

**FORESHORE APPLICATION FOR MAINTENANCE DREDGING ON THE RIVER  
BOYNE COMMERCIAL ESTUARY, RIVER ENTERANCE AND SEAWARD  
APPROACHES, 2012 – 11<sup>th</sup> FEBRUARY 2021**

**SUPPORTING NOTES/DOCUMENTATION**

This document has been prepared to support the Foreshore Licence Application Form. The information has been set out under the headings which correspond to sections of the Foreshore Licence Application Form.

## FORESHORE APPLICATION - SECTION 2 – DETAILED DESCRIPTION

### Purpose of the operation

The purpose of the operation is for on-going maintenance dredging. To understand the requirement for maintenance dredging it is important to understand the dynamic of the river in respect of siltation, sediment transport and material deposition at the river mouth and seaward approaches, as well as the port's operation which is the driver of the need to dredge.

The River Boyne rises in the north midlands and exists to the sea at Mornington Co. Meath. The river flows through the towns of Kells, Trim, Navan, Slane and finally Drogheda where commercial shipping traffic use the river to serve Drogheda Port.

From Drogheda town to the sea at Mornington the river has been trained by means of training walls constructed around the 1850s by the then Drogheda Harbour Commissioners. This captured the main river flow with estuarine polders being created north and south of the training walls. This important work had two effects in that it increased the tidal exit velocity and thereby produced a scouring effect and created a reserve of water from the estuarine polders to supplement the falling tide.

The fresh water flows and tidal exit velocities from the River Boyne were further enhanced in the late 1960s by the Boyne drainage scheme of the upper reaches between Kells, Trim and Navan.

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.

The high velocities experience allows the Boyne to carry a very substantial quantity of sediment and fluvial material out to the river mouth providing a natural scour to the estuary. However, within the river this does not totally eliminate the need for maintenance dredging particularly at 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.

The entrance to the Boyne estuary lies within the coastal cell between Clogherhead in the north and Bremore to the south, on a shallow shoaling sandy beach where there is net annual movement of material from south to north.

The entrance to the port is particularly vulnerable to gales from the northeast through to the southeast which deposits mobile sediments from the shallow gradient shoreline north and south into the deeper dredged port approach channel. This is compounded by the fact that the sediment storage reservoir behind the south training wall constructed in 1970s has now been exhausted allowing full sediment bypass, accelerated by south easterly storm events. This impacts the navigation channel reducing the warranted depth, effecting safe navigation.

From the late 1960s the Drogheda Harbour Commissioners and latterly the Drogheda Port Company has carried out several detailed physical and mathematical modelling studies of the coastal cell from Clogherhead in the north to Bremore in the south and has a detailed understanding of the coastal processes and sediment transport regime (**see Attachment A Kirk McClure Morton Report, 2001**). It has been established that circa 120,000m<sup>3</sup> of sediment is moving annually from south to north, accelerated during south east gales and spring tides.

### Loading Area

Within the waterway under the jurisdiction of the Drogheda Port Company, maintenance dredging takes place primarily and most frequently at the river mouth and seaward approaches. Thereafter, maintenance dredging can take place at any location within the commercial estuary as determined by the Port Company as the navigational authority for the purpose of ensuring safe navigation.

The extent of area which falls within the area to be dredged is indicated on **Figure 2 Loading Site Extent and Boundary** and the co-ordinates delimiting this area are:

Area	Latitude	Longitude	ITM
Seaward approaches	53 43.36N	06 14.22W	716230.47, 776214.52
	53 43.25N	06 14.26W	716311.10, 776018.36
	53 43.24N	06 13.60W	717038.15, 776015.56
	53 43.35N	06 13.60W	717033.06, 776219.54
Commercial channel berths & swing basins from Drogheda town quays to the sea at Mornington	53 42.81N	06 20.95W	708975.40, 775014.22
	53 42.82N	06 20.96W	708963.36, 775036.39
	53 43.36N	06 14.33W	716230.47, 776214.52
	53 43.25N	06 14.26W	716311.10, 776018.36

The river under the jurisdiction of the Drogheda Port Company is approximately 7km in length from St. Marys Bridge in the town of Drogheda to the river mouth at Mornington. In the town there are five working berths numbered 1 - 4, length 430mtrs, on the north side the Knaggs Head, length 60mtrs on the south side. There are three ship-swinging areas that can accommodate vessels of lengths 90mtrs, 95mtrs and 105mtrs. The berths are maintained to depths of approximately -1.6mtrs at Chart Datum. At low water vessels on these berths take the bottom in soft mud.

From the town at Drogheda the river narrows to the point of Donors Green. Immediately east of this point on the south side of the river is the Maxol Hydrocarbon terminal and Flogas LPG terminal that jointly share this single berth. The berth is maintained at -3.0mtrs Chart Datum within a dredged pocket of 100mtrs x 25mtrs. Vessels at this berth are required to remain afloat at low water.

From this location the river is maintained at -2.2mtrs at Chart Datum over the full length of the navigation to the sea at Mornington.

The berths at Premier Periclase Ltd are found on the north shore. Depths are maintained at - 1.0mtrs Chart Datum over the 180mtr quay immediately adjacent to the deeper navigation channel at -2.2mtrs at Chart Datum. At low water vessels on this berth take the bottom in soft sand/gravels.

The Tom Roe's Point berths to the north side of the channel lie within a deep-water dredged pocket of a length of 210mtrs, width 25mtrs excluding side slopes, maintained to a depth of -5.5mtrs at Chart Datum. This dredged pocket is essential, as vessels nominated to these berths are required to remain always afloat.

To the east of this facility, 2km from the sea is the Fish Meal Quay. This berth in state ownership 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 -2.5mtrs at Chart Datum.

From the Maxol Hydrocarbon terminal the channel has been dredged to a uniform width of 50mtrs with side slopes of a general 1:5 gradient. At the South Point beacon (53 43'.89N, 06 16'.14W) the channel width increases to 60mtrs to the Carrick beacon (53 43'.76N, 06 15'.42W). From this point the channel width is maintained at 50mtrs to the Bull beacon (53 43'.30N, 06 14'.62W) where the channel width is increased to 100mtrs with side slopes 1:10, and extends to a point 700mtrs east of Lyons Light (53 43'.24N, 06 14'.26W).

A summary of the minimum depths within areas to be dredged is provided in the Table 1.

**Table 1. Minimum depths within areas to be dredged**

Town Berths, No 1- 4, Knaggs Head & Ship Swinging Areas	-1.6m CD
Oil / LPG Berth	-3.0m CD
Premier Periclase Berth	-1.0m CD
River Channel from Town Berths to Hydrocarbon/LPG Berth	-1.0m CD
Tom Roes Point Berth	-5.5m CD
Maxol Hydrocarbon/Flogas LPG Berth to sea	-2.2m CD
Seaward Approach Channel	-2.2m CD
<b>Note:</b> The above are the minimum depths as advertised to ships Masters and ships Owners for voyage planning purposes. When dredging an over dredge allowance of 15% of advertised depths would not be untypical.	

## Details of the Operation

Drogheda Port Company engages its own internal hydrographical unit to maintain an on-going monitoring programme on channel depths particularly at the sensitive river mouth and seaward approaches. 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 x 365 maintenance dredging policy for the river mouth and seaward approaches without any encumbrances. This is essential to maintain the port operations.

Maintenance dredging within the estuary i.e. river channel, river bends, berths and swing basins is pre-planned with timing determined by plant availability, opportunity dredging from passing plant, operational requirements, market conditions etc.

## Dredging requirements

Over the previous five year maintenance dredging licence periods the port has accumulated a good deal of data and experience on the performance of the river and bar and the effects of weather. This coupled with mathematical modelling (**see Attachment A – Kirk McClure Morton Report, 2001**) now allows realistic figures to be placed on our maintenance dredging prediction going forward over the next period. Monitoring of the bar/river mouth and the most sensitive area of the river in dredging requirement terms is now carried out by the port internal hydrographic unit, thereby maintaining a good check on depths particularly after easterly wind storm events.

Estimated annual quantities of maintenance dredging of the berths, swing basins, channel, river mouth and seaward approaches are shown below in Table 2. These estimates are averages, based on the last 11 years of data on actual quantities dredged (for full details see **Attachment B Annual Quantities Actually Dredged 2001 – 2011**). Annual requirements may increase or decrease on this average estimate depending on weather events.

**Table 2. Estimated Annual Quantities of Maintenance Dredging 2012 - 2021**

LOCATION	ESTIMATED ANNUAL QUANTITIES
Channel from town to sea, including all berths and ship swing areas	30,000m <sup>3</sup> (48,000 tonnes)*
Seaward approaches	90,000m <sup>3</sup> (144,000 tonnes)**
Contingency	100,000m <sup>3</sup>

\*For calculation and planning purposes dredge quantities are generally given in metre cubic m<sup>3</sup>. A conversion factor of 1.6 is used for tonnes.

\*\* This quantity is based on an average over the previous 11 year history.

A contingency of an additional 100,000m<sup>3</sup> is to allow for the unexpected and unplanned events that may impede the navigation channel. This is to cover an unexpected weather event or where the river retaining walls that created the estuarine polders collapse (as occurred in 2000) and the material contained within a polder flows out into the main navigation channel. This can occur due to a differential water pressure between the retained waters in the polder and the river falling tide levels. The river walls were constructed in the 1850s and their construction and current condition leave them susceptible to the effects of ship wash and hydrodynamic action. The contingency also covers other unforeseen events where accreted material may impede safe navigation or reduce safe navigational water depths.

## **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) and unit rate. For this Maintenance Dredging application, typical plant to include for utilisation on the river Boyne estuary, berths, swing basins and bar area/approach channel are:

**Trailer suction dredger:** This is where the dredging vessel 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 her hull that open to release the hold contents. The vessel continuously passes over the area to the dredged gradually increasing the depths to the required levels.

**Backhoe dredger:** This is a stationary dredger similar to a flat to 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 self-propelled or towed barges that moor 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.

**Split barge:** this is a purpose built barge for receiving dredged material from a dredging vessel such as the backhoe. Once the hold of the vessel is filled, she sails to the approved dumpsite and through bottom doors in her hull that open, releases the material.

**Grab dredger:** This is a vessel with a grabbing crane on board and dredges using a clam shell bucket. The material is generally deposited into the vessels hold for later sea disposal via bottom doors. This is a coarse dredger method, dredging holes to create the required depth. On occasions bed levelling may be required following the dredging where the material does not naturally slump.

**Bed levelling:** this is where a small tug or similar vessel tows a cage or plough and removes material to the required level. It is particularly useful after the work of the trailer suction dredger or backhoe to level out high spots remaining to obtain the required dredge level.

**Plough:** Similar to the bed levelling, this is where a cage or plough is towed behind a small tug or similar vessel. The water is agitated 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.

**Date of commencement of loading operations:** Foreshore Licence is sought for a period 2012 to 11<sup>th</sup> February 2021. This is to cover in parallel the existing Dump at Sea Permit No. 387 and a new Dump at Sea Permit application currently under consideration by the Environmental Protection Agency. Other than the Foreshore Licence start and finish date, there is no date, time constraint or time limit sought for the maintenance dredging. Dredging at the river mouth and port approaches is generally driven by weather events that cannot be predicted or scheduled. If the river mouth silts up due to a weather event resulting in impaired water depths that impact on safe navigation then dredging is required. If dredging is not required than no dredging takes place.

**Location and method of loading of the substance or material:** The primary locations for maintenance dredging are referred to above in **Figure 2 – Loading Site Extent and Boundary** *i.e.* the commercial estuary including all berths and ship swing basins, channel and the river mouth and seaward approaches. However, dredging can take place at any location within the commercial estuary.

**Total quantities (in tonnes and cubic metres) to be loaded:** Estimates for the annual total quantities to be dredged for the Foreshore Licence period are outlined above in **Table 2**, with a 100,000m<sup>3</sup> additional contingency.

Daily, weekly or monthly dredge quantities are difficult to define in the absence of a contract where the contractor can advise of a vessel or plants production/capacity.

Experience to date with the range of suitable vessels for maintenance dredging in a shallow water tidal estuary and noted in our current permit of 9,000tonnes/5,600m<sup>3</sup> meets the current ports requirements. Again, based on historical experience a maintenance campaign at the river mouth and seaward approaches typically has duration of about three weeks. For dredging within the commercial estuary *i.e.* channel, berths and ship swing basins, the daily product and duration is dependent on the location, quantity, operational constraints and particular vessel contracted.

## **FORESHORE APPLICATION SECTION 4(ii) PREVIOUS PERMISSION**

**Current Dumping at Sea permit:** Dump at Sea Permit No. 387, issued 28.02.2008 (**See Attachment C Dump at Sea Permit No.387**)

## **FORESHORE APPLICATION SECTION 10 – PUBLIC SAFETY – MITIGATION – MATERIAL ANALYSIS – RECEIVING ENVIRONMENT IMPACT**

### **Assessment of the predicted impacts of the proposed dumping at sea**

Maintenance dredging at Drogheda Port is primarily trailer suction dredging. As part of an EIS prepared in 1997 for a capital dredging scheme, a comprehensive study was conducted in respect of run off from the dredging vessel (**see Attachment D – Sediment Plume Analysis, extract from 1997 EIS**) which found that there is minimal release with low sediment in suspension. Often when the river is in full spate, background material levels in suspension exceeds the dredging vessels run off. Maintenance dredging is considerably less intensive than capital dredging (for which the 1997 study was conducted). Maintenance dredging is tidal, twice daily, usually commencing three hours before high water to one hour after high water, generally of a three weeks duration. Campaigns are typically twice yearly depending on weather. Run-off from the dredger will only occur in the latter stages of the loading operation when the dredger's hold is almost at capacity and generally on the ebb tide. The channel at the primary dredge site is 100mtrs in width (channel toe to toe, actual channel width breakwater to breakwater is considerably greater including the open sea outside of the breakwaters). A typical dredger's beam is only 12/14 metres, therefore extent of and spread of run-off is minimal considering the scale of the dredge, the dredge timing duration, site location and the duration of the run off.

Dredge material is contained within the enclosed hold of the vessel while dredging and in transport to the dumpsite with the usual method of disposal of material via bottom door discharge.

Given that dredging takes place in shallow water, within a defined channel, from a vessel with a draft of 3-5mtrs, where the flows are either flood or ebb, in a river that has a high fluvial material in suspension content, dispersal from dredging is difficult to quantify however as is indicated in the study undertaken as part of the 1997 EIS (**see Attachment D – Sediment Plume Analysis, extract from 1997 EIS**) there is minimal release with low sediment in suspension.

A similar argument can be made in respect of the inshore Dump Sites A2 and A3 where the depth of water at Chart Datum is only 4mtrs. At the off shore Dump Site A1 a Sediment Disbursement Analysis

using tracking drogues was carried out in November 2006. This study demonstrated there is little or no movement of dumped sediment landwards when released at Dump Site A1.

Dump Site A1 has been the subject of two Impact Hypothesis, the most recent in June 2006 as part of a capital dredging scheme. (**See Attachment E - Aquatic Ecological Study (Extract), ASU, June 2006**). This study has demonstrated that this site has a reduced species diversity and abundance due to the history of use of this dump site.

Both the commercial estuary and dumpsite fall under the navigational jurisdiction of the Drogheda Port Company and there are no conflicts with navigation or leisure boating activities.

With regard to fishing and nursery habitats, as part of the 2006 Maxol Capital Dredging programme of 1.3km of the upper estuary, an extensive amount of environmental assessment work has been commissioned for previous dredging projects (**Attachment D – Sediment Plume Analysis, extract from 1997 EIS as well as Attachment E - Aquatic Ecological Study (Extract), ASU, June 2006**). These studies demonstrated that there is minimal release of dredge material and that dredging is not expected to have any significant negative impact on protected fisheries. This information while applicable to a capital scheme where new depths were being created, can also be applied to this maintenance scheme, however, it is important to appreciate that the impacts are considerably less by virtue of the fact that the dredging is only maintaining current depths, less concentrated in terms of activity levels and plant involved, carried out over a much shorter time scale (generally 2/3 weeks as opposed to 24/7 capital dredging methodology), mostly concentrated at the river mouth and seaward approaches.

The mussel fishery is closed. There is no Ministerial Bivalve Molluscs (Production Area) Designation. There are no vessels licenced to harvest the fishery. The fishery has no management plan.

There is a government ban on all licenced net salmon fishing on the river Boyne.

There is no commercial or recreational fishing at the offshore dumpsite given that it is a spoil ground, port anchorage and quarantine area etc. There is no commercial fishing at the inshore dumpsites given the shallow water and proximity to the low water mark.

The Drogheda Port Company has carried out extensive estuarial and seaward dumpsite archaeological investigations associated with its capital dredging schemes in 1999-2000 and 2006. Both of these dredging campaigns un-earthed a range of archaeological finds.

Archaeology investigation on the river has been on-going and in respect of particular areas of concern following the 1999-2000 capital dredging (*i.e.* "The Boyne Boat" in position close approximate to the Queensboro navigational beacon 53 43.49N 006 17.17W) and the capital dredging in 2006 (*i.e.* the "Viking Boat" in position close approximate to the Milestone navigational beacon 53 43.18N 006 19.12W), agreement has been reached between the Maritime Archaeological Unit of DoEHLG and the Port Company on the mechanisms for maintenance dredging in the two particular areas of archaeological concern should dredging be required.

As part of the 2002 – 2007 maintenance programme a once off monitoring programme was put in place without any archaeological artefacts being found. Maintenance dredging by its nature is not dredging to new depths but maintaining the current depths (eroded due to sediment accretion) and therefore is not invasive to archaeology. As policy, archaeological monitoring in respect of maintenance dredging is not now required (**see Attachment F – letter from D. Fadden 2003**).

None of the dump sites fall within cSAC, SPA or pNHA designations. The loading areas however fall under the following designations:

- The River Boyne and River Blackwater candidate Special Area of Conservation cSAC & pNHA 2299
- The Boyne Coast and Estuary cSAC 1957
- The Boyne Estuary Special Protection Area SPA 4080

Potential impacts on these designated sites are addressed in detail in the **Natura Impact Statement (see Attachment G)**. This report concludes that with the correct implementation of proposed mitigation measures negative impacts on these designated sites will be avoided.

A range of potential impacts have been examined in the **Natura Impact Statement (see Attachment G)**, including potential impacts of the loading and dumping operations on coastal processes and the sediment regime within the coastal sub-cell within which the operations are located. **The RPS 2012 report Boyne Entrance Channel Dredging Impact on Sediment Cell 2012 (see Attachment H)**, examines this in detail and concludes that the quantities of materials which it is proposed to dredge and either dump or remove for beneficial re-use are sustainable in terms of the coastal processes and sediment regime. This study concluded that, in order to ensure there are no impacts on the overall coastal cell from the dredging operations, not more than an annual average quantity of 60,000m<sup>3</sup> of dredged sand should be brought ashore for beneficial reuse. The remaining 30,000m<sup>3</sup> of material that is required on average to be dredged from the Boyne Estuary entrance is equivalent to about 0.6mm sand depth over the active beach area which is considered to be minor and insignificant. Nonetheless, the Drogheda Port Company has given a commitment that the 30,000m<sup>3</sup> (average) of additional material to be dredged will be retained within the coastal cell, either within the active system (dumped at Dump Sites A2 and A3, depending on operational conditions) or placed in the offshore dump site.

### **Material Analysis**

Sediment analysis to Marine Institute specification has been undertaken at 17 sampling points; 14 within the channel from town centre to the sea, and one each at the three dump sites (**See Figures 3 and 4**). Sediment analysis on behalf of the Radiological Protection Institute was also carried out. Full results of this analysis are included (**see Attachment I**).

### **Monitoring**

In line with the sediment analysis which Drogheda Port has undertaken for previous Dump at Sea Permit periods, sediment analysis will be carried out within the Foreshore Licenced area after a five year period in compliance with the guidelines from the Marine Institute.

Drogheda Port will maintain its Tier 1 pollution response.

Drogheda Port will maintain a daily dredging register of all loading including details of the loading and dumping locations/times etc.

## **FORESHORE APPLICATION SECTION 11 – DISPOSAL & ALTERNATIVES**

### **General Information**

The seaward Dumpsite 'A1' has been used as the main dumpsite for over the past decade and a half for Drogheda Port maintenance and capital dredging. Drogheda Port Company is the only permit holder in respect of the dump site (**see Figure 1 Location of Maintenance Dumpsites**).

Detailed data about past disposal operations are included in an Excel spread sheet (**see Attachment B Annual Quantities Actually Dredged 2001- 2011**) and previous Dump at Sea Permits.

Two Impact Hypotheses have been carried on Dumpsite 'A1'. The study demonstrated that this site has a reduced species diversity and abundance due to the history of use of this dump site.

Sediment Disbursement Analysis using tracking drogues was carried out in November 2006 at Dumpsite A1. This study demonstrated there is little or no movement of dumped sediment landwards when released at Dump Site 'A1'.

The main dumpsite primarily used in the past for port maintenance and capital dredging is site Dumpsite 'A1' (**see Attachment J Figure 1 – Location of Maintenance Dredging Dumpsites**). This site is used for both sand, silt and mud materials. This is the site requested for the future maintenance dredging sea disposal 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 contained within the defined port limits of the Drogheda Port Company and is regulated as such from a navigational and control of shipping perspective. The site located within the designated anchorage of Drogheda Port in a depth of 13 - 15 metres of water at Chart Datum. The site is also within the designated ship quarantine area for implementation of the International Ship and Port Facility Security Codes (ISPS) and EU Security Directive 65/2005.

Dredge material has been disposed of at the site over the last decade and a half. There has been no significant impact or reduction on navigational depths or impact to the overall site hydrodynamics.

The north and south near shore sites 'A2' & 'A3' (**see Attachment J Figure 1 – Location of Maintenance Dredging Dumpsites**). sites are contained within the defined port pilotage limits of the Drogheda Port Company and regulated as such from a navigational and control of shipping perspective. Both have been determined by hydraulic and hydrodynamic mathematic computer modelling to be the advantageous sites to aid the coastal process and beach re-nourishment (**see Attachment A – Kirk McClure Morton Report, 2001**).

Both sites are only suitable for sand material from the river mouth and seaward approaches.

The depth at both sites is shallow with only 4mtr of water at Chart Datum. Dredger access for safe material dumping is conditional on weather, state of the time i.e. late flood or early ebb tide and vessel manoeuvrability.

## **Alternative Measures**

The OSPAR Convention recognises that dredging is essential to maintain navigation in ports and harbours as well as for the development of port facilities and that much of the material removed during these necessary activities requires disposal at sea. Within the OSPAR Convention framework dredged materials have been listed in Article 3.2 of Annex II as being permitted to be dumped at sea.

However the OSPAR Convention requires consideration of beneficial re-use of dredged materials, over dumping at sea, where possible. The OSPAR Commission's Guidelines for the Management of Dredged Material (2009) states "that where no beneficial or financially viable use for dredged material is available then disposal of material at sea is acceptable".

OSPAR lists 3 possible uses for marine dredged materials:

1. Engineering uses, land creation, fill material etc;
2. Agricultural and product use; and
3. Environmental enhancement.

Over previous dredging projects, both capital and maintenance, Drogheda Port has examined the following alternative disposal means in detail, but has rejected all, primarily on environmental and economic grounds.

Relevant findings from studies undertaken to examine alternative disposal options are:

- **Disposal on north beach as dune creation.** Not environmentally/ecologically acceptable as the area is designated as Special Protection Area (SPA), proposed Natural Habitats Area (pNHA) and candidate Special Area of Conservation (cSAC). Of particular concern is a Little Tern breeding colony at this location.

- **Disposal on south beach.** Contain gravels not suitable for an amenity Blue Flag beach.
- **Disposal behind the south training wall.** Not technically possible due to beach levels. Also area designated as SPA, pNHA & cSAC. There are high levels of sand bypass from behind the wall as the storage capacity of the wall has already been used up. In south easterly gales material would be immediately re-deposited into the approach channel.
- **Disposal in estuary polders.** Not environmentally/ecologically acceptable as these are designated as SPA, pNHA, & cSAC.
- **Other disposal methods.** Alternative means of land disposal or beach nourishment would be very expensive involving a considerable increase in project time and dredging contractor's time on site making it commercially unviable.

#### Material from the Channel, Berths & Swing Basins

The material within the commercial estuary from the Drogheda Port inner town quays to the river entrance at Mornington, including all berth, swing basins *etc.* comprises mostly silts and muds. These materials contain none of the physical or chemical properties suitable for any of the three OSPAR suitable uses. This leaves sea disposal as the only environmentally and commercially acceptable option for this material.

While the silts and mud's have no re-use or beneficial value, Drogheda Port has over the period of the previous 5 year permit been placing some sands from the bar and approach channel onto the north near shore Dumpsite 'A2' (**see Figure 1 in Attachment J**), subject to suitable tides, weather conditions and dredger manoeuvring restrictions, to assist in beach nourishment. This was a recommendation of the Drogheda Port Company Five Year Maintenance Dredging Programme, September 2001 (**see Attachment A – Kirk McClure Morton Report, 2001**).

#### Entrance and Seaward Approaches

Material at the river entrance and seaward approach is primarily sand with some gravel. This material is suitable for beneficial re-use for the construction industry provided the quantities to be dredged are large, economics of scale can be applied and market conditions are suitable. Specialist dredging and shore side handling equipment is usually required for this. This type of beneficial re-use is generally more suited to capital dredging where fresh material is being dredged rather than deposition of suspended material for which maintenance dredging is required.

However following detailed investigations and in line with the requirements of condition 'R' of Permit No. 387 (**see Attachment C**), over the past 24 months in conjunction with an aggregate company, Drogheda Port has been trialling beneficial re-use of the material from the river mouth and seaward approaches, with a proportion of this dredge material going into the construction industry. As a core principal this is not considered or promoted as aggregate dredging or winning of sand. Dredging at the river mouth and seaward approaches is primarily in response to sediment accretion caused by weather events, i.e. south east and north east gales when accelerated sediment accretion impacts immediately on safe navigational water depths. Natural accretion occurs over a longer period. Since July 2010, 94,470m<sup>3</sup> of material has been taken ashore as part of this beneficial re-use trial. This is only a portion of the total material dredged from the river mouth and seaward approaches, the balance going to the seaward dumpsite. The river mouth and seaward approaches dredging and beneficial re-use project trial are tied together, generally in response to weather events. If this beneficial trial was not being operated then all the material from the river mouth and seaward approaches would be destined for sea disposal. The Environmental Protection Agency has been appraised of this trial which is still on-going.