary (S03 & S04), where the salinity gradually increases, and the conditions were affected by stronger tidal currents.

Stations S01 and S02 were classified as *Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud (SS.SMu.SMuVS.NhomTubi), which reflected the low salinity, muddy conditions. Station S03 was classified as Dense *Lanice conchilega* and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand (SS.SCS.ICS.SLan), with *Lanice conchilega* casts abundant in the sediment. Station S04 was classified as *Mytilus edulis* beds on sublittoral sediment (SS.SBR.SMus.MytSS), with the fauna differing greatly due to the

stony substratum, and likely strong currents. All the stations outside the Boyne Estuary (S05-S16) were classified as *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (SS.SSa.IMuSa.FfabMag) (Connor *et al*., 2004).

The biotopes recorded at stations S02 and S03 fall within the broad subtidal fine sand dominated by polychaetes community, which define the subtidal element of the Annex I habitat [1130] Estuaries within the Boyne Coast and Estuary SAC (NPWS, 2012b). The stony community recorded at S04 is due to local conditions with regard to currents, and does not reflect a deviation from the baseline conditions.

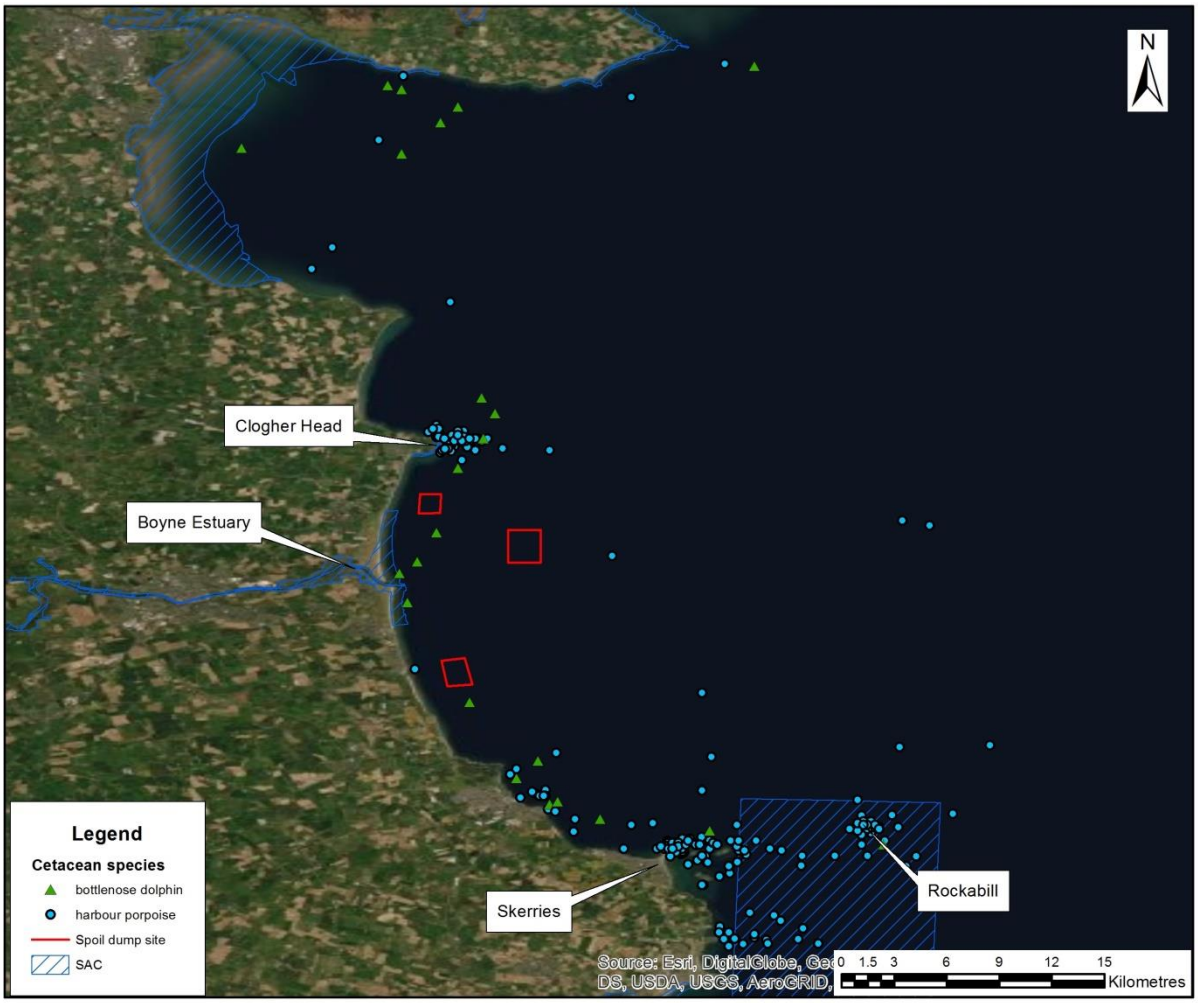
Further details of the results of the intertidal survey can be found in Appendix 3.

4.2.3. Marine Mammals

Four species of marine mammal are listed under Annex II of the Habitats Directive: Harbour porpoise (*Phocoena phocoena*), Bottlenose dolphin (*Tursiops truncatus*), Grey seal (*Halichoerus grypus*) and Harbour seal (*Phoca vitulina*). Of these, only Harbour porpoise and Harbour seal have been regularly recorded in the vicinity of the proposed operation, though Grey seals have been recorded in the vicinity of Clogherhead to the north and Cardy Rocks to the south (NBDC, 2019). The only SAC designated for the protection of Harbour porpoise on the east coast is the Rockabill to Dalkey Island SAC. The only SAC designated for the protection of Harbour seal on the east coast is Lambay Island SAC, which is also designated for Grey seal.

IWDG Distribution data for Harbour porpoise and Bottlenose dolphin off the east coast between north Dublin and Louth are presented in Figure 9 (IWDG, 2019).

Figure 9: Distribution of Harbour porpoise and Bottlenose dolphin in relation to the proposed operation



4.2.4. 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.

Berrow *et al.* (2011) carried out a visual and hydro-acoustic survey in a block within the northern Irish Sea, extending from Carlingford Lough, Co. Louth in the north to Bray Head, Co. Wicklow in the south. Harbour Porpoise was by far the most commonly recorded marine mammal species, with 51 sightings comprising 83 individuals. It is clear from the distribution of the sightings, that the marine mammal activity in the inshore area was concentrated in the section from Skerries, Co. Dublin down to Bray Head, Co. Wicklow. Only a small number of Harbour porpoise sightings were made north of Skerries, with no sightings recorded directly offshore from the Boyne Estuary.

The main concentrations of validated Harbour porpoise sightings are around Clogherhead, Co. Louth, and Skerries Islands and Rockabill, Co. Dublin (Figure 9). The pattern of sightings may be due, in part, to vantage points, as marine mammals are more visible from elevated points, such as Clogherhead. Level of recording effort is also important, as evidenced by the number of records by the same people around Rockabill. However, Harbour porpoise are known to focus around islands, headlands, or restricted channels due to current flows creating enhanced foraging opportunities by concentrating prey (Johnston *et al*., 2005). This behaviour suggests that the distribution pattern seen in the data reflects the typical distribution of the species in the vicinity of the Boyne Estuary.

Harbour porpoises were recorded in the course of the current survey. Three sightings of an individual animal were made (Table 3). Two of these sightings were as part of the constant effort watch survey, while the other was a casual sighting made while carrying out the subtidal grab survey from the M.V. Sharpshooter.

Table 3: Harbour porpoise sightings recorded during the current survey

Date	Location	Latitude	Longitude	Comment
20-03-19	Outside Boyne Estuary	53.72373°	-6.23617°	Constant effort watch. 1 adult.
20-04-19	Outside Boyne Estuary	53.72389°	-6.23467°	Constant effort watch. 1 adult.
26-04-19	Mouth of Boyne Estuary	53.72176°	-6.236848°	Casual sighting. 1 Adult observed from M.V. Sharpshooter just after dredger had left.
12-05-19	N/A	N/A	N/A	Constant effort watch. No Harbour Porpoise sightings.
14-06-19	N/A	N/A	N/A	Constant effort watch. No sightings.

Harbour porpoises are listed under Annex II and IV of the Habitats Directive. There are three SACs in Ireland designated for the protection of the species: Blasket Islands SAC [002172], Roaringwater Bay and Islands SAC [000101] and Rockabill to Dalkey Island SAC [003000]. Harbour porpoises are also protected by the Whale Fisheries Act 1937 and the Wildlife Acts 1976-2018.

A log of sea craft activity during marine mammal surveys was recorded. As a summary, clam fishing boats and DPC's pilot boat were present during the March and April surveys for which Harbour porpoise were observed; no sea craft was recorded during surveys in May; and, DPC's dredger was present for 15minutes during the marine mammal survey in June. No notable reaction to sea craft activity was recorded during surveys.

4.3. Seals

Grey seals and Harbour seals are commonly recorded along the east coast of Ireland. The most important areas around the Irish coasts for Grey seals are located on the west coast and are designated as SACs, owing to the fact that Grey seals are listed under Annex II of the Habitats Directive. The only SAC designated for the protection of Grey seals in the Irish Sea is at Lambay Island, Co. Dublin [000204]. While certain localities are of particular importance as moulting and breeding sites, Grey seals travel widely when foraging and can be recorded all along the coast and some distance offshore.

Grey seals are also protected under the Wildlife Acts 1976-2018.

Harbour seals are also recorded all around the coast of Ireland, with the west coast providing the best habitat, though Carlingford Lough is also a notable Harbour seal site (Duck & Morris, 2017). Harbour seals are listed under Annex II of the Habitats Directive and there are thirteen SACs designated for their protection. Of these SACs, only Lambay Island SAC [000204] is located in the Irish Sea. Harbour seals are also protected under the Wildlife Acts 1976-2018.

A review of records on the mapping system of the National Biodiversity Data Centre (NBDC, 2019) 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. No Grey seals were recorded in the vicinity of the Boyne Estuary, with the closest records at Clogherhead to the north and Cardy Rocks, Balbriggan, to the south (NBDC, 2019).

In the course of the current survey, 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. A particularly notable haul-out was within Baltray Bay, where up to 15 individuals were recorded.

4.3.1. Fish

The Irish Sea and its estuaries are home to a range of commercial and recreational fishing activities. Commercial fisheries include trawlers, dredgers and potters exploiting numerous species of fish and shellfish, while recreational fishing comprises shore-based and boat-based angling. Migratory fish also move through estuaries on their journey from spawning grounds to feeding grounds.

Five migratory fish species have been recorded from the Boyne River system: Atlantic salmon (*Salmo salar*), Sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), Sea lamprey (*Petromyzon marinus*) and River lamprey (*Lampetra fluviatilis*) (O'Connor, 2006; Kelly *et al*., 2015; 2017; Noel McGloin, IFI, pers. comm.). Salmon and Sea trout spawn in freshwaters and migrate to sea to feed and grow before returning to freshwaters. European eel spawn in the Sargasso Sea in the western North Atlantic, with young eels migrating up rivers as glass eels before metamorphosing into elvers. River lamprey spawn in freshwater, but migrate to transitional waters to feed as adults for one to two years, while Sea lamprey spawn in freshwater and migrate to the sea to mature (Maitland, 2003). Salmon and River lamprey are listed under Annex II of the Habitats Directive and Salmon is a Qualifying Interest in the River Boyne and River Blackwater SAC [002299] upstream of the Boyne Estuary.

As well as these migratory fish, other fish species make use of the estuaries for all or part of their life cycle. Surveys by Inland Fisheries Ireland (IFI, previously the Central and Regional Fisheries Boards) recorded 23 species (counting Sea trout and Brown trout as different species) in the Boyne Estuary in both 2009 and 2012, with only slight difference is the species list between the two years (Table 4).

***Table 4**: Fish species recorded from the Boyne Estuary in 2009 and 2012 (adapted from CRFB, 2009; IFI, 2012). Habitat from Froese & Pauly (2019) M = Marine, B = Brackish, F = Freshwater*

Scientific name	Common name	2009 Total	2012 Total	Habitat
Sprattus sprattus	Sprat	2232	5	M, B
Platichthys flesus	Flounder	114	164	M, B, F
Taurulus bubalis	Long-spined sea scorpion	99	5	M, B
Gadus morhua	Cod	86	46	M, B
Pomatoschistus minutus	Sand goby	41	66	M, B
Ammodytes tobianus	Lesser sandeel	36	1159	M, B
Anguilla anguilla	Eel	27	32	M, B, F
Pleuronectes platessa	Plaice	20	8	M, B
Clupea harengus	Herring	16	-	M, B
Pholis gunnellus	Gunnel (Butterfish)	10	3	M, B
Chelon labrosus	Thick-lipped grey mullet	9	-	M, B, F
Syngnathus acus	Greater pipefish	8	1	M, B

Scientific name	Common name	2009 Total	2012 Total	Habitat
Ciliata mustela	Five-bearded rockling	6	31	M
Gasterosteus aculeatus	Three-spined stickleback	5	17	M, B, F
Pollachius pollachius	Pollack	5	2	M
Salmo trutta	Sea trout	3	5	M, B, F
Agonus cataphractus	Pogge	3	1	M
Rutilus rutilus	Roach	3	1	B, F
Merlangius merlangus	Whiting	3	-	M
Salmo salar	Salmon	2	13	M, B, F
Myoxocephalus scorpius	Short-spined sea scorpion	2	1	M, B
Salmo trutta	Brown trout	1	12	B, F
Phoxinus phoxinus	Minnow	1	829	B, F
Gobiusculus flavescens	Two-spotted goby	-	5	M, B
Spinachia spinachia	Fifteen-spined stickleback	-	1	M, B
Barbatula barbatula	Stone loach	-	1	F

Of the migratory species mentioned above, Sea and River lamprey were not recorded in the course of the estuarine survey. Four species (Cod, Whiting, Herring and Plaice) recorded are of interest to commercial sea fisheries and are covered by quotas (Marine Institute, 2018).

Bass (*Dicentrarchus labrax*) has also been recorded from the Boyne Estuary, as has Twaite Shad (*Alosa fallax*) (Noel McGloin, IFI, pers. comm.). The latter is not known to have established a population in the Boyne (*ibid.*) and the only known spawning area is at the upper tidal limit of the River Barrow (Doherty *et al*., 2004).

Basking sharks have been occasionally sighted in the coastal waters off counties Louth, Meath and Dublin (IWDG, 2019); however, these sightings are infrequent and generally around headlands and islands.

The inshore waters outside the Boyne Estuary, and the northwest Ireland Sea in general, are home to a Razor clam (*Ensis siliqua*) dredge fishery (Clarke & Tully, 2011). Numerous Razor clam dredgers were observed operating along the coast outside the Boyne Estuary during the current survey.

Draft netting for Salmon returning to the River Boyne used to take place within the Boyne Estuary, but licences are no longer issued for this fishery due to declining Salmon stocks. The estuary also once supported a Mussel (*Mytilus edulis*) fishery, with Mussels being harvested from the bottom with rakes from small boats either side of low tide (EcoServe, 2011). This fishery no longer operates following capital dredging of the channel into Drogheda Port. A population of mussels continues to occur within the estuary (EcoServe, 2011; current survey) and the spawning effort from the Boyne Estuary is thought to have influence as far south as Howth Head (Maguire et al., 2007).

4.3.2. Little Terns

Little tern were recorded during every visit between 30th May and 9th August 2018. Table 5 below provides a summary of Little tern activity recorded at each VP location. The table also includes observations of other tern species including Roseate tern and Common tern which are SCI species of Rockabill SPA.

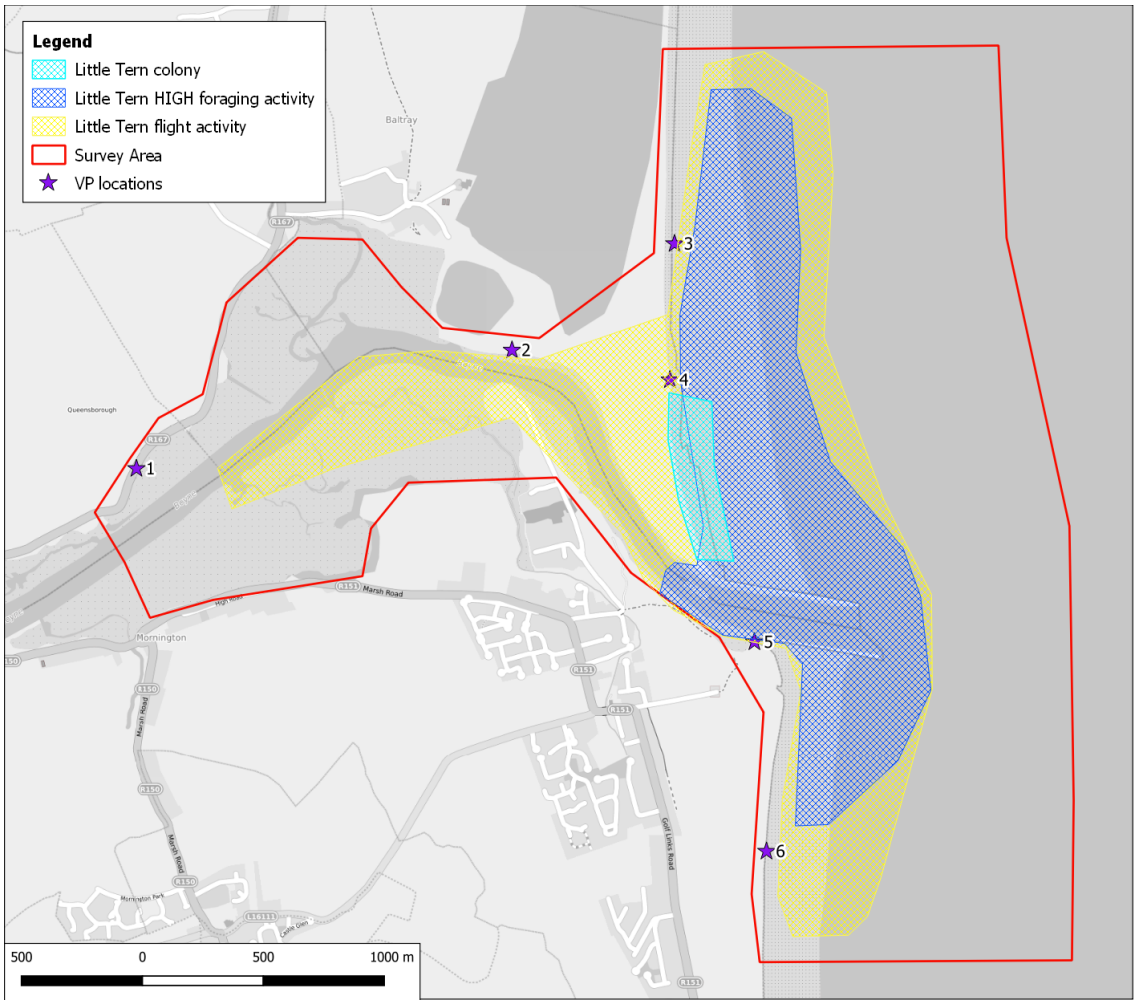
Table 5: Summary of Little tern activity within the survey area recorded at each VP location

VP	Location and Activity
1	A single Little tern was recorded foraging as far inland as VP1 (*c.* 3km upstream of the estuary mouth) on one occasion in June during a survey at low tide. No further observations of Little tern were recorded at VP1 during surveys.
2	Small numbers of Little terns, one and two birds, were recorded during June and July surveys. Birds were recorded foraging along the river channel edge on the northern shore at low tide, closest to the colony. These birds were also recorded regularly commuting over the dune system to the colony *c.* 200-300m east.

VP	Location and Activity
4	This VP was located *c.* 700m north of the colony and recorded foraging Little tern and birds in transit to foraging grounds further north of the VP. Little tern were recorded foraging along the shoreline in shallow waters. A maximum count of 17 Little terns in June, 25 in July and 12 in August were counted during disturbance events in the colony which flushed terns north of the colony during these events. Up to five Roseate terns and Common terns were recorded roosting along the shoreline in early August. These birds also foraged along the shoreline at VP3, although in deeper waters further out to sea compared to Little terns. It is likely that larger congregations of mixed flocks of terns gathered in this area later in August prior to migration.
3	This VP is closest to the colony, therefore activity captured included terns leaving the colony, foraging and returning back to the colony again. Birds foraged in shores adjacent to the colony and along the northern sea wall. This VP also captured events where the colony was flushed due to disturbance or as a result of social behaviour within the colony. A maximum count of 32 Little Tern were recorded during the June survey. There did not appear to be any variation in activity between high and low tide. Roseate terns and Common terns were also recorded during surveys at VP3. A mixed flock of Common terns and Roseate terns with a maximum count of 66 birds were recorded in June foraging in shallow water close to the colony. In August a mixed flock of 32 Common terns and Roseate terns were recorded foraging to the north of the colony. A mixed flock of c.120 roosting Roseate and Common tern were recorded along the northern beach shoreline and close to the northern breakwater during August surveys.
5	This VP had views over the estuary mouth towards the Little tern colony. Terns were regularly recorded foraging in the estuary mouth, close to the breakwaters, and the seaward side of the breakwaters. It was noted during surveys that greater numbers of beach users were recorded at VP5 as this area of the beach is readily accessible to the public via Mornington. A maximum number of 34 Little tern were recorded in July from this VP location. A mixed flock of 254 Common terns and 127 Roseate terns were recorded roosting on the northern breakwater in August.
6	This VP location faced seaward and was located *c.* 850m from the southern breakwater. Little tern foraging activity was lower at this location, with a maximum count of six Little tern recorded during any one survey. Like along the northern beach shoreline at Baltray, Little tern foraged in shallow waters within the VP6 viewshed. Common terns and Roseate terns were also recorded at this location, however similarly numbers appeared to be lower than in other parts of the survey area *e.g*. 1-5 birds during any one survey.

Figure 10, below, summarises the areas of high Little tern activity as described in Table 5. The blue shaded area was created by overlaying Little tern foraging activity recorded during each survey, to show the area of highest use by foraging birds. The yellow shaded area shows the extent of all Little tern activity recorded within the survey area, this includes foraging birds, disturbance events close to the colony, and/or commuting birds moving between foraging grounds and the nesting area.

Figure 10: Areas of high Little Tern activity and VP locations



Disturbance was recorded during surveys to ascertain current levels within the survey area. It is important to note that disturbance is difficult to detect in some cases where the birds reaction is a subtle change in behaviour or flightpath which may go unnoticed.

Disturbance was lowest at VP1 with only two disturbance events noted across 10 surveys, both of which resulted from a single fisherman walking on navigation walls. Disturbance at VP2 largely related to dogs off the lead either in the river or along the shoreline, and to a hunting Kestrel. Disturbance at VP3 related entirely to dog walkers. VP4 disturbance was associated with dog walkers, people on the breakwaters, a hunting Kestrel, warden within the colony, and horse riders at the breakwaters. Disturbance at VP5 included recreational walkers, dog walkers, sun bathers, and general beach users. Disturbance at VP6 largely resulted from horse riders on the beach, recreational walkers and dog walkers. It was evident that numbers of people using the beach was greater south of the breakwaters at Mornington. Across the survey area walkers and dogs caused the majority of disturbance events.

Commercial vessels entering the river channel at the breakwaters, Drogheda Port pilot craft and fishing vessels off the coastline were not noted to cause detectable disturbance to birds, however it may be the case that disturbance to such craft and vessels is subtle and may have gone unnoticed.

A dredger was present during seven of the 10 visits carried out between 30th May and 9th August 2018 and operating in the navigation channel and east of VP5. The dredger did not appear to cause disturbance to foraging birds, however again disturbance may be subtle, and during the survey on 30th May, Little terns were observed diving for prey items in the wake of the dredger.

4.3.3. Wintering waterbirds

Wintering surveys carried out between September 2018 and April 2019 recorded 12 SCI species associated with the Boyne Estuary SPA, Nanny River and Estuary SPA and Dundalk Bay SPA.

Table 6: Peak counts of SCI bird species recorded during 2018-19 winter bird surveys

Species	Date	Tide	Count Area	Peak count 2018-19	1% National[5]	1% International[6]
Light-bellied Brent Goose (*Branta bernicla hrota*)	25/01/2019	High	3	220	360	400
Shelduck (*Tadorna tadorna*)	25/01/2019	High	2	78	120	3000
Teal (*Anas crecca*)	25/01/2019	High	5	159	340	5000
Mallard (*Anas platyrhynchos*)	20/11/2018	Low	7	76	290	45000
Red-breasted Merganser (*Mergus serrator*)	20/12/2019	Low	11	4	20	1700
Oystercatcher (*Haematopus ostralegus*)	15/10/2018	High	10	**950**	690	8200
Ringed Plover (*Charadrius hiaticula*)	15/10/2018	High	13	34	100	730
Golden Plover (*Pluvialis apricaria*)	12/02/2019	Low	2	**1200**	1200	1700
Grey Plover (*Pluvialis squatarola*)	25/01/2019	Low	13	**35**	30	2500
Lapwing (Vanellus vanellus)	25/01/2019	Low	6	**1260**	1100	72300
Knot (*Calidris canutus*)	25/01/2019	Low	13	**1600**	280	4500
Sanderling (*Calidris alba*)	15/10/2018	High	13	**165**	60	1200
Black-tailed godwit (*Limosa limosa*)	20/09/2018	High	8	**524**	190	610
Bar-tailed Godwit (*Limosa lapponica*)	20/09/2018	Low	6	93	150	1200
Curlew (*Numenius arquata*)	25/01/2019	Low	6	83	350	8400
Redshank (*Tringa tetanus*)	25/01/2019	High	7	**715**	300	3900
Turnstone (*Arenaria interpres*)	20/09/2018	Low	13	1	95	1400
Black-headed Gull (*Chroicocephalus ridibundus*)	16/04/2019	High	6	300	-	20000
Common Gull (*Larus canus*)	20/11/2018	Low	13	60	-	16400
Herring gull (*Larus argentatus*)	20/11/2018	Low	13	220	-	10200

Eight SCI species were recorded in numbers at or above 1% of the national population and included Oystercather, Golden plover, Grey plover, Lapwing, Knot, Sanderling, Black-tailed godwit and Redshank. There was no distinct pattern in usage by SCI species of count areas within the estuary over low and high tide cycles, however it was evident that count area 13, the largest count area, held greatest number of birds over both tides (see Figures 11 and 12). Count areas 10 and 6 also held the largest numbers of birds at low and high tide respectively. Count area 10 also held the greatest diversity of species accommodating 24 different species of waterbirds over the 2018-19 wintering waterbirds surveys.

[5] Crowe, O., & Holt, C. 2013. Estimates of waterbird numbers wintering in Ireland, 2006/07 – 2010/11. Irish Birds 9, 545-552.

[6] Wetlands International (2019). *"Waterbird Population Estimates"* . Estimates available at http://wpe.wetlands.org/ [last accessed 19/08/2018]

Figure 51: Total wintering SCI peak count numbers at low tide across count areas within the Boyne Estuary

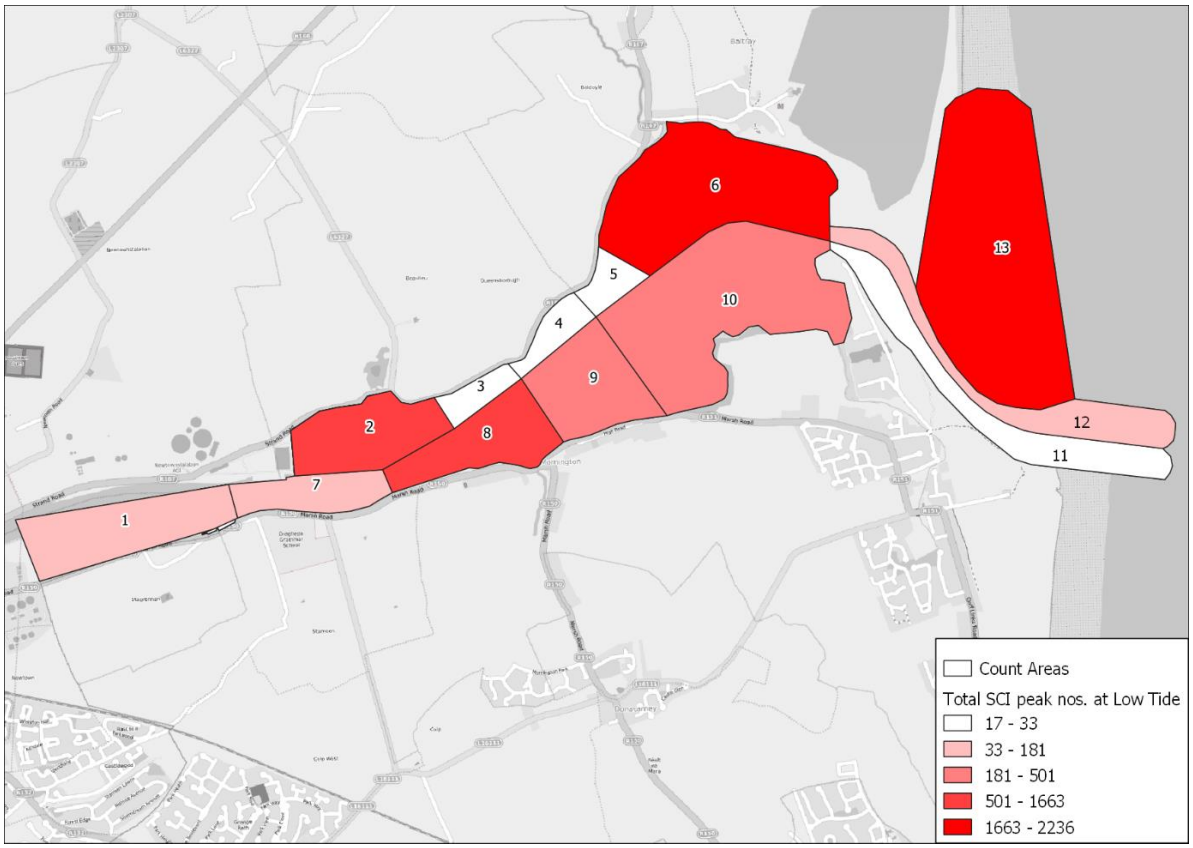
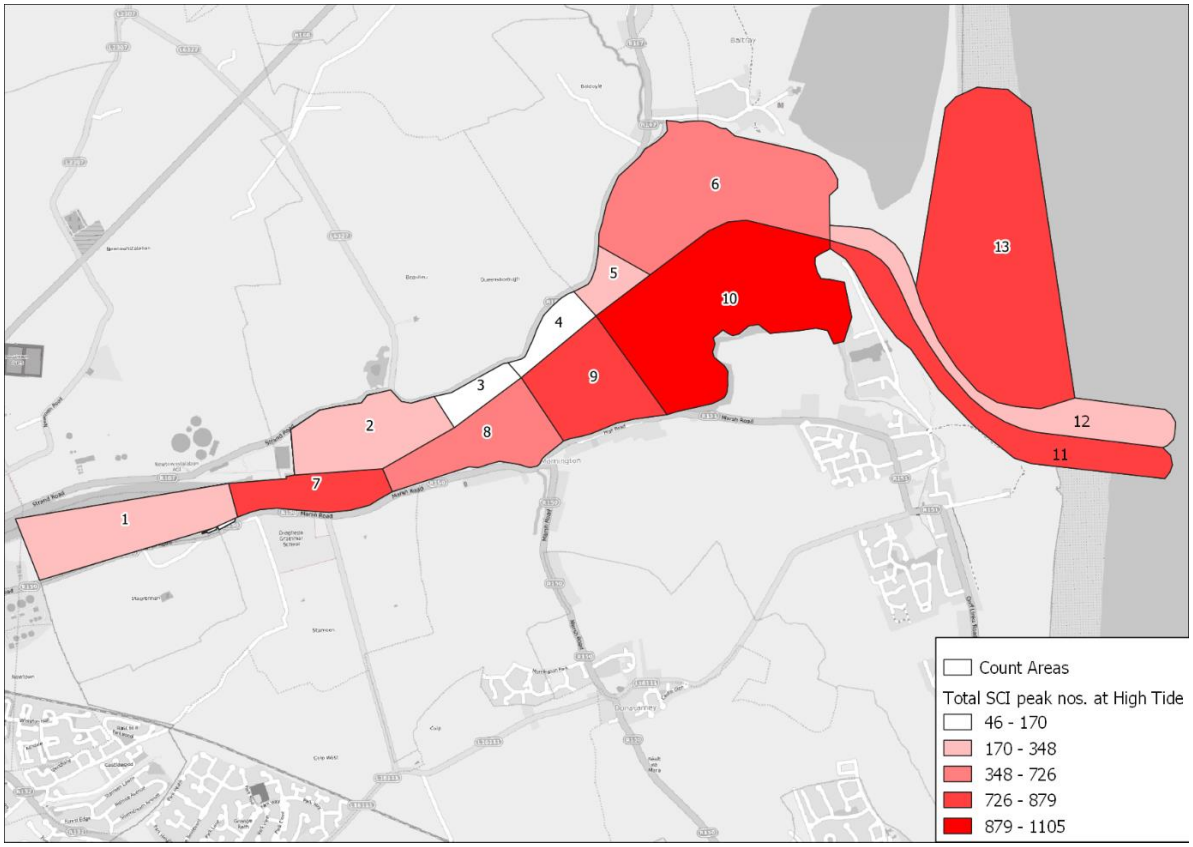


Figure 62: Total wintering SCI peak count numbers at high tide across count areas within the Boyne Estuary



5. Potential Impacts of the Operation on the Receiving Environment and their Potential Zone of Influence, Identification of European Sites within the zone of influence of the Operation and Assessment of Likely Significant Effects

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

- Habitat loss or disturbance
- Effects from siltation
- 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

5.1. Habitat loss and disturbance

The maintenance dredging operation site lies within three European sites; the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, and the Boyne Estuary SPA. There will be direct habitat loss or disturbance of dredged material as result of the maintenance dredging operation within these areas.

5.2. Effects from siltation

Maintenance dredging operational works will produce a sediment plume and has the potential to affect water quality in the receiving tidal extent and downstream hydrological environment of the River Boyne, Boyne Estuary and Irish Sea. The Boyne River and Estuary are dynamic hydrological environments that are tidal and in full spate often have suspended materials in the water column which exceed levels of suspended solids created by the dredging works.

Nonetheless, silt plumes of a sufficient magnitude, have the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, and the Boyne Estuary SPA, River Boyne and River Blackwater SPA, and River Nanny and Estuary SPA located c3.7km south of the Boyne Estuary.

5.3. Disturbance and displacement impacts

Disturbance and displacement of fauna species could potentially occur within the vicinity of the works. For mammals such as otter disturbance effects would not be expected to extend beyond 150m[7]. For birds, disturbance effects are not expected to extend beyond a distance of c.100m, a distance typically avoided by birds where high average boat activity occurs[8]. The noise levels generated during dredging operations depends on the characteristics of the vessel used, as well as the nature of the dredged material, with gravel being noisier than sand (Robinson *et al*., 2011). Given that the material to be dredged is predominately sand with some silt, the noise generated by the dredger will be similar to that generated by a normal vessel of a similar size, or lower as the dredger moves at very low speeds. Dredging operations at the site are currently part of the existing baseline activity within the estuary and main channel, a continuation of dredging operations under a renewed licence application is not expected to increase or change the existing disturbance levels at the dredge site.

[7] This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual zone of influence of construction related disturbance likely to be much less in reality.

[8] Cutts, N., Phelps, A. and Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Huber INCA.* Institute of Estuarine and Coastal Studies, University of Hull.

Disturbance and displacement impacts from the operation of maintenance dredging may result in the displacement of aquatic and marine mammals and fish species such as Atlantic salmon and River lamprey.

Disturbance and displacement impacts occurring at a sufficient magnitude, has the potential to affect aquatic and marine mammals, birds and fish populations that occur in the receiving aquatic and marine environment (either alone or in combination with other disturbance and displacement pressures) to an extent that undermines the conservation objectives of European sites in the immediate vicinity; River Boyne and River Blackwater SAC, the Boyne Estuary SPA, River Nanny and Estuary SPA, and River Boyne and River Blackwater SPA; and, European sites designated for mobile fauna species which could occur within the zone of influence; Rockabill to Dalkey Island SAC, Dundalk Bay SPA, and Rockabill SPA.

5.4. Mortality as a result of a pollution event

An accidental pollution event *i.e.* spill/leak of hydro-carbons from plant used for the operation of the maintenance dredging and dump at sea works, has the potential to affect water quality in the receiving tidal extent and downstream hydrological environment of the River Boyne, Boyne Estuary and Irish Sea. An accidental pollution event of a significant magnitude is highly unlikely given the small volumes of hydro-carbons carried on dredging plant. The River Boyne and Irish Sea are tidal waterbodies and it is expected that any spill of minor quantities would readily dissipate.

Nonetheless, a pollution event, of a sufficient magnitude, has the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, and the Boyne Estuary SPA, River Boyne and River Blackwater SPA, and River Nanny and Estuary SPA located c3.7km south of the Boyne Estuary.

Populations of Atlantic salmon and River lamprey occur with the River Boyne migrating up stream to spawning grounds near the headwaters and could be vulnerable to pollution events in the lower reaches of the river during migration. Otter occurring in the River Boyne and marine mammals occurring in the Irish Sea close to the Boyne Estuary could also be vulnerable to a pollution incident affecting the water quality in the receiving environment.

Internationally important numbers of wintering birds and a colony of breeding Little tern use intertidal and estuarine habitats in the Boyne Estuary for feeding and roosting. These species would be vulnerable to an accidental pollution incident either directly *e.g.* through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting.

A pollution event of a sufficient magnitude, has the potential to affect wintering and breeding waterbird populations, marine and aquatic mammals, and fish populations that utilise the receiving aquatic and marine environment (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of European sites in the immediate vicinity of the maintenance dredging and dump at sea sites River Boyne and River Blackwater SAC, Boyne Estuary SPA, River Nanny and Estuary SPA, and River Boyne and River Blackwater SPA.

Mobile bird species associated with European sites a greater distance from the maintenance dredging and dump at sea sites can also be affected by a pollution event if occur within the zone of influence of the proposed operation. These European sites could include; Rockabill to Dalkey Island SAC, Dundalk Bay SPA, and Rockabill SPA.

5.5. Reduced prey availability

Maintenance dredging produces a sediment plume which temporarily changes the turbidity of the water column in an area localised to the dredging works. The sediment plume has the potential to affect the foraging efficiency of birds that dive through the water column in search of prey items that may feed within the plume zone and therefore reduce prey availability in the receiving hydrological environment of the River Boyne, Boyne Estuary and Irish Sea. There is potential for reduced prey availability as a result of increased turbidity and reduced visibility, deteriorating the detection of prey items, to be experienced by Atlantic salmon, River lamprey and Otter.

It is not expected that Kingfisher territories associated with the special conservation interest population of the River Boyne and River Blackwater SPA would extend as far downstream as the dredging operation and sediment plume created by the works, therefore Kingfisher will not be at risk from reduced prey availability impacts.

Wintering waterbirds which occur in wetlands in the Boyne Estuary are intertidal feeding species, which feed on vegetation or buried organisms that are present in the intertidal mudflats and sandflats. Suspended sediments produced by the dredging operation will not impact intertidal feeding wintering waterbirds occurring in the Boyne Estuary.

Little tern are shallow water feeders and dive to catch their prey. In Irish waters Little tern's main prey items are sand eel and sprats (Cummins *et al.*, 2016). Little tern have been reported to have an average foraging radius of less than 4km from the colony, and varying during different stages of the breeding season (Eglinton & Perrow, 2014). Foraging at Kilcoole, Co. Wicklow was recorded up to 1.5km from the colony, but mostly within 30m of the shore (Phalan, 2000 as cited in Eglinton and Perrow, 2014). Little tern feeding habitats are shallow tidal waters, which during certain weather conditions, the dynamic nature of sandy shoreline can naturally create a turbid water column.

Nonetheless, a plume event, of a sufficient magnitude, has the potential to affect the prey availability of diving birds species in the receiving aquatic and marine environments (either alone or in combination with other pressures on prey availability) to an extent that undermines the conservation objectives of the Boyne Coast and Estuary SAC, the Boyne Estuary SPA, and Rockabill SPA.

5.6. Mortality as a result of entrapment

Maintenance dredging works will be carried could be carried out using a range of dredging plant, however works will most likely be carried out by a trailer suction dredger. Interactions between the dredger and fish within the estuary has the potential to result in mortality of QI species, Atlantic salmon and River lamprey, for which the River Boyne and River Blackwater SAC is designated.

5.7. Mortality as a result of collision

Marine mammals can suffer injury, or even death, as a result of collision with boats and ships. Various factors affect the likelihood of collision, including species, age and sex, habitat, vessel size, vessel speed, shipping density (Van Waerebeek *et al.*, 2007). Interactions between the dredger and marine mammals within the estuary has the potential to result in mortality of QI species, Atlantic salmon and River lamprey, for which the River Boyne and River Blackwater SAC is designated.

5.8. Summary

The potential impacts associated with the operation have the potential to affect the receiving environment and, as a result, the conservation objectives supporting the qualifying interest/special conservation interests of five European sites: the River Boyne and River Blackwater SAC.

The potential impacts of the works on the receiving environment, their zone of influence, and the European sites at risk of likely significant effects are summarised in Table 7 below.

Table 7: Summary of the potential impacts of the works on the receiving environment, their potential zone of influence, and the European sites within the zone of influence

Potential Direct or Indirect Impacts and zone of influence of the Potential Effects	Are there any European sites within the zone of influence?
Habitat loss or disturbance Habitat loss will be confined to the maintenance dredging works within the River Boyne channel, estuary mouth and breakwaters.	Yes Boyne Coast and Estuary SAC, and the Boyne Estuary SPA
Effects of siltation Habitats and habitats of species within the tidal reach of the Boyne and downstream of the operation site.	Yes River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, the Boyne Estuary SPA, and the Nanny River and Estuary SPA

Potential Direct or Indirect Impacts and zone of influence of the Potential Effects	Are there any European sites within the zone of influence?
Disturbance and displacement impacts Potentially up to several hundred metres from the works, dependent upon the predicted levels of noise, vibration and visual disturbance associated with the works, in conjunction with the sensitivity of the qualifying interest species to disturbance effects.	Yes River Boyne and River Blackwater SAC, the Boyne Estuary SPA, the Nanny River and Estuary SPA, Rockabill to Dalkey Island SAC, Dundalk Bay SPA, and Rockabill SPA
Mortality as a result of a pollution event Potential for an accidental pollution event to affect water quality in the receiving intertidal and estuarine habitats used by roosting and feeing wintering waterbirds and breeding Little Tern.	Yes Boyne Estuary SPA, the Nanny River and Estuary SPA, River Boyne and River Blackwater SPA, Rockabill to Dalkey Island SAC, Dundalk Bay SPA, and Rockabill SPA
Reduced prey availability Potentially reduced feeding efficacy of birds, aquatic and marine mammals and fish within the sediment plume area produced by the maintenance dredging.	Yes River Boyne and River Blackwater SAC, the Boyne Estuary SPA, and Rockabill SPA
Mortality as a result of entrapment The suction dredger could potentially entrain fish and deposit them into the hold of the ship with the sediment.	Yes River Boyne and River Blackwater SAC
Mortality as a result of collision Interactions between the dredger and marine mammals within the estuary has the potential to result in mortality	Yes River Boyne and River Blackwater SAC

6. Assessment of Impacts on European Sites

This section of the NIS assesses the direct and indirect impacts of the works on the European sites which fall within its zone of influence. For each of these European sites, the assessment below sets out the relevant ecological baseline information, the analysis of the potential impacts, the qualifying interests/special conservation interests at risk of these potential impacts, in view of the sites' conservation objectives, and the mitigation measures (if required) to avoid/reduce the effects of any potential impacts.

The assessment of the works in combination with any other plans or projects on European sites is presented in Section 8.

6.1. River Boyne and River Blackwater SAC [002299]

6.1.1. Ecological Baseline Description for the River Boyne and River Blackwater SAC

6.1.1.1. Habitats

The main areas of qualifying interest habitat alkaline fens [7230] are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough in the upper reaches of the River Blackwater. The hummocky nature of the local terrain produces frequent springs and seepages which are rich in lime. A series of base-rich marshes have developed in the poorly-drained hollows, generally linked with these three lakes. Alkaline fens within the River Boyne and River Blackwater SAC are not within the zone of influence of the maintenance dredging operation.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] are located along stretches of the River Boyne at a small chain of three islands c.3.2km west of the nearest operation site at Tom Roes Berth. The islands were formed by the build-up of alluvial sediment in this part of the river where water movement is sluggish. The tidal reach of the Boyne Estuary does extend to this area of alluvial woodland and past it to the weir located at c. O 03846 75728. The alluvial woodland is considered to be outside the zone of influence of the maintenance dredging and sediment plume zone. At the Tom Roes Berth and Swing Basin, c.5.6km downstream of the nearest alluvial forest area, the sediment plume analysis modelled by RPS (2019) shows that the plume at high neap tide extends c.600m upstream of the swing basin which is still c.5km downstream of the alluvial forest. The alluvial woodland, however could be subject to impacts from an accidental pollution event affecting water quality that could potentially extend upstream to the tidal extent of the Boyne Estuary.

6.1.1.2. Fauna

Atlantic Salmon *Salmo salar* [1106] use the tributaries and headwaters of the Boyne as spawning grounds and run the Boyne almost every month of the year. The Boyne catchment is the most important river for Atlantic Salmon on the east coast of Ireland, and the current population is said to be large and healthy (ASU, 2006). In 2018 numbers of Atlantic salmon in the River Boyne, Drogheda District, were considered to be below the conservation limit of the River Boyne and River Blackwater SAC (Technical Expert Group on Salmon, 2018). River Lamprey *Lampetra fluviatilis* [1099] also migrate upstream from their coastal feeding grounds into freshwater to spawn and are present in the lower reaches of the River Boyne. A survey of juvenile lamprey populations in the Boyne catchment was undertaken on behalf of the National Parks and Wildlife Service in the summer of 2005 (O'Connor, 2006). The surveys confirmed *"that significant populations of river/brook lampreys occur throughout the River Boyne catchment".*

The maintenance dredge site is part of the migratory route for Atlantic Salmon and River Lamprey. As both species migrate upstream to either headwaters of river catchments or upstream to freshwater, it is unlikely that the maintenance dredging will occur in the vicinity of spawning grounds of either Atlantic Salmon and River Lamprey. The dredging operation has potential to impact these anadromous fish species, as they migrate between the sea and the river to spawn and therefore pass through the area in which the dredging will take place.

Otter *Lutra lutra* [1355] can be found throughout the River Boyne and River Blackwater SAC and are known to occur within the River Boyne and Estuary and are likely to have breeding sites within it, 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.

6.1.1.3. Qualifying Interests and Conservation Objectives of the River Boyne and River Blackwater SAC

The qualifying interests of the River Boyne and River Blackwater SAC, and the overall conservation objective, are listed below in Table 8.

Table 8: Qualifying Interests and Conservation Objectives of the River Boyne and River Blackwater SAC

Qualifying Interest(s)	Conservation Objective(s)
[7230] Alkaline fens [91E0] *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [1106] Atlantic Salmon *Salmo salar* (only in fresh water) [1099] River Lamprey *Lampetra fluviatilis* [1355] Otter *Lutra lutra*	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected

In the absence of a site-specific conservation objectives document for the River Boyne and River Blackwater SAC, to inform this assessment a set of site-specific conservation objectives has been compiled for the qualifying interests of the SAC, based on site-specific conservation objectives documents available for other European sites with equivalent qualifying interests. As a precautionary approach, "restore" is used to define the conservation objective in this assessment. The attributes, measures and targets that would be expected to define the favourable conservation condition of the qualifying interests of the River Boyne and River Blackwater SAC are presented in Section 6.1.3, Table 99.

6.1.2. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of the River Boyne and River Blackwater SAC, are:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability
- Mortality as a result of entrapment

6.1.2.1. Disturbance and displacement impacts

There will be no disturbance or displacement impacts to Atlantic salmon or River lamprey at spawning grounds as the dredging site is located in the lower reaches of the River Boyne and spawning grounds are further upstream and in the headwaters of the river for both QIs, Atlantic salmon and River lamprey.

It is considered high unlikely that works within the dredge site will result in disturbance or displacement impacts on either of these anadromous fish during migration as there will be no change in volumes or types of craft that currently use the river channel as a result of the renewed maintenance dredging licence. The current dredging works do not cause any barrier to movement of migrating fish and do not displace of fish from using the lower reaches of the river.

Otter occur throughout the River Boyne system, and are likely to occur in the vicinity of the dredge site. Although no holts were recorded during surveys, if present, the dredging works do not occur in the immediate proximity to suitable riparian habitat. The river channel is frequented regularly by fishing and cargo vessels, pilot boats, and current dredging operations. There is no predicted change in volumes of craft using the river channel as a result of the renewed maintenance dredging licence. The continuation of existing dredging operations will not cause any disturbance to otter occurring within the River Boyne and River Blackwater SAC and area of the dredging operation.

6.1.2.2. Mortality as a result of hydrological impacts

The proposed dredging works have the potential to impact water quality through increasing the concentration of suspended sediment in the water column within the dredge site and sediment plume. Dredging works will

result in increased localised concentrations of suspended solids in the water column, however hydraulic modelling carried out by RPS (2019) has shown that simulation of the maintenance dredging of the fine silt deposits from Tom Roes 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 about 80 mg/l and they further disperse relatively quickly.

There is potential for oil or fuel spills during the operation of the dredging machinery. Although a spill event is extremely unlikely, should an accidental spill occur it could have significant negative impacts on water quality and therefore indirectly on Atlantic salmon, River lamprey and Otter.

There is no potential for mobilisation of contaminated material into the water column. Sediment analysis carried out to the Marine Institute specification by Aquafact International Services Ltd in February 2019 was undertaken at 17 sampling points. Sediment analysis to ascertain radiological hazard was also carried out by the EPA. Full results of the analysis are included in Section B of the dump at sea permit application.

The dredging operation will result in a temporary increase in the suspended solids load of the water column within the Boyne Estuary. Due to their mobile nature, fish are unlikely to suffer lethal effects from events such as high sediment loads in the water column and salmonids have been shown to preferentially avoid sediment plumes (Kjelland *et al*., 2015) and all fish living within estuarine systems will be adapted to deal with occasional high levels of suspended solids. The plume associated with the dredging will be temporally and spatially limited due to the episodic nature of the dredging operation, and also due to the water flows within the estuary. For this reason, there will be no significant adverse effect on the populations of Atlantic salmon and River lamprey as a result of the proposed operation.

Spills of hydrocarbons or other chemicals could have a lethal effect on fish within the estuary. Such events are unlikely due to normal vessel house-keeping and shipping operations. For this reason, there will be no significant adverse effect of Atlantic salmon or River lamprey due to the proposed dredging.

6.1.2.3. Reduced prey availability

Reduced prey availability in this case is considered to be a result of increased suspended sediments, increased turbidity and reduced visibility deteriorating the detection of prey items for Atlantic salmon, River lamprey and Otter. As provided in the hydraulic modelling the sediment plume created by the dredging works will be minimal and localised to the dredger vessel. When the River Boyne is in full spate, suspended materials in the water column exceed levels of suspended solids created by the dredging works. Reduced visibility in the area of the sediment plume will not reduce the feeding efficacy of Atlantic salmon, River lamprey and Otter.

6.1.2.4. Mortality as a result of entrapment

Interactions between the dredger and fish within the estuary has the potential to result in mortality. The suction dredger could potentially entrain fish and deposit them into the hold of the ship with the sediment. Carlson (2001) found that the area of effect of the suction head is small and the risk of such entrainment is negligible.

6.1.2.5. Summary

Table 9 below presents a summary of the potential impacts of the works on the qualifying interests the River Boyne and River Blackwater SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 9: Potential Impacts on the Conservation Objectives of the River Boyne and River Blackwater SAC

Conservation Objectives Attribute/Measure/Target	**Potential impacts requiring mitigation?**	**Are mitigation measures required?**	**Residual impacts?**
[7230] Alkaline fens To restore the favourable conservation condition of the species in the River Boyne and River Blackwater SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No 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.	No	No
Habitat distribution / Occurrence / No decline, subject to natural processes			
Hydrological regime / Flow rates, metres / Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat			
Peat formation / Flood duration / Active peat formation, where appropriate			
Water quality: nutrients / Water chemistry measures / Appropriate water quality to support the natural structure and functioning of the habitat			
Vegetation composition: typical species / Presence / Maintain vegetation cover of typical species including brown mosses and vascular plants			
Vegetation composition: trees and shrubs / Percentage / Cover of scattered native trees and shrubs less than 10%			
Physical structure: disturbed bare ground / Percentage / Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%			
Physical structure: drainage / Percentage / Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%			
[91E0] *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) To restore the favourable conservation condition of the species in the River Boyne and River Blackwater SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	No 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).	No	No
Habitat distribution / Occurrence / No decline			
Woodland size / Hectares / Area stable or increasing			
Woodland structure: cover and height / Percentage and metres / Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer			
Woodland structure: community diversity and extent / Hectares / Maintain diversity and extent of community types			

Conservation Objectives Attribute/Measure/Target	Potential impacts requiring mitigation?	Are mitigation measures required?	Residual impacts?
Woodland structure: natural regeneration / Seedlines: sapling: pole ratio / Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy			
Hydrological regime: flooding depth/height of water table / Metres / Appropriate hydrological regime necessary for maintenance of alluvial vegetation			
Woodland structure: dead wood / m^3 per hectare; number per hectare / At least $30m^3$/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)			
Woodland structure: veteran trees / Number per hectare / No decline			
Woodland structure: indicators of local distinctiveness / Occurrence / No decline			
Vegetation composition: native tree cover / Percentage / No decline. Native tree cover not less than 95%			
Vegetation composition: typical species / Occurrence / A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix spp*) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)			
Vegetation composition: negative indicator species / Occurrence / Negative indicator species, particularly non-native invasive species, absent or under control			
[1106] Atlantic Salmon *Salmo salar* To restore the favourable conservation condition of the species in the River Boyne and River Blackwater SAC, which is defined as follows:			
Distribution: extent of anadromy / % of river accessible / 100% of river channels down to second order accessible from estuary	No 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.	No	No
Adult spawning fish / Number / Conservation Limit (CL) for each system consistently exceeded			
Salmon fry abundance / Number of fry/5 minutes electrofishing / Maintain or exceed 0+ fry mean catchment-wide abundance threshold value			
Out-migrating smolt abundance / Number / No significant decline			
Number and distribution of redds / Number and occurrence / No decline in number and distribution of spawning redds due to anthropogenic causes			
Water quality / EPA Q Value / At least Q4 at all sites sampled by EPA			

Conservation Objectives Attribute/Measure/Target	Potential impacts requiring mitigation?	Are mitigation measures required?	Residual impacts?
[1099] River Lamprey *Lampetra fluviatilis* To restore the favourable conservation condition of the species in the River Boyne and River Blackwater SAC, which is defined as follows:			
Distribution / % of river accessible / Access to all water courses down to first order streams	No 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 effects on fish migrating through the Boyne Estuary. The risk of entrainment by the suction head is negligible.	No	No
Population structure of juveniles / Number of age/size groups / At least three age/size groups of river/brook lamprey present			
Juvenile density in fine sediment / Juveniles/m² / Mean catchment juvenile density of brook/river lamprey at least 2/m²			
Extent and distribution of spawning habitat / m² and occurrence / No decline in extent and distribution of spawning beds			
Availability of juvenile habitat / Number of positive sites in 2nd order channels (and greater), downstream of spawning areas / More than 50% of sample sites positive			
[1355] Otter *Lutra lutra* To restore the favourable conservation condition of the species in the River Boyne and River Blackwater SAC, which is defined as follows:			
Distribution / Percentage positive survey sites / No significant decline	Yes 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.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Extent of terrestrial habitat / Hectares / No significant decline			
Extent of marine habitat / Hectares / No significant decline			
Extent of freshwater (river) habitat / Kilometres / No significant decline			
Extent of freshwater (lake/lagoon) habitat / Hectares / No significant decline			
Couching sites and holts / Number / No significant decline			
Fish biomass available / Kilograms / No significant decline			
Barriers to connectivity / Number / No significant increase			

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.

6.1.4. Residual Impacts

The dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats or species of the River Boyne and River Blackwater SAC, and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of the River Boyne and River Blackwater SAC.

6.1.5. Conclusion of Assessment for the River Boyne and River Blackwater SAC

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of the River Boyne and River Blackwater SAC, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the dredging operation does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the River Boyne and River Blackwater SAC, and there is no reasonable scientific doubt with the conclusion.

6.2. Boyne Coast and Estuary SAC [001957]

6.2.1. Ecological Baseline Description for the Boyne Coast and Estuary SAC

6.2.1.1. Habitats

This SAC is a coastal site which includes most of the tidal sections of the River Boyne, intertidal sand and mudflats, salt marshes, marginal grassland, and the stretch of coast from Bettystown to Termonfeckin that includes the Mornington and Baltray sand dune systems. The Boyne River channel, which is navigable and dredged, is defined by training walls, these being breached in places. Intertidal flats occur behind the training walls on the sides of the channelled river. The sediments vary from fine muds in the sheltered areas to sandy muds or sands towards the river mouth. The linear stretches of intertidal flats to the north and south of the river mouth are mainly composed of sand. Parts of the intertidal areas are fringed by Atlantic salt marsh.

The SAC has been selected for the following Annex I Habitats Directive habitats; Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], *Salicornia* and other annuals colonizing mud and sand [1310], *Spartina* swards (*Spartinion maritimae*) [1320], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Mediterranean salt meadows (*Juncetalia maritimi*) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] and *Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130].

Dredging will only occur within the main navigation channel as defined by the training walls with no dredging occurring within polders in the Boyne Estuary. Therefore only one habitat type, Estuaries [1130], occurs directly within the area where the dredging occurs.

There are two sand dune systems within the SAC, at Baltray and Mornington. These are of conservation value, despite the restricted distribution of the intact areas and the high recreational pressure to which they are subjected. A gradient from embryonic dunes to Marram dunes and then fixed dunes is shown at both systems. The embryonic dunes are particularly well-developed at Baltray where there is active accretion. The embryonic dunes grade into a narrow band of shifting Marram dunes. Some dune slacks may still occur at this SAC. A number of scarce plants such as Viper's-bugloss (*Echium vulgare*), Adder's tongue (*Ophioglossum vulgatum*), Variegated Horsetail (*Equisetum variegatum*) and Wild Sage (*Salvia verbenaca*) have been recorded from this SAC in the past. The last named species is of particular note as it is a Red Data Book species at its most northerly known Irish station. The SAC supports a population of the rare snail, *Helix pisana*, in Ireland known only from the coast between counties Louth and Dublin. There will be no direct impacts on sand dune habitat from this proposed dredging activity as all works will take place between the river training walls which is outside of the area where sand dune habitat occurs. Potential indirect impacts on these habitats as a result of removal of volumes of sands by the dredging activity have however been carefully examined and addressed.

6.2.2. Qualifying Interests and Conservation Objectives of the Boyne Coast and Estuary SAC

The qualifying interests of the Boyne Coast and Estuary SAC, and the overall conservation objective, are listed below in Table 9.

Table 1: Qualifying Interests and Conservation Objectives of the Boyne Coast and Estuary SAC

Qualifying Interest(s)	Conservation Objective(s)
[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1310] *Salicornia* and other annuals colonizing mud and sand [1320] *Spartina* swards (*Spartinion maritimae*) [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2130] *Fixed coastal dunes with herbaceous vegetation (grey dunes)	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected

As detailed in the site-specific conservation objectives document, the attributes, measures and targets to define the favourable conservation condition of the qualifying interests of the Boyne Coast and Estuary SAC are presented in Section 6.2.3, Table 910.

6.2.3. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of the Boyne Coast and Estuary SAC, are:

- Habitat loss or disturbance
- Effects of siltation

6.2.3.1. Habitat loss or disturbance

Dredging operations can result in habitat loss or disturbance across a range of spatial or temporal scales through the removal and deposition of sediment and the associated fauna. The focus of the proposed dredging will be the sandy sediment at the mouth of the estuary, with more limited dredging carried out further up the channel.

Potential disturbance to two Annex I marine habitats that occur within the Boyne Coast and Estuary SAC was considered. Estuaries [1130] will be most affected, as all dredge operations will take place within the subtidal zone. There will be removal of sediment and associated fauna for disposal at the dredge spoil dump sites. The mouth of the estuary is a dynamic habitat, which is the reason that dredging is required to keep the shipping channel open after movement of sediment up from the south and also inshore during storm events. For this reason, the fauna present are adapted to disturbance. Dredging operations will have a temporary impact on the habitat, with the recovery aided by fauna washed back in through run-off from the dredger and also from adjacent habitats through migration, colonisation and sediment movement. Significant continuous or ongoing disturbance to an area of less than 15% of dynamic marine communities is considered acceptable in relation to meeting the conservation objectives of the site (NPWS, 2012). The proposed dredging is weather driven with approximately 2 to 4 campaigns per annum and affect a limited area of habitat at any one time, and so is not likely to have a significant adverse effect on this dynamic habitat.

There will be no direct impact on the Mudflats and sandflats not covered by water at low tide [1140] within the Boyne Coast and Estuary SAC from the proposed dredging work, as they will all take place within the subtidal zone. There is likely to be some increase in the settlement of suspended sediment on this habitat from the water column during the dredging operations, but this is very limited (RPS, 2019) and will not have a significant adverse effect as the habitat is depositional in nature and the species present are adapted to life in these conditions.

6.2.3.2. Effects of siltation

The proposed operation will result in the suspension of sediment in the water column, which has the potential to impact on downstream habitats. There is also the potential for accidental leaks and spillages of chemicals, such as hydrocarbons that could impact on marine habitats.

The estuarine and marine habitats within the Boyne Coast and Estuary SAC are dominated by sediment substrata. For this reason, any temporary increase in the levels of suspended solids will not have a significant adverse effect. The habitats are created by the interaction of current and sediment movement, and the faunal community are adapted to the dynamic conditions.

A pollution event, of a sufficient magnitude, has the potential to affect the receiving intertidal environments (either alone or in combination with other pressures on water quality) to an extent that could undermine the conservation objectives of the Boyne Coast and Estuary SAC. This examination and analysis of impact on intertidal habitats also corresponds to wetland habitat used by internationally important numbers of wintering waterbirds or which the Boyne Estuary SPA and River Nanny and Estuary SPA are designated.

6.2.3.3. Summary

Table 10 below presents a summary of the potential impacts of the works on the qualifying interests of the Boyne Coast and Estuary SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 2: Potential Impacts on the Conservation Objectives of the Boyne Coast and Estuary SAC

Conservation Objectives **Attribute/Measure/Target**	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
Estuaries [1130] Maintain or restore the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	No Area to be disturbed limited and no permanent loss. Habitat resilient to disturbance due to the dynamic nature of the estuarine and marine system.	No	No
Community distribution / Hectares / Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with *Hediste diversicolor* and *Corophium volutator* community; and Subtidal fine sand dominated by polychaetes community			
Mudflats and sandflats not covered by water at low tide [1140] Maintain or restore the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes An accidental pollution event of a sufficient magnitude during operation, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Community distribution / Hectares / Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with *Hediste diversicolor* and *Corophium volutator* community; and Fine sand dominated by bi-valves community complex			
***Salicornia* and other annuals colonising mud and sand [1310]** Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event of a sufficient magnitude during operation, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/absence of physical barriers / Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			
Vegetation composition: typical species and sub-communities / Percentage cover / Maintain the presence of species-poor communities listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Atlantic salt meadows *(Glauco-Puccinellietalia maritimae* [1330] Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	Yes An accidental pollution event of a sufficient magnitude during operation, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/absence of physical barrier / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimetres / Maintain structural variation within sward			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: vegetation cover / Percentage cover at a representative number of monitoring stops / Maintain more than 90% of area outside creeks vegetated			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - *Spartina anglica* / Hectares / No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%			
Mediterranean salt meadows (Juncaetalia marimtimi) [1410] Maintain or restore the favourable conservation condition The status of Mediterranean salt meadows (Juncetalia maritimi) as a qualifying Annex I habitat for Boyne Coast and Estuary SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat.			
Embryonic shifting dunes [2110] Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from the hydrological impacts associated with the dredging operations.	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of foredune grasses / Percentage cover / More than 95% of sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)			
Vegetation composition: typical species and sub-communities / Percentage cover / Maintain the presence of species-poor communities with typical species: sand couch (*Elytrigia juncea*) and/or lyme-grass (*Leymus arenarius*)			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from the hydrological impacts associated with the dredging operations.	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of dune grasses / Percentage cover / 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present).			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lymegrass (*Leymus arenarius*)			
Vegetation composition: negative indicator species / Percentage cover Negative indicator species (including non-native species) to represent less than 5% cover			
***Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]** Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area increasing, subject to natural processes including erosion and succession	No Terrestrial habitats above the high tide line are not at risk of effects from the hydrological impacts associated with the dredging operations.	No	No
Habitat distribution / Occurrence / No decline, or change in habitat distribution, subject to natural processes			
Physical structure: functionality sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediment and organic matter, without any physical obstructions			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: bare ground / Percentage cover / Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes			
Vegetation structure: sward height / Centimetres / Maintain structural variation in the sward			
Vegetation composition: typical species and sub-communities / Percentage cover at a representative number of monitoring stops / Maintain range of sub- communities with typical species listed in Ryle et al. (2009)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non-native species) to represent less than 5% cover			
Vegetation composition: scrub/trees / Percentage cover / No more than 5% cover or under control			

6.2.4. Mitigation Measures

This section presents the mitigation measures that will be implemented during the operation of maintenance dredging works and dump at sea sites to avoid or reduce the potential impacts of the works on the Boyne Coast and Estuary 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.

See the following sections above to mitigation measures to protect the water quality in Boyne River, Estuary and Irish Sea; 6.1.4.1 Measures to protect water quality in the receiving environment.

6.2.5. Residual Impacts

The dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats of the Boyne Coast and Estuary SAC, and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of the Boyne Coast and Estuary SAC.

6.2.6. Conclusion of Assessment for the Boyne Coast and Estuary SAC

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of the Boyne Coast and Estuary SAC, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the operational dredging does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the Boyne Coast and Estuary SAC, and there is no reasonable scientific doubt with the conclusion.

6.3. Rockabill to Dalkey Island SAC [003000]

6.3.1. Ecological Baseline Description for the Rockabill to Dalkey Island SAC

6.3.1.1. Habitats

This SAC is a marine site which is a rectangle extending from Rockabill south to Dalkey Island in south Dublin. The SAC has been selected for the Annex I Habitats Directive habitat: [1170] Reefs.

The proposed operations take place more than 27 km from the closest reef habitat (around Rockabill). The only potential impact would be the deposition of sediment disturbed in the course of dredging and spoil dumping on reef habitat via the sediment plume. Given the distance, there is no likelihood of an adverse effect.

6.3.1.2. Fauna

The only species listed as a qualifying interest for the Rockabill to Dalkey Island SAC is the Harbour porpoise *Phocoena phocoena* [1351]. Surveys of the site estimated that there are 211±47 Harbour porpoises in the northern part of the site and 138±33 in the southern part (Berrow *et al*., 2010). Calves and juveniles have been recorded across the SAC, which suggests the site has value in the reproductive cycle of the species.

While the proposed operation would have no significant adverse effect on Harbour porpoises within the SAC boundary, this is a mobile species and individuals encountered in the vicinity of the Boyne Estuary and the associated spoil dump sites may form part of the population of the Rockabill to Dalkey Island SAC.

6.3.2. Qualifying Interests and Conservation Objectives of the Rockabill to Dalkey Island SAC

The qualifying interests of the Rockabill to Dalkey Island SAC, and the overall conservation objective, are listed below in Table 11.

Table 3: Qualifying Interests and Conservation Objectives of the Rockabill to Dalkey Island SAC

Qualifying Interest(s)	Conservation Objective(s)
[1170] Reefs [1351] Harbour porpoise *Phocoena phocoena*	To maintain the favourable conservation condition of the Annex I habitat and the Annex II species for which the SAC has been selected.

As detailed in the site-specific conservation objectives document, the attributes, measures and targets to define the favourable conservation condition of the qualifying interests of the Rockabill to Dalkey Island SAC are presented in Section 6.3.3, Table 912.

6.3.3. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of the Rockabill to Dalkey Island SAC, are:

- Disturbance and displacement impacts
- Mortality as a result of collision
- Effects of siltation

6.3.3.1. Disturbance and displacement impacts

While the dredging and spoil dumping operations are not within the Rockabill to Dalkey SAC, there is the potential for noise to travel through the water column, and also to interact with Harbour porpoises travelling outside the boundary of the SAC.

The noise levels generated during dredging operations depends on the characteristics of the vessel used, as well as the nature of the dredged material, with gravel being noisier than sand (Robinson *et al.*, 2011). Given that the material to be dredged is predominately sand with some silt, the noise generated by the dredger will be similar to that generated by a normal vessel of a similar size, and in the region of 180 dB re 1 µPa (DAHG, 2014, Robinson *et al*., 2011). Noise in the water column attenuates due to a range of factors including distance from source, water temperature, salinity, water depth and sediment type. Using a simple mixed spreading model, the noise levels likely to cause a temporary threshold shift (TTS) in Harbour porpoise hearing would only occur within 200 m of the dredger. Defra (2003) found that the TSHD *Arco Adur* was not detectable above ambient levels at a range of 500m. Short-term avoidance by Harbour porpoises at ranges of 600 m from a TSHD operating to the west of Sylt (Germany) was recorded by Diederichs *et al.* (2010). Richardson *et al.* (1995) summarised Harbour porpoise avoidance of ships as possible from a distance of 1-1.5km, with a stronger reaction within 400m.

The distribution data available for Harbour porpoise in the vicinity of the Boyne Estuary mouth and adjacent waters suggests there is likely to be limited exposure of Harbour porpoises to noise generated by the dredger due to low occurrence of the species. This, combined with the tendency of Harbour porpoises to avoid ships within 400m, means that any physical effect on Harbour porpoises in the form of TTS is highly unlikely. The only likely effect of the proposed dredging is an avoidance of the immediate vicinity of the dredger, which will not have any significant adverse effect on the species.

6.3.3.2. Mortality as a result of collision

Marine mammals can suffer injury, or even death, as a result of collision with boats and ships. Various factors affect the likelihood of collision, including species, age and sex, habitat, vessel size, vessel speed, shipping density (Van Waerebeek *et al*., 2007). A study by Baker & Martin (1992) on 41 stranded Harbour porpoises found no evidence of vessel collision, while Jepson (2005) reported one stranded Harbour porpoise with injuries consistent with boat collision for the period 2000-2004, and other with blunt trauma that may be attributable to watercraft collision, but also bycatch and Bottlenose dolphin attacks.

Collision impacts on small marine mammals tend to be from smaller, faster watercraft, including jet skis. The slow speeds at which the dredger will be operating during dredging and transit to the spoil dump site means that the risk of collision with a Harbour porpoise is negligible.

6.3.3.3. Effects of siltation

The potential for an impact on the Annex I habitat [1170] Reefs as a result of sediment plumes or accidental spillages was considered. Given the distance between the proposed dredging and spoil dump sites, there is no likelihood of a significant adverse effect on reef habitat from the proposed operations.

6.3.3.4. Summary

Table 12 below presents a summary of the potential impacts of the works on the qualifying interests of the Rockabill to Dalkey SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 4: Potential Impacts on the Conservation Objectives of the Rockabill to Dalkey Island SAC

Conservation Objectives **Attribute/Measure/Target**	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
Reefs [1170] Maintain the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	No Reef habitat is too distant from the area of operations for there to be any adverse effect.	No	No
Habitat distribution / Occurrence / Distribution is stable or increasing, subject to natural processes.			
Community structure / Biological composition / Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.			
Harbour porpoise [1351] Maintain the favourable conservation condition			
Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	No The attenuation of noise between the operational area of the dredger and the SAC boundary means there will be no significant adverse effect on individuals within the site. Low usage of the coast in the vicinity of the operation by Harbour porpoise, along with the noise levels being below those likely to cause injury, means there is little risk to individuals travelling outside the site beyond minor avoidance. Slow speeds at which the dredger, along with the avoidance behaviour of Harbour porpoise with respect to ships, means that the risk of collision is negligible.	No	No
Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site			

6.3.4. Mitigation Measures

No mitigation measures are required to protect the qualifying interests of the Rockabill to Dalkey Island SAC from effects of the proposed operations, which will be highly localised and temporary.

6.3.5. Residual Impacts

The operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats or species of the Rockabill to Dalkey Island SAC, and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of the Rockabill to Dalkey Island SAC. The only residual effect likely is the avoidance by Harbour porpoise of the immediate vicinity of the dredger.

6.3.6. Conclusion of Assessment for the Rockabill to Dalkey Island SAC

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of the Rockabill to Dalkey Island SAC, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the operation does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the Rockabill to Dalkey Island SAC, and there is no reasonable scientific doubt with the conclusion.

6.4. Boyne Estuary SPA [004080]

6.4.1. Ecological Baseline Description of the Boyne Estuary SPA

6.4.1.1. Wintering waterbirds

This SPA comprises most of the estuary of the Boyne River and part of the estuary is a Wildfowl Sanctuary. Apart from one section which is over 1km wide, its width is mostly less than 500m. The river channel, which is navigable and dredged, is defined by training walls, these being breached in places. Intertidal flats occur along the sides of the channelled river. The sediments vary from fine muds in the sheltered areas to sandy muds or sands towards the river mouth. The linear stretches of intertidal flats to the north and south of the river mouth are mainly composed of sand. One or more species of Eelgrass (*Zostera* spp.) occur in the estuary. Parts of the intertidal areas are fringed by salt marshes, most of which are of the Atlantic type. Common Cord-grass (*Spartina anglica*) occurs frequently on the flats and salt marshes.

The Boyne Estuary is the second most important estuary for wintering birds on the Louth-Meath coastline. It has a total of ten species with populations of national importance; Shelduck, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Black-tailed Godwit, Redshank and Turnstone. Of particular note is that the site supports 7% of the national population of Knot and 4% of the total for Golden Plover.

Other species which occur, some of regional or local importance, include Bar-tailed Godwit, Cormorant, Brent Goose, Wigeon, Teal, Dunlin, Curlew, Mallard, Red-breasted Merganser, Greenshank, Ringed Plover and Mute Swan. The site provides both feeding and high-tide roost areas for the birds. The estuary also attracts large numbers of gulls in winter, including Black-headed Gull, Common Gull, Herring Gull and Great Black-backed Gull.

6.4.1.2. Breeding Little tern

An area of shingle at Baltray beach is an important breeding site for Little Tern (see Figure 8). Little Tern have bred here since at least 1984. In the intervening years breeding numbers and fledgling success has varied significantly. In 1996 approximately 20 pairs fledged 15-20 chicks but in 1998 and 1999 part of the shingle bank where the birds nested was washed away by storms. In 2007 a successful Little Tern breeding colony was

recorded (NPWS, 2012c). During the 2018 surveys, see Section 2.5.6, a maximum count of 32 Little tern were recorded at the colony, and a total of 7 chicks fledged (Louth Nature Trust, 2018)[9].

Of particular significance is that two of the wintering species, Golden Plover and Bar-tailed Godwit are listed on Annex I of the Birds Directive. Little Tern is also listed on Annex I of this directive.

6.4.2. Qualifying Interests and Conservation Objectives

The special conservation interests of Boyne Estuary SPA, and the overall conservation objective for each, are listed below.

Table 5: Special Conservation Interests and Conservation Objectives of Boyne Estuary SPA

Qualifying Interest(s)	Conservation Objective(s)
[A048] Shelduck (*Tadorna tadorna*) [A130] Oystercatcher (*Haematopus ostralegus*) [A140] Golden Plover (*Pluvialis apricaria*) [A141] Grey Plover (*Pluvialis squatarola*) [A142] Lapwing (*Vanellus vanellus*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A156] Black-tailed Godwit (*Limosa limosa*) [A162] Redshank (*Tringa totanus*) [A169] Turnstone (*Arenaria interpres*) [A195] Little Tern (*Sterna albifrons*) [A999] Wetland and Waterbirds	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

This document sets out the attributes, measures and targets that define the favourable conservation condition of the special conservation interests within the Boyne Estuary SPA and the River Nanny and Estuary SPA. Affecting the conservation condition of the special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the special conservation interests of Boyne Estuary SPA and the River Nanny and Estuary SPA are presented in Section 6.4.3, Table 614.

6.4.3. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the special conservation interests of Boyne Estuary SPA, are:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability

6.4.3.1. Disturbance and displacement impacts

Wintering waterbirds

The 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 for which the SPAs are designated. There will be no dredging activity within the polders and so there will be no direct impact on wintering birds. The river channel is frequented regularly by fishing and cargo vessels, pilot boats, and current dredging operations. There is no

[9] Louth Nature Trust (2018) https://www.louthnaturetrust.org/end-of-season-2018/

predicted change in volumes of craft using the river channel as a result of the renewed maintenance dredging licence. The continuation of existing dredging operations will not cause any disturbance to wintering waterbirds occurring within intertidal habitats of the Boyne Estuary, species for which the Boyne Estuary SPA and the River Nanny and Estuary SPA are designated.

Breeding Little tern

Breeding Little tern at Baltray are not considered to be subject to disturbance impacts from the dredging operation at the nesting site, located on shingle beach at Baltray just north of the breakwaters. However, they were recorded foraging within the dredge site in the navigable channel between the breakwaters at the estuary mouth (see Figure 10). Disturbance events at the colony during 2018 surveys resulted from walkers and dogs in the majority of cases, and noted that the dredger, which was present on 10 surveys between 30th May and 9th August 2018, did not appear to cause disturbance to foraging Little terns. Although disturbance shown by foraging terns towards the dredger may have been subtle and could have gone unrecorded, Figure 10 shows the area of highest foraging activity which overlaps with the dredging site in the river channel and at the breakwaters. The continuation of existing dredging operations will not cause any disturbance to breeding Little Tern at the Baltray colony or feeding within the aquatic and marine habitats of the Boyne River, Boyne Estuary and Irish Sea, for which the Boyne Estuary SPA are designated.

6.4.3.2. Mortality as a result of a pollution event

An accidental pollution event i.e. accidental hydro-carbon spill or leak during operation from plant used to undertake the dredging operation, has the potential to affect water quality in the Boyne River, Estuary and Irish Sea. Therefore, an accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially affect the water quality in intertidal, estuarine and marine habitats of the Boyne Estuary and Irish Sea which are used by internationally important numbers of wintering waterbirds and a breeding colony of Little tern for feeding and roosting. These species are vulnerable to an accidental pollution incident either directly through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely on for feeding and roosting.

An accidental pollution event of a significant magnitude is highly unlikely given the small volumes of hydro-carbons carried on dredging plant. The River Boyne and Irish Sea are tidal waterbodies and it is expected that any spill would readily dissipate.

Affecting the water quality of the Boyne Estuary and coastal habitats due to an accidental pollution event during operation has the potential to undermine the conservation objectives of Boyne Estuary SPA by affecting the quality of intertidal habitats or through direct contact with special conservation interests species causing harm or mortality.

6.4.3.3. Reduced prey availability

Breeding Little Tern

Maintenance dredging produces a sediment plume which temporarily changes the turbidity of the water column in an area localised to the dredging works. The sediment plume has the potential to affect the foraging efficiency of birds that dive through the water column in search of prey items that may feed within the plume zone and therefore reduce prey availability in the receiving environment.

Little tern are shallow water feeders and dive to catch their prey. In Irish waters Little tern's chief prey items are sand eel and sprats (Cummins *et al.*, 2016). Little tern have been reported to have an average foraging radius of less than 4km from the colony with a smaller range c.1.6-2.0km during incubation period (April-May) and c.1.0-1.2km during chick rearing (June-July) (Eglinton & Perrow, 2014). Foraging at Kilcoole, Co. Wicklow was recorded up to 1.5km from the colony, but mostly within 30m of the shore (Phalan, 2000 as cited in Eglinton and Perrow, 2014). Little tern feeding habitats are shallow tidal areas, therefore during a rising or falling tide, suitable shallow waters available for feeding terns increases accordingly. During certain weather or tidal conditions the dynamic nature of sandy shoreline can create a turbid water column.

Surveys carried out at the colony between 30th May and 9th August 2018 focussed on feeding behaviour of Little terns within the extent of the Boyne Estuary, breakwaters of the Boyne Estuary and the coastal area north and south of the estuary mouth. Results, set out in Section 4.2.7, showed that within the survey area highest levels

of feeding activity was in shallow waters along the shoreline adjacent to the colony, north of the colony, along the north breakwater and along the coastline immediately south of the breakwaters, although feeding here was less regular and with fewer numbers of Little tern. Little tern were also recorded feeding between the breakwaters in the estuary mouth. During surveys, the dredger was present for 35 of 222 Little tern foraging recordings.

Hydraulic modelling carried out for the maintenance dredging works has shown that the total suspended sediment concentrations are very low and the plume does not approach the shoreline immediately adjacent to where the little terns nest on the northern side of the breakwaters, and which appears to be their preferred feeding area, in any modelled scenario, see Figures 3.7 to 3.12 of the report produced by RPS (2019). The sediment plume evident in the wake of the dredger in the mouth of the estuary does overlap with the area of little tern foraging activity in these locations however the suspended sediment plume concentrations are generally low with values typically less than about 80 mg/l and disperse relatively quickly with the tidal flow (RPS, 2019). It should also be noted that during easterly weather conditions, sediments along the shoreline adjacent to the Baltray colony will become suspended from wave movement and is likely to cause higher turbidity on the water column compared to that produced from dredging operations.

Dredging operations will not increase as a result of the continuation of maintenance dredging works under a renewed licence. Little terns have successfully fed in areas of the Boyne Estuary affected by dredging in previous years, and surveys carried out in 2018, focusing on Little tern foraging activity, did not show any obvious change in feeding behaviour when the dredger was present or absent. Little tern have breed at Baltray since at least 1984 and long-term monitoring at the colony, undertaken by Louth Nature Trust, suggests that other environmental factors such as predation and severe easterly weather events have the greatest damaging impacts on the breeding colony.

A relationship has been identified between increased turbidity and increased fish catches recorded east of Norfolk in the UK, and was attributable to fish moving closer to the surface to feed amongst the plankton. As cited in Eglinton and Perrow (2014), Cyrus (1991) also noted concentrations of Little tern foraging activity in a plume of turbid water at a large river mouth.

Sandeel are a primary component of Little tern diet in Ireland (Green, 2017). Their lifecycle typically involves spawning in December and January producing up to 15,000 eggs; eggs stick to seabed substrate where they hatch in February or March; plankton larvae enter the water column and drift with prevailing currents until larvae metamorphosis of larvae to juvenile fish typically occurs in late May to early June. Sandeel feed on a range of zooplankton often occurring along the edges of sandbanks (Green, 2017).

There is potential for dredging activities to remove sandeel eggs and larvae which may be attached to material blown into the estuary mouth by weather conditions and later removed by dredging operations. Given the localised extent of the dredging works, it is considered highly unlikely that the removal of material from the estuary mouth and river channel would result in the removal of sandeel or other prey items and have any perceptible reduction in prey biomass available.

Overall, the dredging operation, which is currently ongoing and will continue at the same level under a renewed licence will not affect prey availability or feeding efficacy of Little tern.

Table 6: Potential Impacts on the Conservation Objectives of Boyne Estuary SPA

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Boyne Estuary SPA			
Shelduck (*Tadorna tadorna*) [A048], Oystercatcher (*Haematopus ostralegus*) [A130], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Lapwing (*Vanellus vanellus*) [A142], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Black-tailed Godwit (*Limosa limosa*) [A156], Redshank (*Tringa tetanus*) [A162], Turnstone (*Arenaria interpres*) [A169] To restore the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event of a sufficient magnitude during operation, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation			
Little Tern (*Sterna albifrons*) [A195] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests / Number / No significant decline	No The dredging works will not directly impact on the breeding site at Baltray	No	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline	No The dredging works will not directly impact on the breeding site at Baltray	No	No
Distribution: breeding colonies / Number; location; area (hectares) / No significant decline	No The dredging works will not directly impact on the breeding site at Baltray	No	No
Prey biomass available / Kilogrammes / No significant decline	No Hydraulic modelling carried out for the maintenance dredging works has shown that the total suspended sediment concentrations are very low and the plume does not approach the shoreline immediately adjacent to where the little terns nest on the northern side of the breakwaters, and which appears to be	No	

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
	their preferred feeding area, in any modelled scenario (RPS, 2019). Therefore suspended sediments will not impede Little tern feeding by way of reduced visibility. Removal of dredged material will not result in the removal of any perceptible numbers of prey items to cause any reduction of prey biomass available.		
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No	No	No
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of little tern among the post-breeding aggregation of terns	No Surveys in 2018 at the Baltray colony did not record any disturbance events at the breeding site caused by the existing dredging works, which will continue at the same rate under a renewed licence.	No	No
Wetlands and Waterbirds [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 594ha, other than that occurring from natural patterns of variation	No There will be no loss of wetland habitat used by wintering waterbirds as a result of the dredging operation.	No	No

6.4.4. Mitigation Measures

This section presents the mitigation measures that will be implemented during the operation of maintenance dredging works and dump at sea sites to avoid or reduce the potential impacts of the works on the Boyne Estuary SPA. 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.

See the following sections above to mitigation measures to protect the water quality in Boyne River, Estuary and Irish Sea; 6.1.4.1 Measures to protect water quality in the receiving environment.

6.4.5. Residual Impacts

The dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the SCI species of and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of those European sites.

6.4.6. Conclusion of Assessment for the Boyne Estuary SPA

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the special conservation interests of Boyne Estuary SPA, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the dredging operation does not pose a risk of adversely affecting (either directly or indirectly) the integrity of these European sites, and there is no reasonable scientific doubt with the conclusion.

6.5. River Nanny and Estuary SPA [004158] and Dundalk Bay SPA [004026]

6.5.1. Ecological Baseline Description of the River Nanny and Estuary SPA

The site comprises the estuary of the River Nanny and sections of the shoreline to the north and south of the estuary (c.3km in length). The estuarine channel, which extends inland for almost 2km, is narrow and well sheltered. Sediments are muddy in character and edged by saltmarsh and freshwater marsh/wet grassland. The saltmarsh is best developed in the eastern portion of the estuarine channel. The shoreline, which is approximately 500m in width to the low tide mark, comprises beach and intertidal habitats. It is a well-exposed shore, with coarse sand sediments. The well-developed beaches, which are backed in places by clay cliffs, provide high tide roosts for the birds. The village of Laytown occurs at the northern side of the River Nanny estuary.

This is an important site for wintering waders, with nationally important populations of Golden Plover, Oystercatcher, Ringed Plover, Knot and Sanderling present. The populations of Knot and Sanderling are of particular note as they represent approximately 4% of their respective national totals. Black-headed Gull and Herring Gull also occur here in significant numbers. A range of other waterbirds also occurs, including Cormorant, Brent Goose, Mallard, Grey Plover, Lapwing, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Common Gull and Great Black-backed Gull.

The site is of most importance as a roost area for the birds but the intertidal flats also provide feeding habitat. Many of the birds also utilise the intertidal areas and beaches further to the north, at the Boyne Estuary, and south, and also the fields above the shore. Two species using the site, Golden Plover and Bar-tailed Godwit, are listed on Annex I of the Birds Directive.

6.5.2. Ecological Baseline Description of the Dundalk Bay SPA

Dundalk Bay is a large open shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16 km from Castletown River on the Cooley Peninsula, in the north, to Annagassan/Salterstown in the south.

The extensive sand flats and mud flats have a rich fauna of bivalves, molluscs, marine worms and crustaceans which provides the food resource for most of the wintering waterfowl. The outer part of the bay provides excellent shallow-water habitat for divers, grebes and sea duck. In summer, it is thought to be a major feeding area for auks from the Dublin breeding colonies. The bay is used at night for roosting by wintering flocks of

Greylag Goose, Greenland White-fronted Goose and Whooper Swan from Stabannan/Braganstown (inland of Castlebelligham) and other inland sites.

The site is important for the following wintering waterbirds: Great Crested Grebe, Greylag Goose, Light-bellied Brent Goose, Shelduck, Teal, Mallard, Pintail, Common Scoter, Redbreasted Merganser, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull and Herring Gull. In spring and autumn the site attracts a range of passage migrants, including Little Stint, Curlew Sandpiper and Ruff.

6.5.3. Qualifying Interests and Conservation Objectives

The special conservation interests of the River Nanny and Estuary SPA and the Dundalk Bay SPA, and the overall conservation objective for each, are listed below.

Table 7: Special Conservation Interests and Conservation Objectives of the River Nanny and Estuary SPA and the Dundalk Bay SPA

Qualifying Interest(s)	Conservation Objective(s)
River Nanny and Estuary SPA	
[A130] Oystercatcher (*Haematopus ostralegus*) [A137] Ringed Plover (*Charadrius hiaticula*) [A140] Golden Plover (*Pluvialis apricaria*) [A143] Knot (*Calidris canutus*) [A144] Sanderling (*Calidris alba*) [A184] Herring Gull (*Larus argentatus*) [A999] Wetland and Waterbirds	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA
Dundalk Bay SPA	
[A005] Great Crested Grebe (*Podiceps cristatus*) [A043] Greylag Goose (*Anser anser*) [A046] Light-bellied Brent Goose (*Branta bernicla hrota)* [A048] Shelduck (*Tadorna tadorna*) [A052] Teal (*Anas crecca)* [A053] Mallard (*Anas platyrhynchos*) [A054] Pintail (*Anas acuta*) [A065] Common Scoter (*Melanitta nigra)* [A069] Red-breasted Merganser (*Mergus serrator)* [A130] Oystercatcher (*Haematopus ostralegus)* [A137] Ringed Plover (*Charadrius hiaticula)* [A140] Golden Plover (*Pluvialis apricaria)* [A141] Grey Plover (*Pluvialis squatarola)* [A142] Lapwing (*Vanellus vanellus)* [A143] Knot (*Calidris canutus)* [A149] Dunlin (*Calidris alpina)* [A156] Black-tailed Godwit (*Limosa limosa)* [A157] Bar-tailed Godwit (*Limosa lapponica)* [A160] Curlew (*Numenius arquata)* [A162] Redshank (*Tringa tetanus)* [A179] Black-headed Gull (*Chroicocephalus ridibundus)* [A182] Common Gull (*Larus canus)* [A184] Herring Gull (*Larus argentatus)* [A999] Wetlands & Waterbirds	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

This document sets out the attributes, measures and targets that define the favourable conservation condition of the special conservation interests within the River Nanny and Estuary SPA. Affecting the conservation condition of the special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the special conservation interests of the River Nanny and Estuary SPA are presented in Section 6.5.4, Table 616.

6.5.4. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the special conservation interests of the River Nanny and Estuary SPA, are:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event

6.5.4.1. Disturbance and displacement impacts

The 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 for which the SPAs are designated. There will be no dredging activity within the polders and so there will be no direct impact on wintering birds. The river channel is frequented regularly by fishing and cargo vessels, pilot boats, and current dredging operations. There is no predicted change in volumes of craft using the river channel as a result of the renewed maintenance dredging licence. The continuation of existing dredging operations will not cause any disturbance to wintering waterbirds occurring within intertidal habitats of the Boyne Estuary, species for which the River Nanny and Estuary SPA are designated.

6.5.4.2. Mortality as a result of a pollution event

An accidental pollution event i.e. hydro-carbon spill or leak during operation from plant used to undertake the dredging operation, has the potential to affect water quality in the Boyne River, Estuary and Irish Sea. Therefore, an accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially affect the water quality in intertidal, estuarine and marine habitats of the Boyne Estuary and Irish Sea which are used by internationally important numbers of wintering waterbirds and a breeding colony of Little tern for feeding and roosting. These species are vulnerable to an accidental pollution incident either directly through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting.

Affecting the water quality of the Boyne Estuary and coastal habitats due to an accidental pollution event during operation has the potential to undermine the conservation objectives of the Nanny River and Estuary SPA by affecting the quality of intertidal habitats or through direct contact with special conservation interests species causing harm or mortality.

Table 8: Potential Impacts on the Conservation Objectives of the River Nanny and Estuary SPA and Dundalk Bay SPA

Conservation Objectives Attribute/Measure/Target	**Potential Impacts Requiring Mitigation?**	**Are mitigation measures required?**	**Residual Impacts?**
River Nanny and Estuary SPA			
Oystercatcher (*Haematopus ostralegus*) [A130], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Knot (*Calidris canutus*) [A143], Sanderling (*Calidris alba*) [A144], Herring Gull (*Larus argentatus*) [A184] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the Boyne Estuary is protected during the dredging operation.	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation			
Wetlands and Waterbirds [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 230ha, other than that occurring from natural patterns of variation	No There will be no loss of wetland habitat used by wintering waterbirds as a result of the dredging operation.	No	No
Dundalk Bay SPA			
Great Crested Grebe (*Podiceps cristatus*) [A005], Greylag Goose (*Anser anser*) [A043], Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Teal (*Anas crecca*) [A052], Mallard (*Anas platyrhynchos*) [A053], Pintail (*Anas acuta*) [A054], Common Scoter (*Melanitta nigra*) [A065], Red-breasted Merganser (*Mergus serrator*) [A069], Oystercatcher (*Haematopus ostralegus*) [A130], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Lapwing (*Vanellus vanellus*) [A142], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Black-headed Gull (*Chroicocephalus ridibundus*) [A179], Common Gull (*Larus canus*) [A182], Herring Gull (*Larus argentatus*) [A184] To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes An accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the intertidal habitats and the fauna communities they support.	Yes The mitigation measures described in Section 6.1.4 to protect water quality in the receiving environment, will ensure that water quality in the	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing and intensity of use of areas by all of the above named species, other than that occurring from natural patterns of variation			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
		Boyne Estuary is protected during the dredging operation.	
Wetlands and Waterbirds [A999] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the areas of 8136, 4374 and 649 hectares respectively for subtidal, intertidal, and supratidal habitats, other than that occurring from natural patterns of variation	No There will be no loss of wetland habitat used by wintering waterbirds as a result of the dredging operation.	No	No

6.5.5. Mitigation Measures

This section presents the mitigation measures that will be implemented during the operation of maintenance dredging works and dump at sea sites to avoid or reduce the potential impacts of the works on the River Nanny and Estuary SPA and Dundalk Bay SPA. 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.

See the following sections above to mitigation measures to protect the water quality in Boyne River, Estuary and Irish Sea; 6.1.4.1 Measures to protect water quality in the receiving environment.

6.5.6. Residual Impacts

The dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the SCI species of and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of those European sites.

6.5.7. Conclusion of Assessment for the River Nanny and Estuary SPA and Dundalk Bay SPA

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the special conservation interests of River Nanny and Estuary SPA and Dundalk Bay SPA the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the dredging operation does not pose a risk of adversely affecting (either directly or indirectly) the integrity of these European sites, and there is no reasonable scientific doubt with the conclusion.

6.6. Rockabill SPA [004014]

6.6.1. Ecological Baseline Description of the Rockabill SPA

Rockabill consists of two small, low-lying, granitic islets situated c. 7 km off the Co. Dublin coast. The islands are separated by a narrow channel, though are connected at low spring tides. The site is a important for the following species: Purple sandpiper, Roseate tern, Common tern and Arctic tern.

Rockabill has a long history of nesting by terns and it is now the most important Roseate tern colony in Europe. The All-Ireland Tern Survey in 1995 recorded an internationally important population of Roseate tern (554 pairs) and nationally important populations of Common tern (351 pairs) and Arctic tern (49 pairs) on Rockabill. Intensive wardening, management and monitoring since the 1980s has seen the colony grow significantly. In 2010 the Roseate population had increased to 1,093 pairs, which represents approximately 65% of the entire European biogeographic population. The Common tern population is the largest in Ireland with 1,940 pairs recorded in 2010. The Arctic tern population has also increased with 250 pairs recorded in 2010. Sandwich tern nested up to the 1930s but apparently not since. Surveys of the foraging behaviour of the Roseate tern population on Rockabill have recorded up to 73% of Roseate terns foraging within 3.5 km of the islands. The seas surrounding the islands, to a distance of 3.5 km, are therefore included within the SPA to protect the foraging resource of this internationally important Roseate tern population.

Other breeding seabirds while utilise the site include Black guillemot (82 pairs in 2010) and a small colony of Kittiwake (163 pairs in 2010). Both of these species are monitored annually and most of the chicks produced are ringed. In winter the site supports a nationally important population of Purple sandpiper (48). Other species recorded include Cormorant (18), Oystercatcher (14) and Turnstone (38) – all figures are 3 year mean peaks for the period 1997/98 to 1999/2000.

6.6.2. Qualifying Interests and Conservation Objectives

The special conservation interests of Rockabill SPA, and the overall conservation objective for each, are listed below.

Table 9: Special Conservation Interests and Conservation Objectives of Rockabill SPA

Qualifying Interest(s)	Conservation Objective(s)
[A148] Purple Sandpiper *Calidris maritima* [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea*	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

This document sets out the attributes, measures and targets that define the favourable conservation condition of the special conservation interests within the Rockabill SPA. Affecting the conservation condition of the special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the special conservation interests of the Rockabill SPA are presented in Section 6.6.3, Table 618.

6.6.3. Examination and Analysis of Potential Direct and Indirect Impacts

The direct and/or indirect impacts by which the works could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the special conservation interests of Rockabill SPA, are:

- Disturbance and displacement impacts
- Mortality as a result of a pollution event
- Reduced prey availability

6.6.3.1. Disturbance and displacement impacts

Roseate and Common terns were recorded foraging within the Little tern survey area during surveys in 2018, and were noted to feed in a similar area to Little terns but further seaward in deeper waters. Numbers were also recorded roosting on the breakwaters at the estuary mouth in August in peak counts of 254 Common terns and 127 Roseate terns, and were likely to form larger congregations of post-breeding terns later into August after surveys had been completed.

Disturbance events of Common and Roseate tern species as a direct result of the dredging operations were not specifically recorded. It is possible that roosting terns were temporarily lifted when vessels entered the river mouth at high tide creating a wake which covered the breakwaters, however this effect was not specific to dredging plant. The continuation of existing dredging operations will not cause any disturbance to roosting or feeding Roseate and Common terns which were recorded using the aquatic and marine habitats of the Boyne River, Boyne Estuary and Irish Sea.

6.6.3.2. Mortality as a result of a pollution event

An accidental pollution event i.e. hydro-carbon spill or leak during operation from plant used to undertake the dredging operation, has the potential to affect water quality in the Boyne River, Estuary and Irish Sea. Therefore, an accidental pollution event of a sufficient magnitude, either alone or cumulatively with other pollution sources, could potentially affect the water quality in marine habitats of the Boyne Estuary and Irish Sea which are used by Common and Roseate tern for feeding and roosting. These species are vulnerable to an accidental pollution incident either directly through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting.

Affecting the water quality of the Boyne Estuary and coastal habitats due to an accidental pollution event during operation has the potential to undermine the conservation objectives of the Rockabill SPA by affecting the quality of intertidal habitats or through direct contact with special conservation interests species causing harm or mortality.

6.6.3.3. Reduced prey availability

Maintenance dredging produces a sediment plume which temporarily changes the turbidity of the water column in an area localised to the dredging works. The sediment plume has the potential to affect the foraging efficiency

of birds that dive through the water column in search of prey items and that may feed within the plume zone of the dredger.

Surveys carried out between 30th May and 9th August 2018 covering the extent of the Boyne Estuary, breakwaters of the Boyne Estuary and the coastal area north and south of the estuary mouth recorded Common and Roseate terns feeding within a similar area to Little tern however further seaward in deeper waters.

Hydraulic modelling carried out for the maintenance dredging works has shown that the suspended sediment plume concentrations are generally low with values typically less than about 80 mg/l and disperse relatively quickly with the tidal flow (RPS, 2019). Furthermore, during easterly weather conditions, wave action causes suspended sediments and greater turbidity in the water column over an extensive shoreline area compared to that produced from dredging operations. Dredging operations will not increase as a result of the continuation of maintenance dredging works under a renewed licence.

Sandeel are a large component of Common and Roseate tern diet in Ireland (Green, 2017). Their lifecycle typically involves spawning in December and January producing up to 15,000 eggs; eggs stick to seabed substrate where they hatch in February or March; plankton larvae enter the water column and drift with prevailing currents until larvae metamorphosis of larvae to juvenile fish typically occurs in late May to early June. Sandeel feed on a range of zooplankton often occurring along the edges of sandbanks (Green, 2017).

There is potential for dredging activities to remove sandeel eggs and larvae which may be attached to material blown into the estuary mouth by weather conditions and later removed by dredging operations. Given the localised extent of the dredging works, it is considered highly unlikely that the removal of material from the estuary mouth and river channel would result in the removal of sandeel or other prey items and have any perceptible reduction in prey biomass available.

Overall, the dredging operation, which is currently ongoing and will continue at the same level under a renewed licence will not affect prey availability or feeding efficacy of Common tern or Roseate tern.

Table 10: Potential Impacts on the Conservation Objectives of Rockabill SPA

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Purple Sandpiper Calidris maritima [A148] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	No Purple sandpiper were not recorded at the dredging site or within the zone of influence of the operation	No	No
Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing or intensity of use of areas by purple sandpiper other than that occurring from natural patterns of variation	No Purple sandpiper were not recorded at the dredging site or within the zone of influence of the operation	No	No
Roseate Tern (*Sterna dougallii*) [A192] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests / Number / No significant decline	No The nearest nesting Roseate tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline	No The nearest nesting Roseate tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Distribution: breeding colonies / Number; location; area (hectares) / No significant decline	No The nearest nesting Roseate tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Prey biomass available / Kilogrammes / No significant decline	No Hydraulic modelling carried out for the maintenance dredging works has shown that the total suspended sediment concentrations are very low and disperse relatively quickly with the tidal flow (RPS, 2019). Furthermore, during easterly weather conditions, wave action causes	No	

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
	suspended sediments and greater turbidity in the water column over an extensive shoreline area compared to that produced from dredging operations. Dredging operations will not increase as a result of the continuation of maintenance dredging works under a renewed licence. Removal of dredged material will not result in the removal of any perceptible numbers of prey items to cause any reduction of prey biomass available.		
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No The nearest nesting Roseate tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding Roseate tern population	No The nearest nesting Roseate tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Common Tern (*Sterna hirundo*) [A193] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests / Number / No significant decline	No The nearest nesting Common tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline	No The nearest nesting Common tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Distribution: breeding colonies / Number; location; area (hectares) / No significant decline	No The nearest nesting Common tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Prey biomass available / Kilogrammes / No significant decline	No Hydraulic modelling carried out for the maintenance dredging works has shown that the total suspended sediment concentrations are very low and disperse relatively quickly with the tidal flow (RPS, 2019). Furthermore, during easterly weather conditions, wave action causes suspended sediments and greater turbidity in the water column over an extensive shoreline area compared to that produced from dredging operations. Dredging operations will not increase as a result of the continuation of maintenance dredging works under a renewed licence. Removal of dredged material will not result in the removal of any perceptible numbers of prey items to cause any reduction of prey biomass available.	No	No
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No The nearest nesting Common tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding Common tern population	No The nearest nesting Common tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Arctic Tern (*Sterna paradisaea*) [A194] To maintain the favourable conservation condition of wetland habitats within the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests / Number / No significant decline	No The nearest nesting Arctic tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Productivity rate: fledged young per breeding pair / Mean number / No significant decline	No The nearest nesting Arctic tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Distribution: breeding colonies / Number; location; area (hectares) / No significant decline	No The nearest nesting Arctic tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Prey biomass available / Kilogrammes / No significant decline	No Artic tern were not recorded foraging within the zone of influence of the dredging operations.	No	No
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase	No The nearest nesting Arctic tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding Arctic tern population	No The nearest nesting Arctic tern colony is located at Rockabill c.20km southeast of the dredging operations.	No	No

6.6.4. Mitigation Measures

This section presents the mitigation measures that will be implemented during the operation of maintenance dredging works and dump at sea sites to avoid or reduce the potential impacts of the works on the Rockabill SPA. In this case, the dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the SCI species therefore no mitigation measures are proposed.

6.6.5. Residual Impacts

The dredging operation poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the SCI species of and there are therefore, no residual direct or indirect impacts associated with the works that could adversely affect the integrity of those European sites.

6.6.6. Conclusion of Assessment for the Rockabill SPA

Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the special conservation interests of Rockabill SPA, the potential impacts, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the works does not pose a risk of adversely affecting (either directly or indirectly) the integrity of these European sites, and there is no reasonable scientific doubt with the conclusion.

7. In Combination Assessment

7.1. Analysis of Potential In Combination Effects

This section of the report presents the assessment carried out to examine whether any other plans or projects have the potential to act in combination with the dredging operations to adversely affect the integrity 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. All other European sites fall beyond the zone of influence of the proposed development. Therefore, there is no potential for any other plans or projects to act in combination with the proposed development to adversely affect the integrity of any other European sites.

Maintenance dredging operations are currently in existence 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 a renewed maintenance dredging licence.

Razor clam fishing occurs off the coast of Drogheda under licence from the Sea Fisheries Protection Authority and are discourage 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.

As assessed in Section 6, none of the potential impacts associated with the dredging operations 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 dredging operations that will adversely affect the conservation objectives supporting the conservation condition of the qualifying interests/special conservation interests of those European sites, and the dredging operations in isolation will not adversely affect the integrity of those European site.

7.2. Conclusion of In Combination Assessment

As the dredging operations will not have any effects on the conservation objectives of any European sites, and considering the mitigation measures described in Section 6, there is no potential for any other plan or project to adversely affect the integrity of any European sites in combination with the dredging operations.

8. NIS Conclusion

This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the works, the potential impact sources and pathways, how these could impact on the sites' special conservation interest species and whether the predicted impacts would adversely affect the integrity of the **River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC, Rockabill to Dalkey Island SAC, Boyne Estuary SPA, River Nanny and Estuary SPA, River Boyne and River Blackwater SPA, Rockabill SPA, and, Dundalk Bay SPA**. There are no other European sites at risk of effects from the works.

It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the dredging operations, that the operations will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.

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APPENDIX 1: LITTLE TERN 2018 SURVEY DATES, TIMES, TIDE TIMES AND CYCLE, AND WEATHER CONDITIONS

Date	VP	Start time	End time	Tide time high water[10]	Tide movement[11]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (X/8)	Visibility
30/05/2018	1	14:00	14:30	13:32	Ebb	Low	17	4	E	None	0	Good
30/05/2018	2	14:30	15:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	3	15:00	16:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	4	16:00	17:00	13:32	Ebb	High	17	4	E	None	0	Good
30/05/2018	5	10:15	11:30	13:32	Flow	Low	17	4	E	None	0	Good
30/05/2018	6	09:00	10:00	13:32	Flow	Low	17	4	E	None	0	Good
07/06/2018	1	09:30	10:30	06:13	Ebb	Low	19.5	2	E	None	2	Good
07/06/2018	2	10:45	11:45	06:13	Ebb	Low	19.5	2	E	None	0	Mod. (heat haze)
07/06/2018	3	13:15	14:15	06:13	Flow	Mid	20	2	E	None	1	Mod. (heat haze)
07/06/2018	4	12:05	13:05	06:13	Slack	Low	19	2	E	None	1	Mod. (heat haze)
07/06/2018	5	15:30	16:30	19:05	Flow	Mid	22	2	E	None	1	Mod. (heat haze)
07/06/2018	6	16:40	17:40	19:05	Flow	High	22	1	E	None	1	Good
13/06/2018	1	16:00	17:00	11:42	Ebb	Low	19	5	S	Light showers	8	Good
13/06/2018	2	14:50	13:50	11:42	Ebb	Mid	18	5	S	None	8	Good
13/06/2018	3	12:20	13:20	11:42	Ebb	High	16.5	3	S	Light showers	8	Good
13/06/2018	4	13:32	14:32	11:42	Ebb	Mid	16	4	S	None	8	Good
13/06/2018	5	10:20	11:20	11:42	Flow	High	17	2	S	None	8	Good
13/06/2018	6	09:05	10:05	11:42	Flow	High	17	2	S	None	8	Good
20/06/2018	1	11:30	12:35	05:24	Ebb	Low	15	3	N	None	6	Good
20/06/2018	2	12:40	13:40	18:09	Flow	Mid	16	4	N	None	8	Good
20/06/2018	3	15:15	16:15	18:09	Flow	High	15	4	N	None	6	Good

[10] Drogheda Tide Tables 2018, high tide times for Tom Roes Point

[11] Ebb tide is a falling tide; flow tide is a flooding tide; and, slack tide is the short period when the tides are turning and there is neither an ebb or flow movement

Date	VP	Start time	End time	Tide time high water[10]	Tide movement[11]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (X/8)	Visibility
20/06/2018	4	14:05	15:05	18:09	Flow	Mid	16	4	N	None	7	Good
20/06/2018	5	08:45	09:45	05:24	Ebb	Low	13	5	N	None	8	Good
20/06/2018	6	09:55	10:55	05:24	Ebb	Low	13	4	N	None	8	Good
27/06/2018	1	12:45	13:30	12:02	Ebb	High	23	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	2	11:25	12:25	12:02	Flow/Slack	High	23	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	3	10:10	11:10	12:02	Flow	High	22	2	NE	None	2	Mod. (heat haze & sun reflection)
27/06/2018	4	09:00	10:00	12:02	Flow	Mid	20	3	N	None	2	Mod. (heat haze)
27/06/2018	5	13:50	14:50	12:02	Ebb	Mid	23	2	NE	None	2	Mod. (heat haze)
27/06/2018	6	15:00	16:00	12:02	Ebb	Low	23	2	NE	None	2	Mod. (heat haze)
04/07/2018	1	11:45	12:30	16:22	Flow	Mid	23	2	E	None	0	Good
04/07/2018	2	12:40	13:40	16:22	Flow	Mid	23	2	E	None	0	Good
04/07/2018	3	14:00	15:00	16:22	Flow	Mid	22	3	E	None	0	Good
04/07/2018	4	15:10	16:10	16:22	Flow	High	22	3	E	None	0	Good
04/07/2018	5	09:05	10:05	16:22	Ebb	Low	20	1	E	None	0	Good
04/07/2018	6	10:15	11:15	16:22	Ebb/Slack	Low	22	2	E	None	0	Good
16/07/2018	1	07:50	08:50	14:51	Ebb/Slack	Low	17	1	E	None	3	Good
16/07/2018	2	09:15	10:15	14:51	Flow	Low	17	1	E	None	3	Good
16/07/2018	3	10:40	11:40	14:51	Flow	Low	20	1	N	None	4	Good
16/07/2018	4	11:50	12:50	14:51	Flow	Mid	20	1	N	None	6	Good
16/07/2018	5	14:00	15:00	14:51	Flow/Slack	High	20	3	SE	None	7	Good
16/07/2018	6	15:15	16:15	14:51	Ebb	Mid	17	4	SE	None	8	Good
23/07/2018	1	12:15	13:15	09:18	Ebb	Mid	20		SE	None	7	Good
23/07/2018	2	13:30	14:30	09:18	Ebb	Mid	23	2	NE	None	8	Good
23/07/2018	3	14:40	15:40	09:18	Ebb/Slack	Low	20	5	SE	None	6	Good
23/07/2018	4	15:50	16:50	09:18	Flow	Low	20	5	SE	None	6	Good
23/07/2018	5	09:03	10:03	09:18	Flow/Slack	High	20	1	S	None	8	Good

Date	VP	Start time	End time	Tide time high water[10]	Tide movement[11]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (X/8)	Visibility
23/07/2018	6	10:20	11:20	09:18	Ebb	High	20	2	SE	None	8	Good
03/08/2018	1	09:15	10:15	04:01	Ebb	Low	20	2	W	None	6	Good
03/08/2018	2	10:30	11:30	04:01	Flow	Mid	20	2	W	None	7	Good
03/08/2018	3	12:00	13:00	04:01	Flow	Mid	19	2	W	None	6	Good
03/08/2018	4	13:15	14:15	16:33	Flow	Mid	19	1	W	None	6	Good
03/08/2018	5	15:30	16:30	16:33	Flow/Slack	High	20	1	W	None	4	Good
03/08/2018	6	16:40	17:40	16:33	Ebb	High	20	1	W	None	4	Good
09/08/2018	1	12:15	13:15	10:20	Ebb	Mid	19	2	S	None	4	Good
09/08/2018	2	13:25	14:25	10:20	Ebb	Mid	19	4	SW	None	5	Good
09/08/2018	3	14:45	15:15	10:20	Ebb	Low	19	2	S	None	4	Good
09/08/2018	4	15:15	15:45	10:20	Ebb	Low	19	2	S	None	4	Good
09/08/2018	5	10:45	11:45	10:20	Ebb	Mid	19	2	S	None	3	Good
09/08/2018	6	09:35	10:35	10:20	Flow/Slack	High	17	2	S	None	2	Good

APPENDIX 2: WINTERING BIRD 2018-2018 SURVEY DATES, TIMES, TIDE TIMES AND CYCLE, AND WEATHER CONDITIONS

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
20/09/2018	1	15:15	15:40	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	3	14:50	15:05	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	4	14:10	14:15	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	5	13:50	14:10	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	7	16:00	16:20	09:24	Low	9	3	SE	Heavy rain	8	Good
20/09/2018	8	10:30	11:40	09:24	High	12	3	SE	None	8	Good
20/09/2018	9	10:30	11:40	09:24	High	12	3	SE	None	8	Good
20/09/2018	10	09:30	10:30	09:24	High	11	3	SE	None	8	Good
20/09/2018	11	09:10	09:25	09:24	High	11	3	SE	None	8	Good
20/09/2018	12	08:20	09:00	09:24	High	10	3	SE	None	8	Good
20/09/2018	13	08:20	09:00	09:24	Low	10	3	SE	Light rain	8	Good
20/09/2018	2	14:25	14:50	09:24	Low	9	3	SE	Heavy rain	8	Poor
20/09/2018	6	13:00	13:50	09:24	Low	9	3	SE	Heavy rain	8	Poor
15/10/2018	1	10:20	10:45	16:25	Low	12	2	SW	None	1	Good
15/10/2018	2	12:40	12:50	16:25	Low	12	2	SW	None	1	Good
15/10/2018	3	12:30	12:35	16:25	Low	12	2	SW	None	1	Good
15/10/2018	4	12:25	12:30	16:25	Low	12	2	SW	None	1	Good
15/10/2018	5	12:20	12:25	16:25	Low	12	2	SW	None	1	Good
15/10/2018	6	11:45	12:15	16:25	Low	12	2	SW	None	1	Good
15/10/2018	7	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	8	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	9	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	10	08:45	10:10	16:25	Low	12	2	SW	None	1	Good
15/10/2018	11	08:30	08:40	16:25	Low	12	2	SW	None	1	Good
15/10/2018	12	08:00	08:15	16:25	Low	12	2	SW	None	1	Good
15/10/2018	13	11:15	11:35	16:25	Low	12	2	SW	None	1	Good
15/10/2018	1	05:00	05:10	16:25	High	12	2	SW	None	1	Good

[12] Drogheda Tide Tables 2018, high tide times for Tom Roes Point

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
15/10/2018	2	04:30	04:40	16:25	High	12	2	SW	None	1	Good
15/10/2018	3	04:25	04:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	4	04:20	04:25	16:25	High	12	2	SW	None	1	Good
15/10/2018	5	04:15	04:20	16:25	High	12	2	SW	None	1	Good
15/10/2018	6	03:50	04:15	16:25	High	12	2	SW	None	1	Good
15/10/2018	7	05:10	05:15	16:25	High	12	2	SW	None	1	Good
15/10/2018	8	05:15	05:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	9	05:15	05:30	16:25	High	12	2	SW	None	1	Good
15/10/2018	10	05:30	05:45	16:25	High	12	2	SW	None	1	Good
15/10/2018	11	05:45	05:50	16:25	High	12	2	SW	None	1	Good
15/10/2018	12	05:50	06:00	16:25	High	12	2	SW	None	1	Good
15/10/2018	13	15:25	15:45	16:25	High	12	2	SW	None	1	Good
20/11/2018	1	09:50	10:05	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	2	10:10	10:15	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	3	10:15	10:20	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	4	10:20	10:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	5	10:25	10:30	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	6	10:30	10:45	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	7	09:35	09:45	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	8	09:25	09:35	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	9	09:05	09:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	10	08:30	09:05	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	11	08:05	08:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	12	08:05	08:25	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	13	10:45	11:00	09:24	High	6	7	NE	Heavy showers	7	Rough sea/wind affecting visibility
20/11/2018	1	14:50	15:10	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	2	14:25	14:35	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	3	14:15	14:25	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	4	14:05	14:15	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	5	14:00	14:05	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	6	13:40	13:55	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	7	15:15	15:30	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
20/11/2018	8	15:30	15:45	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	9	15:45	16:00	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	10	16:00	16:15	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	11	16:15	16:20	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	12	16:15	16:20	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/11/2018	13	13:10	13:30	09:24	Low	8	8	NE	Showers	7	Wind affecting visibility
20/12/2018	1	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	2	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	3	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	4	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	5	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	6	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	7	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	8	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	9	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	10	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	11	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	12	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	13	08:40	12:00	09:25	High	4	4	WSW	None	6	Good
20/12/2018	1	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	2	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	3	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	4	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	5	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	6	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	7	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	8	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	9	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	10	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	11	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	12	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate
20/12/2018	13	13:15	16:20	09:25	Low	7	4	W	Showers	8	moderate

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
25/01/2019	1	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	2	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	3	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	4	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	5	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	6	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	7	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	8	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	9	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	10	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	11	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	12	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	13	08:05	12:00	14:30	Low	8	2	S	None	8	Good
25/01/2019	1	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	2	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	3	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	4	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	5	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	6	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	7	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	8	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	9	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	10	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	11	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	12	13:15	15:40	14:30	High	8	2	S	None	8	Good
25/01/2019	13	13:15	15:40	14:30	High	8	2	S	None	8	Good
12/02/2019	1	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	2	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	3	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	4	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	5	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	6	08:00	12:00	16:12	Low	7	4	SW	None	5	Good

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
12/02/2019	7	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	8	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	9	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	10	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	11	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	12	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	13	08:00	12:00	16:12	Low	7	4	SW	None	5	Good
12/02/2019	1	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	2	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	3	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	4	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	5	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	6	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	7	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	8	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	9	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	10	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	11	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	12	13:40	17:00	16:12	High	7	4	SW	None	5	Good
12/02/2019	13	13:40	17:00	16:12	High	7	4	SW	None	5	Good
27/03/2019	1	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	2	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	3	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	4	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	5	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	6	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	7	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	8	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	9	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	10	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	11	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	12	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
27/03/2019	13	14:00	16:40	16:06	High	12.5	3	SE	None	4	Good
27/03/2019	1	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	2	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	3	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	4	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	5	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	6	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	7	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	8	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	9	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	10	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	11	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	12	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
27/03/2019	13	08:30	12:50	16:06	Low	10	3	SE	None	5	Good
16/04/2019	1	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	2	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	3	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	4	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	5	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	6	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	7	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	8	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	9	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	10	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	11	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	12	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	13	13:10	16:25	09:45	Low	10	4	E	None	7	moderate
16/04/2019	1	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	2	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	3	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	4	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	5	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate

Date	Count Area	Start time	End time	Tide time high water[12]	Tide cycle	Temp (*C)	Wind Speed (Beaufort)	Wind Direction	Rain	Cloud Cover (x/8)	Visibility
16/04/2019	6	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	7	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	8	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	9	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	10	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	11	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	12	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate
16/04/2019	13	08:50	11:50	09:45	High	10	5	E	Light rain	8	moderate

APPENDIX 3: SEA CRAFT ACTIVITY LOG DURING 2019 MARINE MAMMAL SURVEYS & SUBTIDAL SURVEY

Date	Start	End	Activity	Porpoise sightings?
Marine Mammal Surveys				
20/03/2019	08:30	10:00	Clam dredgers working just off-shore, including x2 around the mouth of the estuary and x2 further south. Pilot boat went out and returned.	Y
20/04/2019	09:30	11:00	Clam dredgers working just off-shore, including x2 around the mouth of the estuary and x4 further south. Pilot boat carrying out hydrographic survey at river mouth for last hour of watch.	Y
12/05/2019	07:50	09:20	No vessel activity.	N
14/06/2019	07:25	08:55	Dredger 'Argus' on station at river mouth. Left after 15 minutes.	N
Subtidal Survey				
26/04/2019	NA	NA	Dredger 'Argus' on station at river mouth as we returned to port. Harbour porpoise sighted at same time.	Y

APPENDIX 4: EMERGENCY PLAN (INCLUDING POLLUTION RESPONSE PLAN). DROGHEDA PORT COMPANY (2017)

The DPC Emergency Plan can be accessed at:
www.droghedaport.ie
User Name: emergency
Password: DP002

EMERGENCY PLAN

(Including Pollution Response Plan)

JUNE 2019

Update No: 13

Next Review Due: December 2020

EMERGENCY PLAN

(Including Pollution Response Plan)

Contents

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AMENDMENTS TO PLAN

Amendment No.	Date of Issue	Paragraphs amended	Pages substituted or added	Approved by:
1	6/1/97	Various	Nil	M. Donnelly
2	6/3/98	Various	4 Sheet Revised Appendix 5	M. Donnelly
Overall Plan Revision 3	March 99			M. Donnelly
Overall Plan Revision 4	December 2000	Appendix amended	Distribution List, Appendix 4, 6,7,8,10	M. Donnelly
Overall Plan Revision 5	May 2004	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 6	Sept 2007	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 7	Jan 2010	Complete Revision	Complete Revision	M. Donnelly
Overall Plan Revision 8	July 2011	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 9	Jan 2013	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 10	April 2014	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 11	June 2016	Minor Amendments	Minor Amendments	M. Donnelly
Overall Plan Revision 12	Oct 2017	Minor Amendments	Minor Amendments	M Donnelly
Overall Plan Revision 13	June 2019	Minor Amendments	Minor Amendments	M Donnelly

DISTRIBUTION LIST

Irish Coast Guard

Gardaí

Drogheda Fire Brigade

Meath County Council

Louth County Council

National Ambulance Service

HSE

Our Lady of Lourdes Hospital, Drogheda

Iarnrod Éireann Station Master Drogheda

Drogheda Coast Guard Unit

R. N. L. I. Clogherhead.

Drogheda Pilots

Pilot Boat Coxswains

RHI Magnesita (Premier Periclase Ltd)

Flogas Ireland Ltd

Drogheda Port Logistics

Martin Butterly & Co Ltd

Hamilton Shipping

Fast Shipping Ireland Ltd.

Fast Terminals Ltd.

KC Shipping Ltd.

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Pollution & Waste Services Ltd

EMERGENCY PLAN

(Including Pollution Response)

INTRODUCTION

For the purpose of interpreting this plan the Drogheda Port Company define an emergency as "**An event that occurs within the jurisdiction of the port with little or no warning, causes or threatens":**

- **Death or injury**
- **Serious disruption to port services**
- **Damage to property**
- **Damage to the environment**
- **Terrorist threat or attach**
- **Pollution incident**

As a result of a marine/or marine related incident, or a serious incident adjacent to the port, impacting on the port or its environs requiring activation of the plan".

1. This plan, agreed to by all existing appropriate authorities in the Port, sets out the AGREED ACTIONS to be taken during ANY EMERGENCY/ POTENTIAL EMERGENCY in the Port. The success of this plan rests on the willing and faithful compliance of all.

2. The plan takes the form of a chapter dealing with emergencies in general, followed by separate chapters giving the actions to be taken in each particular type of emergency. There are also a number of appendices on the various factors affecting different types of emergency.

3. The purpose of this plan is to provide an overall plan of actions to be taken by all authorities in an emergency or potential emergency. Each undertaking or authority will be responsible for issuing their own detailed instructions within the general provisions of this Plan. Drogheda Port Company issue annually "Notice to Masters" (Appendix 1) "Considerations on affecting all types of Emergency's", displayed on www.droghedaport.ie and issued to Ships Agents in Drogheda Port.

4. It is intended that exercises should be held at least annually to test out the efficiency and practicability of the plan and a general meeting will be convened after these exercises to review the plan.

5. The production of this plan and the general co-ordination of all interested parties has been undertaken by the Drogheda Port Company, acting in the general interests of all undertakings in the port.

6. It is important that this plan should be kept up to date and any changes, which affect the plan, should be notified without delay to the Harbourmaster, Harbourville, Mornington Road, Drogheda, Co. Meath who will be responsible for issuing the necessary amendments to the plan.

7. The appendices to the plan include maps of all jetties/quays, private and public within the jurisdiction of the port.

This plan has been produced by the Drogheda Port Company to cover emergencies within the jurisdiction of the Authority. The Drogheda Port Company recognises the existence of the following emergency plans Louth County Council, Meath County Council, Flogas and the North Eastern Health Board. This plan of the Drogheda Port Company is complementary to existing emergency plans.

GENERAL CHAPTER: Considerations affecting all Types of Emergencies.

1. Raising the Alarm and Control of Operations
2. Control of Shipping Movements
3. Responsibility for Fire Fighting Operations
4. Information to Public, Press etc

SECTION A: Fire or Explosion on Jetty/Quay

1. Raising the Alarm
2. Action by Jetty Owner involved
3. Action by Master
4. Action by Jetty Owner not involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Action by Medical Services
8. Action by Gardaí
9. Action by ICG
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION B: Fire or Explosion on a Vessel alongside a Jetty/Quay

1. Raising the Alarm
2. Action by Master
3. Action by Jetty Owners Involved
4. Action by Jetty Owners Not Involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Action by Medical Services
8. Action by Gardaí
9. Action by ICG
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION C: Fire or Explosion on a vessel at Anchor or Moored in the Roads or underway in the channel.

1. Raising the Alarm
2. Action by Master
3. Action by Drogheda Port Company
4. Action by Fire Brigade
5. Action by Medical Services
6. Action by Gardaí
7. Action by Jetty Owners
8. Action by ICG
9. Action by Other Marine Services
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Subsequent Action by all Personnel

SECTION D: Collision or Emergency, other than Fire or Explosion, including oil pollution.

1. Raising the Alarm
2. Action by Master
3. Action by Drogheda Port Company
4. Action by Fire Brigade
5. Action by Medical Services
6. Action by Gardaí
7. Action by Jetty Owners
8. Action by ICG
9. Action by Other Marine Services
10. Establishment of Control Posts
11. Control of Shipping Movements
12. Severe Oil Pollution
13. Subsequent Action by all Personnel

SECTION E: Potentially Hazardous Situations occurring on a Ship or a Jetty.

1. General
2. Raising the Alarm
3. Action by Master
4. Action by Jetty Owner Involved
5. Action by Drogheda Port Company
6. Action by Fire Brigade
7. Control Posts and Situation Reports

SECTION F: Emergencies outside the jurisdiction of the port.

1. General
2. Action by Drogheda Port Company

SECTION G: Terrorist Attack or Threatened Terrorist Attack

1. General
2. Raising the Alarm
3. Action by the Master/Ships Security Officer
4. Action by the PFSO

SECTION H: Pollution Response

1. General
2. Action by Drogheda Port Company

General Chapter:

Considerations affecting all types of Emergency.

1. Raising the Alarm and Control of Operations.

1.1 When an emergency/potential emergency occurs, it is vital that the alarm should be raised immediately. Any person can raise the alarm.

1.2 All reasonable steps will be taken by those on the spot to render whatever aid is immediately available. Subsequent action will be co-ordinated through the control posts as set out in Appendix 9.

1.3 The decisions to designate an emergency/potential emergency and implementation of this Emergency Plan (Including Pollution Response) will be made by the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.4 The Fire Brigade and other Emergency Services may be mobilised before an emergency is declared to deal with a minor incident on a ship or jetty. The Harbourmaster must always be informed immediately of any such incident.

1.5 The Emergency Plan will be activated in whole or in part in all incidents involving fire on board a vessel however minor.

2. Control of Shipping Movements

2.1 All decisions regarding the movements of shipping during an emergency will be made by the Harbourmaster and where necessary, he will decide the order in which ships are to be moved. In this context and throughout the Plan, the acting Harbourmaster will have the have authority to act for the Harbourmaster in the event of his absence or non-availability.

2.2 During an emergency, no vessel will be allowed to enter the port without the specific authorisation of the Harbourmaster.

2.3 The regulation of port shipping movements will normally be executed through the Drogheda Port Company office.

2.4 No sea-going or cargo-carrying vessels are to be moved from jetties, quays or lay bys after the receipt of an alarm without the prior concurrence of the Harbourmaster unless the vessel is in immediate danger of being affected by the emergency and it is found to be impossible, owing to special circumstances, to obtain this concurrence. Movement without concurrence should only be adopted where grave risk exists by leaving the vessel in position and every effort has been made to contact the Harbourmaster.

2.5 If conditions permit, tankers not involved in the emergency but moored close to a jetty/quay where an emergency is taking place will be moved to sea or other berth at the first opportunity.

2.6 Where a fire occurs in a vessel alongside a jetty/quay the vessel should, except in very special circumstances, be kept alongside the berth to facilitate fire-fighting operations and increase the safety of the ship's crew and the fire-fighting personnel.

2.7 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

2.8 VESSELS IN ANY DANGER OF SINKING WILL NOT ENTER THE PORT LIMITS UNLESS DIRECTED TO DO SO BY THE HARBOURMASTER.

2.9 During emergencies the Harbourmaster will normally be at the Forward Control. (See Appendix 9)

2.10 On receipt of an alarm, all loading and discharging operations will cease at all jetties/quays (public and private). All cargo vessel hatches should be battened down, tanker hoses will be disconnected and all vessels will make ready their engines. Operations will not be resumed without the specific approval of the Harbourmaster. Such approval may be subject to conditions.

3. Responsibility for Fire Fighting Operations.

3.1 In all cases initial first aid fire fighting will be undertaken by personnel on the scene with whatever equipment is available.

3.2 For fires at jetties/quays direction of all available fire fighting aids, including the direction of the fire fighting resources of the tug, dredger and other craft available will be exercised by the Harbourmaster on the public quays, and on the private quays bye the quay owners/operators in consultation with the harbourmaster until the arrival of the Fire Brigade, when overall direction of fire fighting will be assumed by the Senior Officer of the Fire Brigade present.

3.3 For fire on vessels alongside jetties/quays, underway, or at anchor within the port limits the direction of all available fire fighting aids, including the direction of the fire fighting resources of the pilot boats and other craft available will be exercised by the Harbourmaster until the arrival of the Fire Brigade when overall direction of the fire fighting will be assumed by the Senior Officer of the Fire Brigade present.

3.4 Should any question concerning the safety or stability of a ship arise in the course of fighting the fire, the Harbourmaster, the vessels Master and the Senior Officer of the Fire Brigade present will pay strict attention to the stability of the vessel and, in conjunction with the above, will take the necessary steps to ensure the vessel's safety.

3.5 Should any question concerning the safety or future use of the port or jetty/quay arise, the Harbourmaster or the representative of the Jetty Owners, or both, as applicable, will be responsible for calling the attention of the officer directing fire fighting operations to this, and in conjunction with this officer take any steps necessary to ensure their safety and efficient working.

3.6 Any incident involving the jetties or shipping in Drogheda Port will present the Fire Service with difficult problems and may require the activation of the County Major Emergency Plan.

4. Information to the Public and Press.

4.1 Information to the Press will be channelled through the communications officer of the Drogheda Port Company with respect to emergencies within the estuary or on the Drogheda Port Company public quays. For incidents/emergencies at the private facilities a close liaison will be maintained between the private facility emergency controller and the Drogheda Port Company Communications Officer before any public information releases are made.

SECTION A: Fire or Explosion on Drogheda Port Company town quays, Tom Roes Point terminal and Fishmeal Quay

1. Raising the Alarm

1.1 The responsibility for raising the alarm rests with any person engaged on the quays. This may be a member of the Drogheda Port Company staff or stevedore employee.

1.2 Drogheda Port Company will issue instructions to its staff and stevedores who operate on its property on the lines given in para 1.3 below on raising the alarm.

Method of Raising Alarm.

1.3 By personnel on the jetty concerned, alarm should be raised by: -
(a) Sounding any local alarm signal, then
(b) Reporting the emergency as quickly as possible as follows: -
(1) Ringing Fire Brigade, Tel.No.999/112, and ask for Fire Brigade, giving a short message stating where the fire is and, if possible whether any casualties have occurred or are likely to occur.
(11) Ringing the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400 -1645hrs Mon-Fri) or VHF R/T Channel 11, or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087 2305950 passing the same message together with any information concerning shipping at the jetty, which may become affected.

2. Site action by Drogheda Port Company and or stevedores

2.1 Having raised the alarm the responsibility for fighting the fire will rest with the Drogheda Port Company or stevedores until the Fire Brigade arrives, when the Senior Officer of the Fire Brigade present will undertake overall control of fire fighting. (See General Chapter, section 3)

2.2 Evacuate all personnel to their assembly points, stop all cargo operations, disconnect hoses, close hatches and advise all vessels alongside to prepare for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval of the Harbourmaster or his deputy and the tidal conditions (See General Chapter, section 2).

2.3 The stevedores will inform the Drogheda Port Company office of details of type and quantities of cargo aboard all vessels alongside. This information will also be given to the Senior Officer of the Fire Brigade on attendance.

2.4 The Drogheda Port Company will set up CONTROL POSTS as detailed in paragraph 10 of this section..

2.5 Where hand portable VHF R/T radios are available then these should be handed to the Senior Officer Fire Brigade, if floating plant is required with portable fire fighting equipment.

2.6 Drogheda Port Company and the stevedores will take a head count at the assembly point and report to the Senior Fire Office of any missing persons.

2.7 If, after reporting a fire, casualties subsequently occur, the Drogheda Port Company or the stevedore will notify the need for ambulances as soon as possible, stating the urgency and likely number of casualties, to the Ambulance Control (Dial 999 / 112 and ask for "Ambulance").

3. Action by Master

3.1 On the alarm being raised the Master will be responsible for taking all immediate steps to safeguard his ship until assistance becomes available.

4. Action by Jetty Owners Not Involved

4.1 On receipt of an alarm, all loading and discharging operations will cease, hatches closed, cargo hoses disconnected and all vessels alongside prepared for sea and maintain a listening watch on VHF R/T channel 11. (See General Chapter, section 2)

4.2 Jetty Owners will, on request, inform the Drogheda Port Company Office of the quantities and type of cargo on board all vessels alongside.

4.3 Jetty Owners will maintain a continuous listening watch on VHF R/T channel 11 (if fitted) and will ensure that the direct line telephones to the Drogheda Port Company office are manned throughout the period of an emergency in order to received SITREPS and other information from the Drogheda Port Company Office.

5. Action by Drogheda Port Company

5.1 Overall control of shipping in the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in case of vessels or jetties/quays not directly involved.

5.2 The Harbourmaster will contact each Jetty Operator/Owner by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted.

5.3 On receipt of the alarm, the Drogheda Port Company office will immediately inform all interested parties as detailed in Appendix 7.

5.4 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

5.5 Drogheda Port Company floating plant may be used after crew mobilisation to transport Fire Brigade Officers, men and equipment to the river side scene of the fire, and for any other use.

5.6 The Drogheda Port Company pilot launches, if not required for rescue work, will be used to transport pilots as necessary.

5.7 The Drogheda Port Company office will be responsible for organising suitable small craft to convey Fire Brigade personnel and mobile pumps to the scene if required for close quarter fire fighting.

5.8 If it is necessary to take the Incident Medical Officer to the jetty by river or if casualties are to be evacuated by river the Drogheda Port Company office will organise the necessary launches.

5.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in Appendix 7, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

5.10 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on VHF Channels 11 & 16. SITREPS should not be acknowledged.

5.11 Tugs from adjacent ports may be employed.

5.12 River Pilots will be available throughout an emergency and Pilotage services will be co-ordinated through the Harbourmaster.

6. Action by Fire Brigade

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene.

6.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

7. Action by Medical Services

7.1 The North Eastern Health Board Ambulance Service will make available the necessary numbers of staff and vehicles to deal with whatever emergency arises within their remit on the request of the Drogheda Port Company.

8. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Officer at Drogheda Garda Station will:

8.1 Direct a Garda with Radio to scene to set up Radio Base.

8.2 Ensure that Harbour Master, Drogheda Port Office, Fire Service and Ambulance Service are aware of the position.

8.3 (i) Organise cordon and or traffic control:

(ii) Ensure that only Emergency vehicles are allowed past these points.

8.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

8.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended.

9. Action by ICG.

9.1 ICG will assist if requested by the Harbourmaster in providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

10. Establishment of Control Points.

10.1 The Base Control Point will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Point will be established by the Harbourmaster at a point closest to the scene (similar to the fire attendance post) of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements (See also General Chapter, Section 2).

11.1 If it is considered by the Harbourmaster that the emergency is such that shipping is likely to be involved, he will issue the necessary instructions through the Drogheda Port Company office.

11.2 If conditions permit, vessels moored to a jetty where an emergency is taking place will be moved to sea or to a vacant berth on another jetty at the first opportunity but only after instructions have been received from the Harbourmaster.

11.3 No vessels will enter the port whilst an emergency is in force without the specific approval of the Harbourmaster.

12. Subsequent Action by all Personnel.

12.1 After the alarm has been raised and all responsible officials are on the scene, future actions will be decided by them as circumstances dictate and all measures affecting the Port will be made known to ships and other establishments not directly involved through the Drogheda Port Office.

12.2 In case of minor fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to Appendix 1 – 12

SECTION B: Fire or Explosion on a Vessel alongside Drogheda Port town quays, Tom Roes Point terminal and Fishmeal Quay

1. Raising the Alarm.

All ship fires will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.1 The responsibility for raising the alarm rests with any person engaged on the quays or aboard the vessel.

1.2 Drogheda Port Company will issue instructions to its staff and stevedores who operate on its property on the lines given in para 1.3 below on raising the alarm.

Method of Raising Alarm.

1.3 By personnel on the ship concerned, alarm should be raised by:
(a) Continuous sounding of any fog signalling apparatus and/or other emergency signal and
(b) Reporting the emergency quickly as follows: -
(i) Informing responsible personnel on the jetty,
(ii) Calling the Drogheda Port Company office 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11, or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087 2305950 giving a short message stating name of ship, where the fire is and whether any casualties have occurred or are likely to occur.

2. Action by Master

2.1 Having raised the alarm, the Master will be responsible for taking all immediate steps to safeguard his ship until assistance becomes available. The Master should therefore start fighting the fire with all available resources. When the fire brigade arrives overall control of fire fighting will be undertaken by the Senior Officer of the Fire Brigade present (see General Chapter, section 3).

2.2 A Senior Officer of the vessel involved will remain with the Senior Officer of the Fire Brigade present to provide detailed information on the ship and her equipment and cargo.

3. Site action by Drogheda Port Company and stevedores

3.1 Render all possible assistance to the Master in fighting the fire aboard ship.

3.2 Render all possible assistance to the Masters of other vessels alongside.

3.3 Drogheda Port Company and or the stevedore will start fighting any resulting fires, which may occur on the jetty until the Fire Brigade arrives, when overall control will be assumed by the Senior officer of the Fire Brigade (see General Chapter, section 3).

3.4 Evacuate all personnel to their assembly points, stop all cargo operations, disconnect hoses and advise all other vessels alongside to batten down and prepare for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval of the Harbourmaster or his deputy and tidal conditions (see General Chapter section 2).

3.5 The stevedores will inform the Drogheda Port Company office of the quantities and type of cargo on board all vessels alongside. This information, will be given to the Senior Officer of the Fire Brigade 0n attendance.

3.6 The Drogheda Port Company will set up CONTROL POSTS as detailed in paragraph 10 of this section.

3.7 Where hand portable VHF/RT radios are available than these should be handed to the Senior Officer Fire Brigade for use in direct communication with the floating plant that may be used to transport fire fighting personnel and equipment by river to the scene.

3.8 Drogheda Port Company and the stevedores will take a head count at the assembly point and report to the Senior Fire Office of any missing persons.

3.9 If, after reporting the fire, casualties subsequently occur, Drogheda Port Company will notify the need for ambulances as soon as possible describing the emergency and stating the likely number of casualties to the Ambulance Control (Dial 999/112 and ask for "AMBULANCE".).

4. Action by Jetty Owners not involved

4.1 On receipt of alarm the Jetty Owner will stop cargo operations, disconnect hoses, close hatches and advise vessels alongside to prepared for sea and maintain a listening watch on VHF R/T channel 11. Removal from the jetty will be subject to specific approval (See General Chapter, section 2).

4.2 Jetty Owners will, on request, inform the Drogheda Port Company office of the quantities and type of cargo on board all vessels alongside.

4.3 Jetty Owners will maintain a continuous listening watch on VHF R/T (if fitted) Channel 11 and will ensure that the direct line telephones to the Drogheda Port Office are manned throughout the period of an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

5. Action by Drogheda Port Company

5.1 Overall control of the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of jetties not directly involved.

5.2 The Harbourmaster will contact each Jetty Operator/Owner by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted.

5.3 On receipt of the alarm, the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 7.

5.4 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

5.5 Drogheda Port Company floating plant may be used after crew mobilisation to transport fire brigade officers, men and equipment to the riverside scene of the fire, and for any other use.

5.6 The Drogheda Port Company pilot launches, if not required for rescue work, will be used to transport pilots as necessary.

5.7 The Drogheda Port Company office will be responsible for organising suitable small craft to convey fire brigade personnel and mobile pumps to the scene if required for close quarter fire fighting.

5.8 If is necessary to take the Incident Medical Officer to the scene by river or if casualties are to be evacuated by river the Drogheda Port Company office will organise the necessary launches.

5.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in appendix 5, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

5.10 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on Channels 11 & 16. SITREPS should not be acknowledged.

5.11 Tugs from adjacent port may be employed.

5.12 River pilots will be available throughout an emergency and Pilotage services will be coordinated through the Harbourmaster.

6. Action by Fire Brigade.

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Ships Master, Harbourmaster.

6.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

7. Action by Medical Services.

7.1 The North Eastern Health Board Ambulance Service will make available the necessary numbers of staff and vehicles to deal with whatever emergency arises within their remit at the request of the Drogheda Port Company.

8. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Orderly at Drogheda Garda Station will:

8.1 Direct a Gardaí with Radio to scene to set up Radio Base.

8.2 Ensure that Harbour Master, Drogheda Port Office, Fire Service and Ambulance Service are aware of the position.

8.3 (i) Organise cordon and or traffic control
(ii) Ensure that only Emergency vehicles are allowed past these points.

8.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

8.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended.

9. Action by ICG.

9.1 ICG will assist if requested by the Harbourmaster in providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

10. Establishment of Control Posts

10.1 The Base Control Post will be established by the Harbourmaster in the Drogheda Port Office.

10.2 A Forward Control Post (similar to the forward fire attendance post) will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements. (See General Chapter, section 2).

11.1 If it is considered by the Harbourmaster that the emergency is such that other shipping is likely to be involved, he will issue the necessary instructions concerning their movements through the Drogheda Port Company office.

11.2 If conditions permit, other vessels moored to a jetty/quay where an emergency is taking place will be moved to sea, to an anchorage or to a vacant berth on another jetty at the first opportunity but only after instructions have been received from the Harbourmaster.

11.3 Except in exceptional circumstances, a vessel, which is on fire, will be kept alongside the berth to facilitate fire-fighting operations and improve the safety of the ship's crew and fire fighting personnel.

11.4 No vessels will enter the Port whilst an emergency is in force without the specific approval of the Harbourmaster.

11.5 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Subsequent action by all Personnel.

12.1 After the alarm has been raised and all responsible officers are on the scene, further action will be taken by them as circumstances dictate and all measures affecting the port will be made known to ships and other establishments not directly involved through the Drogheda Port Company office

12.2 In the case of minor fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to Appendix 1 - 12

SECTION C: Fire or Explosion on a Vessel at Anchor or Underway in the Port.

1. Raising the Alarm

1.1 All ship fires will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.2. The responsibility for raising the alarm will rest with the Master or crew member of the vessel concerned. Any person other than personnel of the vessel involved who see a fire or explosion on board a vessel in the Port not alongside a jetty should report the fact to the Drogheda Port office only as outlined in para 1.5. below.

Method of Raising Alarm.

1.3 In cases of fire or other emergency, the vessel should raise the alarm immediately by one of the following methods:-
(a) By plain language message on VHF R/T Channels 11 to the Drogheda Port Company office.
(b) By visual message.
(c) By exhibiting one or more of the Signals prescribed in Anne IV of the Collision Regulations (for vessels in distress and requiring assistance).
(d) By calling the Irish Coast Guard on VHF R/T Channel 16 or tel 01 6620922/3.
(e) By calling the Drogheda Port Company office by mobile telephone on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.4 As soon as possible after raising an alarm, an amplifying message should be sent giving details:
(a) Fire - what is on fire - extent - possible dangers.
(b) Damage - extent - effect on stability and seaworthiness.
(c) Casualties - number - type of injury - number of stretchers required.
(d) Oil spillage - if any danger of oil spillage exists this should be reported.

1.5 Persons seeing a fire or explosion on a vessel at anchor or underway in the channel should:
(a) Ring the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645hrs Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 /086-2547827 / 087-2305950.

ON NO ACCOUNT SHOULD THE INITIAL ALARM MESSAGE BE DELAYED IN ORDER THAT FULL DETAILS CAN BE PROVIDED.

2. Action by Master

2.1 Having raised the alarm, the Master having command at all times of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship until assistance arrives. When the Fire Brigade arrives, overall control of fire fighting will be undertaken by the Senior Officer of the Fire Brigade present (see General Chapter, section 3). Ship's personnel should therefore start fighting the fire with all appliances available.

2.2 The Master will report to the Drogheda Port Office the quantities, types and distribution of cargo aboard his vessel. This information will be passed to the Senior Officer of the Fire Brigade on his arrival.

3. Action by Drogheda Port Company

3.1 Overall control of the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of shipping and jetties not directly involved.

3.2 The Harbourmaster will after consultation with the vessels Master advise the Senior Fire Brigade Officer on what action should be taken to safeguard the ship in question and the port in general and will decide as to whether a full or partial emergency should be declared.

3.3. The Harbourmaster will contact each jetty owner/operator by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted. Dublin Radio may rebroadcast this message.

3.4. If circumstances make it necessary, orders will be issued by the Harbourmaster to stop cargo operations at individual jetties, to batten down hatches, disconnect hoses and vessels prepare for sea.

3.5. The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

3.6. The Harbourmaster will designate the position of the forward control post and will nominate the collection points for embarkation and disembarkation of all services. (see Appendix 9 and Port map)

3.7. On receipt of the alarm the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 5.

3.8. The Drogheda Port Office will mobilise Port Authority launches and floating plant for the purpose of transporting personnel and equipment or other deployment as determined by the Harbourmaster and/or Senior Fire Brigade Officer.

3.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in appendix 7, and if deemed necessary by the Harbourmaster, request that ICG assist in the handling of the emergency.

3.10 The Drogheda Port Company office will make available to the Senior Fire Brigade Officer portable VHF communication equipment if required.

3.11 Situation Reports may not be broadcast during the initial stages of and emergency but as soon as the level of VHF R/T communications permits, SITREPS will be broadcast on Channels 11 & 16. SITREPS should not be acknowledged.

4. Action by fire brigade

4.1 Fire services will attend with their Pre-Determined attendance & equipment.

4.2 A reconnaissance team consisting of a Senior Fire Officer will be sent to the vessel.

4.3 The reconnaissance team, following contact with the Harbourmaster will proceed to the vessel to assess the incident and request what assistance is necessary

5. Action by medical services

5.1 The North Eastern Health Board Ambulance Service will make available the necessary number of staff and vehicles to deal with whatever emergency arises within their remit at the request of the jetty owner or Drogheda Port Company.

6. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Officer at Drogheda Garda Station will:

6.1 Direct a Gardaí with Radio to scene to set up Radio Base.

6.2 Ensure that Harbour Master, Harbour Office, Fire Service and Ambulance Service are aware of the position.

6.3 (i) Organise cordon and traffic controls.
(ii) Ensure that only Emergency vehicles are allowed past these points.

6.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

6.5 In the event of fatalities arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc, will be attended to.

7. Action by Jetty Owners.

7.1 If required by the Harbourmaster Jetty Owners will be requested to maintain a continuous listening watch on VHF R/T (if fitted) Channel 11 and will ensure that the direct line telephones to the Drogheda Port Office are manned throughout the period of an emergency in order to receive SITREPS and other information from Drogheda Port Office.

8. Action by ICG

8.1 ICG will assist if requested by the Harbourmaster by providing helicopter assistance, lifeboat assistance and local ICG boats with coast and cliff rescue services if required.

9. Action by other Marine services.

9.1 Volunteer services such as The R.N.L.I., The Drogheda River Rescue and Recovery Service and Civil Defence boating sections may be requested to assist in the handling of and emergency and as such will be required to comply with the directions of the Harbourmaster.

10. Establishment of Control Posts

10.1 The Base Control Post will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Post will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone. (See appendix 9)

10.3 Where appropriate a representative of the ships Agents involved will be stationed at the Forward Control.

11. Control of Shipping Movements (see also Page 8, General Chapter, section 2)

11.1 If it is considered by the Harbourmaster that the emergency is such that other shipping is likely to be involved, he will issue the necessary instructions concerning their movements through the Drogheda Port Company office.

11.2 UNDER NO CIRCUMSTANCES MAY ANY VESSEL ON FIRE OR IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Subsequent Action by all Personnel

12.1 When all responsible officers are at the scene, further action will be taken by them as circumstances dictate and all measures affecting the port will be made known to ships and other establishments not directly involved by the Drogheda Port Company office.

12.2 In the case of all fires, cargo operations will not be resumed until the Fire Brigade Officer and Harbourmaster have inspected the area involved and confirmed that it is safe.

For additional information refer to appendix 1 – 12

SECTION D: Collision or Emergency other than Fire or Explosion.

1. Raising the Alarm

1.1 All ship emergencies will be treated as potentially dangerous and this Plan will be activated. The decision to declare a full emergency will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

1.2. The responsibility for raising the alarm will rest with the Master of the vessel or vessels concerned. Any person other than personnel of the vessel/vessels involved who see a collision or emergency on board a vessel/vessels in the Port not alongside a jetty should report the fact to the Drogheda Port Company office only as outline in para 1.5 below.

Method of Raising Alarm.

1.3. In cases of collision or emergency, the vessel/vessels should raise the alarm immediately by one of the following methods: -
(a) By plain language message on VHF R/T Channels 11 to the Drogheda Port Company office.
(b) By visual message.
(c) By exhibiting one or more of the Signals prescribed in Anne IV of the Collision Regulations (for vessels in distress and requiring assistance).
(d) By calling the Irish Coast Guard on VHF R/T Channel 16, tel 01 6620922/3.
(e) By calling the Drogheda Port Company office by mobile telephone on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.4. As soon as possible after raising an alarm, an amplifying message should be sent giving details:
(a) Collision - nature - extent - possible dangers.
(b) Emergency - nature - extent - possible dangers.
(c) Damage - extent - effect on stability and seaworthiness.
(d) Casualties - number - type of injury - number of stretchers required.
(e) Oil spillage - if any danger of oil spillage exists this should be reported.

1.5 Persons seeing a collision or emergency on a vessel at anchor or underway in the channel should
(a) Ring the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

2. Action by Master

2.1 Having raised the alarm, the Master being in command at all times of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship.

2.2 The Master will provide the Drogheda Port Company office with details of the incident as quickly as possible and will make regular and frequent reports on the progress of any incident.

2.3 The Master will be responsible for co-ordinating and directing pilot launches, tugs and other services available until the arrival of the Harbourmaster where after consultation with the Master individual responsibilities will be determined depending on circumstances.

3. Action by Drogheda Port Company

3.1 Overall control of shipping in the port will be exercised by the Harbourmaster. His instructions will usually be passed through the Drogheda Port Company office in the case of vessels and jetties not directly involved.

3.2 The Harbourmaster will decide after consultation with the Master and/or the Owner's Agent what steps should be taken to safeguard the ship in question and port in general, and whether a full or partial emergency shall be declared.

3.3 The Harbourmaster will contact each jetty owner/operator by telephone and will make a broadcast on VHF R/T Channels 11 and 16 declaring an emergency, the purpose being to ensure that all persons concerned are alerted. Dublin radio may rebroadcast this message.

3.4 If circumstances make it necessary, orders will be issued by the Harbourmaster to stop cargo operations at individual jetties, to batten down hatches, disconnect hoses and for vessel to prepare for sea.

3.5 The Drogheda Port Company office will be responsible for informing all vessels underway in the channel or at anchor and will pass any necessary instructions to them.

3.6 The Harbourmaster will designate the position of the forward control post and will nominate the collect points for embarkation and disembarkation of all services (See Appendix 9 and Port Map).

3.7 On receipt of the alarm the Drogheda Port Company office will immediately inform all interested parties as detailed in appendix 5.

3.8 The Drogheda Port Company office will mobilise Port Authority launches and floating plant for the purpose of transporting personnel and equipment or other deployment as determined by the Harbourmaster.

3.9 The Drogheda Port Company office will inform ICG in Dublin as laid down in Appendix 7, and if deemed necessary by the Harbourmaster request that ICG assist in the handling of the emergency.

3.10 Situation reports may not be broadcast during the initial stages of an emergency but as soon as the level of VHF R/T communications permits SITREPS will be broadcast on VHF Channels 11 & 16. SITREPS should not be acknowledged.

4. Action by Fire Brigade

4.1 Fire services will attend with their Pre-Determined attendance & equipment.

4.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Harbourmaster, Ships Master.

4.3 Following contact the Fire Officer in charge of the first attendance will request further backup if required.

4.4 The Fire services will inform Louth/Meath County Council Pollution Control Officers.

4.5 The Fire services will Inform Drogheda Corporation's water extraction Pumping Station.

5. Action by Medical Services

5.1 The North Eastern Health Board Ambulance Service will make available the necessary number of staff and vehicles to deal with whatever emergency arises within their remit at the request of the jetty owner or Drogheda Port Company.

6. Action by Gardaí

On becoming aware of an Emergency or Potential Emergency the Station Orderly at Drogheda Garda Station will:

6.1 Direct a Gardaí with Radio to scene to set up Radio Base.

6.2 Ensure that Harbour Master, Harbour Office, Fire Service and Ambulance Service are aware of the position.

6.3 (i) Organise cordon and traffic controls:

(ii) Ensure that only Emergency vehicles are allowed past these points.

6.4 If necessary, direct Patrol Car with Public Address System to the area to inform residents of the position.

6.5 In the event of fatality arising from the incident, arrange for a Garda on site to set up temporary morgue facilities where the question of identification etc. will be attended to.

7. Action by Jetty Owners

7.1 If requested by the Harbourmaster Jetty Owners will maintain a continuous listening watch on VHF R/T channel 11 (if fitted) and will ensure that the direct line telephones to the Drogheda Port Company office are manned throughout the period of an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

8. Action by ICG.

8.1 ICG will assist if requested by the Harbourmaster by providing helicopter assistance, lifeboat assistance, and local ICG boats with coast and cliff rescue services if required.

9. Action by other Marine services

9.1 Volunteer bodies such as the Drogheda River Rescue and Recovery Service and Civil Defence boat sections may be requested to assist in the handling of an emergency and if so will be required to work under the direction of the Harbourmaster.

10. Establishment of Control Posts

10.1 A Base Control Post will be established by the Harbourmaster in the Drogheda Port Company office.

10.2 A Forward Control Post will be established by the Harbourmaster at a point closest to the scene of the incident with mobile or fixed VHF R/T equipment and a direct line telephone (See Appendix 9).

10.3 Where appropriate, a representative of the ship's Agent involved will be stationed at the and Forward Control.

11. Control of Shipping Movements

11.1 If it is decided by the Harbourmaster that the emergency is such that other shipping is likely to be involved he will issue the necessary instructions concerning their movement through the Drogheda Port Company office.

11.2 UNDER NO CIRCUMSTANCES MAY ANY VESSEL IN DANGER OF SINKING BE MOVED WITHOUT THE SPECIFIC AUTHORITY OF THE HARBOURMASTER WHO WILL LAY DOWN THE AREA TO WHICH THE VESSEL WILL BE MOVED.

12. Oil Pollution.

12.1 If oil pollution has occurred, this fact must be reported immediately to the Drogheda Port Company, who will co-ordinate arrangements for dealing with the spill as is considered most appropriate by the Harbourmaster at the time.

12.2 The Drogheda Port Company office will inform ICG in Dublin of the pollution.

13. Subsequent Action by all Personnel

13.1 After the alarm has been raised and all responsible Officers are on the scene, further action will be taken by them as circumstances dictate and all measures affecting the Port will be made known to ships and other establishments not directly involved through the Drogheda Port Company office.

For additional information refer to appendix 1 - 12

SECTION E: Potentially Hazardous Situations occurring on a Ship or on a Jetty/Quay.

1. General.

1.1. This section of the Plan sets out the steps to be taken whenever a potentially hazardous situation occurs upon a ship or on a jetty. The decision to declare an emergency and to activate the Plan in whole or in part will be made by the Harbourmaster, acting Harbourmaster or senior officer of the company after full consultation with the Jetty Owner or Master concerned in light of circumstances.

1.2 Should the potential emergency escalate into an actual emergency, Sections A, B, C, D or H of this Plan will apply and will be activated by the Harbourmaster, acting Harbourmaster or senior officer of the company.

2. Raising the Alarm

2.1 It is undesirable that the alarm should be raised in the case of potential emergencies in a manner, which would bring the incident to the immediate knowledge of the port in general, and a degree of confidentiality of communication should be observed wherever possible. It is essential, however, that the alarm should be raised without delay.

2.2. Responsibility for raising the alarm will rest with the Master of the vessel and/or the Jetty Owner involved, depending on the location of the incident. Immediate reports will be made to the Drogheda Port Company office.

Method of Raising the Alarm.

2.3. By personnel on the ship, the alarm should be raised as quickly as possible by: -
(i) Making an immediate report to responsible personnel on the jetty involved by the quickest possible means.
(ii) Telephone the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or VHF R/T Channel 11 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 stating name of ship and nature of incident.

2.4. By personnel on the jetty concerned. The alarm should be raised as quickly as possible by:-
(i) Ringing the Fire Brigade, telephone number 999 / 112 and asking for "Fire Brigade", giving a short message stating the name of the jetty or ship involved and the nature of the incident.
(ii) Ringing the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 and passing a message containing information concerning other shipping at the jetty which might become involved.

3. Action by Master

3.1 Having raised the alarm the Master at all times in command of the vessel under his charge will be responsible for taking all immediate steps to safeguard his ship.

3.2 In the case of a vessel alongside the Master will report to the Jetty Owner details of the incident and the quantity, distribution and type of cargo aboard his vessel. He will ensure that regular and frequent reports on the progress of the incident are being made.

3.3 In the case of a vessel at anchor or underway, these reports will be made direct to the Drogheda Port Company office on VHF R/T channel 11or after hours contact the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 stating name of ship and nature of incident.

4. Action by Jetty Owner Involved

4.1 If a potentially dangerous situation has occurred on board a ship alongside, the Jetty Owner will provide all available assistance to the Master of the ship.

4.2 If the potentially dangerous situation has occurred on the jetty itself, the Jetty Owner will be responsible for taking immediate action to minimise the risk of increased danger.

4.3 The Jetty Owner will be responsible for keeping the Harbourmaster fully and frequently informed on the progress of the incident and on receipt of a request from the Drogheda Port Company office, will ensure that a continuous listening watch is maintained on VHF channel 11, (if fitted), and the direct line telephones are manned throughout an emergency in order to receive SITREPS and other information from the Drogheda Port Company office.

5. Action by Drogheda Port Company

5.1 The Harbourmaster will immediately report to the scene of the incident.

5.2 On arrival at the incident he will consult with the Jetty Owner, and Master if involved, and a control and information point will be set up on the jetty.

5.3 If Required the Drogheda Port Company launches will be provided and directed by the Harbourmaster.

5.4 The Drogheda Port Company office will ensure that the Fire Brigade has been notified.

5.5 Immediate steps will be taken to inform those listed in Appendix 7 if considered appropriate by the Harbourmaster or Jetty Owner involved.

5.6 The Drogheda Port Company office will take such preliminary steps as are considered necessary by the Harbourmaster to prepare for the activation of the full Emergency Plan.

6. Action by Fire Brigade

6.1 Fire services will attend with their Pre-Determined attendance & equipment.

6.2 The Fire Officer in charge of the first attendance will contact the senior person present at the scene e.g. Harbourmaster, Ships Master, Jetty Owner.

6.3 The fire service will be confronted by two basic situations:

1. An incident that can be contained and rendered safe with the pre-determined attendance within the Drogheda Port Emergency Plan.

2. An incident which has clearly, or is likely to, progress beyond that of a conventional incident and which requires the activation of another Emergency Plan. (Refer to Louth County Council Emergency Plan, Meath County Council Emergency Plan, Flogas Emergency Plan, Premier Periclase Emergency Plan, ICG Emergency Plan).

7. Control Posts and Situation Reports.

7.1 The decision to set up control posts or issue SITREPS will be made by the Harbourmaster and Jetty Owner involved, after consultation with the Fire Brigade, as circumstances demand. (see Appendix 9).

For additional information refer to appendix 1 - 12

SECTION F: Emergencies outside the Jurisdiction of the port.

1. General

1.1 All emergencies occurring outside the Jurisdiction of the Drogheda Port Company will be handled and co-ordinated by ICG in Dublin.
In the handling of the emergency ICG may request through the Harbourmaster to use part of or all of the facilities and floating equipment and general equipment within the port area.

2. Action by the Port Company

2.1 Following a request by ICG to the Harbourmaster to use the facilities at Drogheda Port the Harbourmaster will decide whether a partial or full emergency should be declared and will notify the appropriate authorities, companies, personnel accordingly. Thereafter the Drogheda Port Company Emergency plan will be implemented.

SECTION G: Terrorist threat or attack on a vessel or port facility

1. General

1.1 All terrorist threats or attacks on vessels or port facilities within the jurisdiction of the Drogheda Port Company will be handled in accordance with the provisions of the International Ship and Port Facility (ISPS Code).

2. Action by the Port Company

2.1 Following notification of a terrorist threat or in response to a terrorist attack the ISPS Port Security Pan will be activated. These plans will be operated in parallel to the Port Emergency Plan.

3. Action by the Ship or Port facility

3.1 The Ships Security Officer will implement the Ship Security Plan and will liaise with the Harbourmaster. The Port Facility Security Officer will implement the individual Port Facility Security Plans and will liaise with the Harbourmaster.

SECTION H: Pollution Response

1. General

1.1 A pollution incident may arise from any of the scenarios outline in Section A – G.

1.2 Reported pollution incident will be investigated by the Harbourmaster, acting Harbourmaster or officer of the company.

1.3 The decision to implement the pollution response will rest with the Harbourmaster, acting Harbourmaster or senior officer of the company.

2. Action by the Port Company

2.1 Actions by the Port Company if appropriate will be taken in conjunction with action from scenarios A – G.

2.2 An assessment will be made of the cause and extend of the pollution.

2.3 Where there is a pollution incident alone, the extent of the pollution and its severity may warrant the implementation of the full Port Emergency Plan or just the pollution response part of the plan at levels Tier 1, Tier 2 or Tier 3.

2.4 Inform the Irish Coast Guard of the pollution, the activated response level or request assistance.

2.5 Inform the Drogheda Port Company pollution response contractor Pollution and Waste Services requesting what level of response is required, if any.

APPENDIX 1: DROGHEDA PORT COMPANY NOTICE TO MASTERS

General considerations affecting all types of Emergency's
Drogheda Port Company Emergency Plan – "Appendix 1" - extract:

To: Agents, Operators Masters, Skippers, Pilots, Coxswains and persons in charge of marine plant

1. Control of Movements of Shipping

THE AUTHORITY RESPONSIBLE FOR THE REGULATION AND CONTROL OF SHIPPING WITHIN THE JURISDICTION OF THE PORT OF DROGHEDA IS THE **DROGHEDA PORT COMPANY**. The Port Office, which is the centre for all communications, is situated at Harbourville, Mornington Road, Drogheda, Co. Meath (opposite Tom Roes Point terminal). It is through this office, which is manned from 0900-1300 & 1400 -1645hrs Monday-Friday and throughout any emergency that shipping movements are programmed and the requirements of the Harbourmaster will be made known. A listening watch during working hours is maintained on VHF R/T channel 11, telephone 041-9838378 or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950.

1.1 All decisions regarding the movements of shipping during an emergency will be made by the Harbourmaster and, where necessary, he will decide the order in which ships are to be moved. In this context and throughout the Plan, the acting Harbourmaster will have the authority to act for the Harbourmaster in the event of his absence or non-availability.

2. Control of Emergency Operations

2.1 When an emergency or potential emergency occurs, it is vital that the alarm should be raised immediately.

2.2 All reasonable steps should be taken by those on the spot to render whatever aid is immediately available.

2.3 The decisions to designate an emergency or potential emergency and implementation of the Drogheda Port Company Emergency Plan will be made by the Harbourmaster.

2.4 The Fire Brigade and other Emergency Services may be mobilised before an emergency is declared to deal with a minor incident on a ship or jetty. The Harbourmaster must always be informed immediately of any such incident.

2.5 The Emergency Plan will be activated in whole or in part in all incidents involving fire on board a vessel, however minor. (A copy of the complete Drogheda Port Company Emergency Plan is available by request through your Agents or by request from the Drogheda Port Company Office).

3. Raising the Alarm

3.1 (a) Dial 999 / 112 and ask for the appropriate emergency service.
(b) Informing a responsible person on the jetty.
(c) Telephoning the Drogheda Port Company office on 041-9838378 (0900-1300 & 1400-1645 Mon-Fri) or after hours the Harbourmaster on 041-9838385 / 086-2547827 / 087-2305950 giving a short message stating the name of the vessel, the nature & location of the emergency and any other appropriate information to assist in the immediate emergency response..
(d) Continuous sounding of any fog\signaling apparatus and or other emergency signal.
(e) Mayday on channel 16 VHF.
(f) By exhibiting one or more of the signals prescribed in Annex IV of the Collision Regulations.

3.2 As soon as possible after raising an alarm an amplifying message should be sent giving details:
(a) Fire - what is on fire - extent - possible dangers.
(b) Damage - extent - effect on stability and seaworthiness.
(c) Casualties - number - type of injury - number of stretchers required.
(d) Oil spillage - risk of - extent.

4. Action by the Master.

4.1 Having raised the alarm the master will be responsible for taking all immediate steps to safeguard his vessel until assistance arrives.

4.2 Overall control of fire fighting will be undertaken by the fire brigade senior attending officer.

A copy of the "**Drogheda Port Company Emergency Plan"** is available upon request to the Agent or direct to the Drogheda Port Company port office or www.droghedaport.ie

Capt. Martin J. Donnelly
Harbourmaster
01.01.19

APPENDIX 2: TIER 1, OIL POLLUTION RESPONSE EQUIPMENT STORED ON SITE

The following equipment placed in a mobile unit is positioned at Drogheda Port (Maxol Site), Marsh Road, Drogheda, serviced and maintained for deployment where and when required within the Port Company jurisdiction. The purpose of this equipment is to affect an immediate **Tier 1** response to a marine pollution, or marine related pollution. A full copy of the Drogheda Port Company pollution plan is available on request.

Item	Description	Quantity
1	Box covered galvanized trailer	1
2	Robin EY15D petrol 4 stroke water pump	1
3	Ryobi RSV 3100E petrol 2 stroke air inflator	1
4	Fastank	1
5	Skimmer for 3"hose	1
6	4mtr Drizit sea booms	10
7	Skirt booms	2
8	Beach sealing booms	5
9	Tow plates c/w tow bridles attached	2
10	16 kg anchor sets	2
11	20m x 12mm rope c/w eyes and shackles	4

Item	Description	Quantity
1	7.62m x 2.43 x 2.59m standard ISO Service container to house ancillary oil spill response equipment as listed below **(Static Unit)**	1
2	4mtr Drizit booms	42
3	Drizit Wood loose 10kg	26
4	Blue absorbent pads	
5	Heavy duty plastic bags for oily waste	50
6	Roll of 1000 gauge Visqueen	1
7	Squeegees	5
8	Shovels	5
9	Yard Brushes	5
10	Sledge Hammers	2
11	2" stakes	12
12	14mm Blue Rope	1
13	5ltr containers of oil free part 1	32
14	25ltr containers of oil free part 1	4
15	PVC Suits	6
16	Safety helmets	6
17	Clear safety goggles	6
18	PVC Gauntlets (18")	12
19	Safety Wellingtons	6
20	Sample box	1
21	Safety Torches	2
22	First aid box	1
23	Eye wash bottles	2

APPENDIX 3: RISK ASSESSMENT, BEACH CLEAN UP CLASSIFICATION AND GUIDELINES

Risk Assessment

Oil Types:

1. **Crude oil:** Crude oil is the term used for oil in its "raw" state, or in the form in which it exists as it issues from the production well. It can vary greatly in colour, viscosity, flash point and pour point. The qualities of the oil and constituents play a large role in the behaviour of the oil in the sea and have a great influence on the effects and persistence of the oil in the marine environment.

2. **Refined products:** is the term used for the various oils and by-products, which result from the refining process. The oils vary from premium and unleaded petrol's to asphalt's and bituminous products.

3. **Waste oils:** This term would cover oils or oily mixtures which are neither crude oil or refined products and includes oils in ships bilges, sludge tanks, cargo washings etc. This oil varies greatly in content depending on factors such as whether the oil is neat, has emulsified with water, whether cleaning chemicals or solvents have been used. Engine room oil will include diesel oil, hydraulic , lubricating oil and thermal oil

How oil may enter the marine environment

1. **Ship/shore interface:** Oil is stored ashore and received into the shore storage tanks from the ship. Storage tanks can overflow or leak, bund walls can fail and oil can flow into the drainage system. Discharge pipelines and hoses can leak or fail under pressure. Ship piping can fail or valves may be turned in the wrong direction allowing ships tanks to overflow. Failures can occur in the integrity of the ship tanks or hull. The may result from heavy contact damage during docking, weather damage or stress fracture.

2. **Transportation:** Risks are associated with the actual transportation such as collision, grounding or structural failure

3. **Operational/human errors:** Operational errors, negligence or deliberate action on board may also leak to pollution.

Types of oil spillage

Oil spill can vary in many ways, such as, the amount of oil released, rate of release, rate of spread, direction of spread. The spreading characteristics will depend on the type of oil, its viscosity, water and air temperature, tidal conditions and sea state. Where the leak is from a vessel the leakage rate may depend on the head oil and height of the tide. Where there is catastrophic failure the release may be instantaneous. Where the leak or release is as a result of human failure the quantity will depend on the response time to correct the mistake and the pumping rate involved.

Assessment of spillage and subsequent action

An effective oil spill response will depend on accurate information being received at the outset. In quantifying the problem and determining an efficie4nt response the following should be considered:

- Determine the exact status of the casualty, including damage assessment, ststus of power and pumping system,
- Establish oil on board and distribution on board,
- Establish the source of the leakage, approximate rate of outflow and direction of flow,
- Determine the rate of spreading, slick size and approximate thickness,
- Determine weather conditions, sea state, wind direction and speed, tidal state and duration of current tidal flow,
- Determine amenity areas and local resources that might be threatened as a result of the spillage,

The response plan will be based on two principles:

1. Stop or reduce the spillage,
2. Minimise the damage resulting from the spillage.

Action to stop /reduce flow

The action to achieve this end will depend on factors such as:

- Source of the leakage, shore or afloat,
- Type of oil and location of spillage,

Where the spillage is as a result of a collision in the channel or grounding the hull/tank damage may be under the waterline. The degree of spillage will depend on oil levels, draft and tidal height. Internal transfer, ship to ship or ship to shore installation or ship to road tankers must be considered. Additional consideration will be weather, location of suitable transfer vessels, casualty's ability to pump, type of oil and risk of fire, accessibility for shore mounted operation.

Where the spillage is as a result of a shore side failure at the ship/shore interface, than the supply must be isolated. Consideration must be given to minimise ground seepage or entry into the water via culverts and drains.

Where the oil is on the water consideration must be given to the basic movement characteristics of oil. Initially the oil will spread at a rate dependant on its viscosity, air and water temperature and agitation from wave or sea action. Without other influences the oil will spread in a concentric manner.

Lighter fraction will immediately begin to evaporate. The rate will depend on the oil type and chemical composition, air and water temperature.

The oil slick will move as a result of wind and current action. Movement rate may be considered as 100% of current speed and 3% of wind speed.

Beach Cleanup Guidelines

Index: **Shore Line Type:**

1. Boulders/Rock armour and Training Walls.
2. Sandy Beach.
3. Salt Marsh.
4. Rocks, Mud & Gravel.
5. Quay Walls : Port Area.

1. Bounders/Rock armour and Training Walls

Note:
Cleaning this area will be a difficult and dangerous operation confined to periods of calm sea. Access is possible to the North Break Waters at low water via Baltray shore side. Access to the South Breakwater south side is possible via the Mornington Beach at low tide. Access to The North Side is only possible by boat.

What to do:

- Hand cleaning is possible although extremely difficult and inefficient.
- Hose effected area with diluted dispersant (if authorised) use high pressure water jets. (Dispersants will only be effective on exposed surfaces).
- Run off oil from cleaning should be collected on rising tide.
- Pay attention to safety of personnel in tidal areas.

2. Sandy Beaches

Considerations:

- Decide clean up priorities by discussion with local authority taking into consideration the Season, Weather conditions, Amenity usage.
- With unfavourable conditions re-oiling may occur.
- Arrange for access to beach to be restricted before and during clean up operations.
- Establish collection points and disposal routes for oily waste.
- If dispersents or other chemicals are authorised, apply them with incoming tide.
- Consider use of earth moving equipment to gather oil and oily sand.
- Consider use of Sorbents in tided pools at low water.

3. Salt Marshes:

The salt marshes or estuarine polders have no amenity use, but are of national importance for wild birds and qualify as internationally important wet land on ornithological grounds. The areas are incorporated into the EU Bird Directive (79/409/EEU). There is a designated Wildfowl Sanctuary. The mudflats and developing salt marshes are of notable botanical interest.

Note:
For protection of the mudflats/salt marshes/estuarial polders consideration must be given to the location of the pollution sources, the tidal cycle (re Spring/Neaps) predictions and flow (ebb/flood). In certain circumstances a twelve-hour window of opportunity to locate booming defences may be available.

- Access to the various guts is the possible from the North and South shore roads, via the bund walls/walkways, except on large Spring tides.
- Pay attention to personnel safety over stony/rocky/uneven ground and for rising tides.
- Give priority to protection by booming etc. use propane gas can or similar device to scare away birds if oiling of a particular area appears inevitable.
- Consult with experts familiar with the wildlife and seasonal cycle.
- Consider use of organic Sorbent. Also one of dispersants (if authorised) for areas draining by out going tide.
- At low water use surface skimmers at gut/weir pool.
- Depending on damage extent a "leave alone" solution maybe the most ecologically desirable.

4. Rocks, Mud and Gravel

Note:
These areas are difficult to clean and may reveal oil even after clean up.

- Sorbent may be used in tidal pools at low water, and on muddy surfaces.
- Where appeared use light mechanical equipment for manual cleaning (shovels & spades).
- On River Walls pressure machines may be necessary.
- Hand cleaning possible although extremely difficult and inefficient.
- Dispersants can be used if authorised, but they are only effective on exposed surfaces.
- Where adjacent areas are ecologically sensitive or already cleaned, consider the deployment of booms, skimmers, sorbents to contain oil.
- Pay attention to safety of personnel affected by rising tides, especially Spring tides.
- Quay Wall – Port Area.
- In Portal Area where hazard of explosion or fire may exit, cause pollution with a layer of fire fighting foam.
- Use treatment chemicals (dispersants and sorbent) on any free-floating oil, if authorised.
- Hose quay walls with hot water and/or dispersants if authorised.
- Dispersant gels if authorised may also be used if appropriate.
- Arrange discussion with owners of ships installations on what clean up is required, involve insurance experts.

APPENDIX 4: MARINE SERVICES AVAILABLE

Drogheda Port Company

"Boyne Haveloc" 6 person (2 crew, 4 passengers) Dept. of Transport, Tourism & Sport P3 licensed passenger vessel. Licensed operational area not more than 15nm from Drogheda Bar and not more than 3nm from the coast. Specification, Aqua Star 38', single screw, 18kts, AIS, GPS, VHF, radar, EPIRB.

"Boyne Protector" 6 person (2 crew, 4 passengers) Dept. of Transport, Tourism & Sport P5 licensed passenger vessel. Licensed operational area not more than 15nm from Drogheda Bar and not more than 30nm from the coast. Specification, steel 48', single screw, 12ts, 6 tonne bollard pull/push, AIS, GPS, VHF, radar, EPIRB.

R.N.L.I. Clogherhead 041-9822600 / 087 2246361 / 087 8556059
(a) Shannon Lifeboat/ VHF

R.N.L.I. Skerries 01 8491692 / 087 2418967
(a) Atlantic Inshore/ VHF

Greencastle Tugs 0044 7831 680934

"Mourne Shore" 800hp/vhf - bollard pull 14 tonne
"Mourne Valley" 500hp/vhf - bollard pull 7 tonne
"Mourne Venture" 2300hp/vhf – bollard pull 32 tonne

Drogheda Coast Guard 086 3850677 / 087 2200572 / 086 3807507

2 x RIBs, vhf

Civil Defence Dundalk 042 9332272

Holy Head Towing 0044 1407760111

Meath Civil Defence
Mr. Michael Fitzsimons 0872450062/046 9097214

APPENDIX 5: MEDICAL SERVICES AVAILABLE

Arrangements for dealing with Major Accidents within the Port of Drogheda.

Notification of Major Accidents

Notification of a major incident should be made to the Gardaí and Drogheda Port Company office who will notify all the emergency response agencies for the purpose of responding to that emergency.

Ambulance Arrangements

The North Eastern Health Board Ambulance Service will be responsible for the conveyance of casualties from the site of the accident or landing location to the reception hospital or hospitals, including calling in any outside resources available as required.

Landing of Casualties

In the case of incident occurring on vessel underway in the channel or at anchor the necessary launches will be order by the Drogheda Port Company office. A suitable riverside location for landing will be determined by the Harbourmaster where the casualties will be conveyed thence to hospital by ambulance.

Incident Medical Officer

The first doctor on the scene will be the Incident Medical Officer until relieved. The Incident Medical Officer will be responsible for the co- ordination of medical services at the scene of the incident. The Incident Medical Officer will inform the Gardaí of casualties and arrange with the Gardaí for the custody of the dead.

Removal of Casualties

In the case of incidents occurring on vessels at anchor or underway in the port and not alongside jetties, it will be the Masters or Owners \ Agents responsibility to provide the necessary launches to bringing casualties to the shore. These launches will be ordered through the Drogheda Port Company office. In the case of vessel lying alongside in the port, casualties will whenever possible be moved by means of the North Eastern Health Ambulance Service. Where it is more convenient to move these casualties by boat, they will be taken to the landing place nominated by the Harbourmaster to which the ambulances will be directed.

Additional Assistance

Assistance by Red Cross/Order of Malta/Civil Defence and other voluntary bodies will be available by request.

APPENDIX 6: OTHER RESOURCES AVAILABLE

Company	Address	Contact Name	Telephone / Email	After hours
		PORTABLE EXTINGUSING FOAM		
Flogas Ireland	Knockbrack House, Matthews House, Donore Road Drogheda, Co. Louth	Mr. Paul O'Connell Mr. Chris Bermingham	041-9831041 poconnell@flogas.ie cbermingham@flogas.ie	087-2556001 086-8164851
		GENERATORS / GENERAL ITEMS		
J. Short Ltd.	Quay Street, Dundalk, Co. Louth	Mr. John Short	042-9331676 johnshorthire@eircom.net	042-9377296
Ace Hire	East Coast Business Park, Donore Rd, Drogheda, Co. Louth	Mr. Dean Costello Mr. Terry Matthews	041-9846464 dean@acehire.net terry@acehire.net	041-9846464
Drogheda Hire	Cement Road, Drogheda, Co. Louth	Mr. Danny Dunne	041-9841419 hire@droghedahire.com	086-3366861
RHI Magnesita (Premier Periclase)	Boyne Road, Drogheda, Co. Louth	Mr. Jason Synnott	041-9870700 (24hr) jcsynnott@premierpericlase.ie	041-9870722
Irish Cement	Platin Works, Drogheda, Co. Louth		041-9837641 (24hr)	041-9876000 (24hr)
		OIL POLLUTION EQUIPMENT		
Enva	Toberona, Castletown, Dundalk, Co. Louth	Mr. Gerry Keegan	042-9331145 alliedtankanddrain@gmail.com	087-2500341
Pollution & Waste Services	Unit 107, Baldoyle Ind. Est. Dublin 13	Mr. Brian McGonagle	01-8391000 bmcgonagle@msigroup.ie	087-2561869
		Mr. Brian Prendergast	01-8391000 bprendergast@msigroup.ie	087-2520498

APPENDIX 7: ACTION BY THE PORT AUTHORITY

On receipt of an alarm message the Drogheda Port Company office will contact the following listed below. The information given will state the nature of the alarm, its location, and will advise as to whether the Harbourmaster has declared a full or partial emergency. Additionally the Harbourmaster will contact each Jetty Owner advising of the requirements for each particular jetty. The Harbourmaster will make and initial situation broadcast on VHF R/T channels 16 & 11 and thereafter regular SITREPS will be issued by the Drogheda Port Company.

Company	Title	Name	Email	Telephone	Fax
Drogheda Port	Harbourmaster / PFSO A.O	Capt. Martin Donnelly	martindonnelly@droghedaport.ie	041-9838378 086-2547827 041-9838385	041-9832844
Drogheda Port	Communications A.O	Mr. Paul Fleming	paulfleming@droghedaport.ie	041-9838378 087-2305950 041-9828509	041-9832844
Fire Brigade		24 hr		999 / 112	
Gardaí		24 hr		999 / 112	
Ambulance		24 hr		999 / 112	
Marine Emergency		24 hr		999 / 112	
Irish Coast Guard		24 hr		01-6620922/3	
Drogheda Port	Administration A.O	Mr. Andrew Murray	andrewmurray@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Anne Keegan	annekeegan@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Joan Wiseman	joanwiseman@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Michelle Dixon	maritimehouse@droghedaport.ie		
Drogheda Port	Administration A.O	Ms. Nessa Lally	nessalally@droghedaport.ie		
Drogheda Port	Pilots Coxswain	Mr. Dermot McConnoran	dermotmcconnoran@gmail.com	041-6852999 086-3850677 087-2200572	
Drogheda Port	Pilot Coxswain	Mr. Oliver Kirwan	oliver.kirwan@hotmail.com	0419822679 086-8307331	
Drogheda Port	Pilots Coxswain	Mr. Paul McKeown	Paulmck2010@live.ie	042-9329049 087-6633211	
Drogheda Port	Pilot A.O.	Capt. Andy Breech	andybreachirl@yahoo.co.uk	086-3628824	
Drogheda Port	Pilot A.O.	Capt. Barry Flood	beflood@hotmail.com	087-2442916	
Drogheda Port	Pilot A.O.	Capt. Laurence Kirwan	larkirwan@yahoo.ie	086-3586672	
Drogheda Pot	Pilot A.O.	Capt. Neal Myles	nmyles@compass-marine.com	087-2516938	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Paul O'Neill	buntyoneill@hotmail.com	087-2422355	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Brian Sharkey	briansharkey@hotmail.com	086-2324913	
Drogheda Port	Pilotage Crew / Relief Crew	Mr. Gerard Sharkey	gerrynewgrange@gmail.com	087-7550368	
RHI Magnesita (Premier Periclase)	Shipping Manager & PFSO	Mon-Fri 0830-1300 /1400-1700 excl. Bank & Public Holidays Shift Supervisor Mon-Sun 1300-1400 Incl. Bank & Public Holidays. Mr. F. Hanlon Shipping A.O Ms. Deirdre McCarthy Mr. Anthony McEneaney	 frank.Hanlon@rhi-ag.com Deirdre.McCarthy@rhi-ag.com Anthony.McEneaney@rhi-ag.com	041-9870700 041-9870750 041-9839448 087-2660210 041-9870712 086-3182348 041-9870767	
Flogas Ireland	Office & Security Ops Manager & PFSO	0900-1730 Mon-Fri & 24hr Mr. Chris Bermingham Mr. Paul O'Connell	 cbermingham@flogas.ie poconnell@flogas.ie	041-9831041 086-8164851 087-2556001	041-9834652

Company	Title	Name	Email	Telephone	Fax
Martin Butterly Ltd.	Office Ship Agents	0900-1700 Mon-Fri Mr. Tom O'Reilly Ms. Clodagh O'Reilly	 tom@butterlyireland.com clodaghoreilly@butterlyireland.com agency@butterlyireland.com	041-9831024 041-9838858	041-9833612 086-2572947 086-4181757
Drogheda Port Logistics	Office Ship Agent A.O.	0900-1700 Mon-Fri Ms. Paula Tealon Mr. Martin Fleming	 agency@droghedaportlogistics.ie	041-9838887 086-8110501 086-6684956 / 01-4423956	041-9835428
Fast Shipping	Office Manager Ships Agent	0900-1700 Mon-Fri Mr. Simon Mulvaney Mr. Anthony Duff	simon@fastshipping.ie Anthony@fastshipping.ie	041-9838545 086-2410759 086-4113010	041-9838684
Fast Terminals	Office Manager Ships Agent Ship Agent	0900-1700 Mon-Fri Mr. Simon Mulvaney Mr. Anthony Duff Ms. Elaine McKiernan	 simon@fastshipping.ie Anthony@fastshipping.ie elaine@fastshipping.ie	041-9838545 086-2410759 086-4113010	041-9838684
KC Shipping	Ship Agent	 Mr. Fergal McGuinness Ms. Maeve McGuinness	 kc.services@live.ie agency@kcshipping.ie	041-9847291 086-8049090 086-7734448	
Hamilton Shipping	Ship Agent	0900-1700 Mon-Fri Mr. Leo McParland Mr. Pawel Niciak Mr. Vlad Daineko	 DroghedaAgency@hamiltonshipping.com	01-8559011 087-2423049 087-9681967 087-967883	01-8559022
Iarnrod Eireann	Drogheda Station Station Master	0900-1700 Mon-Fri Mr. Tommy Finegan Mr. Connor Keane	Thomas.finegan@irishrail.ie Connor.keane@irishrail.ie	041-9838749 086-0430520 087-2853138	
RNLI Clogherhead	LOM A.O. DLA	Mr. Declan Levin's Mr. Jim Kirk Capt. James Byrne		041-9822600 Lifeboat station 087-8556059 087-2246361	
RNLI Skerries	DLA Ass. DLA	Mr. Niall McGrotty Mr. David May		087-2418967 01-8491940	
Drogheda Coast Guard Unit	Officer in Charge	Mr. Dermot McConnoran Mr. Andy O'Brien	dermotmcconnoran@gmail.com	041-6852999 086-3850677 087-2200572 086-3807507	041-6852999
Louth Co. Co	Office County Manager Director of Services Sen. Exec. Engineer	0900-1700 Mon-Fri Ms. Joan Martin Mr. Joe McGuinness Mr. John O'Hagan	Joan.martin@louthcoco.ie Joe.mcguinness@louthcoco.ie	042-9335457 086-8517360 042-9335457 086 3831245	042-9334549
Meath Co. Co	Office Chief Executive A.O Director of Infrastructure A.O	0900-1700 Mon-Fri Jacqui Maguire Mr. Des Foley	info@meathcoco.ie Margaret.carroll@meathcoco.ie dfoley@meathcoco.ie	046-9021581 046-9097000	046-9028497
Lourdes hospital	Office	24 hr		041-9837601	
Cottage hospital	Office	24 hr		041-9838628	
St. Mary's Hospital	Office	24 hr		041-9838680	
Meteorological Services	Duty Forecaster	24 hr 24 hr		01-8424655 01-8424411	
Civil Defence Dundalk	Offic	0900-1700 Mon-Fri Mr. Chris Connelly	chris.connelly@louthcoco.ie	042-9332272	
National Ambulance Service	Office	0900-1700 Mon-Fri Mon-Fri		046-9023333	
Health Service Executive		Mick O'Toole	Mick.OToole@hse.ie		
Pollution & Waste Ser.	Office	Mr. Brian McGonagle Mr. Brian Prendergas	bmcgonagle@msigroup.ie bprendergast@msigroup.ie	01-8391000 087-2561869	

APPENDIX 8: COMMUNICATIONS

1. General

1.1 Within the Port of Drogheda the allocated official marine frequency is VHF Channel 11 (156.55mhz) The general marine hailing frequency is VHF channel 16 (156.8mhz)

1.2 The importance of acknowledging immediately all messages received cannot be over-emphasised, even if the answer is not immediately available.

1.3 In order to reduce the number of messages transmitted on the VHF radio telephone to an acceptable level, land lines should be used wherever possible, particularly for arrangements concerning the general public which should not be discussed on official radio channels unless other method of communications (private VHF R/T channels, land lines) are not available.

1.4 Situation Reports may not be broadcast during the initial stages of an emergency but as soon as the level of the VHF R/T communications permits, the Drogheda Port Office will broadcast Situation Reports on Channels 11 and 16 in order to keep all parties informed. SITREPS should not be acknowledged and will be restricted to the shortest possible signal giving the salient points of the emergency. SITREPS will also be passed to the Gardaí Station in order that the Garda may answer any enquiries from the general public regarding the emergency.

2. List of Communications Available

Drogheda Port Company.

Port Office 041-9838378 (0900-1300 & 1400-1645 Mon-Fri)
Fax. 041-9832844
Email; maritimehouse@droghedaport.ie
VHF R/T Frequencies Channel 11 (156.55 MHz)

RHI Magnesita (Premier Periclase)

Office 041-9870700 (0830-1300 and 1400-1700 mon-fri excl Bank & Public Holidays.
041-9870767 (1300-14—mon-fri/sat-sun) incl. Bank & Public Holidays.
087-9049989 Head of Shift

VHF R/T Frequency Channel 11 (156.55mhz)

Flogas Plc

Office 041-9831041
Fax 041-9834652
Security 041-9831041 (24 Hours)
VHF Channel 11 Emergency use only

APPENDIX 9: CONTROL POSTS

Establishment of Control Posts.

1. Base Control Posts as shown below are nominated in order to provide a predetermined point where the various responsible officials can effect the necessary liaison to operate an efficient joint control, either by assembling there, or through representatives left at the post or by message relayed through communications available at the post. When a Forward Control Post, either mobile or otherwise, is established close to the actual scene of the emergency, it will normally be possible to contact this by obtaining its location from the known Base Control Post, or through communications available at the Base Control Post.

2. For emergencies within the estuary, at the anchorage or at the approach to the port the Harbourmaster will establish the position of the Forward Control Post.

3. Communications available at forward control will include either fixed or mobile telephones and fixed or portable VHF R/T equipment.

4. In the event that the nominated control post or it communications have been destroyed, or become inaccessible, a temporary forward control post will be established to the at a point nominated by the Harbourmaster at the nearest convenient point to the operations

5. **Location of Control posts:**

Base Control: Harbourville, Mornington Road, Drogheda, Co. Meath A92 K5RN

Forward Control:

5.1 Public Quays (town & Tom Roes Point terminal)
To be agreed at the time of incident.

5.2 Estuary/Anchorage/Port Approaches
Pilot Station, Crook Road Mornington, Pilot Station, Harbourville, Mornington Road, Drogheda, Co, Meath (or as determined by the Harbourmaster).

5.3 Flogas
To be agreed at the time of incident.

5.4 Premier Periclase
The Emergency Control Centre at PPL will be the Central Control Room. The Emergency Controller will, in the normal course of events, be stationed here. The Emergency Team Leader and the Area Incident Controller will be in the forward position.

5.5 Fishmeal Jetty
To be agreed at the time of incident.

5.6 Afloat
If required a forward control can be established on board the Drogheda Port Company environmental launch Boyne Protector.

APPENDIX 10: ESTABLISHMENT OF INFORMATION CENTRE

The Information Centre will be established in the Drogheda Port Office in order to handle enquiries from Press, Radio and Television reporters. This Information Centre will be manned by an officer of the Drogheda Port Company.

An Information centre will be established by the Garda at their Drogheda headquarters to deal with enquiries from the general public regarding casualties in the Port.

Arrangements for Broadcasts of Warnings in emergency situations.

Broadcast warnings will be issued by the Port Authority Communications Officer.

RTE Newsroom	Television & Radio	24hrs Newsroom	Main Switchboard
01-2083434	01-2083111	01-2083111	01-2083111 Mon-Fri 9-5
info@rte.ie	info@rte.ie	info@rte.ie	info@rte.ie

LMFM Radio	Newsroom7am– 7pm	Main Switchboard	
	041-9836693	041-9832000	
Mr. Eamon Doyle	A.O 0862679163		

Drogheda Independent	041-9838658	
Drogheda Leader	041-9836100	
Irish Independent	01-7055333	01-7055801
Irish Times	01-6758000 mon-fri 9-6	01-6758894

Incidents directly involving the following companies a joint approach to communications will be undertaken.

Company	**Contact Name**	**Telephone**
RHI Magnesita	Mr. Christoph Stock	041-9870700
Flogas Ireland	Mr. Paul O'Connell	041-9831041 (24hr) 087-2556001

APPENDIX 11: ACTIVATION, EXERCISES

Activation:

Where the Harbourmaster has decided to implement the plan either fully or partially for an emergency or potential emergency the Drogheda Port Office will notify those persons/agencies/authorities as listed in appendix 5. Notification will be given by the following message:

THIS IS THE DROGHEDA PORT OFFICE. A MAJOR INCIDENT/POTENTIAL INCIDENT HAS OCCURRED AT ..... THE HARBOURMASTER HAS DECLARED A FULL/PARTIAL EMERGENCY AND THE EMERGENCY PLAN IS NOW IN PERATION. STANDBY FOR SITREPS.

Exercise:

Where an exercise to test the assumptions and procedures laid down in this plan is held, the messages activating the plan shall be preceded by the following statement:

"THIS IS AN EXERCISE"

Appraisal:

This plan issued September 2017 is valid until further notice. An exercise will be held annually to test the effectiveness of the plan, followed by a meeting of the various group for the purpose of updating the plan.

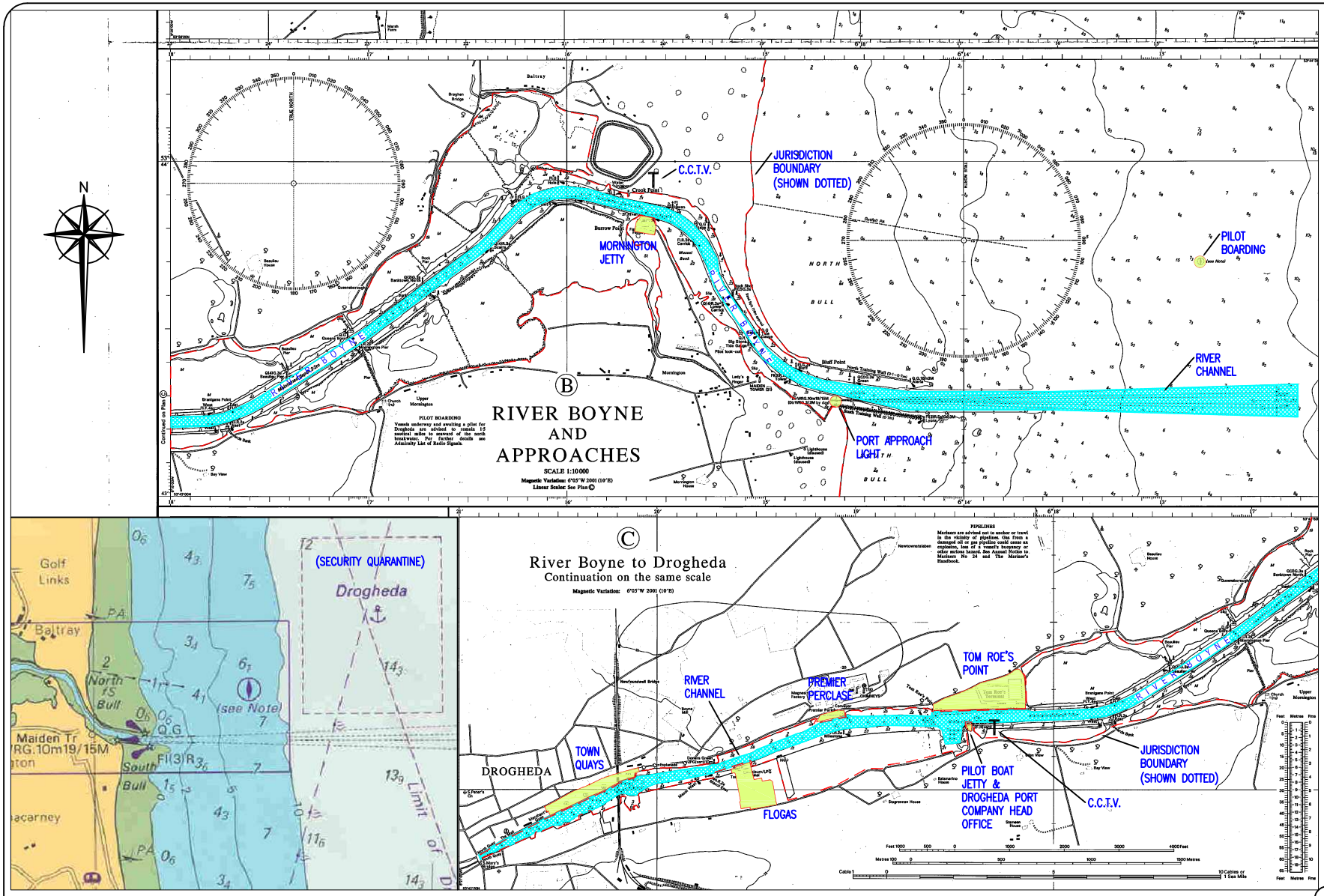
The Drogheda Port Office under the direction of the Harbourmaster will be responsible for:

a) distribution of the plan to all persons/agencies/authorities listed on the distribution list.
b) receiving detail of changes to the appendices and notifying all persons/agencies/authorities on the distribution list.
c) initiating the annual exercise and convening the annual meeting to update the plan.

Any amendments to the appendices should be notified to the Harbourmaster, email martindonnelly@droghedaport.ie, or by fax 041-9832844

APPENDIX 12: DETAILED PORT MAPS

- Site layout, port approach, estuary and facility locations
- Drogheda Port Company town quays
- Drogheda Port Company Tom Roes Point terminal
- RHI Magnesita (Premier Periclase)
- Flogas
- Fishmeal Quay



DROGHEDA PORT COMPANY

EMERGENCY PLAN

FACILITY:

SITE LOCATION MAP

DROGHEDA

NORTH STRAND

WAREHOUSE WALL

No. 2: Gate

NORTH STRAND

BALTRAY

WAREHOUSE

LIGHT SWITCH

WAREHOUSE

LIGHT SWITCH

WAREHOUSE

LIGHT SWITCH

SWITCH ROOM

WAREHOUSE

WAREHOUSE

SPEED RAMPS & SIGNAGE

CARPARKING

CARPARKING

AL

AL

BERTH NO. 4

BERTH NO. 3

BERTH NO. 2

ADMINISTRATION BUILDING

ASSEMBLY POINT

No. 1: Main Gate/Wicket Gate

YACHT MOORING

R I V E R B O Y N E

DROGHEDA

No. 3: Gate

No. 4: Gate. Local DPC controlled access only.

NORTH STRAND

BALTRAY

WAREHOUSE

WAREHOUSE

AL

AL

BERTH NO. 2

BERTH NO. 1

Overlap with above

VIADUCT

PERIMETER OUTLINED IN RED

R I V E R B O Y N E

DROGHEDA PORT COMPANY

SUFFIX	REVISION	DATE	INL

TOWN QUAY EMERGENCY PLAN
SEPTEMBER 2017

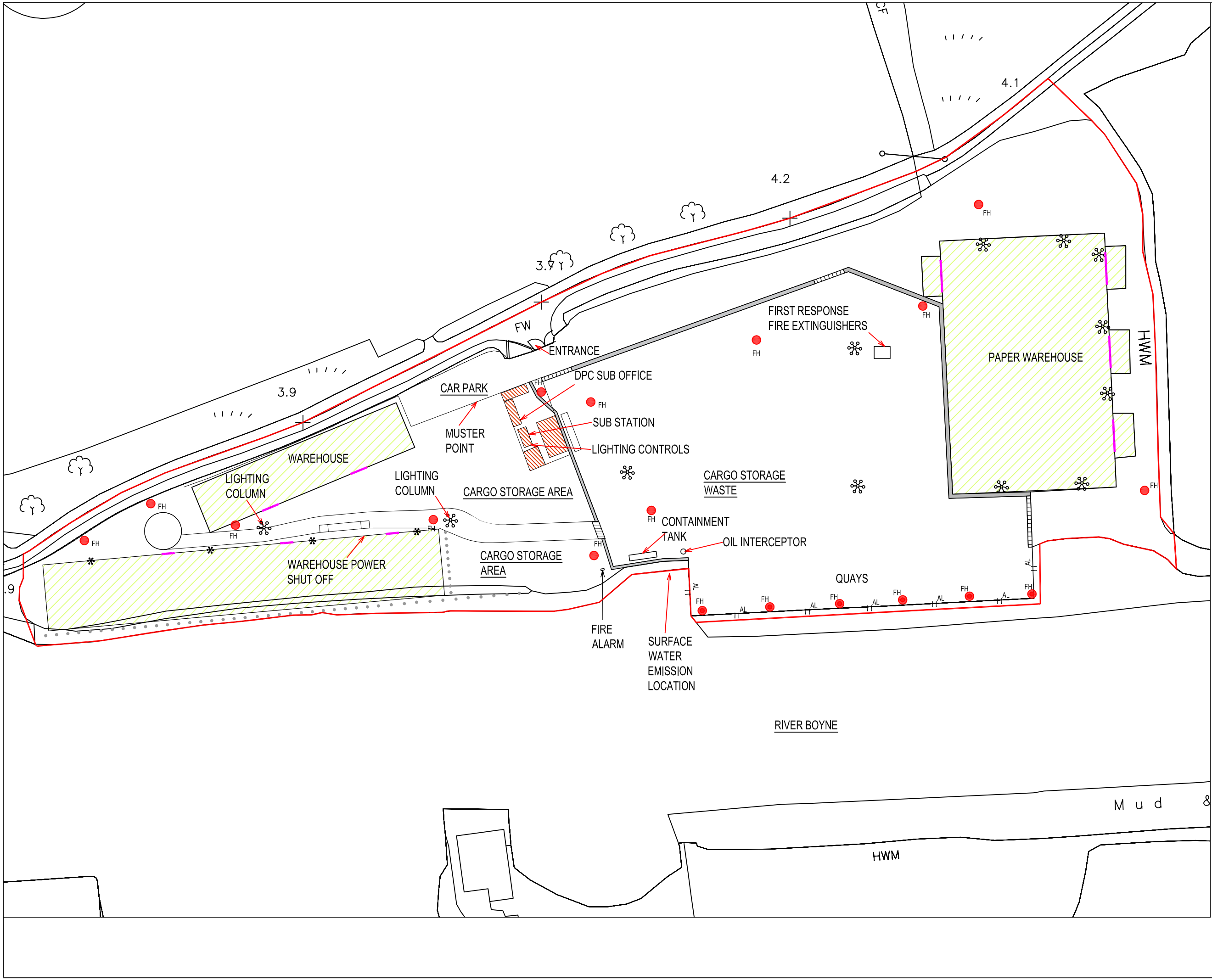
FACILITY:

WORKING TOWN QUAYS

KEY

- EMERGENCY ACTIVATION POINT
- AL — ACCESS LADDERS
- HYDRANT
- LIGHTING
- WAREHOUSE
- SPEED BUMP
- ADMINISTRATION BUILDING
- PEDESTRIAN WALKWAY

N



North

KEY

- AL — ACCESS LADDERS
- HYDRANT
- LIGHTING
- WAREHOUSE
- PEDESTRIAN CROSSING
- ADMINISTRATION BUILDING
- PEDESTRIAN WALKWAY

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES

Suffix	Revision	Date	Inl

Brady Hughes CONSULTING
26 Magdalene Street, Drogheda, Co. Louth
Tel. +353 (0) 41-9830379 (91), Fax. +353 (0) 41-9839422
e-mail: info@bradyhughes.com www.bradyhughes.com

PROJECT:
EMERGENCY PLAN
TOM PRES POINT, DROGHEDA, CO. LOUTH

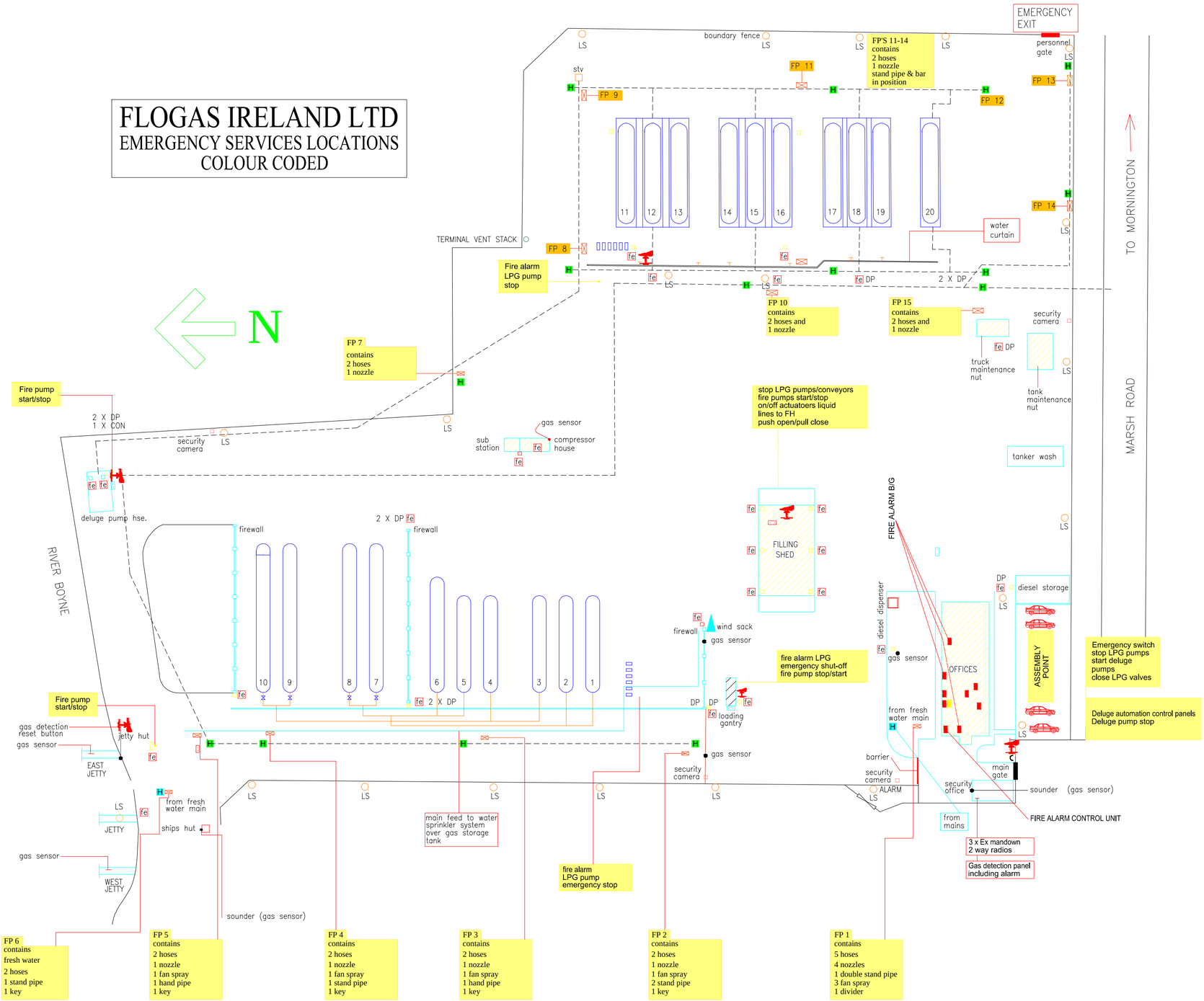
TITLE:
SITE LAYOUT PLAN
EMERGENCY PLAN

CLIENT:
DROGHEDA PORT COMPANY

Drawn by:	Scales:	Date:
HOD	nts	20/09/2017

Drawing No.	Rev. No.
019-18-001	

FLOGAS IRELAND LTD
EMERGENCY SERVICES LOCATIONS COLOUR CODED

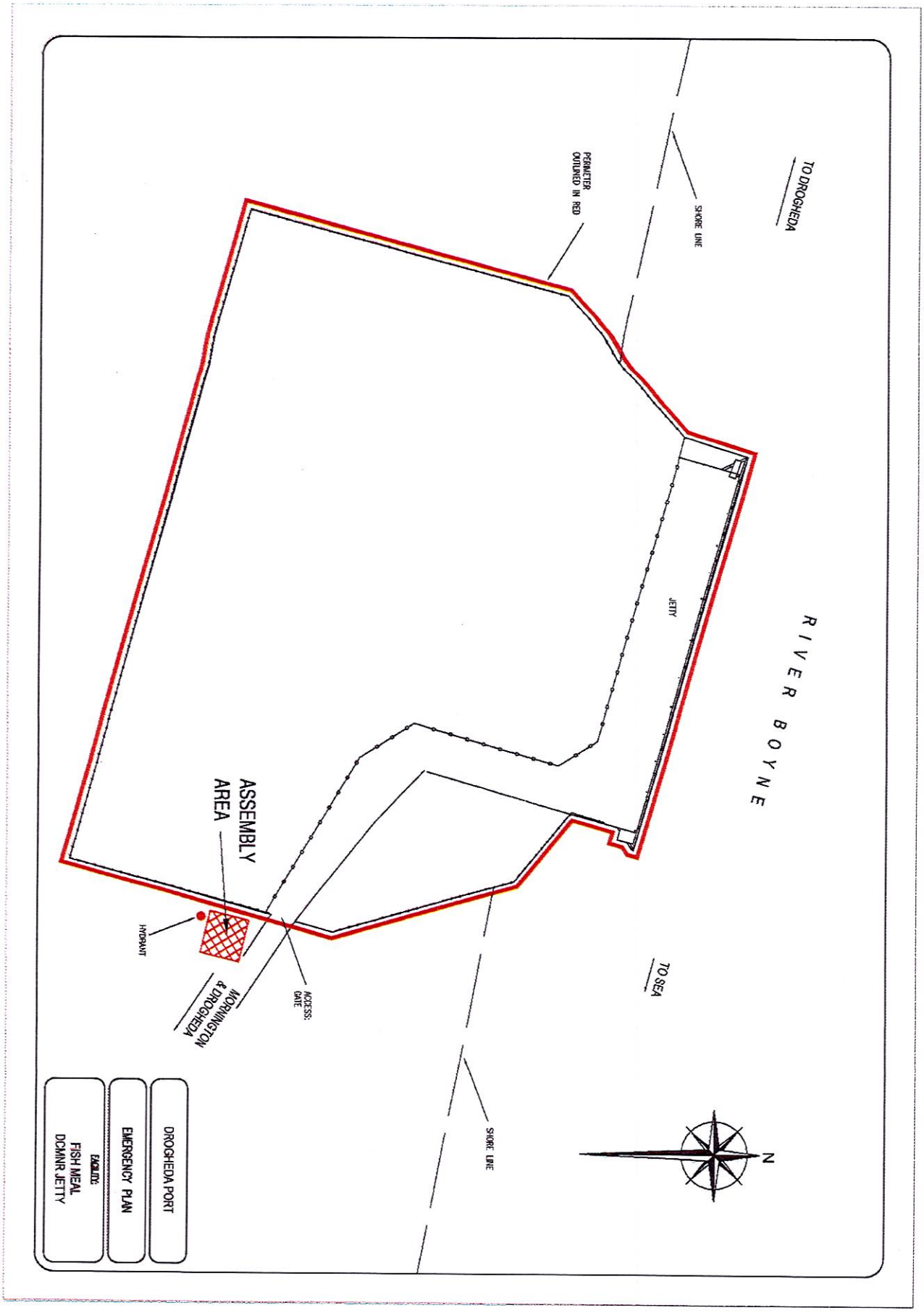


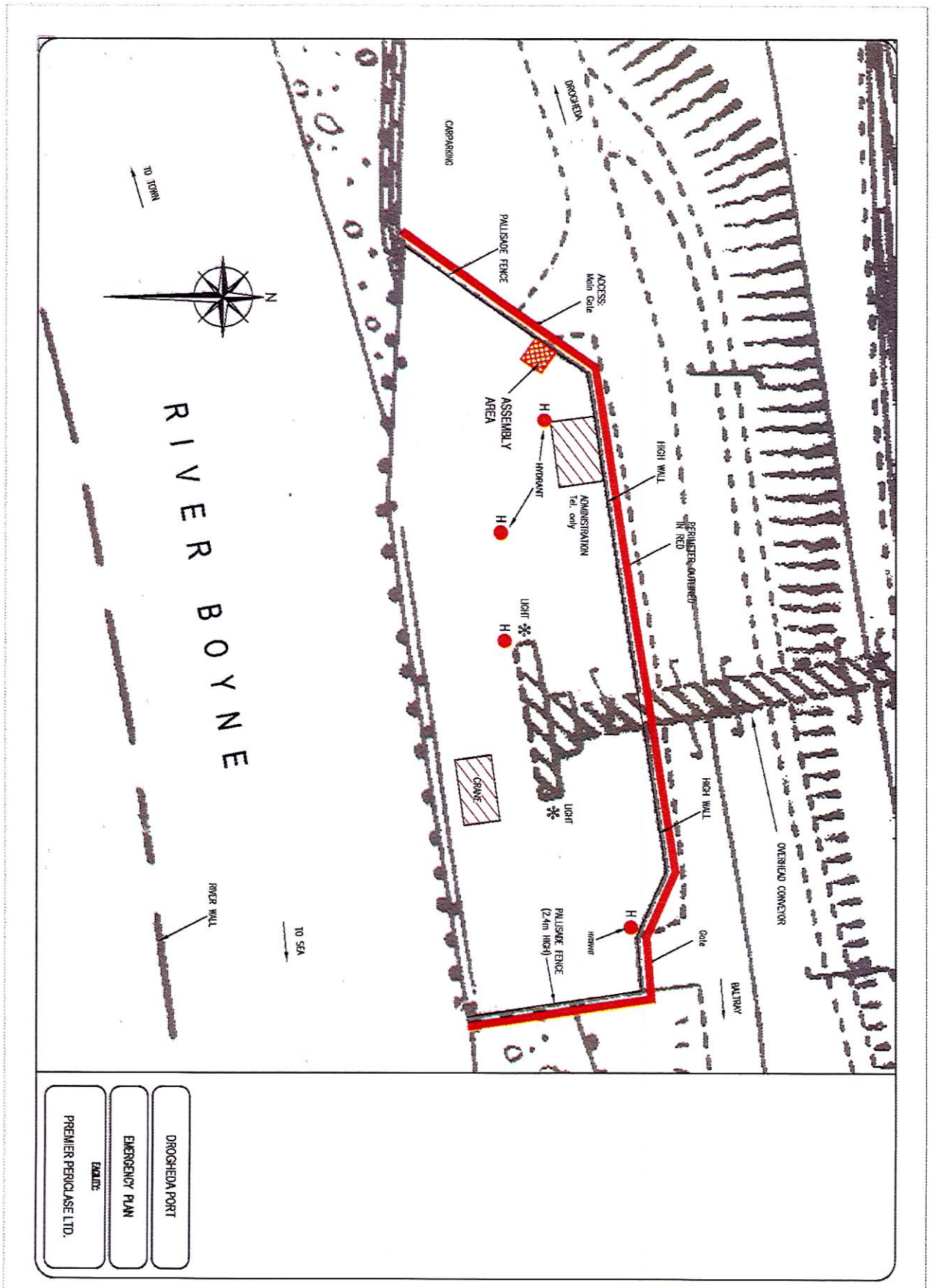
DROGHEDA TERMINAL 'ON-SITE' EMERGENCY PLAN ON-SITE MAP

- H — RIVER WATER HYDRANT
- H — FRESH WATER HYDRANT
- fe — FIRE EXTINGUISHERS
- FP — FIRE POINTS
- EMERGENCY SHUT DOWN LOCATIONS
- SECURITY BUILDING
- SECURITY CAMERAS
- LS — LIGHTS
- PERSONNEL GATE
- TERMINAL VENT STACK
- ASSEMPLY POINT
- UNDERGROUND WATERMAIN
- EMERGENCY STOP

No.	DATE	REVISIONS

DRAWN cad	CHECKED CB	PROJECT TITLE	
SCALE 1/1000	DATE 30-01-13	DROGHEDA LPG MARINE TERMINAL MARSH RD, DROGHEDA	
DRAWING TITLE ON SITE EMERGENCY PLAN ON SITE MAP PLAN	DWG NO 16		


TO DROGHEDA
SHORE LINE
PERIMETER OUTLINED IN RED
JETTY
RIVER BOYNE
ASSEMBLY AREA
HYDRANT
ACCESS GATE
MORNINGTON & DROGHEDA
TO SEA
SHORE LINE
N
DROGHEDA PORT
EMERGENCY PLAN
FACILITY:
FISH MEAL
DCMNR JETTY


DROGHEDA PORT
EMERGENCY PLAN
PREMIER PERICLASE LTD.
RIVER BOYNE
TO TOWN
TO SEA
DROGHEDA
CARPARKING
PALLISADE FENCE
ACCESS: Main Gate
ASSEMBLY AREA
HYDRANT
ADMINISTRATION Tel. only
HIGH WALL
PERIMETER OUTLINED IN RED
LIGHT
CRANE
OVERHEAD CONVEYOR
BALTRAY
Gate
PALISADE FENCE (2.4m HIGH)
RIVER WALL
N

APPENDIX 5: ENVIRONMENTAL LIABILITIES RISK ASSESSMENT. DROGHEDA PORT; DREDGING & DISPOSAL OPERATIONS (S00015-02) AQUAFACT INTERNATIONAL SERVICES LTD (2015)

Environmental Liabilities Risk Assessment

Drogheda Port

Dredging & Disposal Operations

(S0015-02)

Produced by

AQUAFACT International Services Ltd

On behalf of

Drogheda Port Company

March 2015

AQUAFACT INTERNATIONAL SERVICES ltd

12 KILKERRIN PARK

GALWAY

www.aquafact.ie

info@aquafact.ie

tel +353 (0) 91 756812

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1. Introduction

AQUAFACT International Services Ltd. was commissioned by the Drogheda Port Company to carry out an Environmental Liabilities Risk Assessment (ELRA) which is required as a condition of their Dumping at Sea permit (S0015-02).

AQUAFACT International Services Ltd. is an environmental consultancy established in Galway in 1986. We are highly experienced in carrying out a wide variety of marine, freshwater and terrestrial surveys and assessments, with a particular focus on areas and species of conservation importance. All AQUAFACT's staff are highly trained and educated with over half of the staff educated to Ph.D. level in a variety of disciplines. We have a long history of assessing the risks and impacts of a wide range of human activities on the marine environment e.g. dredging and dumping operations, discharges, port expansions, cables and pipelines, offshore renewable energy devices and aquaculture. We have prepared numerous Environmental Impact Assessments and Natura Impact Statements for these activities and we have prepared Environmental Liabilities Risk Assessment for a number of other Irish ports as part of their DaS permit requirements.

Drogheda Port Company is a semi state commercial port company established in 1997 under the Harbours Act 1996 and Amendments. Drogheda Port under the ages of the Minister for Transport has the statutory role for the management control and regulation of Drogheda Port. Parts 111 & IV of the Harbours Act 1996 detail the provision of the Act with respect to navigation, safety, pilotage etc. within the defined limits of Drogheda Port as defined in the Harbours (Amendment) Act 2009. The Harbourmaster appointed by the Drogheda Port Company is the authority for the control and regulation of these particular functions.

Other typical marine legislation that bestows specific powers on the Harbourmaster or Port Authority for the control and regulation of marine activities are:

- Merchant Shipping (Salvage & Wreck) Act 1993
- Sea pollution Act 1999
- Maritime Safety Act 2005
- Port Byelaws

2. Scoping

In order to maintain chartered depths in Drogheda Port, Drogheda Port Company must carry out maintenance dredging at a number of sites primarily and most frequently at the river mouth and seaward approaches (see Figure 2.1). In addition, maintenance dredging can take place at any location within the commercial estuary (*i.e.* the commercial channel berths and swing basins from Drogheda town quays to the sea at Mornington). Dredging at the river mouth and approaches usually occurs twice a year, although some years in the past decade saw three campaigns a year. The dredging in the river mouth and approaches area is typically in response to weather events and the timing of the dredging is dictated by the weather. A typical campaign lasts *c.* 3 weeks, working each tide, twice daily, generally from 3 hours before high water to *c.* 1 hour after high water. The dredged material will be disposed in one of two designated disposal sites (see Figure 2.1).

Dumpsite A1 is the site used for maintenance dredging from the berths, ship swinging basins and channel *etc., i.e.* from town to sea and for the sand material from the river mouth and seaward approaches. Dumpsite A1 is located within the defined port limits of the Drogheda Port Company. Dumpsite A2, to the northwest of Dumpsite A1, is located within the defined port pilotage limits of the Drogheda Port Company. This site is only suitable for sand from the river mouth and seaward approaches as this site is advantageous to aid the coastal processes and beach re-nourishment.

The EPA granted a Dumping at Sea permit (S0015-02) on the 11th February 2013 (as amended by Clerical Amendment No. S0015-02A dated 23rd April 2013). This permit covers the loading and dumping at sea of 2,816,000 tonnes of dredged material over an eight year period (2013-2021). The permit is subject to conditions set out in the Dumping at Sea Acts 1996 to 2010 under which Drogheda Port Company will carry out loading and dumping at sea. A condition of the permit requires Drogheda Port Company to assess their risks to the environment and set aside financial provision to cover for all of the environmental liabilities. This condition is stated below.

Condition 7.3 Environmental Liabilities

7.3.1 The permit holder shall as part of the AER, provide an annual statement as to the measures taken or adopted at the loading areas and dumping sites in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events or accidents/incidents, as may be associated with loading and dumping at sea.

7.3.2 The permit holder shall arrange for the completion, by an independent and appropriate qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) to address the liabilities from loading and dumping at sea. A report on this assessment, to the satisfaction of the Agency, shall be submitted as part of the second AER (required under Condition 6.7). The ELRA shall be reviewed as necessary to reflect any significant change to the volume or character of the material/substance to be loaded and dumped at sea, and in any case every three years following initial agreement. The results of the review shall be notified as part of the AER.

7.3.3 As part of the measures identified in Condition 7.3.1, the permit holder shall, to the satisfaction of the Agency, make financial provision to cover any liabilities identified in Condition 7.3.2. The amount of indemnity held shall be reviewed and revised as necessary, but at least triennially. Proof of renewal or revision of such financial indemnity shall be included in the annual 'Statement of Measures' report identified in Condition 7.3.1.

7.3.4 The permit holder shall have regard to the most recent Environmental Protection Agency Guidance on Environmental Liability Risk Assessment, Decommissioning Management Plans and Financial Provision when implementing Conditions 7.3.2 and 7.3.3 above.

This ELRA has been prepared in accordance with the EPAs '*Guidance on Assessing and Costing Environmental Liabilities*' (EPA, 2014a), '*Guidance on Assessing and Costing Environmental Liabilities – Unit Cost Rates for Verification*' (EPA, 2014b), '*Draft Guidance on Financial Provision*' (EPA, 2014c) and '*Environmental Liability Regulations Guidance Document*' (EPA, 2011).

The purpose of this ELRA is to identify and cost the risks posed to the environment (surface water, groundwater, atmosphere, land, flora, fauna and human health) from the loading and dumping at sea of material dredged from Drogheda Port.

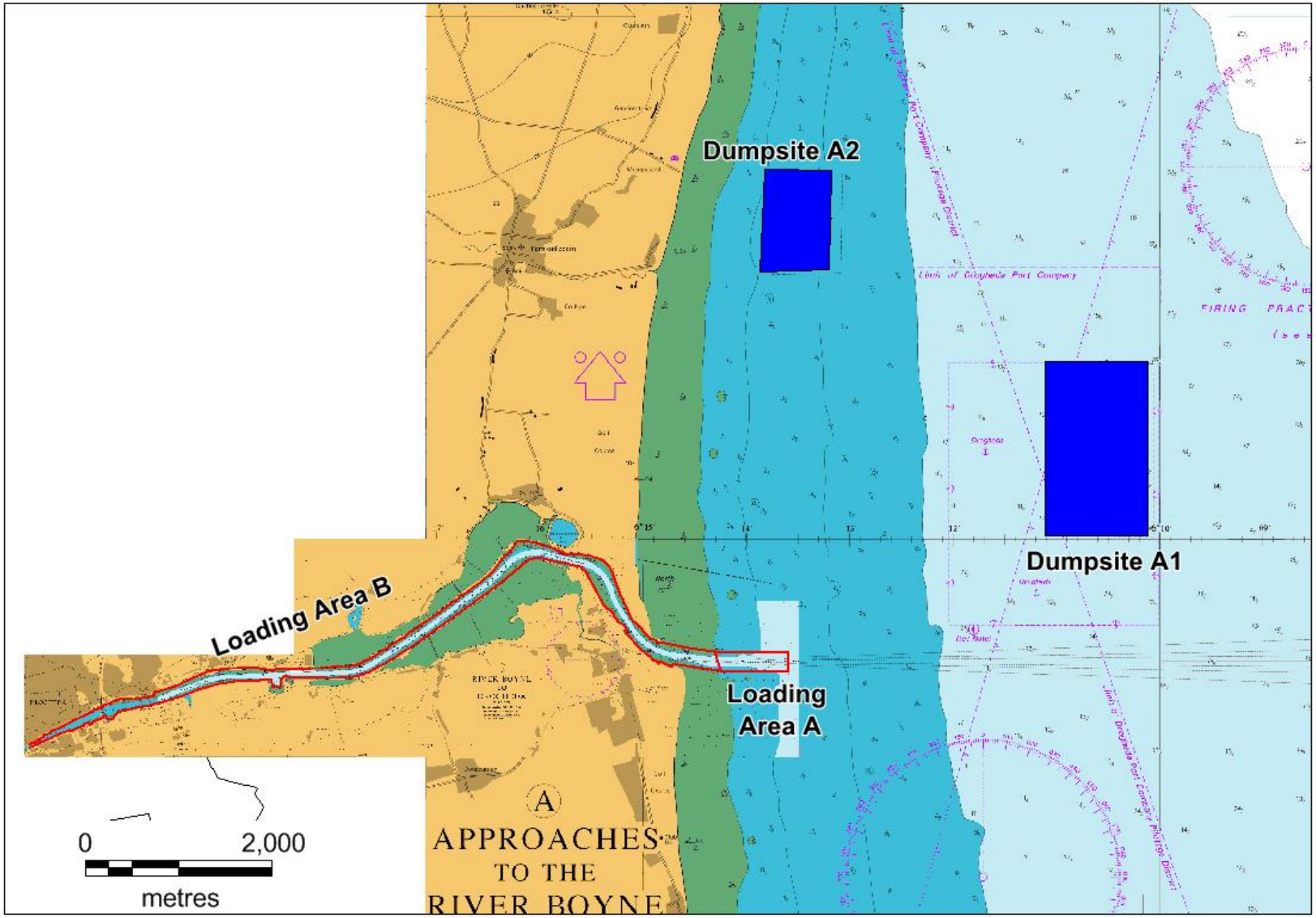

Figure 2.1: Locations of the dredge areas and the disposal sites.

3. Risk Assessment

3.1. Risk Identification

3.1.1. Site Operation

The dredging and disposal campaign for Drogheda Port Company consists of the following activities:

- Dredging and Loading
- Disposal of dredge spoil at 'Dumping Site A1' or 'Dumping Site A2'.

The Port of Drogheda handles over 1.2 million tonnes of cargo each year. The port has a wide balance of bulk and break bulk trade at *c.* 70% export i.e. cement, clinker magnesite and *c.* 30% import of paper, steel, timber, fertilizer, grains and liquefied petroleum gas (LPG). In 2014, the port has 330 cargo vessel calls.

The River Boyne flows through the town of Drogheda where commercial shipping traffic use the river to serve Drogheda Port. 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 (Scott Cawley, 2011). These high velocities allow the Boyne to carry substantial quantities of sediment out to the river mouth providing a natural scour to the estuary. However, this does not totally eliminate the need for maintenance dredging within the river particularly on the berths, ship turning basins and river bends. In addition, the high velocities have little effect at the river mouth and maintenance dredging is required at the approaches to the port, which are maintained at -2.2m CD. The entrance to the port is particularly vulnerable to gales from the northeast through to the southeast which deposit mobile sediments from the shallow gradient shoreline north and south into the deeper dredged port approach navigation channel.

The river under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Mary's Bridge in the town of Drogheda to the river mouth at Mornington (Harbours (Amendment) Act 2009). There are five working berths in the town which are maintained at depths of approximately -1.6m CD. At low water vessels on these berths take the bottom in soft mud. From Drogheda town the river narrows to the point at Donors Green. Immediately east of this point on the south side of the river is the Flogas LPG terminal single berth. Here the berth is maintained at -3.0m CD within a dredged

pocket of 100m x 25m. From this location the river is wider and deeper with the channel being maintained at -2.2m CD over the full length of the navigation to the sea at Mornington.

The berths of RHI Premier Periclase Ltd, are found on the north shore. Depths are maintained at - 1.0m 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. The berths at Tom Roe's Point to the north side of the channel lie within a deep-water dredged pocket of a length of 210m, width 25m excluding side slopes, maintained to a depth of -5.5m CD. To the east of this facility, 2km from the sea at Burrow Point is the Fish Meal Quay. This berth is used primarily for local fishing vessels and the discharge of Class 1 cargoes, classified under the International Maritime Dangerous Goods Code. The berth has a depth of -2.5m CD. The channel has been dredged to a uniform width of 50m with side slopes of 1:5 from the Flogas terminal (opposite Donors Green). At the South Point beacon, *c.* 500m west of Fish Meal Quay, the channel width increases to 60m to the Carrick beacon, *c.* 250m southeast of Fish Meal Quay. From this point the channel width is maintained at 50m to the Bull beacon where the channel width is increased to 100m with side slopes 1:10, and extends to a point 700m east of Lyons Light. There are three ship turning areas at the town quays that can accommodate vessels of lengths 90m, 95m and 105m; and at Tom Roe's Point ships of up to 130m.

Condition 3 of permit S0015-02 outlines the conditions that must be complied with in relation to loading and dumping at sea activities.

The estimated annual quantity of material to be dredged from the commercial channel, berths and swing basins from Drogheda town quays to the sea at Mornington is 30,000m^3 (48,000 tonnes). The quantity to be dredged from the seaward approaches is 90,000m^3 (144,000 tonnes). There is an additional annual contingency of 100,000m^3 (160,000 tonnes) to allow for the unexpected and unplanned events that may impede the navigation channel, such as unexpected weather events at the river mouth and seaward approaches and the collapse of the river retaining walls that create the estuarine polders. With contingency included, the annual average figure increases to 220,000m^3 (352,000 tonnes) and the total over 8 years is 1,760,000m^3 (2,816,000 tonnes). Dredging will primarily be carried out using a Trailer Suction Hopper Dredge (TSHD) with backhoe, grab and plough dredgers used in confined areas of berths and swinging basins that are inaccessible to the TSHD.

A typical dredging campaign lasts 3 weeks, working each tide, twice daily, generally from 3 hours before high water to *c.* 1 hour after high water. No dredging will be carried out at low water. The

dredged material will be disposed in one of two designated disposal sites (see Figure 2.1). Dumping Site A1 is located within the defined port limits of the Drogheda Port Company *c.* 4.2km northeast of Bluff Point. This site is used for maintenance dredging from the berths, ship swinging basins and channel *etc., i.e.* from town to sea and for the sand material from the river mouth and seaward approaches (Loading Area B). It has been used by the Port for the last decade and a half. Dumpsite A2, located *c.* 2.5km northwest of Dumpsite A1, is located within the defined port pilotage limits of the Drogheda Port Company. This site is only suitable for clean sand from the river mouth and seaward approaches (Loading Area A) and it has been used by the Port for the past 5 years. Disposal at Dumping Site A2 will be prohibited from the 1st June to 15th September inclusive for the protection of Bathing Waters. All material will be dumped at Dumping Site A1 during this period.

The disposal of spoil at either dumpsite will be effected by the release of the material through the hull of the TSHD vessel while the vessel is in motion. All reasonable practicable measures will be taken during loading to limit the generation and release of suspended solids into the water column. 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. Emergency oil spill kit and oil spill containment equipment will be held on board by the dredging operator in the event of an oil spill during dredging operations. 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 will carry out a five yearly sediment analysis programme, consistent with the timing of previous sediment programmes and to the guidance of the Marine Institute. A daily log will be automatically recorded during each dumping voyage.

Prior to the commencement of dredging, the Marine Survey Office (MSO) of the Department of Transport will be consulted to ensure that all vessels used in connection with the loading and unloading activities meet the requirements of the MSO. The permit holder will ensure that the vessels used in connection with Permit No. S0015-02 are fully certified. The permit holder will permit authorised officers to be on board the vessel. They shall permit and facilitate the carrying out by the authorised officer of his functions under the Dumping at Sea Acts 1996-2010, and shall comply with the provisions of those Acts in relation to the authorised officer and those functions.

3.1.2. Operator Performance

Drogheda Port Company has held Dumping at Sea Permits since 1996. Dredging will primarily be carried out using a Trailer Suction Hopper Dredge (TSHD) for the bulk of the work in the channel and a small grab dredger for the berths and swinging basins that are inaccessible to the TSHD. Dredging generally occurs twice a year. Examples of TSHD used in the past include the *Lough Foyle*, the *UKD Dolphin, Amazone, Lesse* and *Albatross.* The *UKD Seahorse* has been used in the past for bed levelling and plough dredging. The port is currently contracted with Irish Dredging using the TSD Sospan Dau.

Dredging Notice to Mariners are issued in advance of operations to all parties and posted on the Drogheda Port Company website.

Condition 2.1 of the dumping at sea permit states that the permit holder shall adopt all reasonable practicable measures to minimise the noise impact of the permitted activities. Noise levels from the permitted activities shall not cause a nuisance at any noise-sensitive location (NSL).

In addition, these vessels have certification which provide security and certainty in relation to sea worthiness and ability to undertake dredging works with very little potential risk of an accident/incident. The procedure for vessels employed to dredge Drogheda Port is as follows:

- Prior to arrival in Irish waters, Ship's Agents send a 'Pre-Arrival Form' to the Department of Transport, Tourism & Sport (DTTAS) as part of 'Safe Seas Ireland' (SSI) notification. SSI provides for the electronic notification of i) ships arrival and departure notifications, ii) dangerous or polluting goods (DPG) notification; iii) ISPS (International Ship and Port Facility Security) notifications, iv) waste notifications and v) reporting requirements in the event of an accident or incident.
- It is Inspectors from the Marine Survey Office (MSO) who check ships certification, and check / issue 'Irish Loadline Certificates', where necessary.
- Port Company personnel advise the MSO if something is amiss; the authorities of the 'flag state' issue licences / certificates for their vessels. Vessels do not come on charter until all is in order.
- Ship's crew are all trained to STCW International Marine Standards.
- Contracted vessel with same crews have detailed knowledge of Drogheda Port.
- Prior to arrival the dredger, her Master and shore management are advised of any particular conditions at Drogheda that may give rise to concern and the dredge programme is agreed.

The dredger is included on the daily shipping circulation list of ship movements for the following 24hrs and is therefore up to speed with all port traffic.

- Daily at 1700hrs, the Harbourmaster communicates with the dredger the following 24hr ship traffic movement programme, times, berths, arrivals and departures.
- The same information is relayed to the port Pilots and Coxswains.
- All commercial traffic and traffic directed by the Harbourmaster must use a licence Drogheda Port Pilot.
- Prior to any vessel movements i.e. inward or outward, the ports Pilots and dredger Master communicate to determine the time of arrival at the dredge site and ship passing or meeting requirements and always in compliance with the International Collision Regulations.

All vessels employ best practice measures to minimise any possible impacts on the marine environment.

Drogheda Port Company operates a Port Pollution Plan. A Tier One pollution response unit is immediately available within the port. Port personnel have undergone approved training with the Irish Coast Guard. Annual pollution exercises are carried out. Drogheda port also maintains an annual contract for immediate additional equipment call up and advice. Dredging vessels engaged by Drogheda Port Company have their own pollution plans/equipment response kits and insurance.

There have been no ship or dredger incidents, no pollution and no environmental complaints reported during dredging and disposal operations in Drogheda Port.

3.1.3. Environmental Sensitivity

The environmental sensitivity is considered with respect to the following:

- Surface Waters: Dredging will occur within the Boyne Estuary Transitional Water Body and the Boyne Estuary Plume Zone Coastal Water Body. The water quality of the Boyne Estuary Transitional Water Body is 'Intermediate' and the Boyne Estuary Plume Zone Coastal Water Body is 'unpolluted'. Dumping site A2 is located in the Lough Coast Coastal Water Body which has an unpolluted status. Dumping Site A1 is located outside surface water body zone.
- Natural Habitats and Species: Dredging will occur within three Natura 2000 sites – the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA (Site Code: IE004080). The proposed disposal

sites are not located within any Natura 2000 sites. These cSACs have a number of Annex I habitats and Annex II species that area Qualifying Interests of the cSACs. These habitats and species must be protected in order to maintain the favourable conservation status and integrity of the cSACs. The habitats and species present are: estuaries, mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonising mud and sand, *Spartina* swards (*Spartinion maritimae*), Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), Embryonic shifting dunes, Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes), *Fixed coastal dunes with herbaceous vegetation (grey dunes), Alkaline fens, *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), Atlantic Salmon *Salmo salar* (only in fresh water), River Lamprey *Lampetra fluviatilis* and Otter *Lutra lutra*. The Special Conservation Interests of the SPA include the following: wintering Shelduck *Tadorna tadorna*, wintering Oystercatcher *Haematopus ostralegus*, wintering Grey Plover *Pluvialis squatarola*, wintering Lapwing *Vanellus vanellus*, wintering Knot *Calidris canutus*, wintering Sanderling *Calidris alba*, wintering Black-tailed Godwit *Limosa limosa*, wintering Redshank *Tringa tetanus*, wintering Turnstone *Arenaria interpres*, breeding Little Tern *Sterna albifrons* and Wetlands & Waterbirds

- Human Beings: The dredging operations will occur within the commercial estuary from the Drogheda Port inner town quays to the river entrance at Mornington (including all berths and swing basins) and the seaward approaches. The 7 electoral divisions located around the estuary and seaward approaches have a population of 49,629 (CSO 2011 data). Drogheda town is a typical urban centre with some industrial/commercial lands on the outskirts and rural agricultural lands dominated by one off housing further out. Dredging of the estuary will occur within 100m of residential homes in some locations. Dumping Site A2 is located *c.* 850m east of residential properties in the Clogherhead beach area and Dumping Site A1 is over 4km form the coast. Noise levels from the permitted activities will not cause a nuisance at any noise-sensitive location (NSL).

3.1.4. Risks associated with Activities

As all commercial shipping require a Drogheda Port Company licence pilot for entry to and exit from the port, with Standard Operating Procedures in place for these operations, the risk of a collision between cargo carrying commercial traffic and the operational dredger is eliminated. The navigation channel is well marked. Regular Drogheda Port Company Notices to Mariners are issued and posted on the Drogheda Port Company website. Prior to any Pilot assisted ship movements taking place a ships Master/Pilot Information Exchange must be completed. While a ship is on passage within the

Drogheda Port navigational jurisdiction, ship position reporting must be complied with at designated locations. Ship speed within the commercial channel and port approaches is *c*. 6kt. The dredger speed while dredging is *c.* 1-2kt. The A2 designated Dumpsite is located inshore of the normal shipping routes to/from Drogheda Port approaches. The A1 designated Dumpsite is seaward and north of the designated Drogheda Port anchorage and pilot boarding area. In addition, the risk of a collision while the dredger is en route to either disposal site is eliminated as the ports pilotage district extends to the disposal sites.

In addition, there is no risk of disposal occurring at Dumping Site A2 during its closed period between 1st June and 15th September or any other incorrect location. This risk is not possible as clear instructions are given to the dredging contractor management and dredger Master in advance of arrival at Drogheda and commencing operations. Additionally, Drogheda Port Company through the Harbourmaster monitor via AIS the dredger movements and any error in the dredgers course would be quickly identified and rectified.

The risks associated with Loading Operations are:

- Failure of dredger due to a collision. Unlikely that this would result in a loss of spoil material already dredged. The TSD Dredger is typically a double hulled vessel with the spoil compartment contained within the inner hull. The outer hull is used for ballast. Given the speed of a dredger while dredging at 1-2kt and the speeds of in/out bound vessels to Drogheda port is 6kt, the chance of a 'T' bone collision impacting or penetrating the inner hull is most unlikely. Even if it were to happen, the dredge spoil release would not be significant and dependant on the time of the collision within the dredge cycle. Further to that, the release of the spoil would be to almost the same site as it has previously been dredged unless underway to the dumpsite (most lightly river entrance dredging as this is the greatest dredging frequency). Given that the material is from the coastal sediment drift process and un-contaminated, no environmental risk exists. At the dredge site the actual depth of the column of water varies from 3 to 7m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Failure of dredger due to mechanical failure. While a more likely occurrence the risk is again minimal. While dredging, the failure would occur at very slow speed. Most likely the vessel would take the ground gently in soft sand/mud within the defined navigational channel where the side slopes are typically of a 1:5 gradient, therefore the vessel is contained. The seamanship solution to a loss of power or steering that cannot be immediately returned is to

drop the anchor and all commercial vessels have two anchors. Generally a TSD Dredger may also be fitted with spud legs which can be deployed instantly and pin the vessel to a fixed position.

- Uncontrolled or poorly controlled release during loading or grab dredging due to mechanical failure/human error. This would result in the release of dredge material which may have a temporary negative impact on water quality and/or on the immediate area of the marine environment. Again a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal speed etc. Again the accidentally released material is from the site just dredged and un-contaminated. At the dredge site the actual depth of the column of water varies from 3 to 7m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Fuel spillage from the dredger due to accidental release / storage tank fault / collision. This could result in a discharge to surface water which would have a short term negative impact on the marine environment. While a possible scenario, it is again unlikely. All TSD Dredger bunkering supply operations are carried out while moored at Drogheda port. Bunker transfers are only allowed by permission of the Harbourmaster and SOP's must be followed by the vessel and bunker supply contractor. In the unlikely event of a collision, the vessels bunker tanks are located in the engine room of the dredger within the integral hull, so similar to the spoil hopper given the relative speeds of the vessel, collision impact penetration to an internal bunker tank most unlikely. If a release did occur, given that the TSD Dredger engaged at Drogheda port all use light diesel (MGO), this fuel from a pollution perspective would be left to degrade naturally and this is consistent with the DPC Pollution Response Plan. Additionally, the tidal flows experienced at Drogheda make containment almost impossible.

The risks associated with Disposal Operation:

- Unloading carried out at incorrect location due to human error/fault with navigation system. This would result in the release of dredge material which would have a temporary, negative impact on the marine environment. This again is a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal

speed etc. Again the accidentally released material is from the site just dredged and un-contaminated. At the dumpsites actual depth of the column of water varies from 4 to 14m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.

- Uncontrolled or poorly controlled release during unloading at the dumpsite due to mechanical failure/human error. This would result in the release of dredge material which would have a negative impact on the marine environment. This is a very unlikely scenario given that the dredger bridge team comprises three persons in the control bridge and all employ Bridge Team Resource Management as part of their SOP's. If a release did occur, the impact would only be to the immediate area, dependant on the quantity within the dredger hopper, tidal flow, tidal speed etc. Again the accidental release material is from the site just dredged and un-contaminated. At the dumpsites the actual depth of the column of water varies from 4 to 14m, less the actual draft of the dredger, therefore the fall impact of any material is minimal and dispersion greatly reduced.
- Fuel spillage from the dredger due to accidental release / storage tank fault / collision. If a release did occur, given that the TSD Dredger engaged at Drogheda port all use light diesel (MDO), this fuel from a pollution perspective would be left to degrade naturally and this is consistent with the DPC Pollution Response Plan. The release would only be a small quantity before being noticed and stopped. Additionally, the tidal flows experienced at Drogheda make containment almost impossible.

3.2. Risk Analysis

Risk analysis involves the establishment of the risk classification criteria followed by risk analysis based on these criteria. Risk analysis tables evaluate and rank the risks compared to each other. They form the basis for rating the likelihood (see Table 3.1) of an event occurring and the consequence of impact (see Table 3.2) if the event occurs. The likelihood and consequence ratings are combined to form a risk score for risk evaluation. Table 3.3 shows the Risk Score for the dredging and disposal activities in Drogheda Port.

Table 3.1: Risk Classification Table - Likelihood

Rating	Likelihood	
	Category	**Description**
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

Table 3.2: Risk Classification Table – Consequence

Rating	Likelihood	
	Category	**Description**
1	Trivial	No impact or negligible change to the environment
2	Minor	Minor impact/localised or nuisance
3	Moderate	Moderate impact to environment
4	Major	Severe impact to environment
5	Massive	Massive impact to a large area, irreversible in medium term

Table 3.3: Risk Analysis

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
1	Loading Operations	Rupture/failure of dredger due to collision	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species	2	Volumes relatively small (1,200-1300t maximum, 100-200t more realistic). Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the river will ensure rapid dispersal of sediments to the outer reaches.	1	DPC are presented with certification and inspection of sea worthiness.	2 (this consequence is scored at 2 based on worst-case (1,200-1,300t), in reality however, this scenario is most unlikely (100-200t more realistic)
2	Loading Operations	Rupture/failure of dredger due to mechanical fault	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species	2	Volumes relatively small (1,200-1300t maximum, 100-200t more realistic). Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the river will ensure rapid dispersal of sediments to the outer reaches.	1	DPC are presented with certification and inspection of sea worthiness.	2 (this consequence is scored at 2 based on worst-case (1,200-1,300t), in reality however, this scenario is most unlikely (100-200t more realistic)
3	Loading Operations	Uncontrolled or poorly controlled release of dredge spoil during loading due to	Release sediment plume into the River Boyne and River Blackwater cSAC (Site Code:	1	Run-off from the dredger will only occur in the latter stages of the loading operation when the dredger's hold is almost at	1	DPC are presented with certification and inspection of sea worthiness. The Dumping at Sea	1

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
		mechanical failure / human error	IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA– impact on water quality and natural habitats and species		capacity and generally on the ebb tide Volumes would be very small. DPC has modelled this impact. Material is not contaminated and is suitable for disposal at sea. Material is comparable with the surrounding habitats. High velocities in the Estuary will ensure rapid dispersal of sediments.		permit conditions ensure that best practice measures and mitigation measures are implemented during loading to limit the release of suspended solids into the water column.	
4	Loading Operations	Fuel spillage from dredger during loading due to accidental leakage / storage tank fault / collision	Surface water pollution to the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA – impact on water quality and natural habitats and species	3	Volumes of 1-2mt MGO maximum would be released Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented.	1	DPC are presented with certification and inspection of sea worthiness.	3
5	Disposal Operation	Uncontrolled or poorly controlled release of dredge spoil during dumping at dumpsite	Uneven distribution of material throughout the dumpsite. This would have no implications on natural habitats or water quality beyond what is permitted under the	1	Maximum volume would be 1,200-1,300t. Material is not contaminated and is suitable for disposal at sea. Impacts of the disposal of 1,200-1,300t in wrong part of dumpsite out of a potential 2,816,000t is insignificant. The locations of subsequent	1	DPC are presented with certification and inspection of sea worthiness. The Dumping at Sea permit conditions ensure that best practice measures and mitigation measures are	1

Risk ID	Activity	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
			Dumping at Sea permit.		dumps will be revised to reflect initial error.		implemented to control release of sediments	
6	Disposal Operations	Fuel spillage from dredger during disposal due to accidental leakage / storage tank fault / collision	Surface water pollution to the River Boyne and River Blackwater cSAC (Site Code: IE002299), the Boyne Coast and Estuary cSAC (Site Code: IE001957) and the Boyne Estuary SPA – impact on water quality and natural habitats and species	3	Volumes of 1-2mt MGO maximum would be released Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented.	1	DPC are presented with certification and inspection of sea worthiness.	3

3.3. Risk Evaluation

The risk evaluation uses the outcome of the risk analysis carried out in the previous section to identify and prioritise the risks for risk treatment. Each of the risks are ranked to assist in the prioritisation of treatment. The risk matrix for the dredging and disposal activities in Drogheda Port can be seen in Table 3.4 below. The consequence and likelihood ratings (from Section 3.2 above) are used in the matrix with the level of consequence forming the x-axis and the likelihood forming the y-axis. The matrix is colour coded to provide a broad indication of the critical nature of each risk.

Table 3.4: Risk matrix for the dredging and disposal operations at Drogheda Port.

Occurrence	**V. High**	**5**					
	High	**4**					
	Medium	**3**					
	Low	**2**					
	V. Low	**1**	3, 5	1, 2	4, 6		
			1	**2**	**3**	**4**	**5**
			Trivial	**Minor**	**Moderate**	**Major**	**Massive**
			Consequence				

3.4. Risk Treatment

The risk treatment process involves the identification and prioritisation of management and mitigation measures to mitigate against the risks identified in the risk evaluation process. This results in a Statement of Measures which can be seen in Table 3.5 below.

Table 3.5: Statement of Measures

Risk ID	Potential Risks	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Completion Date	Contact Person
1	Failure of dredger due to collision	2	• Vessels do not come on charter until all certification is in order • Vessel speeds ≤ 6kt	• Mitigates against vessel failure • Minimises damage if collision occurred	None required	Completed	Harbourmaster
2	Failure of dredger due to mechanical fault	2	• Vessels do not come on charter until all certification is in order • Twin anchors and spud legs	• Mitigates against vessel failure • Stabilise vessel if it grounds	None required	Completed	Harbourmaster
3	Uncontrolled or poorly controlled release of dredge spoil during loading due to mechanical failure / human error	1	• Vessels do not come on charter until all certification is in order • Slow speeds during dredging • Overflow from the vessel will be minimised using best practice	• Mitigates against vessel failure and sediment loss	None required	Completed	Harbourmaster
4, 6	Fuel spillage from dredger during loading/disposal due to accidental leakage / storage tank fault / collision	3	• Vessels do not come on charter until all certification is in order • Vigilant crew at all times during operations will ensure that any leak is detected immediately and valves closed (minimum of 2 on the bridge and 1 on the deck). • Ship's Oil Pollution Plan will be implemented and on-board oil pollution control measures implemented. • Emergency oil spill kit and oil spill containment equipment will be held on board by the dredging operator	• Mitigates against vessel failure • Ensures any leaks are detected immediately and source of leak closed/repaired • Ensures any leaks are contained and controlled	None required	Completed	Harbourmaster

Risk ID	Potential Risks	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Completion Date	Contact Person
5	Uncontrolled or poorly controlled release of dredge spoil during dumping at dumpsite	1	• Vessels do not come on charter until all certification is in order • Slow speed within disposal site • Divide the disposal site into sections to ensure even disposal throughout the site	• Mitigates against vessel failure • Mitigate against loss of control • Mitigate against poorly controlled dumping	None required	Completed	Harbourmaster

3.5. Costing

The worst case scenario concerns the release of fuel, albeit in small quantities (Risks 4 and 6). The risks to the environment and water quality associated with the incorrect release of sediments are of a lower consequence than the risk posed by the release of fuel, as the sediment released was taken from the area initially.

The risk involves the release of small quantities (1-2mt) of MGO into the marine environment. Mechanical containment and recovery often net little gain since MGO tends to evaporate and dissolve very quickly after hitting the water surface. In addition, the tidal flows experienced at Drogheda make containment almost impossible. As a result and in accordance with the DPC Pollution Response Plan, a small spill like this would be left to degrade naturally and therefore no clean up costing is required.

4. Summary

This Environmental Liabilities Risk Assessment (ELRA) which is required as a condition of their Dumping at Sea permit (S0015-02) has identified the release of small quantities of fuel (MGO) from the dredger due to accidental leakage, storage tank fault or collision as the plausible worst-case-scenario. In accordance with the DPC Pollution Response Plan, a small spill like this would be left to degrade naturally and therefore no clean up contingency is required.

5. References

EPA. 2014a. *Guidance on Assessing and Costing Environmental Liabilities.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-535-4.

EPA. 2014b. *Guidance on Assessing and Costing Environmental Liabilities – Unit Cost Rates for Verification.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-535-4.

EPA. 2014c. *Draft Guidance on Financial Provision.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-557-6.

EPA. 2011. *Environmental Liability Regulations Guidance Document.* Published by the Environmental Agency, Ireland. ISBN 978-1-84095-416-6.