# Port of Waterford Masterplan

## For the 25 years to 2044

Port of Waterford

Brings you closer

# Document 3.2
Dated October 2019

# Foreword to Masterplan 2020 / 2044

Port of Waterford Company (Port of Waterford) is the commercial state company responsible for the operation and development of Waterford Port.

The port is one of five ports of National Significance within the terms of National Ports Policy 2013 and is classified as a comprehensive port on the EU's Ten-T network.

## Vision

Our vision is to be the preferred cargo gateway for the South East Region

## Mission

Our mission is to provide infrastructure and services to enable trade and economic development in the Region.

## Port Activity

The Port is active in bulk handling, break bulk/project cargoes and container handling (Lo-Lo). Bulk and break-bulk volumes in 2018 exceeded 1.7 million tonnes with container handling standing at 44k TEU. The bulk side of the business is predominately import and focussed on agri-inputs. The container operation supports a wide range of imports and regional exporters from the food, pharmaceutical and other sectors. The annual value of goods through the Port was estimated at €1.7 billion in 2017 with just under 1,000 jobs in, or supported by businesses in, the port zone.

## Economic Context

The Republic of Ireland is a trading nation and as an Island the movement of the vast majority of traded goods happens through our sea ports.

The Irish economy has achieved impressive growth/recovery since 2013 with a concentration of this growth in and around the Greater Dublin Area. Brexit remains unresolved at time of drafting and the potential challenges arising here for the economy and for supply chains are significant. Dublin Port handles the majority of the Nations freight traffic. The impact of a number of years of record growth combined with a range of actions required to prepare for Brexit has meant that Dublin Port is experiencing some level of congestion and may not be as well positioned to deal with the full range of services as heretofore provided. In that context the Country's other Ports may have to carry a greater share of the workload.

Our economic analysis recommends a range of throughput projections due to the complexity and uncertainty of the economic situation. In particular we need to be mindful that changes in the National picture could dramatically change the demands faced by the Port.

## Environmental Context

The Port operates within Waterford Harbour which includes the Lower River Suir SAC and River Barrow and River Nore SAC. The Harbour is 'shared' with a range of estuarial stakeholders and activities, including fishing, leisure, commercial and domestic activities.

The Masterplan options and actions have been devised, designed and developed on an iterative basis that included an extensive formal process of environmental assessment and consultation.

## Policy Context

Project Ireland 2040 and the National Planning Framework sets out the vision for the development of the Country and there is a real focus on development of the Regions. Port of Waterford is identified as an important economic enabler. The forthcoming Regional Spatial and Economic Strategies is expected to build on that position and similarly the Marine Spatial Plan which is in development will recognise the role of our ports.

## Port of Waterford Strategy

Strategy is formulated to position the Port within national, regional and local planning and economic policy. This positioning is supported by the long-term plan for the provision of infrastructure to deliver the future capacity required by the economy. The short to medium term delivery of strategy is communicated and monitored through the 5-year rolling corporate plan where the ports objectives and performance are set out. Ultimately ports provide infrastructure to deliver operational capacity.

## Port Capacity

Port of Waterford is currently operating well within its operational capacity. The expected demand for port throughputs has been projected out for 25 years using a low, medium and high growth scenario. The low growth scenario sees the current berth infrastructure sufficing until 2037 when an additional 200m of quay is needed. There is no requirement for expansion of the container terminal under this scenario. In the medium growth scenario, we see bulk quay investments in 2029 (200m) and 2041 (200m) with again no container terminal investment required. In the high growth scenario, the bulk investments are similar to those under the medium picture but there is need for a container terminal investment in 2035.

Under all scenarios we envisage a requirement for river management works to reduce maintenance dredging, facilitate larger ships and improve navigational safety and access. Furthermore, while there is no apparent and immediate pressure to provide enlarged quay/berth facilities it is necessary to remember that we are operating from a modest base and even moderate shifts in other parts of the economy could have a dramatic bearing on the Port of Waterford situation. This uncertainty combined with the timescales and challenges around consenting processes provides the motivation for a carefully constructed Masterplan to set out the plans for long term infrastructure provision.

The size and timing of demand will evolve and the Port needs to be well positioned and flexible in order to deliver Masterplan projects if and as needed.

## The Masterplan

This plan provides the framework to allow Port of Waterford bring forward essential projects for planning and consent purposes as required. It also clearly conveys the scope of the Port's potential to deliver for the broad range of stakeholders and forms a solid basis for the future formulation of ports and logistical policy at National level.

In developing our first formal Masterplan, Port of Waterford has:

- Invested in and worked through a comprehensive hydrodynamic and sedimentation modelling process
- Consulted with a wide range of stakeholders to understand the potential future commercial and economic challenges
- Considered the environmental impacts of possible and potential actions using Strategic Environmental Assessment, Appropriate Assessment and Strategic Flood Risk Assessment
- Looked at the geophysical attributes of the Masterplan area
- Identified the planning and land use requirements
- Assessed the engineering challenges and possible investment costs
- Engaged in an economic analysis to understand future demand and its drivers

- Assessed market trends in the ports sector and forecast our future growth scenario's
- Prepared financial models for different growth scenarios

The Masterplan seeks to set out a balanced and sustainable 'menu' of potential actions across the wide aspect of our activities. The plan is intended to be practical, achievable, modular in nature and respectful to the many stakeholders and interested parties that interact with us on so many levels.

Port of Waterford is a significant economic facilitator with an important role to play in the economic development of the South East and further afield. To fulfil its role the Port needs to be positioned to deliver the infrastructure and capacity required of it in a timely manner. At a time of significant short-term uncertainty (e.g. Brexit) and when we are seeking to find responses to Climate Change and understand the future shape of our agriculture and transportation models, the onus is on us to have well considered plans in place.

**Des Whelan**
**Chairman.**

**Frank Ronan**
**Chief Executive.**

**Date: 21st October 2019**

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# 1 Introduction

## 1.1 Purpose of the Masterplan

In 2018 the Port of Waterford commissioned a team of professional advisors to work closely with the port management to develop a Masterplan for the port for the next 25 years.
The purpose of the Masterplan is to allow the port to plan for future traffic growth and respond to potential developments in shipping operations and technology, including increases in size of vessels calling at the port, in a logical and timely fashion.

The Masterplan considers current port operations and port capacity, and focuses on immediate improvements to navigational access to the port, reductions in maintenance dredging requirements through the installation of new river training works and identifies and evaluates long term port development options.

This introductory section provides the overall context and objectives of the Masterplan, including a brief description of the existing Port of Waterford and a summary of the port's vision for the development of the port over the next 25 years.

## 1.2 General background

Waterford has a strong maritime heritage, with the protected estuary of the River Suir which was used as a natural harbour by the Vikings over 1,200 years ago. The original commercial port at Waterford was developed from the time of the Vikings and was formally placed under the auspices of the Waterford Harbour Commissioners in 1816. The original port was located on the River Suir in the centre of Waterford City, but the commercial port activities were relocated in 1993 to new facilities on the Belview

*Figure 1.1 – Port of Waterford – Belview site.*

site, five kilometres downstream from the city centre on the north bank of the River Suir.
The Port of Waterford is a State-owned commercial company responsible for the management and development of the Port of Waterford. The port is the fifth largest of the State commercial ports in terms of total tonnage handled and the facilities are considered an infrastructure asset of national importance. The port is designated as a Port of National Significance (Tier 2) within the terms of the National Ports Policy.

The current commercial port comprises some 960m of quays on the north bank of the River Suir at Belview, together with open and covered storage areas and warehouses within the 265Ha area of the designated Belview Port Zone. The general layout of the Belview commercial port area is shown in Figure 1.2 – Container and bulk berths at Belview Port.

*Figure 1.2 –Container and bulk berths at Belview Port.*

## 1.3 The Masterplan Objectives

The ***VISION*** of the Port of Waterford is to be the preferred cargo gateway for the South East Region.

The ***MISSION*** of the Port is to provide the infrastructure and services to enable and facilitate trade and economic development in the region.

This Port Masterplan has been prepared to achieve this vision by providing a clear direction to undertake this mission over the next 25 years.

This Masterplan addresses a wide range of issues including:

- Financial – capital expenditure, cash flows, debt servicing capacity, etc.
- Economic – traffic levels, commodities, shipping patterns etc.
- Engineering – port marine approaches, dredging, berths, landside infrastructure etc.

- Operations – commodities, handling methods, storage etc.
- Environmental – Impacts and mitigation measures.

This has enabled the port to:
- Identify potential levels of future demand for port infrastructure and services
- Identify areas and scope for development
- Prepare alternative development scenarios/schemes
- Evaluate these alternatives and identify preferred option(s)
- Prepare a Masterplan

This Masterplan, prepared to facilitate the ongoing achievement of Port of Waterford's mission, includes:
- A description of the preferred development option(s)
- The levels of investment required
- The concept design and sample phasing of the development(s)
- Identification of the processes and resources required for successful implementation.

## 1.4 Preparation and format of the Masterplan document

### 1.4.1 Main Contributors

This Masterplan has been prepared by Port of Waterford with technical support and contributions from:
- ABP Mer – Hydraulic Modelling/Option Evaluations
- Anthony D Bates Partnership – Dredging and marine access issues
- Jim Power Economics – Economics and trade forecasting
- Malone O'Regan - Engineering and Environmental Issues
- Raymond Burke Consulting – Economic Impacts
- SLR Consulting – Landside Planning
- Stephen Cork – Consultant – Port Masterplanning

### 1.4.2 Overview of contents of this document

This document is in ten Sections with four Appendices.
- **Section 1** contains an introduction and overview of the port and the Masterplan objectives.
- **Section 2** contains a review of the existing port management, infrastructure and operations
- **Section 3** contains economic and financial reviews of the port.
- **Section 4** presents a historical analysis of traffic through the Port of Waterford, together with forecasts of future traffic flows, with low, medium and high growth scenarios.
- **Section 5** determines the future development needs, based on existing port operations and KPIs to identify the scope of development required to meet future traffic flows identified in Section 4.
- **Section 6** considers a range of proposals to be considered for the future physical development of the port
- **Section 7** sets out the land use strategy for Belview Port and defines the Ports response to growth in demand for the facilities and services it provides.
- **Section 8** sets out the major Policies and guidelines at European, national and local level which impact on the development of Port of Waterford.
- **Section 9** contains the assessment and mitigation of marine environmental impacts
- **Section 10** provides guidance and direction for future development, including a phased action plan, outline implementation programmes and financing strategy.

## 1.5 Main Stakeholders and Consultation Process

Stakeholders with direct interests in the Port of Waterford facilities, operations and future plans comprise a wide range of port users, including: -
- port customers

- shipping lines and supply chain providers
- government agencies and regulators
- economic development agencies
- environmental regulators
- employees and operators
- the general port community of Waterford.

### 1.5.1 Regulatory Bodies - Environmental issues

Article 6 of the Strategic Environmental Assessment (SEA) Directive and Article 11 of S.I. 435 of 2004 requires the competent authority (Port of Waterford) preparing a Plan or Programme for the implementation of specific projects to engage in consultation with specific environmental authorities (statutory consultees).

The five statutory consultees are:

- Environmental Protection Agency (EPA)
- Department of Housing, Planning and Local Government (DHPLG)
- Department of Agriculture, Food and the Marine (DAFM)
- Department of Communications, Climate Action and the Environment (DCCAE)
- Department of Culture, Heritage and Gaeltacht (DCHG)

For the development of this Masterplan, PoW has undertaken a series of voluntary consultations with these statutory authorities and incorporated their comments and feedback as appropriate.

### 1.5.2 Other Bodies

In addition to the above regulatory bodies there are a number of non-statutory stakeholders including:

- An Taisce
- Bord Iascaigh Mhara (BIM)
- Chambers of Commerce (Waterford, Wexford, Kilkenny)
- Coastwatch Europe
- Department of Business, Enterprise and Innovation
- Department of Transport, Tourism and Sport (NB the Parent Department)
- Department of Rural and Community Development
- Inland Fisheries Ireland
- Irish Ports Associations
- Irish Environmental Network (Environmental Pillar)
- Irish Maritime Development Office (IMDO)
- Local Heritage Officers (Waterford, Wexford, Kilkenny)
- Local Authorities (Waterford, Wexford, Kilkenny)
- Local Amenity Groups including the Cheekpoint and Faithlegg Development Group
- National Parks and Wildlife Service
- Office of Public Works (OPW)
- Passage East Ferry Company
- Southern Regional Assembly
- The Marine Institute
- The Sea Fisheries Protection Authority
- Transport Infrastructure Ireland

### 1.5.3 Port operators and port users

Waterford Port operators and port users include the following ship owners, charterers and agents, as well as the port stevedoring companies, who are all important stakeholders with commercial interests in the future development of Port of Waterford:

- Licenced Stevedores
  - Southeast Port Services (Bulk)
  - Suir Shipping (Bulk)

- Shipping Lines
  - Samskip (Lo-Lo)
  - DFDS Container Line
- Ships Agents
  - Southeast Port Services
  - Stokestown Port Services
  - Hamilton Shipping
  - Doyle Shipping Group
  - Stafford Shipping
  - Celtic Shipping Agency
- Ship Line Handling
  - Seamus Healy
- Towage
  - Fastnet Shipping
  - South East Tug Services
- Freight Forwarders/ Customs Clearance
  - Leeside Shipping
  - Bell Transport
  - Emerald Cargo
- Others
  - Waterford Port Services
  - Belview Technical Services
  - Smartply Europe
  - Store-All
  - Glanbia
  - ITW MIMA
  - Seedtech,
  - Target Fertilisers
  - Glanway
  - Comex
  - Cefetra
  - R&H Hall
  - ADM Arkady

## 1.6 Consultation Process

A process of consultation has been carried out as part of the Masterplan process. Meetings were held with the main regulatory bodies, relevant non-statutory bodies and port operators and port users. This Masterplan, together with the Strategic Environmental Assessment (SEA) is available online on the PoW website.

In addition, public meetings have been held to obtain feedback from the public on the Port Masterplan. A summary document is also available to the pubic outlining in non-technical language the Masterplan objectives and vision for the port for the next 25 years.

## 1.7 Scope boundaries of the Masterplan

This Port Masterplan concentrates on the physical developments required to efficiently handle the future traffic demands within the physical boundary of the existing port estate and marine approaches. The site location and boundaries of the Port Masterplan are shown in Figure 1.3 below.

In addition the Masterplan addresses the future requirements for additional land areas, improvements to road and rail access immediately adjacent to the port estate and marine improvements such as dredging and marine training walls required for future navigation.

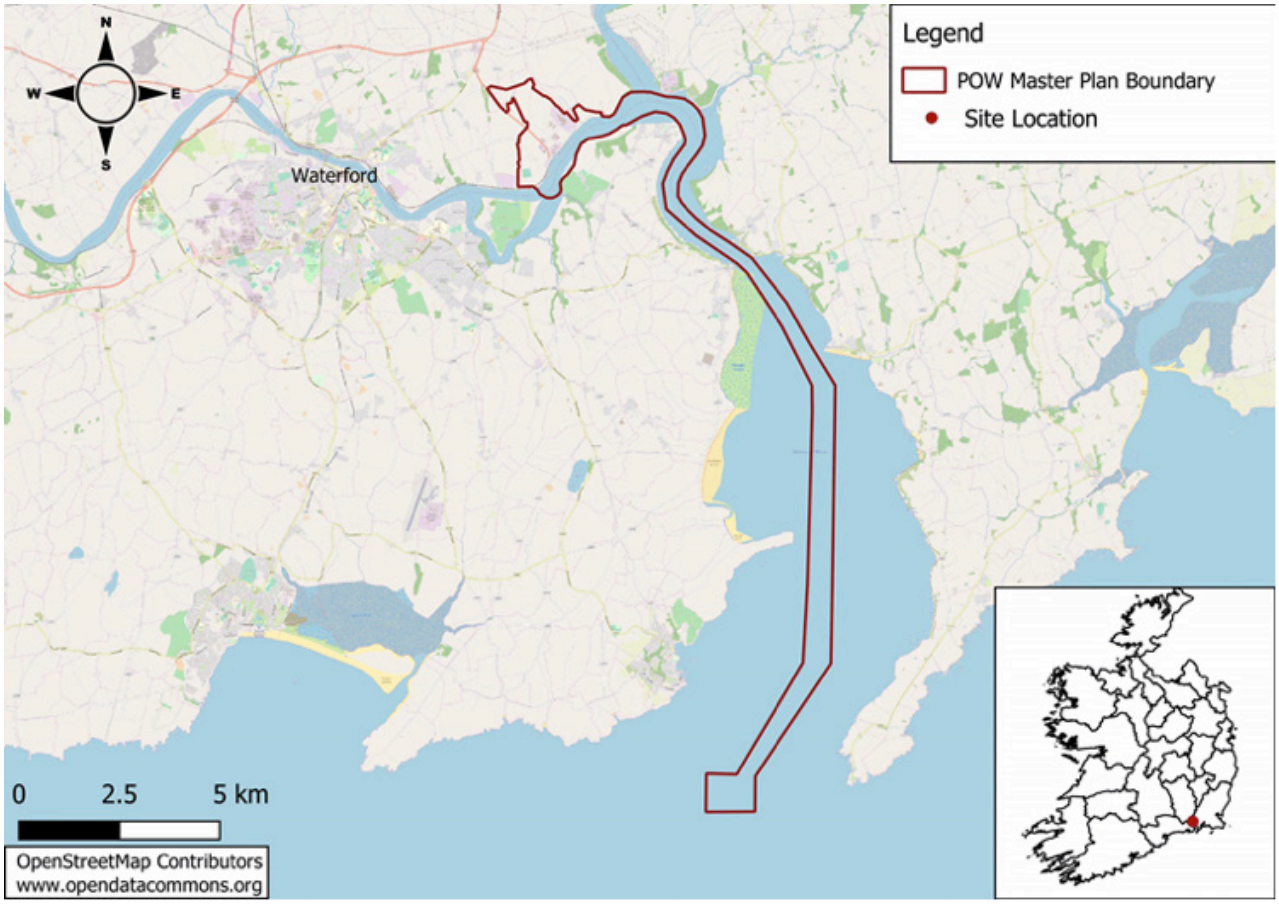



*Figure 1.3 – Port Masterplan boundary covering existing port estate and marine approaches*

# 2 Review of existing port infrastructure and operations

## 2.1 Overview

This section contains a review of the existing port management, infrastructure and operations.

## 2.2 Port ownership and concession agreements

The port is owned by the State and managed and operated by the Port of Waterford, a commercial semi-state company, governed by the Code of Practice for the Governance of State Bodies. The shareholder is the Minister for Transport, Tourism and Sport.

Bulk handling at Belview Port is carried out by licenced stevedores, these stevedoring companies are responsible for the provision of the necessary labour resources, cargo handling equipment and bulk storage (warehousing).

Container handling is carried out directly by the Port Company (container terminal division) who provide labour, specialised container handling equipment and various related and ancillary services.

## 2.3 Port Management and stevedoring

The Port of Waterford management team comprises a Board of Directors and CEO overseeing four operational sectors as shown in Figure 2.1 below:

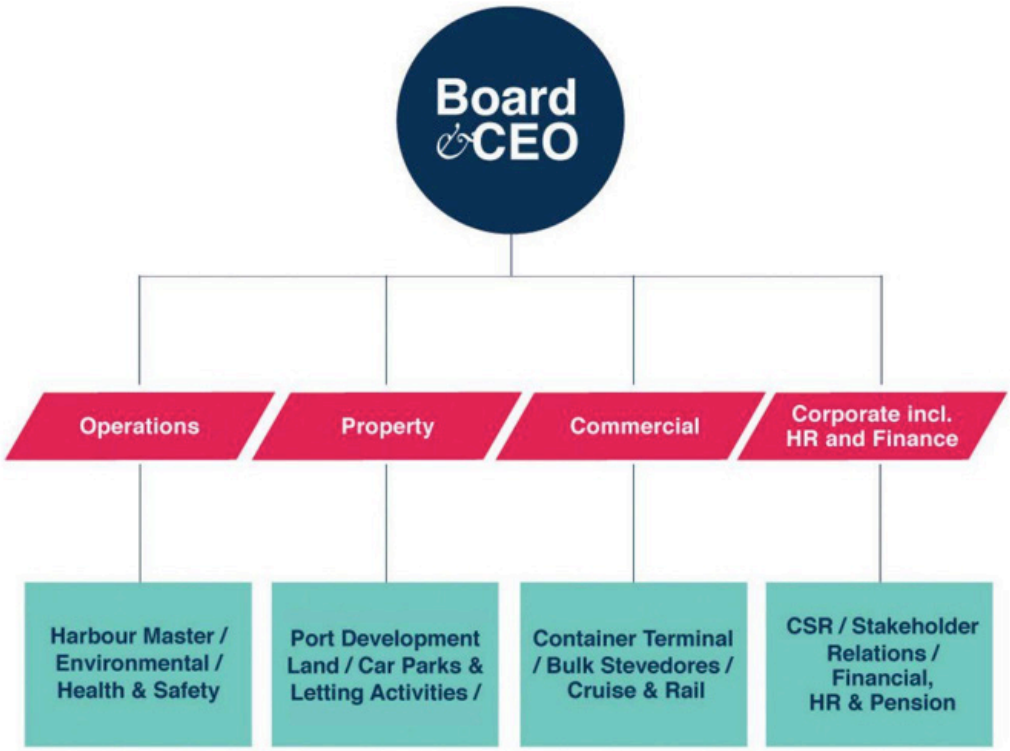



*Figure 2.1 – Port of Waterford Management Structure*

The Port of Waterford management team is directly responsible for the management of the container operation as well as licencing and oversight of the bulk, project and general cargo terminals which are licensed to Southeast Port Services and Suir Shipping.

## 2.4 Port Infrastructure

### 2.4.1 Marine access and operations

#### 2.4.1.1 Existing marine access

The marine access to the Port of Waterford is shown on Admiralty Chart 2046 – Waterford Harbour. The entrance to Waterford Harbour lies at the mouth of the estuary between Dunmore East and Hook Head. The entrance is approximately two nautical miles (3,700m) wide and marked on the west by the Hook Head Lighthouse located at 52°07.3'N 006° 55.7'W. and a port buoy at the 10mCD contour to the east of Dunmore East.

The total transit from the mouth of the estuary to the berths at Belview Port is approximately 10 nautical miles and typically takes around one hour from arrival (pilot on board) at Cheekpoint and takes a further 15 – 30 minutes to turn and berth vessels alongside.

The access channel from the mouth of the estuary to the berths at Belview Port includes a -6.5mCD maintained channel two nautical miles (3700m) long and 100m wide) through Duncannon Bar and a second -6.5mCD maintained channel (600m long and 100m wide between Cheekpoint and Snowhill Point.

The tidal range at Belview varies between 3.6m on neap tides to 4.6m on springs, allowing access to vessels with operating drafts of up to 9.0m over the high tide period.

Large vessels, currently those with up to 9.0m operating draught, plan to arrive at the pilot pick up point around 1 hour 15 minutes before high tide to allow time to transit, turn and back up to the berth in the period leading up to and on high tide.

The navigation channels through Cheekpoint Lower Bar and Duncannon Bar are regularly dredged two to three times a year, with an average annual volume over the past three years of around 185,000m$^3$ and 230,000m$^3$ dredged respectively from each area. Other minor areas are also dredged infrequently such as the berths at Belview Port, the Turning Basins and Great Island Power Station Jetty.
The marine aids to navigation along the channel are good, with fixed leading lights and sector lights along the channel length, supplemented by buoys marking the designated channel in areas of reduced widths and along the dredged channels.

Tide levels at Cheekpoint (52016'N 70 00'W - closest to the berths at Belview) are as follows:

- MHWS +4.6mCD
- MHWN +3.6mCD
- MLWN +1.6mCD
- MLWS +0.8mCD

Tidal streams at the entrance to the channel (52010.5'N 6056.4W) reach up to 1.5 knots 3-4 hours after high tide. In addition, currents at the berths can restrict times of turning, berthing and unberthing to periods of slack water.

#### 2.4.1.2 Vessel manoeuvring and turning areas

On arrival at the port, commercial vessels utilise one of two turning circles, either off Belview Container Quay and O'Briens' Quay or within the area just beyond the downstream end of Belview Quay (between Flour Mill and Snowhill at Cheekpoint Upper Bar. The downstream turning circle is the larger and currently limits the maximum length of vessels which can normally access the port to around 190m LOA.

The location of the existing marine approach channel, dredged areas and turning circles are shown on Figure 2.1 – Port of Waterford location and marine access.

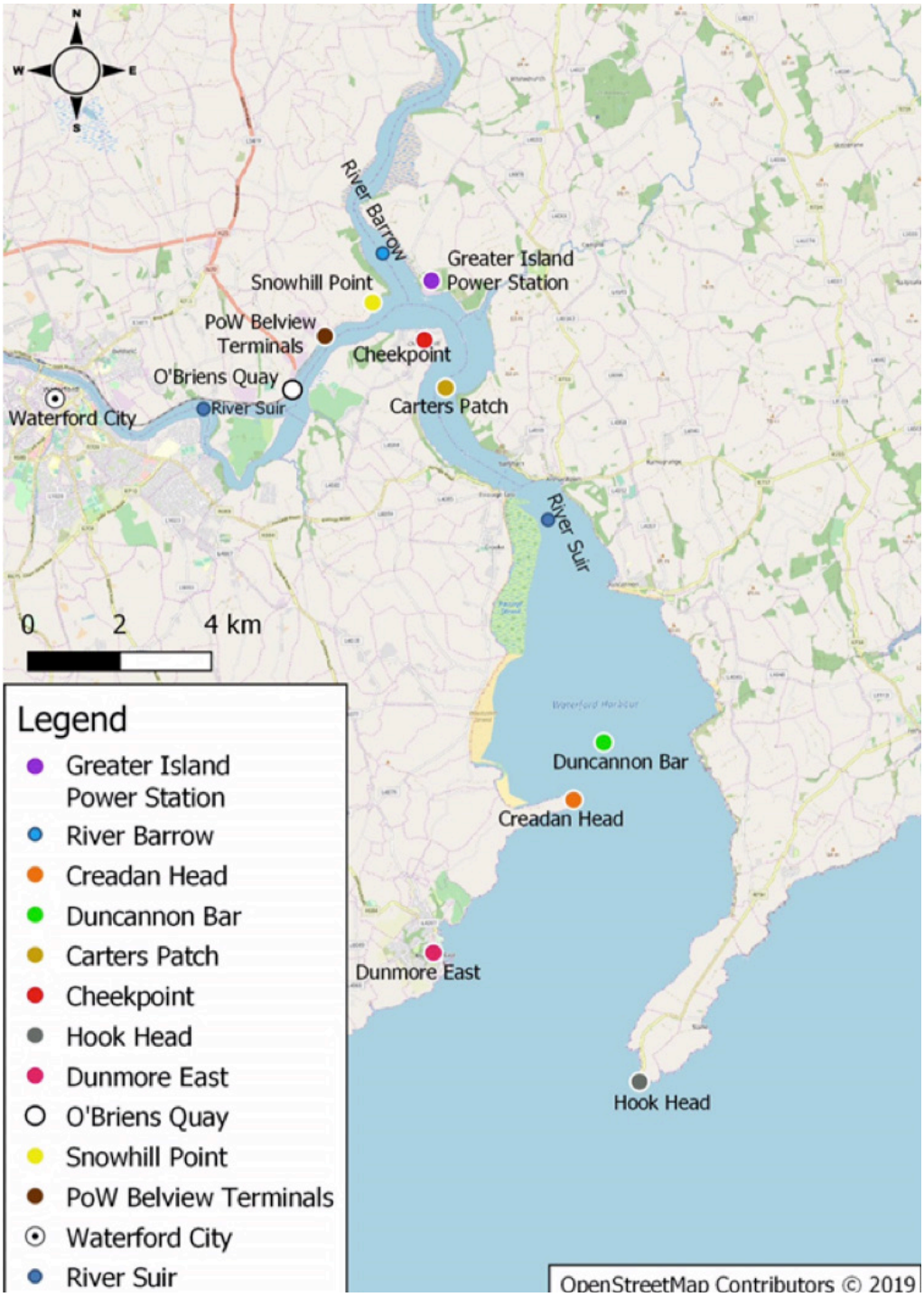



*Figure 2.2 – Port of Waterford location and marine access*

### 2.4.1.3 Vessels calling at Belview Terminals

Currently between 350 and 450 vessels call at the Belview terminals per annum. Table 2.1 below summarises the annual vessel calls at the Belview terminals, split by type of vessel, between 2008 and 2018. In addition to these vessels calling at the Belview terminals, around 100 vessels pa call at New Ross. These vessels are piloted through the common channel from the mouth of the estuary to Cheek Point before continuing north under the Barrow Bridge to New Ross.

It is noted that recent numbers of container and project cargo vessel calls are significantly lower than the "peak year" of operations in 2008, while the number of calls by multipurpose bulk vessels and the size of bulk vessels calling at Waterford have increased significantly from 2008 - 2018.

| | Years | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VESSEL TYPE | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Container | 391 | 331 | 166 | 148 | 102 | 100 | 102 | 101 | 100 | 101 | 99 |
| Multipurpose(bulk) | 191 | 177 | 217 | 197 | 205 | 254 | 238 | 254 | 216 | 243 | 304 |
| Break bulk and project cargo | 137 | 47 | 49 | 63 | 37 | 42 | 56 | 58 | 38 | 65 | 72 |
| Cruise | 3 | 6 | 7 | 3 | 4 | 6 | 1 | 4 | 3 | 6 | 8 |
| Other | 0 | 2 | 2 | 4 | 3 | 4 | 5 | 1 | 0 | 12 | 3 |
| TOTAL | 722 | 563 | 441 | 415 | 351 | 406 | 402 | 418 | 357 | 427 | 486 |

*Table 2.1 - Vessels calling at Belview terminals 2008 - 2018*

Table 2.2 below gives the basic dimensions of the range of general cargo and multipurpose vessels currently using the Port of Waterford Belview terminals.

| DWT (tonnes) | Loa (m) | Lpp (m) | Beam (m) | Max Draught* (m) |
|---|---|---|---|---|
| 30,000 | 188.0 | 179.0 | 27.7 | 11.3 |
| 25,000 | 178.0 | 169.0 | 26.4 | 10.7 |
| 20,000 | 166.0 | 158.0 | 24.8 | 10.0 |
| 15,000 | 152.0 | 145.0 | 22.6 | 9.2 |
| 10,000 | 133.0 | 127.0 | 19.8 | 8.0 |
| 5,000 | 105.0 | 100.0 | 15.8 | 6.4 |
| 2,500 | 85.0 | 80.0 | 13.0 | 5.0 |

*Table 2.2 - General cargo and multi-purpose vessel dimensions (2,500dwt – 30,000dwt)*
*Source: PIANC WG Report121 – 'Harbour Approach Channels Design Guidelines'*
**note: Operating draughts are generally less than the "Max Draught" shown in table*

### 2.4.1.4 Current issues and future requirements for marine access

Sizes of vessels calling at Belview are currently limited by the access channel dimensions (widths and depths), limitations on curved sections of the approaches and turning circles off the berths (diameters and depths).

The ongoing cost of maintenance dredging of the approaches and turning circles represents a significant annual expenditure for the port.

Transit through the Carters Patch section of the channel currently presents a potential navigational safety hazard for larger vessels, since the curve of the channel at this point requires vessels to "crab" when manoeuvring through this area.

There is a demand to allow access to the port for larger vessels in the future to maintain market share, to attract future additional traffic and to maintain the economies of scale and competitiveness of the supply chain. This will require deepening and widening the approach channels and increasing the diameters and depths of the turning areas.

*Figure 2.3 – Width of turning circle and manoeuvring area off the berths at Belview*

## 2.4.2 Port area and berths

The designated Belview Port Zone comprises a total of some 265 Ha (Hectares) of development land currently zoned for port related development. This areas includes the port operational area, open and covered warehousing and storage areas behind the port and some undeveloped areas available for future port related developments including storage, processing and packaging. A general view of the overall Belview Port Zone is shown in Figure 2.4 below

The quays at Belview currently comprises a total berthing length of 840m (nominally 5 - 6 berths) owned

*Figure 2.4 – Port of Waterford looking downstream showing the Belview terminals, Belview Port Zone and O'Briens' quay*

by Port of Waterford plus the 120m long O'Briens' Quay bulk berth privately owned by Suir Shipping . The commercial berths at Belview were constructed over the period 1993 to 2008.

The PoW quays comprise 500m of container berths, with a depth alongside of -8.5mCD and 343m of bulk berths, with a depth alongside of -9.0 to -10.5mCD. The quays are constructed as a suspended deck supported on tubular piles, with a rock armoured revetment under the decks. Cross sections of the berths are shown in Figures 2.8 and 2.9.

The overall PoW container and bulk berth areas at Belview Port are shown in Figures 2.5 and 2.6 below. The layout of the Suir Shipping Bulk Berth at Belview is shown in Figure 2.67.

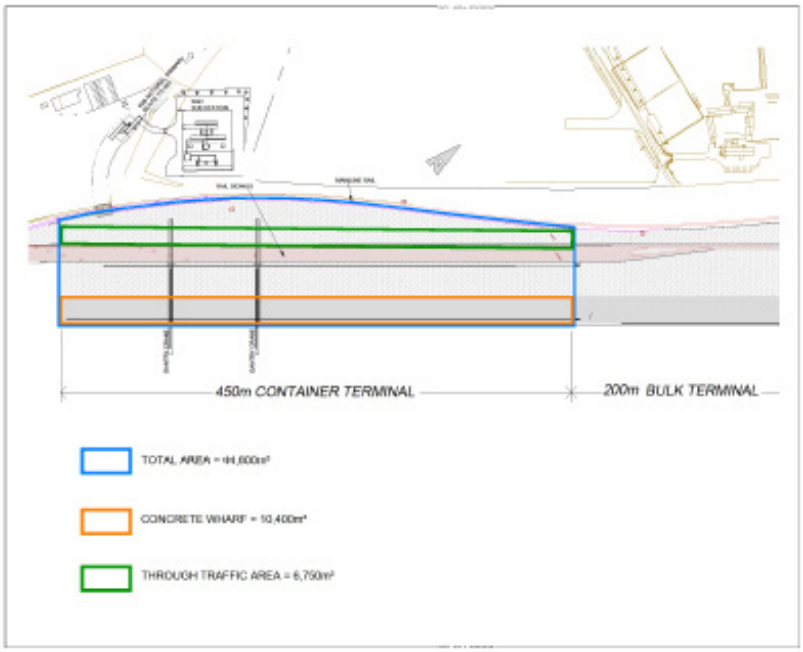



*Figure 2.5 – Layout of existing Container Berths*

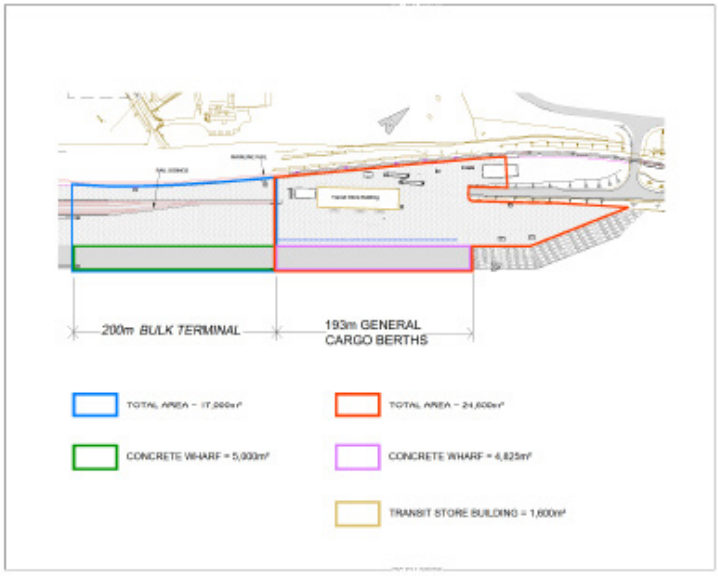



*Figure 2.6 – Layout of existing Bulk and General Cargo Berths*

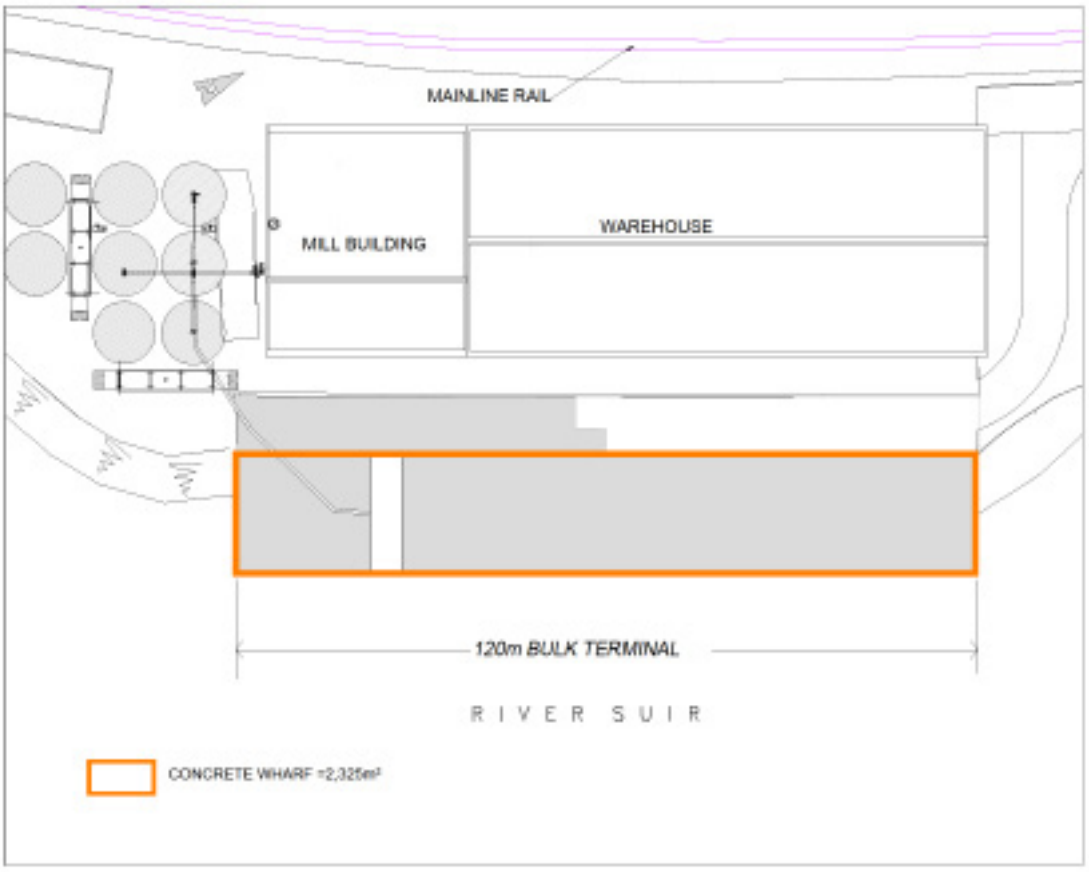



*Figure 2.7 – Layout of Suir Shipping Bulk Berth at Belview*

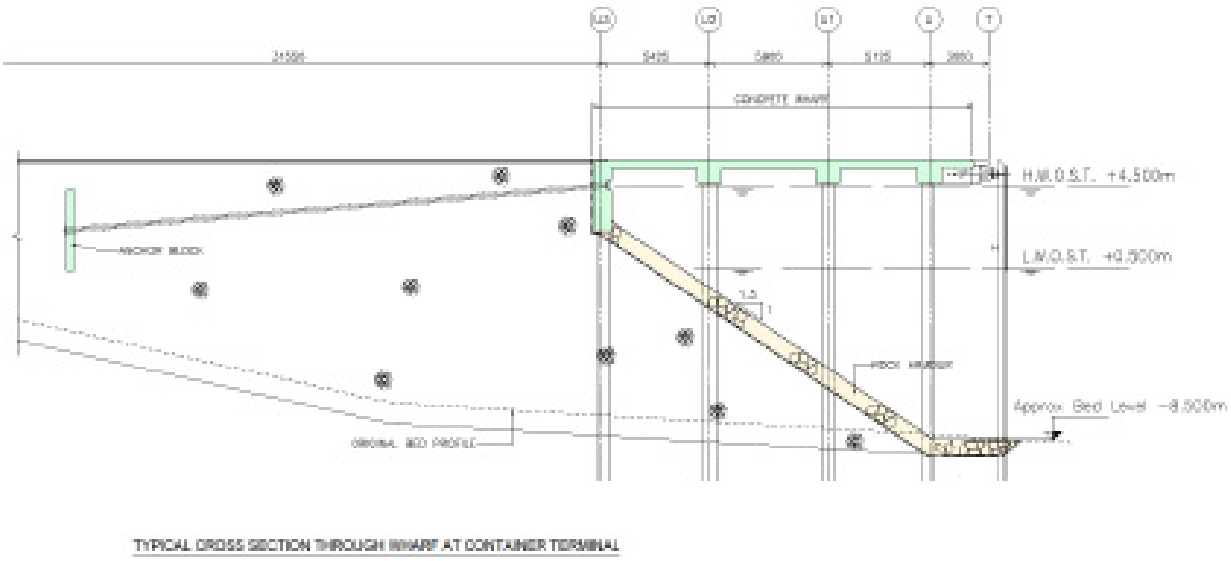



*Figure 2.8 – Typical cross section through the container berths*

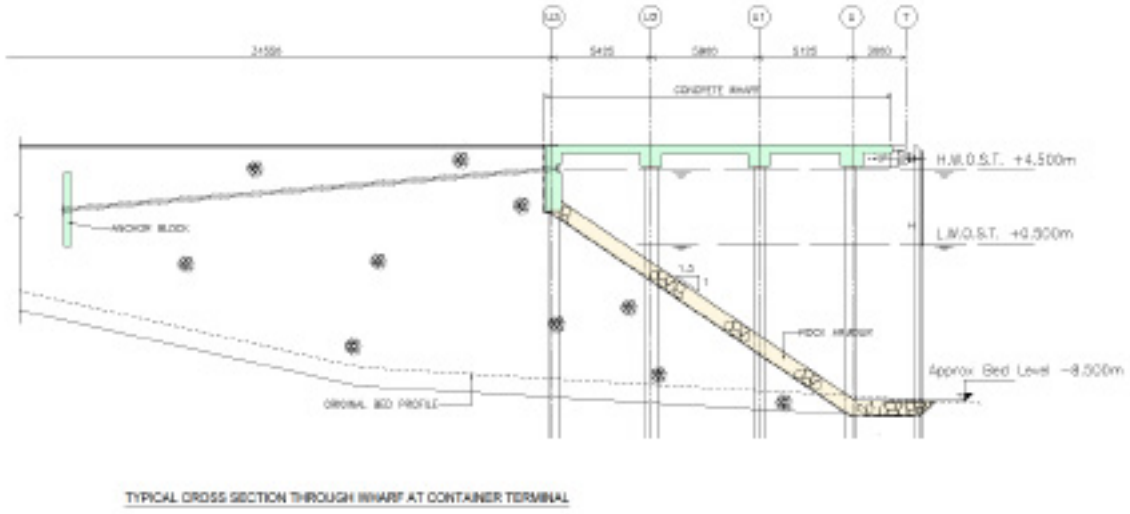



*Figure 2.9 – Typical cross section through the bulk berths*

A summary of the dimensions of the berths are shown in Table 2.3 below.

| Facility | Quay Length(m) | Depth alongside (m) | Max Ship length (m) | Cargo handled |
|---|---|---|---|---|
| Belview Bulk Terminal | 393 | -9m to -10.5CD | 190 | Bulk and general cargo |
| Belview Container Terminal | 450 | -8.5mCD | 160 | Container and project |
| Suir Shipping | 120 | -7mCD | 120 | Bulk |

*Table 2.3 – Port of Waterford Berths at Belview*

## 2.4.3 Port equipment and landside storage areas

### 2.4.3.1 Container handling

The container handling equipment is owned and operated by Port of Waterford. Container handling is carried out using two wide span rail mounted quayside container cranes, loading and landing containers directly to/from the quay. Two reachstackers are used for container handling in the container yard area.

*Figure 2.10 – Belview container berth and quayside container cranes*

The principal dimensions and capacities of the rail mounted quayside container cranes and other shore side equipment are shown in Table 2.4 below.

| Equipment Type | Number, make and year of manufacture | Rail gauge (m) | Outreach (m) | Backreach (m) | Boom air draft (m) | Lifting capacity (Tonnes) |
|---|---|---|---|---|---|---|
| Rail mounted quayside crane | 1 No. Morris 1993 (refurbished 1997) | 48 | 30 | 20 | 29 | 35 |
| Rail mounted quayside crane | 1 No. Leibherr 2002 | 48 | 30 | 20 | 32 | 40 |
| Other equipment | 2 No Linde reachstackers | n/a | n/a | n/a | n/a | 35 |

*Table 2.4 – Container handling equipment at PoW*

### 2.4.3.2 Bulk Handling

The bulk handling equipment is supplied and operated by the two stevedoring companies (Suir Shipping and SEPS) and comprises Mobile Harbour Cranes equipped with large grabs for handling bulks, fixed arm cranes used for timber handling and supporting equipment such as load spreaders for general and breakbulk cargoes, front end loaders, hoppers and cactus grabs for scrap cargoes. The details of the harbour cranes are shown in Table 2.5 below.

| Equipment/supplier | Number/Make | Lift capacity (tonnes) | Grab size (m3) | Handling rate (tonnes/hour) |
|---|---|---|---|---|
| Mobile Harbour Crane - Suir Shipping | 1 No. Liebherr 280 | 84 | 30 | 1,000 – 1,500 |
| Mobile Harbour Crane - Suir Shipping | 2 (Standby) | 30 | | |
| Fixed arm cranes - Suir Shipping (Used for bale and timber handling) | 2 No. Liebherr LH60 | 8 | 6 | 400 |
| Mobile Harbour Crane - SEPS | 1 No. Liebherr 250 | 50 | 20 | 800 |

*Table 2.5 Bulk Handling Equipment at PoW*

*Figure 2.11 – Bulk berths and mobile harbour cranes operating at Belview*

### 2.4.3.3 Port storage/operating areas

The area currently in use for direct port activities immediately adjacent to the Belview commercial berths is around 8.6Ha. The southern boundary is defined by the berthing line and the northern boundary is defined by the mainline rail track running east-west giving an operational width of around 100m behind the berths. This area is used for direct loading/discharge of cargo and includes some open/covered storage areas.

The container operations occupy around 4.5Ha within the port, 4.2Ha for bulk operations and approximately 1.3Ha for bulk at O'Briens' Quay.

There is a further 2.8Ha of privately owned open storage area currently used for wind turbines etc. not owned by PoW adjacent to the immediate port area.
The PoW landside areas are shown in Table 2.6 – Port storage and operational areas

| Location | Description | Area (m2) | Total (m2) |
|---|---|---|---|
| Container Terminal | Operational area | 37,850 | |
| Container Terminal | Through traffic area | 6,750 | |
| | **Container Terminal sub-total** | | **44,600** |
| Bulk Terminal | Concrete wharf | 9,825 | |
| Bulk Terminal | RUBB Store | 1,600 | |
| Bulk Terminal | Operational area | 30,225 | **41,650** |
| | **Bulk Terminal** | | **86,250** |
| **TOTAL** | | | |

*Table 2.6 – Port storage and operational areas at PoW*

## 2.4.4 Port infrastructure services, power, water etc.

### 2.4.4.1 Power
Electrical power is provided by ESB, with a high-voltage (110kV) electrical network running from the nearby CCGT power generating station 3.5 kms from Belview Port, to a 38kV Sub-station in the heart of Belview Port. There are large energy users in area, ranging up to 4MW and 7 MW.

### 2.4.4.2 Fresh Water
Currently, fresh water is provided by means of a number of ground water wells supplying the quays and individual premises. The Port of Waterford has an 800 cubic metre storage tank in the port.
The Belview area in general is served by the South Kilkenny Water Supply Scheme, currently at 3,300m3 water per day. The Water Supply Scheme has the potential to supply 15,000 m3 water per day (of which 9000 m3 will be available for industrial use)

The water scheme serves the local IDA industrial park, approximately 1 kilometre away. There is sufficient capacity to extend this mains supply to bring potable water to the port for drinking and fire purposes and to serve the other businesses in the Belview Port zone.

### 2.4.4.3 Firefighting Water
Water for firefighting within the port area is supplied via a local ground water well linked by a fire main to the quays. Fire-fighting capability to all businesses at Belview, south of the L3412 junction to the IDA business park, is limited to local fire water storage tanks. The Port of Waterford has a large storage tank for fire water connected to the fire mains serving the port quays (1,100 cubic metres).

### 2.4.4.4 Gas
The natural gas network was extended to the Belview area with the construction of a pipeline between Ballinlaw (Great Island pipeline) and Belview as part of the Glanbia development. The Above Ground Installation (AGI) is located at IDA Belview.

### 2.4.4.5 Telecoms
An existing telecommunications wholesaler has a fibre to the cabinet (FTTC) fibre optic broadband in the area. Other providers can supply dedicated wired and wireless services to the area as required.

### 2.4.4.6 Waste water
There is a Municipal Waste Water Treatment Plant nearby which is part of the Waterford Main Drainage Scheme and caters for the needs of Waterford City and the Environs of South Kilkenny. Port of Waterford will continue to enhance its waste water treatment processes and this may include routing some waste streams to the Municipal Plant.

## 2.4.5 Hinterland connections and modal split (road, rail,)

### 2.4.5.1 Road access
The port at Belview is located on a national primary route, the N29, which links directly to the M9/M7 motorways and N25 and N24 national roads

The main road access at the port entrance is currently a single carriageway with 2.5m hard shoulder. There is an immediate objective to form a roundabout at the ‘Glanbia’ turn-off and bring the remaining N29 into the Port down to a 50/60 KPH road.

This will facilitate access to port lands, enhance the safety of the port approaches and deal with a dangerous junction.

### 2.4.5.2 Rail access

Belview Port has full rail access with four rail sidings into the container terminal at Belview, allowing containers to be loaded directly to/from ships or road transport. There was a twice weekly rail service connecting the North West Ireland region in/out of Port of Waterford chartered by DFDS and operated by Irish Rail, but this operation is currently suspended. It is a core objective of PoW to get this connection to the West/North-West back in action.

*Figure 2.12 – Aerial view of Belview terminals showing main road and rail access*

### 2.4.6 Port infrastructure - general condition and useful life

The main quays at Belview were constructed over the period 1993 to 2008. The main structures, including piles and deck, are regularly inspected and are generally in good condition, with only some minor damage to the fendering system in places.

In 2018 PoW embarked on an extensive structural upgrade of the oldest section of quays. With regular surveys and the ongoing annual expenditures made by PoW on cathodic treatments, repairs and other measures the objective is to ensure all structures reach and exceed their anticipated 50 year useful lives.

## 2.5 Port Operations

### 2.5.1 Total port throughput 2008 - 2018

Port throughput for the Belview Terminals for the past 10 years (2008 – 2018) showing breakdown of tonnages handled by commodity is shown in Table 2.7 below.
Significant issues include:

- Container traffic has reduced significantly from 1,190,000tonnes handled in 2008 to 295,000tonnes in 2018. This drop in container throughput was primarily due to the loss of regular shipping services as a result of the financial crisis and an ensuing movement to consolidate wherever possible. The net effect was to focus an even larger proportion of the Nation's trade through Dublin Port.

- Dry bulks ( primarily fertilizers, feedstuffs and cement products) have increased steadily from 702,000tonnes in 2008 to 1,551,000 in 2018
- Overall break bulk and general cargo (excluding containers) has remained fairly constant at 174,000tonnes in 2008 and 150,000tonnes in 2018.

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Container Traffic** | | | | | | | | | | | |
| Laden Containers | 62,000 | 45,000 | 30,000 | 25,000 | 15,000 | 14,000 | 13,000 | 13,000 | 14,000 | 15,000 | 15,000 |
| Laden & Empty TEU | 173,000 | 119,000 | 119,000 | 64,000 | 39,000 | 40,000 | 36,000 | 40,000 | 43,000 | 44,000 | 44,000 |
| Gross Tonnage of Lo-Lo Goods | **1,536,000** | **1,142,000** | **727,000** | **644,000** | **387,000** | **365,000** | **340,000** | **348,000** | **365,000** | **374,000** | **383,000** |
| **Bulk & General Cargoes** | | | | | | | | | | | |
| Fertiliser | 370,000 | 340,000 | 520,000 | 445,000 | 450,000 | 530,000 | 530,000 | 529,000 | 495,000 | 539,026 | 629,808 |
| Feedstuffs, Grains & Cereals | 160,000 | 171,000 | 157,000 | 179,000 | 212,000 | 291,000 | 303,000 | 390,000 | 324,000 | 439,138 | 655,464 |
| Cement, Steet & Timber | 274,000 | 176,000 | 151,000 | 183,000 | 171,000 | 183,000 | 156,000 | 212,000 | 184,000 | 241,062 | 312,793 |
| Fuel Oil | 25,000 | 17,000 | 13,000 | 0 | 0 | 0 | 12,000 | 10,000 | 0 | 0 | 0 |
| Other | 72,000 | 24,000 | 27,000 | 66,000 | 33,000 | 60,000 | 115,000 | 87,000 | 43,473 | 109,683 | 103,514 |
| **Total - All Bulk Terminals** | **901,000** | **728,000** | **868,000** | **873,000** | **866,000** | **1,064,000** | **1,116,000** | **1,228,000** | **1,046,473** | **1,328,909** | **1,701,579** |
| **Bulk & General Cargo by Terminal** | | | | | | | | | | | |
| O'Brien's | 249,018 | 221,184 | 279,802 | 300,098 | 341,705 | 423,049 | 147,458 | 183,721 | 85,312 | 235,079 | 344,928 |
| Port of Waterford Bulk Terminal | 651,982 | 506,816 | 588,198 | 572,902 | 524,295 | 640,951 | 968,542 | 1,044,279 | 961,161 | 1,093,830 | 1,356,651 |
| | | | | | | | | | | | |
| **Gross Tonnes of Cargo (000't)** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Container (Lo-Lo) (*000) | 1,536 | 1,142 | 727 | 644 | 387 | 365 | 340 | 348 | 365 | 374 | 383 |
| Bulk & General Cargo (*000) | 901 | 728 | 868 | 873 | 866 | 1,064 | 1,116 | 1,228 | 1,046 | 1,329 | 1,702 |
| **Total (Container, Bulk and General Cargo) (*000)** | **2,437** | **1,870** | **1,595** | **1,517** | **1,253** | **1,429** | **1,456** | **1,576** | **1,411** | **1,703** | **2,085** |

*Table 2.7 - Breakdown of tonnages handled at Port of Waterford 2008 – 2018 (by commodity)*

## 2.5.2 Dry bulk and general cargo vessel operations

Dry bulk and general cargos are handled at the Belview Bulk Terminal using mobile harbour cranes and/or ships gear. In addition dry bulk is handled at the Suir Shipping O'Briens' Quay again using mobile harbour cranes and/or ships gear.

Bulk cargoes are discharged via hoppers into lorries and then taken to nearby warehouses and packaging plants for storage, processing and onward delivery. General and project cargo (including wind turbine components, are off loaded using mobile harbour cranes and/or ships gear and stored on the areas immediately behind the quay or trucked to storage outside the immediate port area.
Dry bulk and general cargo traffic throughput at the Belview berths reached over 1.7million tonnes in 2018. The largest volumes were fertiliser (630,000tonnes), animal feedstuffs (5000,000tonnes) and construction products (300,000tonnes).

Throughput at the Belview bulk berths is fairly consistent for both fertiliser, at around 45,000t/month, peaking in the spring (Feb/March) at over 75,000t/month in this period, and animal feedstuffs at around 27,000t/month with a peak over the winter months (Nov/Dec) of up to 43,000t/month. The detailed bulk shipping data for 2018 throughputs at the Belview Bulk Terminal has been analysed to determine:

- Total no of bulk vessel calls
    - o The total number of bulk vessels calling at Belview in 2018 was 310.

- Time alongside (days) (average and maximum)
    - o The maximum time alongside (turnaround) for a bulk carrier was 7.7 days
    - o Average time alongside was 1.8 days
- Vessel sizes (dwt)(max and average)
    - o The largest bulk vessel (in terms of dwt) was 38,061 dwt, with eight vessels over 30,000dwt and eight between 20,0000dwt and 30,000dwt.
    - o The average size bulk carrier was 6,257dwt
- Vessel lengths(LOA m)(max and average)
    - o One project cargo and twelve bulk vessels were over 175m LOA, with the largest being 190m in length.
    - o The average length of bulk carrier was 100m
- Vessel draughts(m)(max and average)
    - o The deepest draught bulk vessel was 8.8m,
    - o 31 vessels had draughts of more than 7.5m
    - o The average draught of bulk carrier was 5.95m
- Cargos handled (tonnes) (max average consignments)

o Maximum consignment size was 21,702 tonnes
    - o 17 vessels had consignments of over 10,000 tonnes
    - o Average consignment size was 4,435 tonnes

A summary of this bulk vessel operational data (min. max, average) in shown in Table 2.8 below

| Total no of bulk vessel calls 2018 | 310 | Min | Max | Average |
|---|---|---|---|---|
| Time alongside | (days) | 0.3 | 7.7 (excl dredgers) | 1.8 |
| Vessel sizes | (dwt) | 1,034 | 38,061 | 6,257 |
| Vessel lengths | (LOA m) | 65 | 190 (excl cruise) | 100 |
| Vessel draughts | (m) | 3.1 | 8.8 | 5.95 |
| Consignment size | (tonnes) | 99 | 21,702 | 4,435 |

*Table 2.8 – Bulk vessels operational data (2018)*

In addition, bulks are handled at the privately owned O'Briens' jetty. In 2018 this facility handled 69 vessels and 344,926 tonnes of bulk cargo, with an average vessel length of 99m and average consignment of 4,999 tonnes being discharged in around 43 hours per vessel (1.8 days on berth).

In addition, eight cruise vessels called at Belview in 2018, five of which were more than 175m in overall length, the largest being 204m in length.

### 2.5.3 Container operations

Container handling is carried out at the Belview Container Terminal using wide span rail mounted container cranes. The terminal currently serves a regular Samskip/DFDS service with two vessel call per week. Current (2017) containers handled (Laden and MT) is around 44,000teu, carrying around 374,000tonnes (8.5tonnes/teu). Traffic is relatively constant over the year.

Previously (2007) equivalent figures for containers were significantly higher, handling 186,000teu that year carrying 1,689,000tonnes (9.0tonnes/teu).

*Figure 2.13 – Container Operations at Belview Quays*

The container vessel shipping data for 2018 has been analysed to determine:

- Total no of container vessel calls
  - o The total number of container vessels calls at Belview in 2018 was 99
  - o Regular schedule of two Samskip vessels shared with DFDS – Samskip Express and Samskip Endeavour
- Time alongside (hours) (average and maximum)
  - o Maximum time alongside (turnaround) for a container vessel was 25 hours (5 vessels over 20 hours)
  - o Minimum time alongside 4 hours
  - o Average time alongside was 10 hours
- Vessel sizes (dwt)
  - o Two vessels used – 9,400dwt and 9,322dwt
- Vessel lengths(LOA m)
  - o Two vessels used 140.56mLOA and 140.62mLOA
- Vessel draughts(m)(min, max and average)
  - o Draughts on arrival between 6.3m and 7.4m
  - o Draughts on departure between 6.1m and 7.5m
- Cargos handled (teus average consignments)
  - o Average laden discharged 127teu
  - o Average MT discharged 93teu
  - o Average laden loaded 185teu
  - o Average MT loaded 40teu

A summary of this container vessel operational data (min. max, average) in shown in Table 2.9 below

| Total no of container vessel calls 2018 | 101 | Min | Max | Average |
|---|---|---|---|---|
| Time alongside | (hours) | 04.0 | 25.0 | 10.2 |
| Vessel sizes | (dwt) | n/a | n/a | 9,400 |
| Vessel lengths | (LOA m) | n/a | n/a | 140 |
| Vessel draughts | (m) | 6.1 | 7.5 | 6.8 |
| Laden discharged | (teus) | 60 | 251 | 127 |
| MT discharged | (teus) | 0 | 208 | 93 |
| Laden loaded | (teus) | 78 | 310 | 185 |
| MT loaded | (teus) | 7 | 144 | 40 |

*Table 2.9 – Container vessel vessels operational data (2018)*

## 2.6 Establishing key performance indicators

The 2017 and 2018 vessel operations have been analysed to determine current typical handling rates and berth occupancy figures as summarised below.

- **Berth occupancy** is calculated as a percentage of the total actual vessel times alongside (from time of arrival to time of departure including both working and non-working hours) and total berth availability based on number of berths, working week (5.5 days) and working year (50 weeks)
- **Operational productivity** (tonnes/berth/day) is based on total tonnage/teu handled per annum and total vessel time alongside (both working and non-working hours). This is a reflection on actual quantities handled over total period vessel is alongside and does not reflect any maximum or peak handling rates which may be achieved for limited periods during operations.
- **Hourly productivity** is based on a nominal 12hour/day working period

These KPIs have been used to determine the maximum capacity of the existing facilities to determine future demand for additional facilities to handle projected cargo volumes. This is discussed further in Section 8 – Capacity analysis and future demand

| Lo-Lo | Belview Container Terminal (Port-owned) - 450m | | | Max Capacity |
|---|---|---|---|---|
| Max Capacity | No. of Berths | 3 | ( x 150m LOA vessels) | |
| | Working Week | 5.5 | days | |
| | Working Year | 50 | weeks | |
| | Berths x Days Available | 825 | per year | |
| 2017 Data | | Total | Average | |
| | No. of Vessels | 101 | | |
| | Days in Port | 113 | 1 | Days |
| | LOA | 14,200 | 141 | M |
| | Shipment Size | 42,377 | 420 | TEU |
| | Each berth occupied for | 38 | | Days |
| 2018 Data | | | | |
| | No. of Vessels | 99 | | |
| | Days in Port | 92 | 1 | |
| | LOA | 13,818 | 141 | |
| | Shipment Size | 43,944 | 444 | |
| | Each berth occupied for | 31 | | |
| | **2017** | **2018** | | |
| Berth Occupancy | **14%** | **11%** | | |
| Operational productivity | **375teu/berth/day** | **478teu/berth/day** | | |
| Hourly productivity | **31teu/hour** | **40teu/hour** | | |

*Table 2.10 – Belview Container Terminal operational statistics 2017 and 2018*

| Berths 1-4 | Belview Bulk Terminal (Port-owned) - 393m | | | |
|---|---|---|---|---|
| Max Capacity | No. of Berths | 4 | ( x 100m LOA vessels) | |
| | Working Week | 5.5 | days | |
| | Working Year | 50 | weeks | |
| | Berths x Days Available | 1,100 | per year | |
| 2017 Data | | Total | Average | |
| | No. of Vessels | 270 | | |
| | Days in Port | 521 | 2 | Days |
| | LOA | 27,595 | 102 | M |
| | Shipment Size | 1,096,455 | 4,061 | Tonnes |
| | Each berth occupied for | 130 | | Days |
| 2018 Data | | Total | Average | |
| | No. of Vessels | 318 | | |
| | Days in Port | 575.7 | 2 | |
| | LOA | 32,553 | 102 | |
| | Shipment Size | 1,404,371 | 4,416 | |
| | Each berth occupied for | 144 | | |
| | **2017** | **2018** | | |
| Berth Occupancy | **47%** | **52%** | | |
| Operational productivity | **2,104tonnes/berth/day** | **2,439tonnes/berth/day** | | |
| Hourly productivity | **175tonnes/hour** | **203tonnes/hour** | | |

*Table 2.11 – Belview Bulk Terminal operational statistics 2017 and 2018*

| O'Briens | O'Briens' 120m Jetty (Privately-owned) | | | |
|---|---|---|---|---|
| Max Capacity | No. of Berths | 1 | ( x 100m LOA vessels) | |
| | Working Week | 5.5 | days | |
| | Working Year | 50 | weeks | |
| | Berths x Days Available | 275 | per year | |
| 2017 Data | | Total | Average | |
| | No. of Vessels | 54 | | |
| | Days in Port | 86 | 2 | Days |
| | LOA | 5,117 | 95 | M |
| | Shipment Size | 233,430 | 4,323 | Tonnes |
| | Each berth occupied for | 86 | | Days |
| 2018 Data | | | | |
| | No. of Vessels | 69 | | |
| | Days in Port | 121 | 2 | |
| | LOA | 6817 | 99 | |
| | Shipment Size | 344929 | | |
| | Each berth occupied for | 121 | | |
| | **2017** | **2018** | | |
| Berth Occupancy Rate | **31%** | **44%** | | |
| Operational productivity | **2,714tonnes/berth/day** | **2,851tonnes/berth/day** | | |
| Hourly productivity | **226tonnes/hour** | **238tonnes/hour** | | |

*Table 2.12 – O'Briens' Jetty operational statistics 2017 and 2018*

# 3 Economic and financial review of the port

## 3.1 Economic importance of Port of Waterford

### 3.1.1 Introduction

Raymond Burke Consulting was commissioned by Port of Waterford (PoW) to establish the economic impact of the Belview Industrial Zone incorporating the Port Company and other principal businesses in the Industrial Zone on the area and region.

### 3.1.2 The Belview Industrial Zone

The Belview Industrial Zone comprises 265 hectares of zoned land, including a strategic IDA site of 53 hectares, the Marine Point Business Park and the Port Company. Other major companies located within the Zone are Mima Packaging Systems, Smartply, Store-All, Glanbia, Arachas, Seedtech, Southeast Port Services, Suir Shipping and Glanway.

Belview Port is strategically placed within two hours of Dublin, is a natural hub for the integration of shipping, road and rail freight services and is connected via an exceptional road and rail network. It offers those involved in the shipment of goods an efficient and cost-effective service with savings in both time and fuel.

Ports are central to our national competitiveness and are engines of national economic growth; they facilitate foreign direct investment, act as gateways for tourism and enable a whole range of other industries to function, such as fishing, off-shore wind, gas and oil energy servicing, Ports form a vital part of the supply chain for our industries which are heavily reliant on the import/export of bulk raw materials and finished goods.

The Port of Waterford currently handles over 2.0 million tonnes of freight annually including some 1.7 million tonnes of bulk and break-bulk products (including agri-related and project cargo). The Port also operates in the Container/Lo-Lo sector handling some 44,000 TEUs (equivalent to 383,000tonnes) annually. It is estimated that the annual value of goods through the Port is of the order of €1.7 billion with the container throughput being the major contributor.

The Port of Waterford is the third most popular destination in the Republic for cruise visits.

### 3.1.3 Economic summary

The key findings from this economic study are:

- Across the Belview Industrial Zone and including the Port of Waterford, our analysis established the following Performance Indicators for 2017; the values in brackets show the economy-wide multiplier effects:
    - o A turnover of €388 million (€943 million)
    - o Employment of 632 (980)
    - o Paid €34 million in salaries and wages (€60 million)
    - o Spent €328 million on goods and services (€796 million)
    - o Generated a Gross Value Add of €91 million (€190 million)
- The spend of companies in the Zone on goods and services and employee wages have a major impact on the region's economy.
- A survey of the principal companies, including the Port Company, in the Zone on employee addresses, covering 588 staff (over 93 per cent of total), found that some 54 per cent of employees live in Waterford (317), 25 per cent in Kilkenny (147) and 16 per cent in Wexford

(94). The balance comes from Tipperary (18), Laois (5) and the remainder from other counties including Limerick, Kildare and Cork.

- The Port of Waterford itself plays a key catalytic role in facilitating and supporting economic activity in the Estate and the south-east from an industrial, services and a tourism perspective
- Indeed, its location is seen as very strategic being close to the motorway system and therefore attractive for many of its customers
- The Port has also a strong social impact arising from its corporate social responsibilities and activities
- Over the last ten years, the Port Company
    - o had a turnover of some €76 million and handled 15 million tonnes of freight
    - o spent €33 million on the purchase of goods and services
    - o expended nearly €7 million on CAPEX including the completion of the 190 metre Bulk Quay
    - o paid almost €18 million in Wages and Salaries
    - o generated a Gross Value Add of almost €36 million
- Freight vessels using the Port of Waterford spend varying amounts locally when in port – long journeys can result in significant expenditure particularly where local repairs, crew changes, waste management and purchases of provisions are concerned; it would not be inconceivable to spend up to €100,000 particularly when bunkering is taken into account
- The Port of Waterford is a major cruise destination and the larger cruise ships anchor at Dunmore East; others berth in Belview and at the Frank Cassin Wharf in the heart of Waterford City
- The spend by Port of Waterford cruise passengers and crew in 2017 is estimated to have been some €341,000 excluding any local expenditure by the cruise companies

The economic study has demonstrated the economic importance of the Belview Industrial Zone reflecting, in particular, the value to the local economy of the employment supported, the spend on goods and services, the impact of cruise tourism and the spend of freight vessels while in port and the Gross Value Added which is a significant contribution to Ireland's economic success.

## 3.2 Financial review of the port

Table 3.1 below shows a summary of the throughput figures, accounts data and financial KPIs for the Port of Waterford over the past 5 years.

| KEY PERFORMANCE INDICATORS | | | | | |
|---|---|---|---|---|---|
| | 2018 | 2017 | 2016 | 2015 | 2014 |
| **THROUGHPUT DATA** | | | | | |
| Bulk Tonnage '000 | 1,702 | 1,329 | 1,046 | 1,229 | 1,116 |
| Lo Lo Laden TEU '000 | 31 | 30 | 29 | 28 | 27 |
| Empty TEU '000 | 13 | 12 | 14 | 12 | 9 |
| Total TEU '000 | 44 | 42 | 43 | 40 | 36 |
| **ACCOUNTS DATA** | € | € | € | € | € |
| TURNOVER | 8,151,499 | 7,815,603 | 6,361,841 | 6,574,958 | 6,300,874 |
| DREDGING COST | 1,278,762 | 1,287,264 | 1,326,317 | 1,315,563 | 1,138,643 |
| OPERATING COSTS (EXCLUDING DREDGING) | 5,078,397 | 4,808,706 | 4,822,036 | 4,593,161 | 4,418,917 |
| OPERATING PROFIT/(LOSS) (less exceptionals) | 1,794,340 | 1,719,633 | 213,488 | 666,234 | 743,314 |
| **PROFIT AFTER TAX** | **2,202,990** | **648,172** | **885,809** | **568,985** | **1,289,585** |
| CAPITAL EMPLOYED | 42,585,557 | 41,944,733 | 42,709,465 | 43,695,307 | 44,437,445 |
| SHAREHOLDERS' FUNDS | 32,677,124 | 30,493,555 | 30,859,566 | 30,247,398 | 28,629,998 |
| **PERFORMANCE INDICATORS** | € | € | € | € | € |
| EBITDA (pension finance costs also excluded) | 2,501,818 | 2,401,045 | 1,116,749 | 1,527,369 | 1,661,965 |
| ROCE | 4.21% | 4.10% | 0.50% | 1.52% | 1.67% |
| OPERATING PROFIT/(LOSS) AS A % OF TURNOVER | 22.01% | 22.00% | 3.36% | 10.13% | 11.80% |
| T/O PER EMPLOYEE | 220,311 | 217,100 | 205,221 | 219,165 | 203,254 |
| OP COSTS (EXCLUDING DREDGING) PER EMPLOYEE | 137,254 | 133,575 | 155,550 | 153,105 | 142,546 |
| NUMBER OF EMPLOYEES | 37 | 36 | 31 | 30 | 31 |

*Table 3.1 - PoW financial and operational KPIs over the past 5 years*

# 4 Future Port Traffic Projections

## 4.1 Overview

Jim Power Economics (JPE) was commissioned by the Port of Waterford (PoW) to carry out an analysis of the economic profile of the South East Region, review current Irish Merchandise trade flows and tonnages handled by Irish Ports.

A historical analysis of traffic through the PoW was carried out and based on the above, forecasts were made of future traffic flows, with low, medium and high growth scenarios. The JPE report recommends three growth rates for bulk and three for lo-lo should be considered. The low and medium rates recommended are 2% and 4% for both with high at 6% for bulk and 8% for lo-lo.

## 4.2 Background

Port of Waterford is an essential part of the economic infrastructure in the South East region. It is situated in a very strategic location and has good access via roads and rail to many parts of the country. This sets the Port up as an important driver and facilitator of economic activity in the region and beyond.

In the context of Brexit, the role of ports in the South East is likely to gain in importance as efforts are made to avoid the UK land bridge and ship goods directly to and from continental Europe. Port of Waterford is well placed to play an important role in this context and can assume a more significant role in the external trade activities of the Irish economy and act as a trading hub for North West Europe/ Channel ports.

## 4.3 Economic profile of the South East Region

It is clear from a number of different metrics that the South East region, while clearly improving, is still lagging much of the rest of the country and is clearly not attaining its full potential.
The region has a very strong tourism offering; the quality of life is very high; and the physical infrastructure has improved in recent years. Nevertheless, the region is still lagging and needs strong affirmative action and support from national policy makers.

In 'Ireland 2040-National Planning Framework', Waterford has been highlighted as one of the cities that will feature in the building of accessible centres of scale.

## 4.4 Profile of Irish merchandise trade

### 4.4.1 Background

Figure 4.1 below shows the evolution of Irish merchandise trade volumes since 1930. From the early 1990s onwards, merchandise trade growth picked up very strongly and it became an increasingly important part of the Irish economy.

This reflected the strong growth in multi-national investment in the Irish economy during that period and the increasing integration of the Irish economy into the EU and the impact of globalisation on the Irish economy. Trade volumes slowed sharply during the global recession in 2008, but have recovered strongly over the past five years.

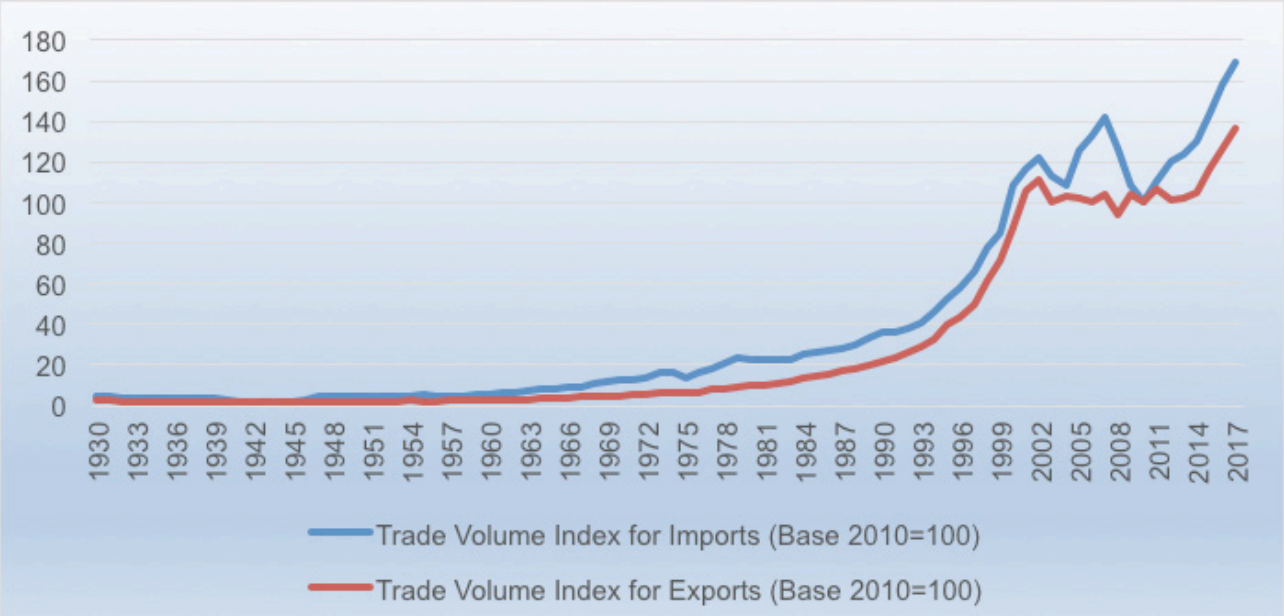



*Figure 4.1 - Volume of Trade through Port of Waterford 1930 - 2017.*
*Source: CSO*

Looking ahead, it is clear that exports will remain a key component of the Irish economy and an important driver of economic growth. This will be driven by both the FDI component of the economy and Indigenous industry.

### 4.4.2 Trends in Irish port performance

In 2017, Dublin, Cork and Shannon Foynes accounted for 85 per cent of the total tonnage of goods handled by Irish ports. Port of Waterford accounted for 3 per cent of the total (1.6mtpa) as shown in Table 4.1 below.

| PORT | GROSS TONNAGE | % TOTAL |
|---|---|---|
| Bantry Bay | 846.000 | 1.6% |
| Castletownbere | 52,000 | 0.1% |
| Cork | 8,967,000 | 16.8% |
| Drogheda | 1,282,000 | 2.4% |
| Dublin | 24,996,000 | 46.9% |
| Dundalk | 82,000 | 0.2% |
| Galway | 604,000 | 1.1% |
| Greenore | 788,000 | 1.5% |
| Killybegs | 33,000 | 0.1% |
| Kinsale | 15,000 | - |
| New Ross | 345,000 | 0.6% |
| Rosslare | 2,166,000 | 4.1% |
| Shannon Foynes | 11,283,000 | 21.2% |
| Sligo | 14,000 | - |
| Tralee Fenit | 33,000 | 0.1% |
| Waterford | 1,612,000 | 3.0% |
| Wicklow | 142,000 | 0.3% |
| Youghal | 82,000 | 0.2% |
| Total | 53,346,000 | |

*Table 4.1 - Total Tonnage of Goods Handled by Irish Ports (2017)*
*Source: Statistics of Port Traffic 2017, CSO, 29th June 2018.*

Table 4.2 shows the breakdown of the total tonnage of goods by category of traffic handled by all Irish ports in 2017. Port of Waterford handles Dry Bulks (over 7% of all bulks through Irish ports), Lift-On/ Lift Off (Containers) and BreakBulk and Other Goods only. PoW does not currently handle Liquid Bulks, although this remains a possibility for the Great Island power station jetty. PoW does not handle Ro-Ro/ Ferry traffic.

| CATEGORY OF TRAFFIC | TONNES (000s) | % OF TOTAL |
|---|---|---|
| Liquid Bulk | 12,211 | 22.9% |
| Dry Bulk | 16,805 | 31.5% |
| Lift-On/Lift-Off | 7,346 | 13.8% |
| Roll-On/Roll-Off | 15,497 | 29.1% |
| Break Bulk & Other Goods | 1,486 | 2.7% |
| Total | 53,345 | 100.0% |

*Table 4.2 - Total Tonnage of Goods Classified by Category of Traffic (2017)*
*Source: Statistics of Port Traffic 2017, CSO, 29th June 2018.*

### 4.4.3 Profile of Port of Waterford

Figure 4.2 shows the trend in the category of goods handled in Port of Waterford since 2000 in tonnage terms. Lift-On/Lift-Off (Container) traffic has declined significantly since a peak in the early 2000's, but dry bulk has grown strongly to account for over 75% of the total tonnage handled in the port. Break bulk has remained steady over the period and accounted for around 7% of total tonnage handled by the port.

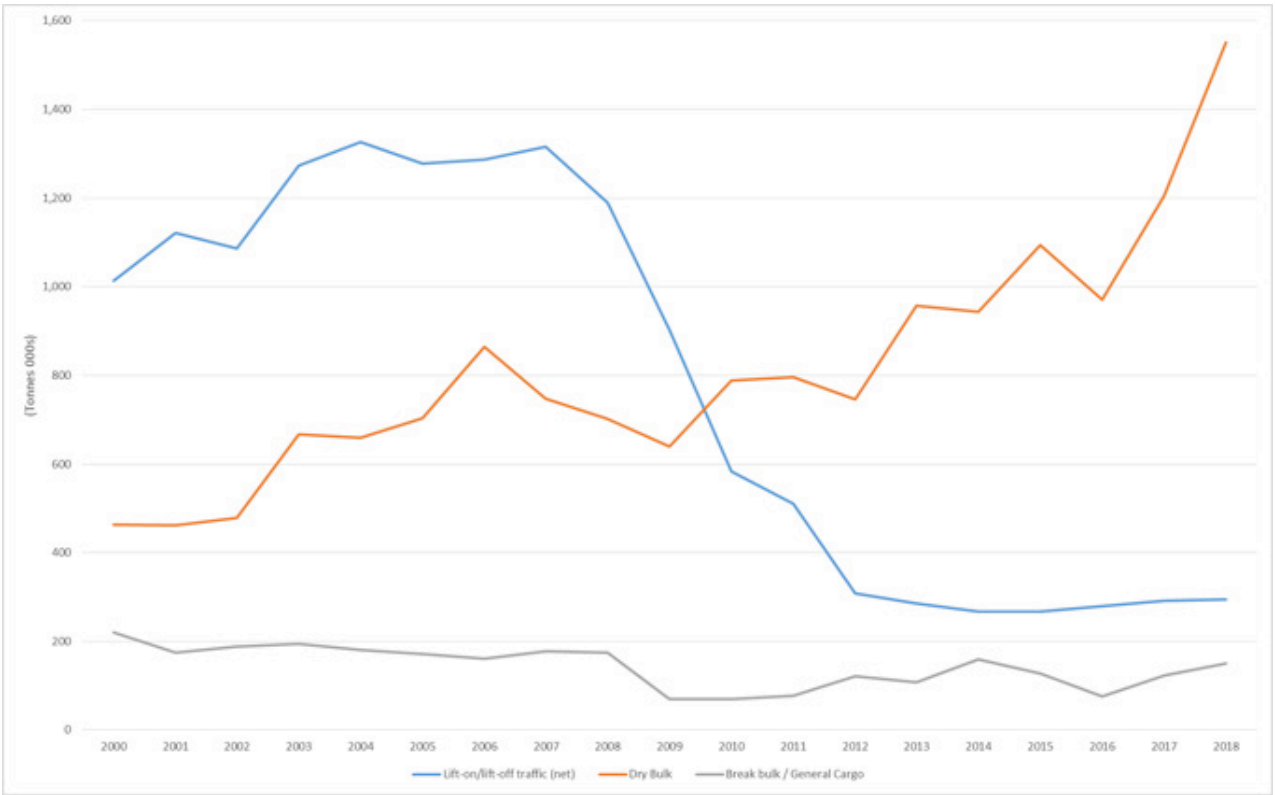



*Figure 4.2 - Trend in Total Tonnage of Goods by Category at Port of Waterford 2000 - 2018*
*Source: CSO Statbank*

**Lift-On/Lift-Off (container) trade**

Table 4.3 shows a breakdown of Lift-On/Lift-Off trade coming in and out of Port of Waterford in 2017 and the percentage of total of the Irish Ports Lo-Lo traffic handled. This data is taken from the latest available data from CSO, Statistics of Port Traffic, 29th June 2018. For Loaded Units, the port accounts for 3.6 per cent of loaded units handled by Irish ports in numerical terms, 4.1 per cent in TEU terms and

4 per cent of total tonnage. (Note 1 full TEU is typically equivalent to 9.5 – 10.5 cargo tonnes).

For Empty Units, the Port accounts for 4.7 per cent of empty units handled by Irish ports and 5.4 per cent in TEU terms.

In total, Port of Waterford accounts for 3.8 per cent of the total number of units handled by Irish ports and for 4.4 per cent of the total in TEU terms. Historically Waterford's share of the Lo-Lo market was significantly higher. The financial downturn in 2008 precipitated a dramatic re-alignment of the trade with a significant move to 'the centre', ie Dublin.

| | LOADED UNITS | | EMPTY UNITS | | TOTAL UNITS | |
|---|---|---|---|---|---|---|
| | Number | TEU's | Number | TEU's | Number | TEUs |
| **Received** | 6,267 | 12,287 | 3,866 | 8,669 | 10,133 | 20,957 |
| **Forwarded** | 8,089 | 17,912 | 2,271 | 3,508 | 10,360 | 21,420 |
| **Total** | 14,356 | 30,200 | 6,137 | 12,177 | 20,493 | 42,377 |
| **% Of Total Port Trade** | 3.6% | 4.1% | 4.7% | 5.4% | 3.8% | 4.4% |

*Table 4.3 - Breakdown of Lift-On/Lift-Off Traffic Handled by Port of Waterford (2017)*
*Source: CSO, Statistics of Port Traffic, 29th June 2018*

**Bulk Products**
Belview Port currently handles over 1.3 million tonnes of bulk products, mainly agri-related imports, together with over 100,000 tonnes of break bulk, mainly timber, steel and project cargoes.

**Total port throughputs**
Table 4.4 shows the breakdown by tonnage of goods moving through the Port of Waterford. Dry Bulk accounts for 86 per cent of goods received. Lift-On/Lift-Off accounts for 70 per cent of goods forwarded through the port and 9.7 per cent of goods received. In total, Dry Bulk accounts for 75.2 per cent of trade through the port and Lift-On/Lift-Off accounts for 18.1 per cent of the total.

| | DRY BULK | LIFT-ON/ LIFT-OFF | BULK BREAK & OTHER GOODS |
|---|---|---|---|
| **Received** | 86.0% | 9.7% | 4.3% |
| **Forwarded** | 7.2% | 70.0% | 22.8% |
| **Total** | 75.2% | 18.1% | 6.7% |

*Table 4.4 - Percentage Tonnage of Goods handled by category through the Port of Waterford*
*Source: CSO, Statistics of Port Traffic, 29th June 2018*

Of total trade through Port of Waterford in tonnage terms, 86.2 per cent of trade is incoming, with just 13.8 per cent outgoing. The 'Other EU' (which excludes the United Kingdom), accounted for 75.9 per cent of total trade. This is comprised of 72.3 per cent of goods received coming from 'Other EU', while 97.8 per cent of goods forwarded are destined for 'Other EU' destinations.

| | Great Britain & Northern Ireland | Other EU | Non-EU | Other Ports | Coastal Trade |
|---|---|---|---|---|---|
| **Goods Received** | 2.0% | 72.3% | 8.6% | 16.3% | 0.8% |
| **Goods Forwarded** | 1.3% | 97.8% | 0.9% | - | - |
| **Total** | 1.9% | 75.9% | 7.5% | 14.1% | 0.6% |

*Table 4.5 - Trade by Region Port of Waterford (2017)*
*Source: CSO, Statistics of Port Traffic, 29th June 2018*

Other EU (excluding the UK) is by a considerable margin, the most important market for trade through Port of Waterford.

### 4.4.4 The growth outlook for trade though Port of Waterford

Port of Waterford is a port of significance in the South East region, but in the aftermath of Brexit, it is likely to assume even greater importance in the context of efforts to bypass the UK land bridge and develop a closer trading relationship with North West Europe/Channel ports. The rail link could seriously open up the port for the North West and Mid-West regions. This would have strong environmental attractions as well as logistical benefits.

Agriculture is a very important component of the economy of the South East and will remain so into the future. Fertiliser and animal feed will continue to be important elements of port activity to fuel the vibrant agricultural economy of the South East. Changes to farming practices, nitrates management, climate change adaptation and other economic impacts all have the potential to significantly alter traffic flows and volumes.

### 4.4.5 Scenario planning for Port of Waterford

The following analysis looks at different trade scenarios for Port of Waterford on a low, medium and high growth scenario for both Lo-Lo and Bulk & General Cargo.

Smooth growth paths do not happen in the real world, because there will inevitably be cyclical fluctuations in economic growth and once-off events such as the farm fodder crisis in 2018, that will cause distortions. However, in modelling out to 2045, a smooth growth path is assumed.

**BULK AND GENERAL CARGO**

In relation to Bulk and General Cargo, a Low scenario growth rate of 2 per cent per annum is assumed out to 2044; a Medium growth scenario of 4 per cent per annum and a high growth scenario of 6 per cent per annum.

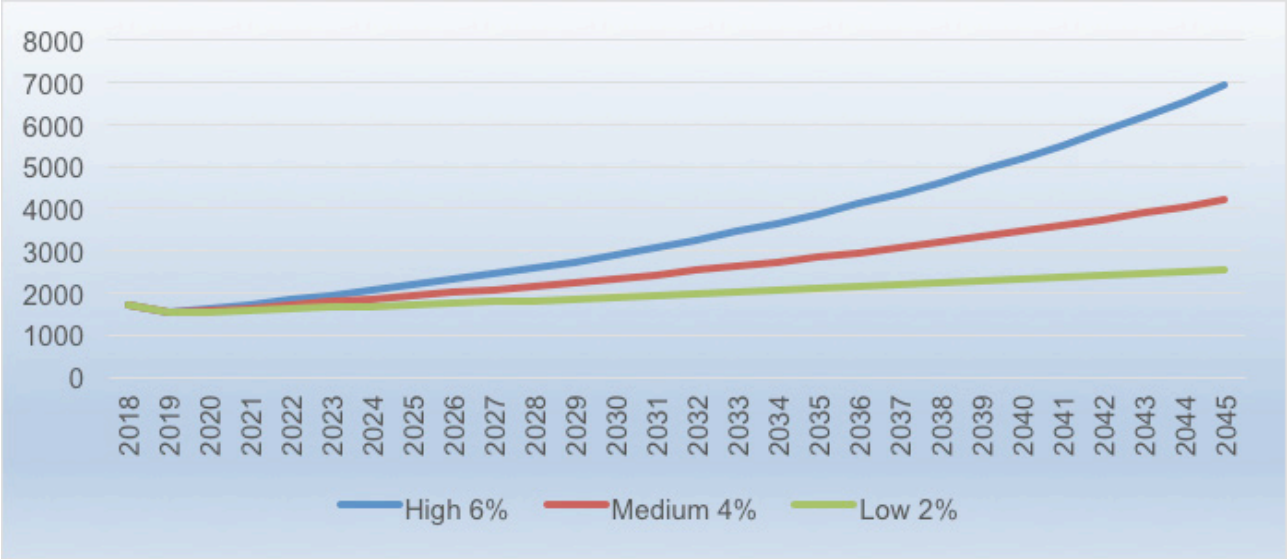



*Figure 4.3 – Future Bulk and General Cargo Growth Scenarios ('000 Tonnes) 2018 - 2045*
*Source: Jim Power Economics*

**LO-LO**

Lo-Lo is currently a considerably smaller part of the business in Port of Waterford. However, it is certainly conceivable that Lo-Lo trade has the potential to experience a step change in activity based on the requirements of the economy of the South East, the rail link and generally strong transport connectivity of the Port, congestion in the larger ports, and potential capacity in Port of Waterford.

For Lo-Lo trade, a Low scenario growth rate of 2 per cent per annum is assumed out to 2044; a Medium growth scenario of 4 per cent per annum; and a high growth scenario of 8 per cent per annum. It is important to recognise the sharp contraction in Lo-Lo activity between 2007 and 2014 (see Figure 10) on

the back of a collapsing economy. Consequently, there is potential for a very quick and significant pick up from such a low base, so it is essential to have contingency plans in place around Lo-Lo capacity.

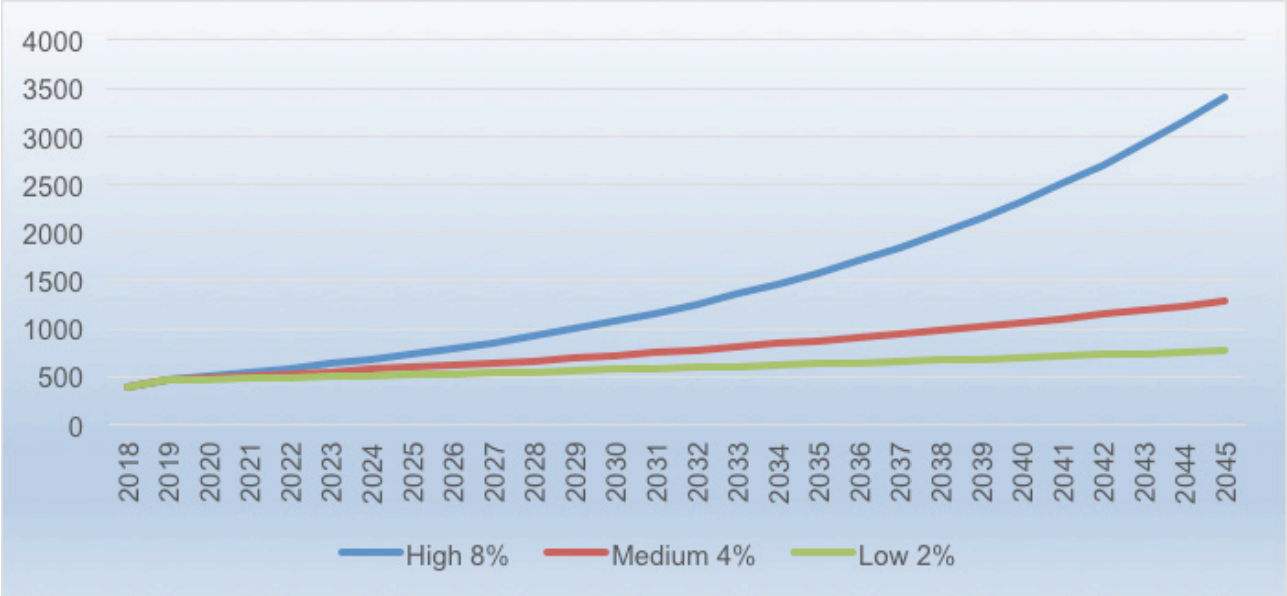



*Figure 4.4 – Future Lo-Lo Growth Scenarios (000 Tonnes) 2018 - 2045*
*Source: Jim Power Economics*

Figure 4.5 shows the combined Bulk and Lo-Lo growth scenarios.

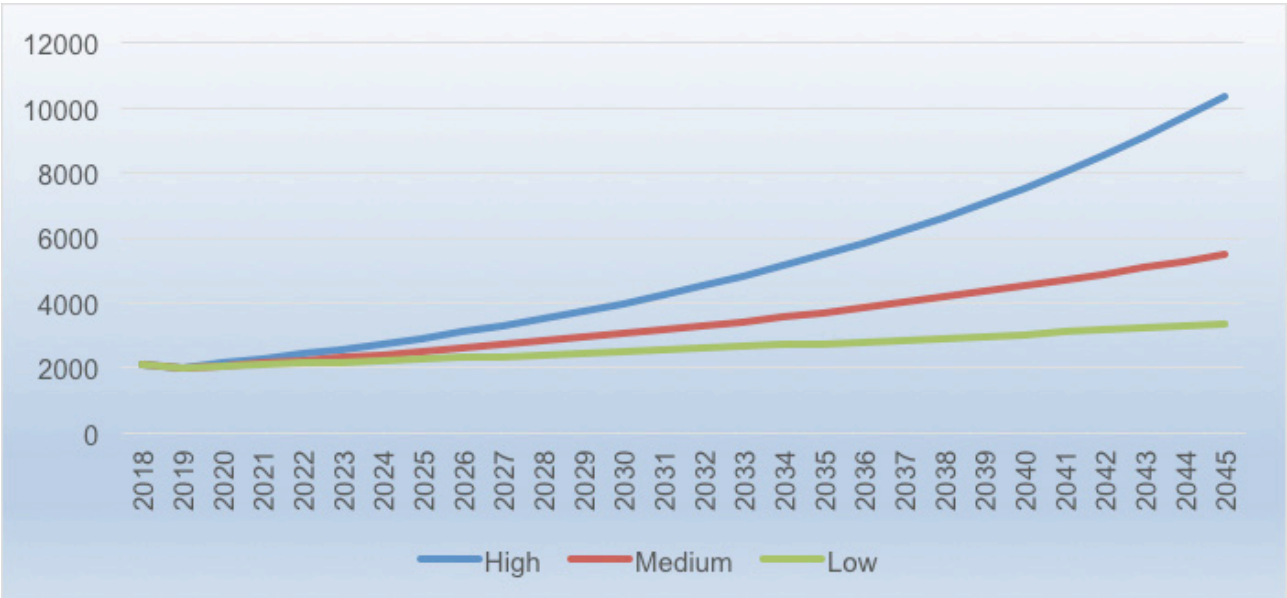



*Figure 4.5 – Future Total Bulk, General Cargo and Lo-Lo Growth Scenarios (000 Tonnes) 2018 - 2045*
*Source: Jim Power Economics*

While it is very difficult to forecast out to 2044, it is essential that the appropriate investment to ensure sufficient capacity is provided to accommodate possible future scenarios. The nature of such capacity investment is that there is a significant time lag involved in delivering the necessary infrastructure. In the context of the future of the South East and regional growth imperatives, investment in port capacity to cope with future growth potential is essential.

### 4.4.6 Impact of competing ports

#### 4.4.6.1 Assessment

An assessment of competing ports which may have an impact on the future development of the Port of Waterford has been carried out in terms of:

- what types and volumes of cargos are currently handled (potential to attract future trade to or away from Waterford)
- what facilities do they have and what are their future development plans where known (potential to attract future trade to or away from Waterford)

In the South East sector of Ireland, the ports of Dublin, Cork (Ringaskiddy) and Rosslare all have established infrastructure to handle Ro-Ro traffic and are likely to continue to dominate in this sector. Ro-Ro traffic is unlikely to be attracted to Waterford due to the need for regular scheduled services, since access to Waterford is tidally driven, lack of suitable areas for Ro-Ro berths and requirement for large parking areas.

Bulk cargos are handled at a number of ports in the South East, but Waterford handles a significant volume of this trade and is likely to retain and increase this traffic.
Containers are also handled at a number of ports, with high levels of container traffic through Dublin. This sector is likely to continue to grow and Waterford, with its existing road and rail links, is likely to attract some additional container lines in future, since movements of containers to/from Dublin is hampered by major road congestion at certain periods.

A description of the major Irish ports and cargoes handled is given below.

#### 4.4.6.2 Port of Cork - Port of National Significance (Tier 1)

The Port of Cork is a key seaport in the south of Ireland. The port services the requirements of all six shipping modes ranging from Lift-on Lift-off, Roll-on Roll-off, Liquid Bulk, Dry Bulk, and Break Bulk to Cruise vessels.

The Port of Cork's facilities and operations are situated at four distinct locations:

**City Quays** – handling bulks with the following quays:

- South Side
  - o Albert Quay - Length: 135.0m - Depth: 5.6mODC
  - o South Jetties - Length: 411.5m - Depth: 8.8mODC
  - o South Deepwater Quay - Length: 194m - Depth 6.0m
- North Side
  - o Penrose Quay - Length: 146.0m - Depth: 3.6mODC
  - o Horgan's Wharf - Length: 205.7m - Depth: 8.8mODC
- Custom House Area
  - o Custom House Quay, North - Length: 176.9m - Depth: 7.3mODC

**Tivoli** - handling Lo-Lo, Ro-Ro, Bulks

- o Roll-on Roll-off Terminal - Length of Berthage: 125.0m, Depth: 5.0mODC
- o ORE/General Purpose Berth - Length: 170.0m, Depth: 8.8mODC
- o Container Terminal - Length: 155.0m. Depth: 8.8m

**Ringaskiddy** - handling RO-RO. Lo-Lo and Bulks

- o Deepwater Terminal - Length: 485.0m, Depth: 13.4mODC
- o Ro-Ro Terminal 1 - Length of berth 180.0m, Depth 9.2mODC
- o Ro-Ro Terminal 2 - Length of berth 150.0m, Depth 8.52mODC
- o Adm Jetty - Length: 259.1m, Depth: 9.6mODC

**Cobh** - handling Cruise vessels
o Cobh Cruise Berth Length 350m Depth 9.1mODC

Port of Cork is currently undertaking a planned €80 Million redevelopment of the port facilities in Ringaskiddy. The project will see the relocation of all activity from City Quays and Tivoli and aims to play a catalytic role in the achievement of the strategy for the sustainable development of the Cork Region and Hinterland.

In 2017 the Port of Cork handled 8.97 million tonnes or 16.8% of total Irish port throughput.
For more information on the Port of Cork, visit www.portofcork.ie

### 4.4.6.3 Dublin Port - Port of National Significance (Tier 1)

Dublin Port Company provides world-class facilities, services, accommodation and lands in the harbour for ships, goods and passengers. Located in Dublin city centre, Dublin Port handles almost 50% of the Republic of Ireland's trade, two thirds of all containerised trade and is the largest of the three base ports on the island of Ireland, the others being Belfast and Cork. Dublin Port also handles over 1.76 million tourists through the ferry companies operating at the port and through the cruise vessels calling to the port.

Port of Waterford is unlikely to attract Ro-Ro traffic from Dublin. Ro-Ro needs a large areas for car parking and trailer storage. There are a limited number of operators and Dublin Port currently has capacity as future traffic level increases.

Berths in Dublin currently have water depths alongside of -9.5mCD to -11.0mCD, with future berths planned to -15mCD, so likely to attract larger container vessels than Waterford.

In 2017 the Port of Dublin handled 25.00 million tonnes or 46.9% of total Irish port throughput.
For more information on Dublin Port Company visit www.dublinport.ie

### 4.4.6.4 Rosslare Europort - Port of National Significance (Tier 2)

Rosslare Europort is the closest point from the southern part of Ireland to the UK and the European Mainland. The Port is a hub of all the major Ro/Ro Passenger and Freight services operating the southern Irish Sea and Continental routes. Rosslare Europort offers scheduled passenger ferry services to Wales and the French mainland, unaccompanied unitized cargo services to France and also offers passenger rail terminal facilities quay side.

In 2017 the Port of Rosslare handled 2.17 million tonnes or 4.1% of total Irish port throughput.
The activities in and services offered by Rosslare and Waterford are highly complementary and need to be viewed in unison to understand the strength and depth of the ports offering in the South East.
For more information on Rosslare Europort visit www.rosslareeuroport.irishrail.ie

### 4.4.6.5 Drogheda Port - Port of Regional Significance (Tier 3)

Drogheda Port is strategically located on the east coast with direct motorway access to the country's key industrial and commercial centres and provides facilities for both general freight and container services. The port's position on the east coast of Ireland provides a geographical advantage for transport links into and out of Ireland and the port has strong short-sea trade links with Europe, Scandinavia and the Baltic states.

In 2017 the Port of Drogheda handled 1.28 million tonnes or 2.4% of total Irish port throughput.
For more information on Drogheda Port Company visit www.droghedaport.ie

### 4.4.6.6 New Ross Port - Inland port (Tier 3)

The Port of New Ross in the south east of Ireland is the country's only inland port. Located on both sides of the River Barrow, the port offers a range of facilities and is experienced in handling, animal

feedstuffs and fertiliser, coal, timber, ore, steel and general cargo.
In 2017 the Port of New Ross handled 0.35 million tonnes or 0.6% of total Irish port throughput.

Pilotage for ship bound for New Ross is managed by Port of Waterford to/from the Barrow Bridge where New Ross pilots take over or hand over.

For more information on New Ross Port visit www.newrossport.ie

#### 4.4.6.7 Shannon Foynes Port (Tier 1)

Shannon Foynes Port is Ireland's second largest port operation, The port company provides a variety of cargo handling services over six port terminals, and also provides warehousing and logistics support. Shannon Foynes Port has the capacity to handle the largest vessels entering Irish waters up to 200,000 dwt. The port specialises in bulk cargoes and accounts for more than 35% of all bulk cargoes in the Republic. Typical cargoes include liquid fuels and chemicals, ores, coal and other energy products, animal feedstuffs and fertilisers, recyclable materials and project cargoes, including wind turbines for wind energy projects.

In 2017 Shannon Foynes Port handled 11.28 million tonnes or 21.2% of total Irish port throughput.
For more information on Shannon Foynes Port Company visit www.sfpc.ie

#### 4.4.6.8 Greenore Port – Private Port

Greenore Port is Ireland's only privately owned commercial port, situated just inside the entrance to Carlingford Lough. Greenore Port can accommodate vessels of 55,000DWT, 8m Draught, 200m LOA and offers facilities to handle commodities including bulk animal feed, fertiliser, coal, steel, timber and general cargo. The port is the main steel port in Ireland, capable of handling over 250,000tonnes per annum and handles an average of 400,000tonnes of dry bulk per annum. Greenore Port is owned by the Doyle Shipping Group.

In 2017 Greenore Port handled 0.79 million tonnes or 1.5% of total Irish port throughput.

For more information on Greenore Port visit www.greenoreport.ie

## 4.5 Other potential traffic and cargos

### 4.5.1 Overview

The Port of Waterford (Belview) has been designed and developed to primarily handle containers and bulk cargoes (fertilizer, animal feed etc.).

The current Masterplan addresses the needs of the port to cater for these trades in the future.
In addition to the container and bulk traffic, consideration has been given to identifying and evaluating potential options for other specialist operations including:

- **Ro-Ro/Ferry services**
- **Cruise vessels**
- **Offshore supply/servicing vessels.**
- **Livestock handling**

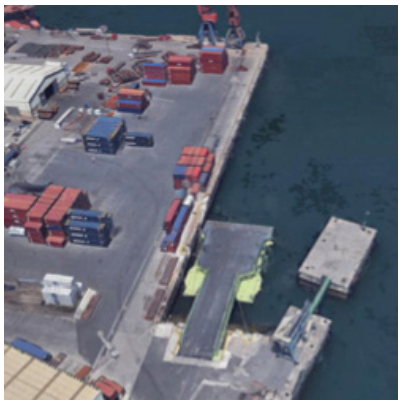
This section considers the issues associated with each of these specialist operations.

### 4.5.2 Opportunities for RoRo

All RoRo vessels are built with ramps on board to link to shore to allow cargo to be driven directly on/off the vessel. The most common configurations are bow/stern ramps for conventional RoRo ferries, normally operating over a fixed shore linkspan system and stern quarter ramps and mid-ship ramps, normally landing on the quay apron directly, for trade car and truck carriers.

Marine access to Belview will be limited to the lower range of RoRo vessels due to length constrictions and draught limitations in the marine approach channel, as well as exposure to wind during manoeuvring and turning.

Any development of RoRo facilities at Belview would be in direct competition with Dublin Port, Rosslare Europort and Port of Cork, which currently benefit from operating well established RoRo services, availability of space for vehicle parking/assembly and customs/immigration processing as well as direct marine access.



In addition to the requirement for large open parking areas and enhanced customs, security and immigration facilities, a link-span would be required to interface from the stern ramp of the vessel and the shore. This would typically be a floating pontoon and link bridge or a hydraulically operated ramp. This structure would be a permanent fixed structure which would typically protrude from the berth face into the channel area, limiting navigation and manoeuvring at the RoRo berth and adjacent berths.

While the Port of Waterford is not ideally located to compete with Ro-Ro services nevertheless opportunities may arise in the future if, for any reason, the 'Landbridge' routes, as currently used by much of Irish/ Continental Ro-Ro traffic, become unattractive.

### 4.5.3 Cruise vessels

The Port of Waterford already provides services to visiting cruise vessels receiving between 15 – 20 vessel calls per annum. Larger vessels are anchored downstream of the port and passengers brought to shore by ships tenders to Dunmore East, or the vessels are brought further upstream to moor alongside at the Great Island Power Station Jetty, the commercial berths at Belview or at the Frank Cassin Wharf in the centre of Waterford.

There is an opportunity to increase the number of cruise vessels calling at Waterford and no direct requirement for any additional facilities to specifically service cruise vessels of the size currently calling at Waterford.

In addition, any dredging of the existing approach channel to improve access to the Belview berths for commercial vessels would benefit cruise ship operations.

### 4.5.4 Offshore supply/servicing vessels.

The Port of Waterford already has experience in the handling of wind farm components and is well equipped with mobile harbour cranes to service the renewable sector. The future demand for offshore supply/servicing vessels in this region will be to support the installation, commissioning, servicing and eventual decommissioning of tidal energy projects and offshore wind farms.

Marine accessibility and proximity to deployment sites is essential. Ideally deployment sites should be within 2 – 4 hours sailing time of the port, although distances of 200 -300km have been used. The marine access through the

approach channel to Belview will take some of this time, but the channel should be suitable for 24 hour operation with the majority of these highly manoeuvrable offshore supply vessels.

### 4.5.5 Livestock handling

Livestock handling vessels are typically older modified bulk or container vessels converted to livestock transport or new special build vessels. The Port of Waterford has experience in the handling of livestock in smaller size carriers through the Port and this is a potential for the future.

For cattle and sheep export, a penned reception area, with access to water, would be required in addition to veterinary and laboratory facilities,  a customs inspection and quarantine area and waste collection and storage facilities.

# 5 Capacity analysis and future demand

## 5.1 Capacity analysis of existing port

Port of Waterford is primarily dedicated to handling containers (Lo-Lo), Dry and Break Bulk cargo and project cargo.

The KPIs of the berths have been determined in Section 2.6, based on 2017 and 2018 vessel operations. The berth productivity has been calculated based on the total annual throughput (tonnes or TEU's) divided by the actual total working hours at the relevant operational berth. The maximum theoretic capacity of the berths can be determined, based on current hourly productivity figures, typical 12 hours/day working, 5.5 working days per week and 50 working weeks per annum and with a 100% nominal berth occupancy of all available berths.

In practice 100% berth occupancy is not achievable in practice and a more realistic maximum berth occupancy figure of 60% - 80% is more appropriate to assess ultimate capacity.
Table 5.1 below shows the maximum theoretical capacities of the existing berths.

| Berths | No of berths | Productivity (per berth) | 60% berth occupancy | 80% berth occupancy |
|---|---|---|---|---|
| Containers | 3 (x150m) | 31 – 40 teu/hour | 210,870teu/annum (1.90mtpa) | 281,160/annum (2.53mtpa) |
| Bulk (PoW) | 4 (x100m) | 175 – 203 tonnes/hour | 1,497,000 tonnes/annum | 1,995,000 tonnes/annum |
| Bulk (O'Briens) | 1 (x100) | 226 – 238 tonnes/hour | 459,360 tonnes/annum | 612,480 tonnes/annum |
| Total containers | | | 1.90mtpa | 2.53mtpa |
| Total Bulk | | | 1.96mtpa | 2.61mtpa |
| **Total (Port)** | | | **3.85mtpa** | **5.14mtpa** |

*Table 5.1 - Port of Waterford berth capacity*

## 5.2 Options for improvements to existing port infrastructure and operations

### 5.2.1 Port infrastructure

There is potential to increase the depths alongside to accommodate deeper draught vessels. This in itself does not increase the ultimate capacity of the berths but may attract additional traffic.

The reinstatement of regular rail traffic is one of PoW current objectives and would serve to attract additional cargo, but will not serve to increase the ultimate capacity of the port.

### 5.2.2 Port equipment

Container operations are currently carried out over a length of 450m of quay, nominally three berths of 150m. These are served by two rail mounted quayside container cranes. If container throughput were to significantly increase in the future then it may be possible to supplement these two cranes with either a third rail mounted crane or additional mobile harbour cranes (MHCs) similar to those currently used for project and general cargo. MHCs can be readily obtained and provide a great degree of flexibility in use.

For the bulk and general cargo operations, the stevedoring companies are responsible for the provision of suitable cargo handling equipment, in terms of type, capacity and number, so that this is not a constraint on future capacity.

### 5.2.3 Port operations

The port currently operates a 12 hour working day. It would be possible to increase the nominal capacity of the port by extending these working hours, but to implement such changes would require a significant cultural change and re-work of the full logistics chain and not just the port operations.

Gate security procedures are not currently a limiting factor at PoW and there is little queuing of traffic in and out of the port. The current facilities can be expanded and improved if future demand so required.

## 5.3 Determination of future port requirements

Port of Waterford is currently operating well within its operational capacity. The expected demand for port throughputs has been projected out for 25 years using a low, medium and high growth scenario. The low growth scenario sees the current berth infrastructure sufficing until around 2037 when an additional 200m of quay is needed. There is no requirement for expansion of the container terminal under this scenario. In the medium growth scenario, we see bulk quay investments required in around 2029 (200m) and 2041 (200m) with again no container terminal investment required. In the high growth scenario, the bulk investments are similar to those under the medium picture but there is need for a container terminal investment in around 2035.

While the port has no necessity for immediate expansion plans that will increase the capacity in the short or medium term, we envisage a requirement for river management works to reduce maintenance dredging, facilitate larger ships and improve navigational safety and access.

There is potential for expanding the physical capacity of the port in the medium to longer term through the construction of additional berth length, expanding back-up areas, provision of additional port handling equipment and deepening and widening the marine access channel to accommodate larger vessels if future demand for facilities increases.

These options are considered further in Section 6.

## 5.4 Assessment of marine operations and future access channel requirements

### 5.4.1 General

Whilst the improvements to the navigation channel will not directly result in an increase in handling capacity for Port of Waterford, they will reduce annual maintenance costs and potentially increase the draft size of vessels that can be accommodated.

Both of these developments (channel dredging and river training wall) are currently undergoing feasibility study/concept design, hence the nominal lead-in times are expected to be approximately 3.5 - 5 years, as shown in Table 5.2 below. Detailed implementation programmes for the dredging works and training wall are shown in Section 10.3

| | Feasibility study | Scheme design and EIA | Consenting | Detailed design and tendering | Construction Period | |
|---|---|---|---|---|---|---|
| | | | | | | **Total** |
| **Development** | **Months** | | | | | |
| River training wall | ongoing | 6 - 8 | 12 - 18 | 12 - 15 | 12 - 15 | **42 - 50** |
| Channel deepening | ongoing4 | 6 – 9 | 10 - 12 | 10 - 12 | 30 - 36 | **55 - 65** |

*Table 5.2 - Lead-in times for proposed developments at Port of Waterford*

### 5.4.2 Current vessels calling at Port of Waterford

Vessels currently calling at Port of Waterford are limited by

- length – currently max of 190mLOA - determined by the available diameter of the turning circles and the radius of the bends through Carters Patch.
- draught – currently up to 9.0m operating draught - limited by the access channels dredged to -6.5mCD with additional water available over high tide
- beam - currently limited by the width of the dredged channels.

In 2017 the largest cargo vessel calling at the port was 38,680dwt with a LOA of 190m and an operating draught of 9.0m.

### 5.4.3 Design vessels and manoeuvring areas

Future vessel sizes will be physically limited by the footprint available to increase the turning circles. It is likely that there will be a demand for vessels up to 160 – 180mLOA to call at the O'Brien terminal, and vessels up to 200 - 220mLOA to call at the remainder of the Belview berths. This will require minimum turning circles of 1.5 x LOA, or 270m and 330m respectively.

The typical dimensions and maximum draughts of these vessels are summarised in Table 5.3 below:

| Vessel type | DWT | LOA(m) | Beam(m) | Max Draught(m) |
|---|---|---|---|---|
| General cargo/bulk | 25,000 | 178 | 26.4 | 10.7 |
| General cargo/bulk | 30,000 | 190 | 27.7 | 11.3 |
| General cargo/bulk | 35,000 | 200 | 28.9 | 12.0 |
| Bulk carrier | 60,000 | 220 | 33.5 | 12.8 |

*Table 5.3 – Bulk and general cargo vessel dimensions*

*Figure 5.1 – Larger bulk vessels operating at Belview bulk berths*

### 5.4.4 Future access channel dredged depths

Future vessel operating draughts will be limited by the depth of water available in the dredged channels. This will depend on the dredged depth and tidal window available over the high tide. This is around 3.6m at MHWS and 4.6m at MHWN. Note that vessels rarely operate at maximum (design) draught and

are normally operating at a reduced draught either through carrying partial loads (consignments smaller than the maximum design capacity of the vessel) or because the cargo is less dense (e.g. animal feed).

The allowable operating draughts for varying depths of dredged channel is summarised in table 5.4 below. This is based on dredged depth (m below CD) allowance for tidal window (assumed at 3.5 – 4.5m) and required Under Keel Clearance (assumed at 0.15 of operating draught)

| Channel | Dredged depth | Tidal window (m) | Actual water depth (m) | UKC (m) | Allowable vessel operating draught (m) |
|---|---|---|---|---|---|
| Current dredged depth(6.5m) | -6.5mCD | 3.5 - 4.5 | 10.0 – 11.0 | 1.3 – 1.4 | 8.7 – 9.6 |
| Future 7.0m | -7.0mCD | 3.5 – 4.5 | 10.5 – 11.5 | 1.4 – 1.4 | 9.1 – 10.1 |
| Future 7.5m | -7.5mCD | 3.5 – 4.5 | 11.0 – 12.0 | 1.4 – 1.5 | 9.6 – 10.5 |
| Future 8.0m | -8.0mCD | 3.5 – 4.5 | 11.5 – 12.5 | 1.5 – 1.6 | 10.0 – 10.9 |

*Table 5.4 – Allowable vessel operating draughts*

### 5.4.5 Future access channel widths

The required widths of the dredged channels are dependent on the beam of the vessel transiting the channel. PIANC guidelines for planning purposes recommend a minimum dredged width at the seabed of around 4 times the vessel beam for straight dredged channels, with an additional width allowance on bends.

The width of the current dredged channel (at the narrowest point) is 100m.
The recommended channel width requirements for the future “design vessels” is tabulated below.

| Vessel type | DWT | LOA(m) | Beam(m) | Channel width(m |
|---|---|---|---|---|
| General cargo/bulk | 30,000 | 188 | 27.7 | 110 |
| General cargo/bulk | 35,000 | 199 | 28.9 | 115 |
| General cargo/bulk | 40,000 | 209 | 30 | 120 |

*Table 5.5 – Recommended Channel Widths*

### 5.4.6 Future channel capacity

The existing access channel to the Belview Terminals and O’Briens’ berths currently accommodates around 480 vessels per annum – equivalent to 960 transits or an average of around 2.6 movements daily. Passage for vessels with large operating draughts requires transit over periods of high water only, so the maximum number of deeper draught vessels that can use the channel is limited to the two periods of high water per day.

Large vessels cannot pass in transit so large vessel movements are limited to one arrival and departure per tide. Smaller vessels can pass, with passing arrangements agreed between pilots or PEC Master. One pilot is allocated per vessel. Some categories of vessels are excluded pilotage including vessels owned by the State, small vessels, pleasure craft and fishing vessels less than 40m in length and tugs, dredgers, hoppersbarges and other similar vessels subject to prior approval of the Harbour Master.

Typical tug requirements are:

- For vessels 120m – 130m one large tug may be required
- For vessels 130m – 145m one large tug is compulsory
- For vessels 145m – 190m two large tugs are compulsory

The maximum number of the larger commercial vessels (arrivals/departures) that can use the channel per day (two tides) is currently limited to one arrival and one departure per tide for the larger vessels. This is equivalent to a maximum of around 730 movements (365 arrivals, 365 departures) per annum for

the larger vessels. Additional movements of smaller vessels which can pass will increase this number overall.

In 1997 there was a total of 434 commercial vessels calling at the Belview terminals (868 movements) and in 2018 this increased to 486 vessels (972 movements) indicating that improvements to increase channel capacity are required.

## 5.5 Demand for future inland transport links

The terminal at Belview benefits from access to the N25 which by-passes Waterford city and links directly onto the motorway network (M9). Access from the East to the Belview terminal will be enhanced by the opening of the Barrow River Crossing on the N25 in 2019. These connections are modern and uncongested.

Rail infrastructure is in place to provide effective freight services to the West/North West, however regulatory support is needed to ensure that these potentially efficient solutions are utilised to best effect, especially in terms of the Country's carbon challenges.

# 6 Proposals for future development

## 6.1 Overview

The requirements for future port facilities have been identified in "Section 5 – Capacity analysis and future demand". This Section 6 now considers a range of proposals to be considered for the future physical development of the port.

## 6.2 Development proposals

The development proposals have been considered under three main headings:

- Options to minimise maintenance dredging and improve marine access:
- Option 1.1 Cheekpoint Lower Bar River Training Wall
- Option 1.2 Carter Patch Channel Widening
- Option 1.3 Approach Channel Deepening
- Option 1.4 Turning Basin Developments, including Bingledies channel area
- Options for development/improvements to berths
- Option 2.1 Belview Quay Extension
- Option 2.2 O'Brien Quay Extension
- Option 2.3 Quay Wall Continuity
- Option 2.4 Berth Deepening
- Options for shore side developments
- Option 3.1 Improvements to road access to port
- Option 3.2 Improvements/development of services infrastructure
- Option 3.3 Development of serviced sites
- Option 3.4 Development of office buildings
- Option 3.5 Development of additional warehousing

The proposed projects to be considered are shown in Figures 6.1 and 6.2 below.

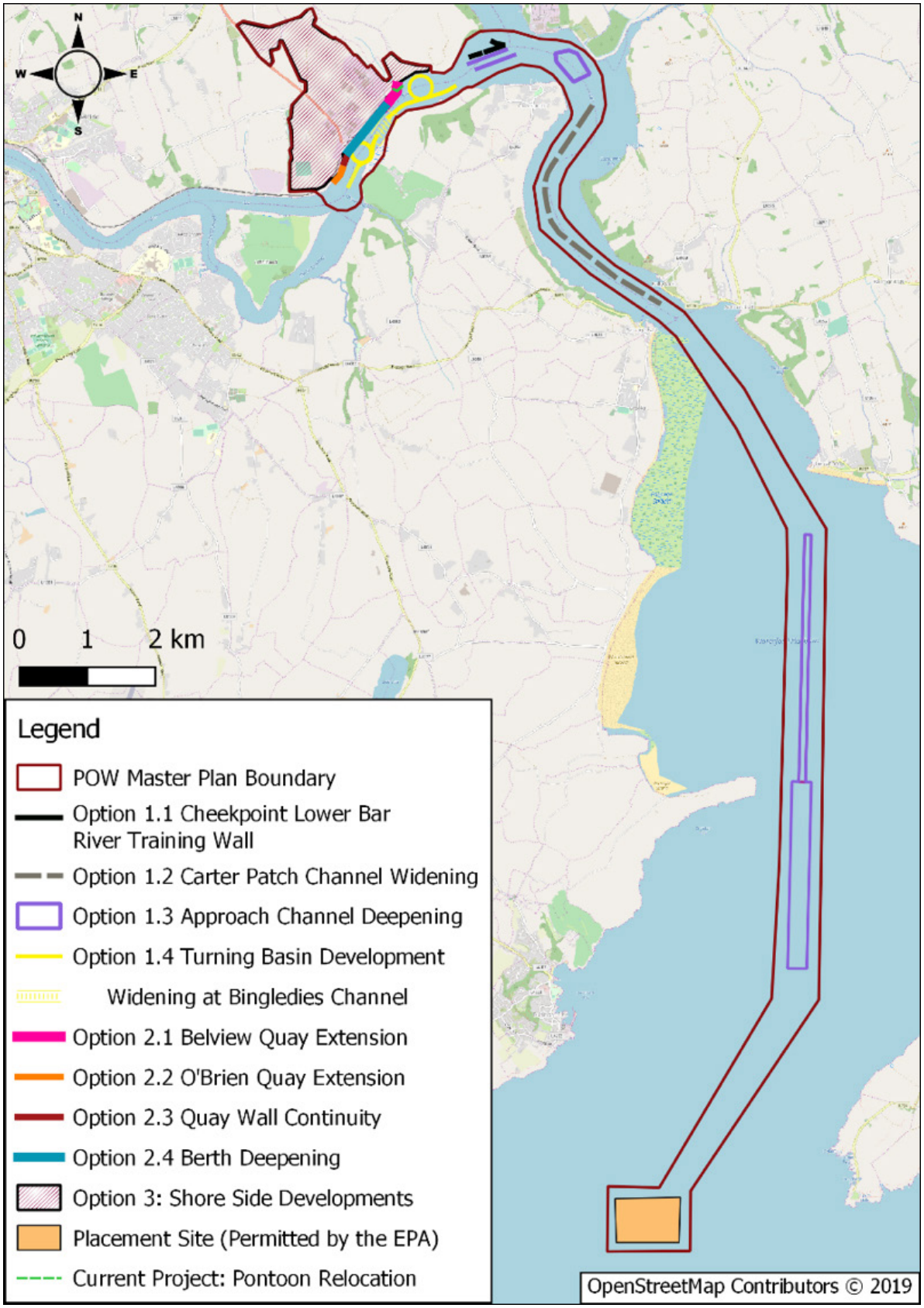



*Figure 6.1 – Overall locations of proposed Masterplan Projects for review*

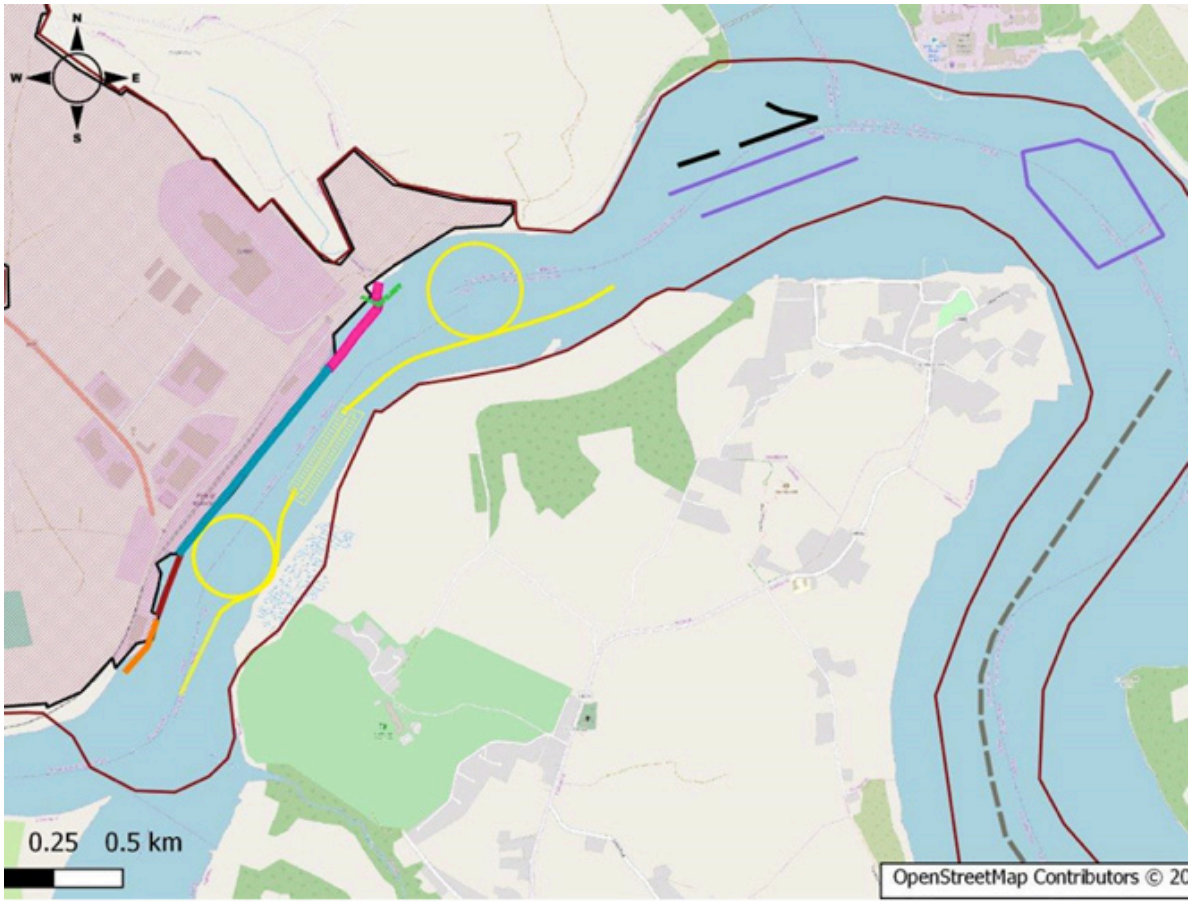



*Figure 6.2 Details of proposed Masterplan Projects at Belview*

## 6.3 Options to minimise maintenance dredging and improve marine access

### 6.3.1 Overview of objectives

The objectives for the future development of the marine access channel are to:

- Minimise future maintenance dredging requirements by reducing sedimentation in the port operational areas, particularly around Cheekpoint Lower Bar (CPLB)
- Improve general navigational safety in marine access channels to and from the port
- Improve vessel manoeuvring areas and vessel turning circles at Belview
- Increase marine access channel dimensions to accept larger vessels.

The current EPA dredging license allows for a maximum dredged depth of -8.0mCD.

It is possible to apply for changes and amendments as to this licence as required, but -8.0mCD is considered a natural threshold for this Masterplan in terms of size of vessel manoeuvring around bends, as well as other factors such as overall economics, costs, particularly with the risks of high costs if rock is confirmed at these levels and other limiting factors such as the market for significantly larger vessels etc.

Future marine channel depths considered are therefore -7.0mCD, -7.5mCD and –8.00mCD.

### 6.3.2 Guidelines for design of marine access channels

Guidelines for the design of layouts, the required water depths, widths, manoeuvring areas etc. of marine access channels, is contained in PIANC Report No. 121 – 'Harbour Approach Channels – Design Guidelines', report of MarCom Working Group 49, published in 2014.

Some general recommendations for channel and manoeuvring area dimensions which have been used for conceptual design for this Masterplan include:

- For a straight one way channel, a bottom width between 3.6 – 6 times the beam of the "design vessel" is recommended, which comprises:
    - Manoeuvring lane between 1.2 and 2.0 times the beam of the largest ship using the channel
    - Bank clearance either side of the manoeuvring lane between 1.0 and 2.0 times the beam of the largest vessel
    - For preliminary planning a channel width of 4.0 times the beam of the largest vessel would be appropriate
    - Additional width is generally required on curves

- The water depths (dredged levels) required depend on:
    - Operating draught of vessel (maximum draught and trim)
    - Tidal variations
    - Movement of vessel due to waves
    - Vessel squat
    - Character of sea bed (soft/hard/rock)
    - For preliminary planning a dredged depth which gives a minimum under keel clearance (UKC) of approximately 15% of the maximum vessel draught can be used
    - A minimum UKC of 0.5m is appropriate for normal bed conditions, increasing to 1.0m over areas of rock dredging due to the potential consequences of a vessel making contact with isolated rocks.

- The required diameter of the turning circles at Belview will depend on:
    - Maximum vessel lengths
    - Available tug assistance.
    - Degree of weather exposure (wind/wave) and impact of currents
    - For preliminary planning purposes the turning circle diameters would normally be between 1.5 and 2.0 times the maximum ship length, but this may not be achievable at Belview due to constraints of river bed width and/or the presence of rock.

### 6.3.3 Assessments undertaken

For each of the potential marine projects assessments were undertaken using both present and historical information to:

- Construct 3D digital base models for the various conceptual designs;
- Calculate volumes of material to be removed using the most relevant survey information;
- Assess the presence of bedrock or difficult dredge layers based on available geophysical information;
- Make assumptions on the material to be dredged;
- Calculate capital budget cost estimates; and
- Evaluate the impact on the annual maintenance dredging costs.

### 6.3.4 Do nothing scenario

The current access channel requires regular maintenance dredging to maintain accessibility). The annual cost of this dredging is around €1.3 million per annum.

If no improvements are made the port will be constrained by the ongoing annual costs of the

maintenance dredging and the numbers of transits and sizes of vessels it can accommodate in the future. Maintaining the status quo would result in losing market share and the port would not be in a position to deliver the facilities and services required by stakeholders in the south east Irish economy.

For these reasons the "Do nothing" scenario is not considered viable.

### 6.3.5 Option 1.1 - Minimise future dredging requirements - Cheekpoint Lower Bar River Training Wall

The Cheekpoint Lower Bar area is regularly maintained by dredging, resulting in the need for the disposal of high volumes of dredged materials and high ongoing maintenance costs. Both trailing sucker hopper dredge and plough dredge approaches are utilised.

Options to reduce sedimentation in the existing port operational areas, particularly around Cheekpoint Lower Bar, have been considered. This could be achieved through the installation of training walls at the confluence of the Rivers Barrow and Suir.

The benefits of such a scheme were identified in the Phase 1 Assessment modelling and the further detailed analysis of options which has been carried out by ABPmer and reported in "Port of Waterford Marine MasterPlan – Option Assessment" - ABPmer June 2018.

The current proposal envisages the construction of two lengths of training wall, one a vee shaped wall approximately 495m long and the other a straight wall 130m long. Bed levels at the site vary from approximately -2.5mCD to -7.5mCD.

Two construction options have been considered:

- Sheet piled walls
- Rubble mound structures

**Sheet piled walls**

The proposed location can be seen on Figure 6.2 and the proposed layout of the sheet piled training walls is shown in Figure 6.3 below. The sheet piles would extend at least 7m and up to 12m above bed level. Silt is likely to build up inside the sheet piled wall especially in the vee section. A photomontage of the proposed sheet piled walls at low tide is shown in Figure 6.4 A and B.

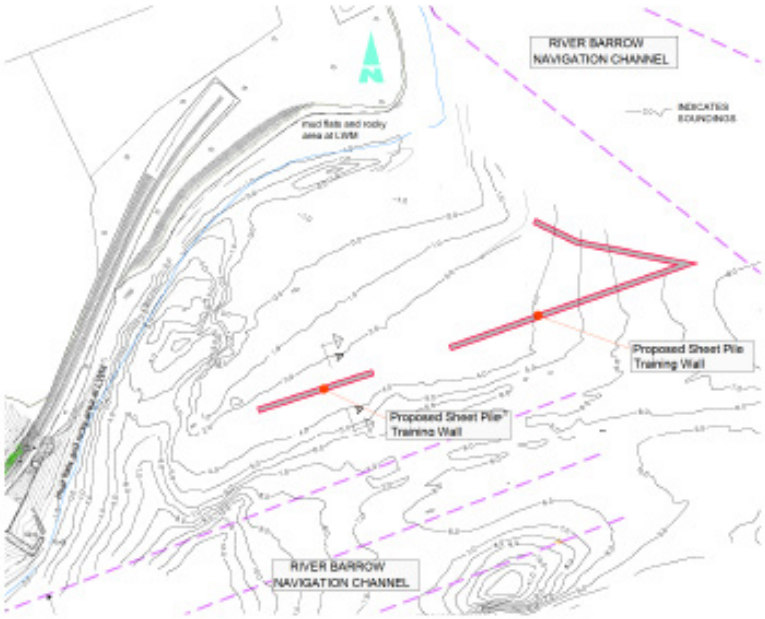



*Figure 6.3 –Proposed layout of sheet piled training walls*

*Figure 6.4A – Photomontage of sheet piled training walls at low tide*

*Figure 6.4B – Photomontage of sheet piled training walls at high tide*

**A single line of sheet piles will not be sufficient to resist the loads imposed due to waves, currents, silt build up and accidental impact. A double wall will therefore be required with open or closed ends – most likely closed. The arrangement will need to be capped with concrete or filled. Waler beams and struts will be required to maintain alignment and ensure the twin wall acts as a single structure. A typical section through the proposed sheet piled wall option is shown in Figure 6.5.**

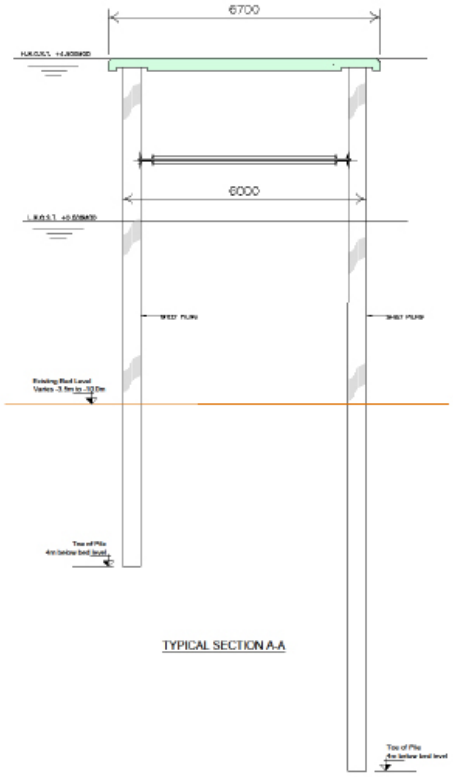



*Figure 6.5 – Typical section through proposed sheet piled training wall.*

Assuming embedment lengths ranging from 4 – 6m depending on water depth and a top level of +4.5mCD the total area of sheet piles amounts to 17,500m2 which is likely to equate to around 2,000tonnes of sheet piles. A further 220tonnes of walers and struts will be required and around 1,250m3 of concrete.

This solution is likely to cost in the region of Euro 6 million plus around 0.7 million to cover general contingencies, site investigations, planning and foreshore lease applications and professional fees, total Euro 6.7 million.

The advantages/disadvantages of a sheet piled training wall include:

- Advantages
  - o Greatly reduced impact on the SAC – 6m wide rather than 35-50m wide for the rubble mound
  - o Impact on SAC confined to the Training Wall footprint i.e. no temporary occupation of the SAC (as would be required for the construction of the rock fill solution)
  - o No land-side impacts (e.g. haul road)

- Disadvantages
  - o Marginally more expensive than rubble mound option
  - o Visual appearance/impact
  - o Subject to corrosion
  - o Difficult to maintain/repair in event of collision damage
  - o Will require barges and pontoons to transport the materials and construction plant to site all of which may have an impact on shipping movements

**Rubble mound structures**

The original scheme envisaged that the training walls would be constructed from quarry run rock fill sourced from a nearby quarry. A haul road would be constructed through the steep embankment down to the foreshore. The proposed layout of the rubble mound structure is shown in Figure 6.6 below.

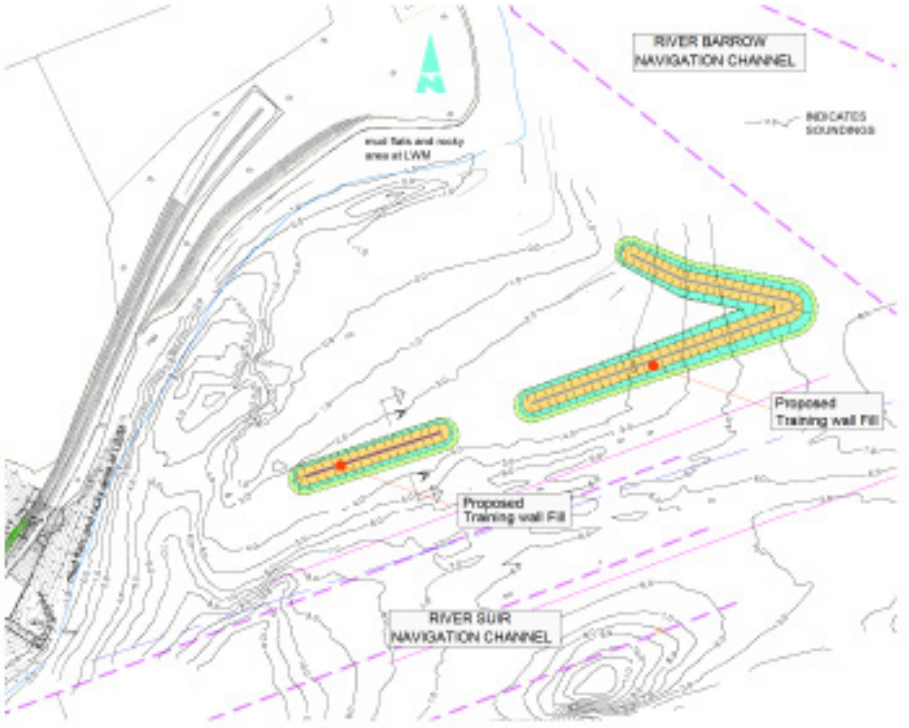



*Figure 6.6 - Proposed layout of the rubble mound structure training walls*

Material would be hauled from the quarry and deposited on the bed of the estuary and extend south-eastwards to the tip of the vee and then west-south-westwards to the western end of the proposed wall. When the western straight section is complete and protected with geogrid and rock armour, the material between this straight section and the vee section would be recovered and returned to the quarry. The vee section would then be protected with geogrid and rock armour and when complete the rock fill from the vee section to the shore would be recovered and returned to the quarry. The proposed section through the rubble mound option is shown in Figure 6.7 below.

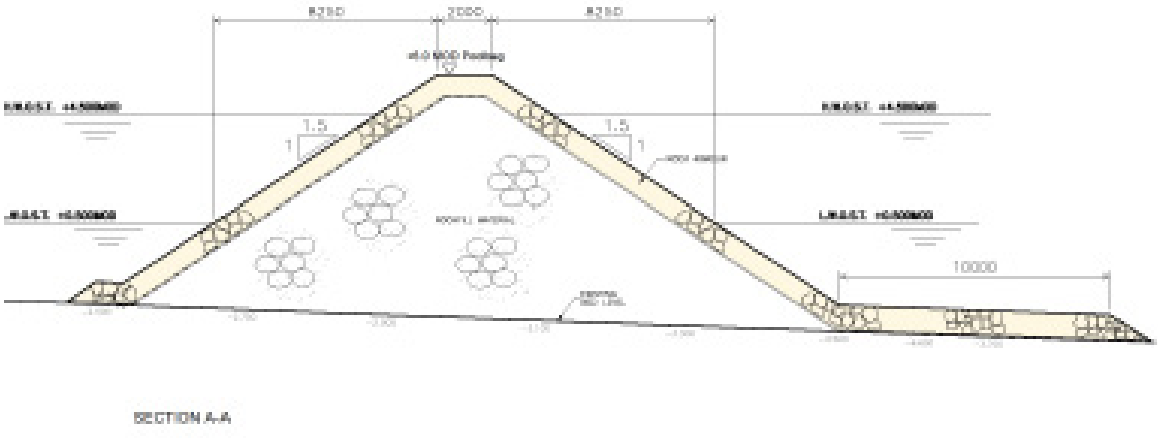



*Figure 6.7 – Typical section through proposed rubble mound training wall*

The estimated cost of this option is approximately Euro6.0 million in full.
The advantages/disadvantages of a rubble mound structure include:

- Advantages
  - o Potentially marginally cheaper than sheet piled solution
  - o Natural materials used which are simpler to maintain and repair
  - o Visually may have less impact

- Disadvantages
  - o Large footprint in the SAC. The footprint of the permanent works at bed level would vary in width from 35m to 51m.
  - o Temporary filling required between the two sections of training wall and from the vee shaped section to the shore
  - o Temporary filling would become waste once removed
  - o A haul road would be required through the heavily wooded steep incline to the foreshore
  - o A foreshore licence would be required for the temporary works
  - o The haul road would cross over the Irish Rail tunnel leading to Barrow Bridge – Irish rail may require a structural assessment of the tunnel to demonstrate that it has sufficient capacity to support the dump trucks
  - o Dredging may be required under the footprint of the rubble mound to remove soft materials

The sheet piled wall is the preferred option due to the lower environmental impact., Therefore the SEA and Natura Impact Report for the Masterplan do not provide assessment of the rubble mound structure.

### 6.3.6 Option 1.2 - Improve navigational safety to and from the port - Carters Patch Channel Widening

Carters Patch represents a particular area of the navigational channel (from Passage East to Sheagh Light) that poses a potential navigational safety hazard to vessels. The curve of the navigational channel

requires vessels to 'crab' when manoeuvring in the channel. This results in a limiting length of vessel able to safely pass through the area.

Based on the environmental characteristics of the harbour, defined by the Harbour Master, and the design vessel (beam 32.0m) the following channel widths are advised by PIANC:

| Area | Required Width from PIANC guidelines (m) | Current Width for - 6.5mCD (m) | Proposed Design Width (m) |
|---|---|---|---|
| Carters Patch | 180 | 100 | 150 |

*Table 6.1 - Carters Patch channel widths*

It can be seen that, based on the environment site parameters, the required channel width is approximately 180m. The current channel does not meet this standard. Carters Patch would require an increase in channel width due to an increased swept path width of the vessels when manoeuvring. The planned 150m width will significantly improve the manoeuvring in this area, albeit without fully meeting the dimensions outlined by PIANC guidelines.

For budgeting purposes the current channel dimensions proposed are deemed sufficient. This will need closer assessment at the project stage.

### 6.3.7 Option 1.3 - Approach channel widening and deepening to accept larger vessels

To accommodate larger, tidally restricted vessels it would be necessary to deepen the approach channel, from the mouth of the estuary to the quays, from -6.5mCD to a more appropriate level, potentially to a depth of up to -8.0mCD.

In order for the port to remain competitive and meet the needs of stakeholders in the future it is essential that additional capital dredging is carried out. A range of dredged depths, from – 7.0mCD to -8.0mCD have been considered. The cost of this dredging increases with increasing depths, and such dredging has to be carried out within the available financial resources of the port. However such work can be carried out incrementally over a number of years before achieving a final depth which will serve the needs of future vessels. Potential vessels to be accommodated in the future are anticipated to be bulk carriers up to around 200 – 210m LOA drawing 10m and container vessels up to 160m LOA drawing around 8m.

### 6.3.8 Option 1.4 – Turning basin development – to improve vessel manoeuvring areas and turning at Belview

Currently, vessels utilise one of two turning circles; either

- Up estuary turning area between Belview Quay and O'Briens' Quay, with a nominal diameter of 200m and depth of -6.5 CD, or
- Down estuary turning area just beyond the downstream end of Belview Quay (between Flour Mill and Snowhill at Cheekpoint Upper Bar), with a nominal diameter of 250m – 300m and depth of -6.5 CD.

Both manoeuvring areas have constraints on length which would restrict larger vessels accessing the Port.

The potential to develop significantly larger turning areas is limited by the width of the river defined by the river banks. Options to expand both the turning circles have been considered and modelling has been carried out by ABPmer.

Based on geophysical information obtained, the proposed diameter of the upper turning circle needs to be reduced significantly and the turning circle at Cheekpoint Upper Bar will be limited to 310m with 1 in 5 side slopes. These changes are made to avoid any potential rock that may be within the design area.

This would allow vessels of up to 25,000dwt (typically 178mLOA with max draught of 10.7m) and potentially larger vessels of up to 40,000dwt (around 210m LOA) at reduced operating draughts, to manoeuvre at the Cheekpoint Upper Bar turning circle. See table below for larger vessel sizes.

| DWT (tonnes) | Loa (m) | Lapp (m) | Beam(m) | Max. Draught (m) |
|---|---|---|---|---|
| 40,000 | 209.0 | 199.0 | 30.0 | 12.5 |
| 35,000 | 199.0 | 189.0 | 28.9 | 12.0 |
| 30,000 | 188.0 | 179.0 | 27.7 | 11.3 |
| 25,000 | 178.0 | 169.0 | 26.4 | 10.7 |

*Table 6.2 - General cargo vessel dimensions (25,000dwt – 40,000dwt)*
*Source: PIANC WG Report121 – 'Harbour Approach Channels Design Guidelines'*

The volumes of material to be removed to achieve various channel depths were calculated based on the design profile using the most relevant bathymetric data. In addition, geophysical survey results were used to establish the likelihood of hard strata within the design profile for each scenario so that it could be designed out where possible.

### 6.3.9 Dredging volumes and costs

Table 6.3 below outlines the volumes required to be removed. These are cumulative volumes and include for the widening of the channel to 150m at Carter's Patch. If it is envisaged that the deepening will be undertaken in a staged process, the figures can be subtracted from each other to determine the stepped volumes.

| Dredged Levels (m) | Navigation Channel ($m^3$) | Turning Circle ($m^3$) | Total ($m^3$) |
|---|---|---|---|
| -7.0mCD | 530,000 | 170,000 | 700,000 |
| -7.5mCD | 930,000 | 210,000 | 1,140,000 |
| -8.0mCD | 1,410,000 | 260,000 | 1,670,000 |

*Table 6.3 - Cumulative Volumes to be removed from the Navigation Channel and Turning Basin at Various Levels*

With regard to the widening of Carter's Patch the geophysical survey showed that a volume of material may be a hard layer. For the potential depths of 7mCD, 7.5mCD and 8mCD, the associated volumes are 20,655$m^3$, 44,036$m^3$, 80,675$m^3$ respectively. A portion of each of these volumes will be within the overdredge and side slopes so may not require removal.

There are a considerable number of variables that can impact on the cost of dredging. The most significant being the variability of production when dredging different types of material. Other variables that will exist are disruption due to other shipping activities, weather and sea conditions, environmental restrictions, disposal limitations, fuel inflation, to name just a few.

Based on the volumes and dredging methods outlined the budget estimates for the depth options being considered are outlined in Table 6.4 below

| Cumulative Costs - €million | Navigation Channel | | Turning Circle | Total Estimate | |
|---|---|---|---|---|---|
| Design Depth | TSHD | TSHD & BHD | TSHD & BHD | Min | Max |
| -7.0mCD | €2.1 | €2.4 | € 2.3 | €4.4 | €4,7 |
| -7.5mCD | €3.6 | €4.2 | €2.7 | €6.3 | €6.9 |
| -8.0mCD | €5.4 | €6.6 | €3.1 | €8.5 | €9.7 |

*Table 6.4 Direct cumulative dredging costs for varying navigation depths*

These budgets deliver the indicated depths plus 150m channel width at Carters Patch plus an enhanced swing basin. In addition to the direct costs outlined in Table 6.4, mobilisation of a suitable BHD and associated barges would be approximately €350,000.

## 6.4 Options for development/improvements to berths

### 6.4.1 Overview of objectives

The demand to accommodate larger (longer and wider) and deeper (drafted) vessels in the future will require increased berth lengths and depths alongside. These options consider improvements to the existing berths (deepening) and potential for additional new berth development at Belview.

### 6.4.2 Do Nothing

Section 5 has identified the potential for additional berthing lengths, with greater depths alongside to accommodate larger vessels in the future. The port currently has spare capacity around its berths and has no immediate plans to expand on this front. However the economic analysis and throughput forecasts indicate possible requirements to provide new berths circa 10 years out. The port believes that the critical issue is not whether or not there is a clear intention to build new infrastructure but rather that the port is positioned to respond to demand and to deliver the infrastructure expected of it in a timely manner. This is a challenging proposition.

The "Do Nothing" option is effectively adopted unless and until this option is expected to becomes a constraint on economic development. Circumstances can change relatively quickly and the port needs to be able to act flexibly, insofar as this is possible, and have a range of options prepared, considered and ideally consented to a sensible extent.

### 6.4.3 Option 2.1 - Belview Quay Extension

Construction of a 400m extension of the main Belview Quay to provide two new berths is considered. This project would require around 6 hectares of land reclamation and capital dredging.

The berths would be designed with the potential to accommodate future vessels with operating draughts of up to 11.0m capable of lying alongside the berths at all states of the tide. This would require a dredged depth of around -11.5mCD minimum in a dredged pocket at the berths. In practice vessel sizes would be limited in future by length in terms of turning and manoeuvring at the berths and available navigation widths and depths in the marine approach channels.

The original 193m long wharf extension which included the dolphin, was constructed on 2007/2008 for Euro 10.2 million. There is no site investigation data available for the area downstream of the existing bulk terminal. However it seems likely that the average length of the piles required may be longer than those supporting the existing wharf. A site investigation would be required to determine this.

**Budget costs**

A budget of around Euro 27 million would be required for a 400m quay extension. This figure is based on the following:

| | |
|---|---|
| • Cost of original 193m wharf excluding dolphin approx. | 9,500.000 |
| • Add for inflation, longer piles, less competitive tender | 1,900,000 |
| • Add for additional protection to steel piles and reinforcement | 1,000,000 |
| • Cost for 193m of quay | 12,400,000 |
| • Pro Rata for 400m of quay | 25,700,000 |
| • Add cost of dolphin at downstream end | 1,000,000 |
| Total budget project cost (excluding dredging costs) | 26,700,000 |

This extension would only be built if the demand is foreseen to deliver the additional tonnages and revenue streams that will allow the business to grow and provide returns as forecast i.e. provide a modest but reasonable return on capital expended.

### 6.4.4 Option 2.2 - O'Brien Quay Extension

The O'Briens' Quay can currently accommodate vessels up to 120m loa. An extension to accommodate vessels up to 190m loa has been proposed. Extensions on either side of the existing quay have been

considered. The turning circle in the vicinity of this Quay would be required to be enlarged to allow longer ships to turn, which would require deepening and maintenance dredging.

Due to the presence of rock in the area of the turning circle this can only be economically dredged to an increased diameter of around 240m to handle vessels of 160m LOA at the O'Brien Quay.

**Budget costs**
The costs of construction of a quay extension at the privately owned O'Brien Quay would be met directly by the owner. The costs of any dredging required would be met by the Port of Waterford.

### 6.4.5 Option 2.3 - Quay Wall Continuity

There is currently a break of 230m in the continuity of the quay wall between Belview Quay and O'Briens' Quay. This area is prone to sedimentation and impinges on safe navigational depths in the adjacent downstream berth. This option is proposed to minimise these impacts and provide additional berthing and storage with the construction of an infill quay wall in this area. There is a possibility to share the costs and benefits of such a development with the owners of O'Briens' Quay, with an extension to this quay and the container berths to be shared operationally. Any such development will be driven primarily by expansion in the container business which is only seen towards the end of the Masterplan under the high growth scenario, so is not considered applicable within the current time frame.

**Budget costs:**
Considering a full infill section of 230m between the O'Briens' Wharf and the Container Terminal, the budget project costs would be around Euro 14 - 15 million (excluding dredging works).

### 6.4.6 Option 2.4 - Berth Deepening

Deepening of berths at Belview has been proposed to accommodate deeper drafted vessels at the terminals. However, the form of construction of the existing quay walls significantly limits the deepening of the berths due to the form of construction with vertical piles and a sloping rock-armoured revetment under the deck. This option is not considered practically and economically viable.

### 6.4.7 Longer term development of additional deep water berths at Snowhill Point or further downstream

The area immediately downstream from the existing berths (towards Snowhill Point), as well as other potential sites further downstream, have previously been considered for port development. Based on the levels of traffic forecast over the next 25 years, and the existing capacity of the port, together with the additional potentials for development discussed above, such longer term development lies outside the timeframe of this Masterplan and has not been considered further. Therefore, environmental aspects of these options have not been assessed in the Masterplan SEA and Natura Impact Report.

## 6.5 Options for shore side developments

### 6.5.1 Belview Port Land Use– Masterplan Objectives

The overall aims of the port land use strategy are listed in Section 1.5. The following land use objectives are aligned with the overall aim of the Masterplan which is to enhance capacity of Belview Port. Objectives include,

1. Identify development land requirement, key projects and Strategic Infrastructure Development required to enhance the capacity and efficiency of the Port;
2. Facilitating the development of zoned land and identify serviced development sites;
3. Improve the storage and handling of materials;
4. Improve Traffic management and Safety
5. Ensure port access and security to relevant ISPS Code requirements
6. Identify supporting infrastructure required to facilitate projects proposals and development of services sites; and
7. Develop an infrastructure action plan, focused on financing and delivery.

Based on these objectives, the following development options have been considered for the shore side developments:

6.5.2 Option 3.1 - Improvements to road access to port
The working (and reasonable) assumption is that the N29 has capacity to deal with the additional traffic arising from the growth scenarios forecast. However other potential developments in the area may create pressure on the N25 links at the top of the N29 and there may also be a requirement to adopt new treatments for service roads joining the N29 in the Port area as and when required. Some alterations to N29 are envisaged at the Rathculliheen turn-off where a new roundabout is planned. This will be a very positive development that will help traffic management at a difficult junction and will also allow a restricted speed from that junction to the port gates. This will facilitate access to lands on the lower end of the N29 that need to be made available for port related use.

### 6.5.3 Option 3.2 - Improvements/development of services infrastructure
Development of services including water supply, effluent treatment, and broadband will be required. Port of Waterford will take a progressive role in promoting these developments within the Port zone.

### 6.5.4 Option 3.3 - Serviced sites
The provision of serviced development sites to support port related activity has historically been driven primarily by private sector investment. In some cases Port of Waterford has held lands that it has made available to the market when demand emerged. Port of Waterford will continue to play a role in the management of the port zone land bank with a view to ensuring the needs of the port are not constrained by the non-availability of appropriate sites.

### 6.5.5 Option 3.4 - Office Buildings
Port of Waterford is seeking to expand the activities supported within the Marine Point office building and sees a case to develop an ‘enterprise hub’ for both port related and other activities supporting employment from a wide hinterland (Waterford, Wexford & Kilkenny).

### 6.5.6 Option 3.5 - Development of additional warehousing
The development of additional warehousing required to support forecasted increased Port throughput has again traditionally been the province of the private sector. Port of Waterford does not anticipate any radical deviation from this successful formula.

## 6.6 Current Projects
The following development projects are currently (2019) in progress:-

### 6.6.1 Pontoon Relocation
The tugs serving Belview Port berth at the Port pontoon system and on the Frank Cassin wharf in Waterford City. The intention is to relocate the Port pontoon to Belview, downstream from the Belview Quay. This would facilitate the berthing of the tugs at Belview with a number of immediate benefits including faster reaction times, lower fuel cost and potentially far fewer openings of the proposed new ‘sustainable bridge’ linking the North and South Quays.

### 6.6.2 Gatehouse Improvements
Renewal and expansion of the security and weighbridge offices at the port entrances is in progress to cater for increased services and throughputs and to bring these buildings up to modern standards. A new gatehouse/security building has been designed for the second or bulk terminal entrance to the Belview Quays. An Appropriate Assessment Screening Report has been prepared, for this project concluding that there are no potential environmental impacts on the River Suir.

# 7 Belview land use strategy

## 7.1 Overview and challenges for landside development

This section sets out the land use strategy for Belview Port and defines the Ports response to growth in demand for the facilities and services it provides. Such growth will of necessity be supported by the expansion of ancillary facilities including new/additional bulk handling and storage capacity, container handling and storage capacity as well as trucking and rail facilities.

The provision of landside services, including the supply of water/fire water/foul water treatment/power/broadband, all requires consideration. The N29 which provides the principal means of access to the port estate will also require intervention to support the delivery of port related development on adjacent zoned land. Similarly the management of cargo residues, light and noise issues and traffic management are all factors to be considered.

The main challenges for landside development are considered to be:

- Facilitating the phased development of zoned land
- Improving road and rail access
- Enhancing services (power, water, communications)
- Improving the storage and handling of materials
- Applying best practice environmental management approach

## 7.2 Existing Traffic and Anticipated Growth

Current traffic levels in terms of articulated truck movements in/out of the Port is running at approximately 80k per annum. The low growth scenario would see this increase to 128k movements per annum and the medium growth scenario to 206k movements per annum by 2044.The high growth scenario would see truck movements at 380k per annum or almost 5 times the current level.

Any utilisation of the rail potential within the Port will mitigate these road traffic figures. Furthermore if this growth in traffic is a result of greater use of Port of Waterford at the expense of Dublin Port for traffic destined for or from the Region then this would/could represent a net decrease in overall road traffic.

The expectation is that the N29 should be capable of handling the low and medium growth scenarios. However the high growth scenario could create a requirement for capacity enhancement. This is particularly the case as other developments occur on the IDA site on the Rathculliheen side of the port zone.

Some measures are currently required and some will become necessary in the shorter term: -

- The proposed roundabout at the Rathculliheen turn-off is needed now.
- The reduced speed section at the lower end of the N29 needs to be extended.

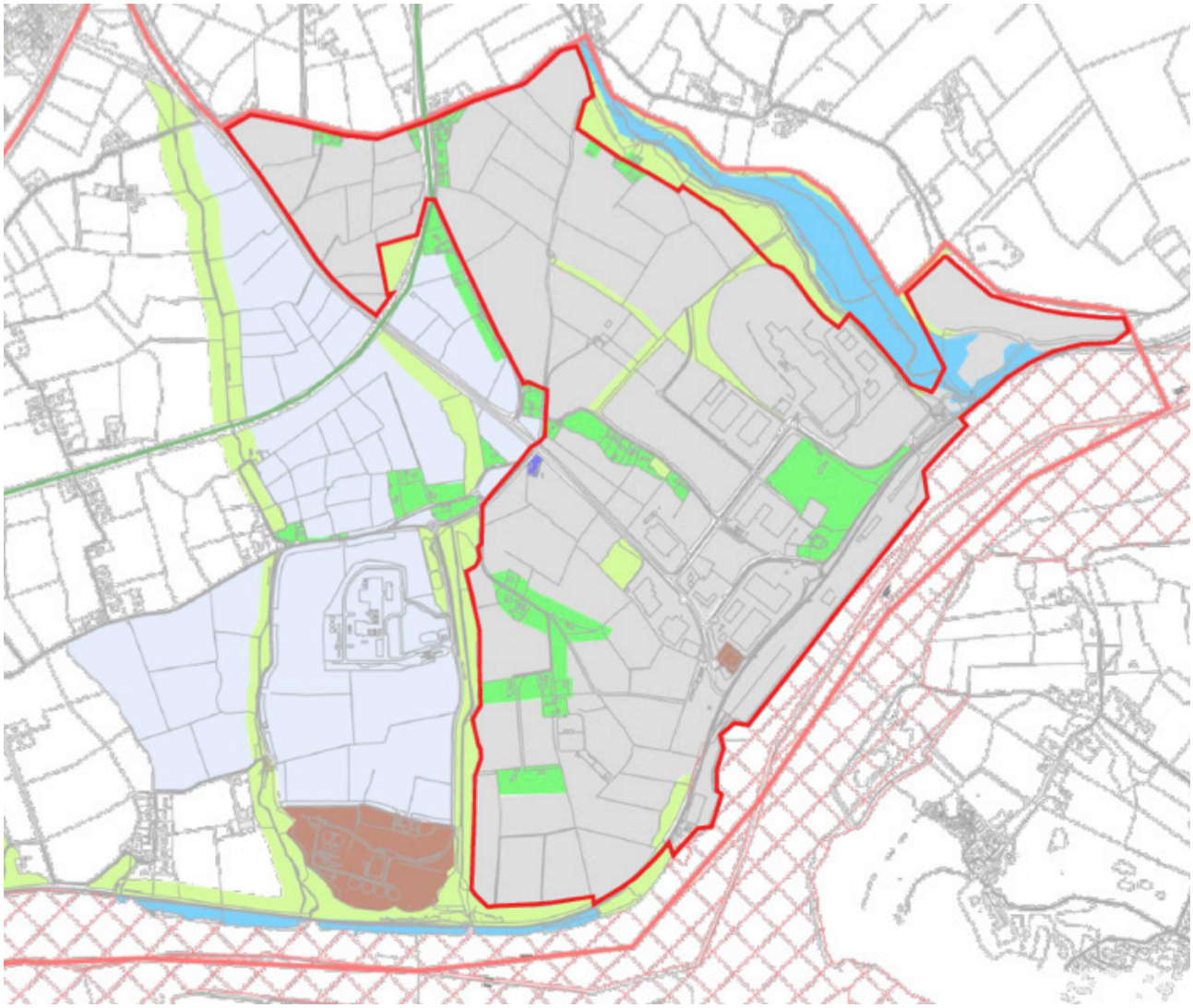


*Figure 7.1 - Landside Masterplan Boundary*

## 7.3 Belview Port and Surrounding Area

Belview Port is located approximately 5km to the East of the City of Waterford on the north bank of the River Suir. The landside Masterplan boundary area is shown in Figure 7.1 and encompasses approximately 249 hectares of land that is zoned for port related use.

### 7.3.1 Layout

Belview Port is long and narrow, as the operational quays are effectively constrained between the Waterford to Rosslare Railway line and the River Suir. The Port comprises a total berth length of 960m and can accommodate two to three container vessels and up to four bulk / project cargo vessels at any time on the main berths, depending on the length of vessels, along with additional vessel(s) at the Suir Shipping berth.

The port is separated into three operational berthing and unloading areas:

- To the west is the Suir Shipping Berth.
- In the centre are the Container Terminal berths.
- To the east are the Bulk and Project Cargo berths.

Cargo imported through the port can be exported either by road or by rail as there are four parallel

railway lines running a significant length through the port for the loading and unloading of trains.

### 7.3.2 Storage

Some areas of the port are used for storage of goods until they are required by clients. This is usually for short periods. Items that may be stored on site include rails, steel beams and project cargo e.g. wind turbine components.

Surrounding the port there is a significant number of warehouses (bulk and palletised) and storage facilities operated by various third party companies. Private enterprise has proven highly effective in developing and running the local storage facilities required to handle port throughputs. It is a fundamental assumption of this plan that private enterprise will continue to operate as heretofore in meeting this aspect of the port's facilities provision.

There is a concern around the treatment of port development land as a long term passive investment which has in the past led to effective sterilisation of lands that should have been actively employed in port related uses. The Port Company needs to preserve its compulsory purchase powers in order to help avoid such effective sterilisation on key sites.

### 7.3.3 Access and Circulation

National Primary Route N29 commences at the port gates to link the port with the N25 Rosslare - Waterford - Cork National Primary Road. The port has two existing access points from the public road network. The primary access is at the end of the N29, and enters the port at the western end of the container cargo area.

The primary access consists of a manned security gatehouse, with two weighbridges and bypass lanes. Lifting barriers are in operation at the gatehouse. This access is manned 24 hours per day, 7 days a week.

On entering the port, traffic immediately passes over a single track railway level crossing.
The secondary access is at the end of a road that joins onto the N29, and enters the port at the eastern end of the bulk / project cargo area. This secondary access road crosses over the railway on a bridge and then ramps down to the wharf area.

## 7.4 Infrastructure Key Issues

The Masterplan will require actions as and when required on the following key aspects:-

- Provision of additional port related storage and processing facilities – private enterprise
- Improving road access capacity
- Downgrading of the N29 to enable assembly of storage infrastructure and manage safety aspects
- Upgrading services infrastructure – water/power/wastewater/etc.
- Improving port security
- Government investment in the national rail freight network

# 8 Policy Context

## 8.1 Overview

This section sets out the major Policies and guidelines at European, national and local level which impact on the development of Port of Waterford.

## 8.2 EU Policy

### 8.2.1 Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system, European Commission - March 2011"

This document sets out a vision for a competitive and sustainable transport system across the EU. In relation to 'Transport infrastructure: territorial cohesion and economic growth' it refers to a core network of strategic European infrastructure — A European mobility network and the need to:

- Define in new TEN guidelines a core network of strategic European infrastructure
- Concentrate European action on the components of the TEN-T network with the highest European added value (cross-border missing links, intermodal connecting points and key bottlenecks)
- Deploy large-scale intelligent and interoperable technologies (SESAR, ERTMS, RIS, ITS, etc.) to optimise the capacity and the use of infrastructure.
- Ensure that EU-funded transport infrastructure takes into account energy efficiency needs and climate change challenges (climate resilience of the overall infrastructure, refuelling/recharging stations for clean vehicles, choice of construction materials …).

**Trans European Network – Transport (TEN-T)**

The ultimate objective of TEN-T is to close gaps, remove bottlenecks and eliminate technical barriers that exist between the transport networks of EU Member States, strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area. The policy seeks to achieve this aim through the construction of new physical infrastructures; the adoption of innovative digital technologies, alternative fuels and universal standards; and the modernising and upgrading of existing infrastructures and platforms.

The European Union's Trans European Network – Transport (TEN-T) consists of a comprehensive transport network, within which there is a core network of high priority. Waterford is a comprehensive port on the Ten-T network.

## 8.3 National Ports Policy

National Ports Policy identifies categorisation of the ports sector into Ports of National Significance (Tier 1), Ports of National Significance (Tier 2) and Ports of Regional Significance.

The Port of Waterford is identified as a Port of National Significance (Tier 2). Tier 2 ports are:

- are responsible for at least 2.5% of overall tonnage through Irish ports;
- have the clear demonstrable potential to handle higher volumes of unitised traffic, and
- have the existing transport links to serve a wider, national marketplace beyond their immediate region.

In relation to meeting future capacity requirements 'There is also a role in this regard for the Ports of National Significance (Tier 2) to develop additional capacity to aid competitive conditions, within the unitised sectors in particular.'

The Government is explicit in identifying a role for the Ports of National Significance (Tier 2) to develop additional capacity to aid competitive conditions, within the unitised sectors in particular.

> "It is the Government's position that those ports considered to be of national significance must be capable of the type of port capacity required to ensure continued access to both regional and global markets for our trading economy. Shareholder support for major port capacity developments designed to address national capacity requirements will only be considered within the framework established above."

The National Ports Policy also encourages Ports such as Waterford to have strategic Masterplans in place to guide their future development as it is in line with international best practice generally and it is consistent with policy to improve integrated planning for all modes of transport. National Ports Policy recognises strongly the desirability of this process for the long-term planning of all Ports of National Significance (Tiers 1 and 2).

The National Ports Policy encourages companies to engage with the relevant planning authorities to ensure that port Masterplans and relevant planning and development strategies are complementary and consistent. Port of Waterford also recognises the potential to integrate the Masterplan within the existing planning hierarchy and has worked closely with local planning authorities to ensure that the process becomes embedded in the regional and local statutory plan. This also offers clarity to all stakeholders regarding the future development plans.

In relation to hinterland connections, the national ports policy affirms that these are critically important to any port's ability to facilitate large volumes of traffic. The European Commission's Communication on a European Ports Policy, published in 2007 also highlights the importance of reliable and sustainable hinterland connections as part of an integrated transport chain. The National Ports Policy also states that it is important that the port network have the potential to offer multi-modal distribution networks thus acknowledging that future development of the maritime sector could result in an increased role for rail-based freight to and from the ports.

## 8.4 Ministerial Guidelines

A series of ministerial guidelines have been issued under section 28 of the Planning and Development 2000. The following guidelines have been taken into account in the preparation of the Masterplan.

- Smarter Travel – A sustainable transport future 2009 -2020 – a national policy document which sets out a broad vision for the future and establishes objectives and targets for transport
- National Climate Change Policy,2013
- The National Mitigation Plan, 2017
- National Adaptation Framework, Planning for a Climate Resilient Ireland, 2018

### 8.4.1 Smarter Travel- A Sustainable Transport Future, A New Transport Policy for Ireland 2009-2020

The Government's Smarter Travel policy recognises the vital importance of continued investment in transport to ensure an efficient economy and continued social development, but it also sets out the necessary steps to ensure that people choose more sustainable transport modes. The policy is a response to the fact that continued growth in demand for road transport is not sustainable from a number of angles; it will lead to further congestion, further local air pollution and contribute to global climate change. The Government reaffirms its view that current transport trends are unsustainable and states that between 1996 and 2006, there was an increase of 115% in total road freight vehicle-kilometres and 250% in total tonnes carried on Irish roads.

Chapter 4 of the policy document affirms the need to develop solutions to make movement of goods more efficient. It recognises that the efficient movement of goods is vital to our competitiveness

and economic welfare. At present 95% of all goods are moved by road and over 30% of transport greenhouse gas emissions emanate from the freight transport sector. In relation to the movement of goods, Action 10 pledges to:

- Ensure that the Department of Transport deals with freight policy issues in a more integrated manner and prepares a specific strategy for the freight sector; setting a target aimed at reducing the environmental impact of freight while at the same time improving efficiency in the movement of goods and promoting economic competitiveness; and
- Organise a forum to bring all interested parties together, including industrial development agencies and industry representative bodies, to explore in greater depth the issues relating to the movement of goods, including:
    - o The realistic potential for rail freight;
    - o Priority freight routes allowing access to vehicles with greater load factors and capacity; and
    - o Developing key logistics centres to transfer goods to more sustainable forms of transport for final delivery in urban areas.

Action 29 of the policy documents undertakes to review ports policy with a view to maximising efficiency in the movement of goods and in the light of the review of the freight sector referred to in Action 10 which is outlined above.

### 8.4.2 National Climate Change Policy, 2013

The extent of the challenge to reduce Green House Gas (GHG) emissions in line with our International and EU obligations is reflected in the National Policy Position on Climate Action and Low Carbon Development (2014) and the Climate Action and Low Carbon Development Act 2015. The National Policy Position establishes the fundamental national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050.

It clarifies the level of GHG mitigation ambition envisaged; and establishes the process to pursue and achieve the overall objective. Specifically, the National Policy Position envisages that policy development will be guided by a long-term vision based on:

- an aggregate reduction in carbon dioxide (CO2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors
- in parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.

### 8.4.3 The National Mitigation Plan, 2017

The measures proposed by the National Mitigation Plan lay the foundations for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050. The Plan includes over 100 individual actions for various Ministers and public bodies to take forward as we move towards implementation. Chapter 4 outlines proposals to 'Decarbonise the Built Environment', with the overall objective of use less energy and for most of the energy to come from low or zero-carbon fuels. This can be achieved by ensuring that new buildings are low or "nearly zero emission" standard and energy efficiency upgrades, known as retrofits, are carried out with respect to the existing building stock. The mitigation plan states that 'as well as expecting buildings to consume much less energy, the mix of fuels providing that energy should be transitioning to a much lower carbon content.'

### 8.4.4 National Adaptation Framework, Planning for a Climate Resilient Ireland, 2018

Ireland's first statutory National Adaptation Framework (NAF) was published in January 2018. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change. The NAF was developed under the Climate Action and Low Carbon Development Act 2015. In relation to the 'Built Environment and Spatial Planning' it states that:-

> ‘It is clear that climate change considerations need to be taken into account as a matter of course in planning-related decision making processes and that the deepening of adaptation considerations in the planning and building standards processes is considered the most appropriate way of increasing the resilience of the built environment.’

Integrating climate considerations into decision making should ensure that inappropriate forms of development in vulnerable areas are avoided and compact development in less vulnerable areas is promoted.

Other considerations include the spatial implications of water stress. Land use policies may also facilitate the conversion or maintenance of land at risk of flooding to less vulnerable uses (e.g. parks, gardens and open spaces for natural habitats, etc.).

Local Authorities are required to prepare Adaptation Strategies and the Guidelines for their preparation recommend that, once approved, strategies should be used to assess the adaptation fitness of spatial plans and ensure that climate change adaptation considerations are mainstreamed into the process. The Adaptation Strategy for Kilkenny is currently in preparation.

## 8.5 National Planning Framework

The recently published National Planning Framework refers to the importance of our ports. It states that ‘as an island nation, we depend on the quality and efficiency of our ports to a far greater extent than many of our trading partners. To maintain economic growth, we must be capable of delivering additional port capacity in a timely and predictable manner.’

Section 7.3 of the National Planning Framework refers to Ports and states that:-

> ‘Ireland’s port and shipping services play an important role as enablers of economic growth. Irish ports are critical infrastructure for international trade, with over 90% of our international trade moving by sea. Ports also serve as logistics and distribution hubs. Port infrastructure involves development on both land and the marine area (foreshore) and often in proximity to areas of environmental importance and protection, and diverse eco-systems. National ports policy seeks to facilitate a competitive and effective market for maritime transport services and identifies a tiered approach to port significance.’

In recognition of the role of Ports, the NPF includes National Policy Objective 40, which is to:
‘Ensure that the strategic development requirements of Tier 1 and Tier 2 Ports, ports of regional significance and smaller harbours are addressed as part of Regional Spatial and Economic Strategies, metropolitan area and city/county development plans, to ensure the effective growth and sustainable development of the city regions and regional and rural areas.’

### 8.5.1 Draft Regional Spatial and Economic Strategies for the Southern Region

New provisions for regional policy have been introduced by the Planning and Development Amendment Act 2018 and these provisions introduce Regional Spatial and Economic Strategies which will support the delivery of the NPF as well as Strategic Infrastructure Development projects identified as part of this Masterplanning process.

The following policies and objectives have been included in the Draft Regional Spatial & Economic Strategy for the Southern Region.

**Our Region's Strategic Port and Harbour Assets**
**RPO 137 Ports**
To strengthen investment to deliver actions under National Ports Policy and investment in sustainable infrastructure projects that:

a. Strengthen and develop the strategic international, national and regional economic roles of our Tier 1 Ports (Port of Cork and Shannon-Foynes Port) and Tier 2 Ports (Port of Waterford and Rosslare Europort);
b. Support the achievement of Tier 1 status for the Ports of Waterford and Rosslare Europort;
c. Strengthen and develop the strategic regional economic role of other regional fishery harbours, ports and harbours;
d. Development proposals will be subject to environmental assessment and feasibility studies to establish that any expansions can be achieved without adverse effects on any European sites and within the carrying capacity of the receiving environment of the ports.

**RPO 138 Ports and Airports**
The critical role of the Region's port and airport assets will be protected by ensuring that local land-use policies facilitate and do not undermine their functions, and their landside access capacity, subject to consideration of environmental concerns including water quality, flood risks, human health, natural and built heritage.

**RPO 139 Port Infrastructure**
Complement investment in port infrastructure by seeking the sustainable development of improved access infrastructure to ports from their regional catchments, including the promotion of rail access where practicable.

**RPO 141 High Quality International Connectivity – Ports**
To achieve NSO: High Quality International Connectivity, the following port development actions are identified (subject to required appraisal, planning and environmental assessment processes) while ensuring the protection of sensitive natural environments and the protection of Natura 2000 sites, the protection of other harbour interests including recreation, tourism and residential amenity:

- Continued development and improvement of ports by the relevant responsible commercial State-Owned Enterprises consistent with sectoral priorities defined through National Ports Policy;
- Continued support for capital infrastructure projects in the Port of Cork's Strategic Development Plan including redevelopment of existing port facilities in Ringaskiddy and preparing City Docks and Tivoli for future regeneration;
- Continued support for the capital infrastructure projects in the Shannon-Foynes Port Company Infrastructure Development Programme including capacity extension works;
- **Continued support for Rosslare Europort and Port of Waterford to maintain and strengthen linkages with EU markets;**
- Strategic Review of Rosslare Europort;
- Strengthening and maintaining access to ports through enhanced transport networks and improved journey times including support for M11 and N80 improved connectivity to Rosslare, N28 Cork to Ringaskiddy Road and N21/N69 Limerick to Adare to Foynes;
- Investment in maritime services programmes to support aids to navigation, Coast Guards and pollution prevention activities.

**RPO 142 Economic opportunities of ports**
For all ports in the Southern Region, seek to:

- Protect the marine related functions of ports in the region including landside accessibility to ensure the future role of ports as strategic marine related assets is protected from inappropriate uses;

- Harness economic opportunities from the ocean economy and the role of Ports in the region in realising the full potential of the ocean economy. Particular regard should be had to the Government's integrated plan for the marine industry – Harnessing Our Ocean Wealth (2012), the National Marine Research and Innovation Strategy 2017-2021 (Marine Institute Ireland, 2017), and Ireland's Ocean Economy (NUIG, 2017), as well as the Marine Strategy Framework Directive and Ireland's Programme of Measures; and Ireland's forthcoming Maritime Spatial Plan (due 2021);
- Support the role of ports, where appropriate, in facilitating the sustainable development and operation of off-shore renewable energy development;
- Support appropriate enabling infrastructure development to harness our ocean wealth at regional and local levels including grid, pier and port facilities to support renewable energy and export potential;
- Undertake feasibility studies to determine the carrying capacity of ports in relation to potential for likely significant effects on associated designated sites including Special Protection Areas and Special Areas of Conservation;
- Port development in the region must adhere to the European Commission guidelines on the Implementation of the Birds and Habitats Directives in Estuaries and Coastal Zones in order to protect European Sites;

Any economic activity which utilises the marine resource shall also have regard to Ireland's obligations under the Marine Strategy Framework Directive (MSFD) which requires achieving and maintaining Good Environmental Status (GES) of coastal and marine waters (comprising both the water column and the seabed beneath it).

**RPO 160 - Investment in National Regional and Local Roads**

The national, regional and local road and transport initiatives will be progressed to achieve NSO: Enhanced Regional Accessibility subject to robust feasibility studies and site/ route selection to reduce impacts on the environment and required appraisal, planning and environmental assessment processes. Upgrade and improving the N29 - access to Port of Waterford Belview is included in this objective.

**RPO 162 – Supporting the optimisation of rail freight options**

To strengthen investment in the maintenance, improvement and strengthening of rail networks in the Region subject to appropriate environmental assessment and the outcome of the planning process. Specific objectives relevant to POW include:

- Optimisation of the existing rail network assets and the protection of these assets for our region's transition to greater levels of sustainable mobility, use of rail and achievement of lower carbon emissions;
- Optimise rail freight to ports in the Southern Region.

### 8.5.2 Kilkenny County Development Plan 2014-2020

Kilkenny County Council is committed to the role of Waterford City as a Gateway and in this regard has facilitated the continued development of the Waterford Environs within County Kilkenny and Belview Port which are seen as having substantial potential for enhancing critical mass. The Council has ensured, through a separate Local Area Plan for the environs of Waterford within County Kilkenny (Ferrybank/Belview LAP), that there is sufficient development capacity for the various land uses required to support the Gateway.

The Council in its approach to developing the Ferrybank/Belview area as an integral part of the Gateway City for the South East Region is conscious of maintaining the area's social, cultural, sporting and political identity into the future.

### 8.5.3 Strategic Locations for Enterprise and Employment

Within County Kilkenny there are two nationally and regionally important strategic locations for enterprise and employment. These are Kilkenny City and Environs and Belview Port in the environs of Waterford City in County Kilkenny.

### 8.5.4 Belview Port

The County Development Plan identifies the Port at Belview as a strategic national, regional and county asset with good road and rail links. The role and status of the port nationally and regionally should be strengthened in line with the NSS by supporting and promoting a balanced multi-modal freight transport policy that safeguards the importance of rail transport as a means of access to the port.

The port has excellent road connections to the national motorway network via the N29 and N25 routes as well as N11 connectivity via the N30 and has benefited significantly in terms of access through the provision of the Waterford Bypass and onward connections via the M9 motorway.

It highlights that while broadband is available in the Belview Port Area it is not of sufficient quality to

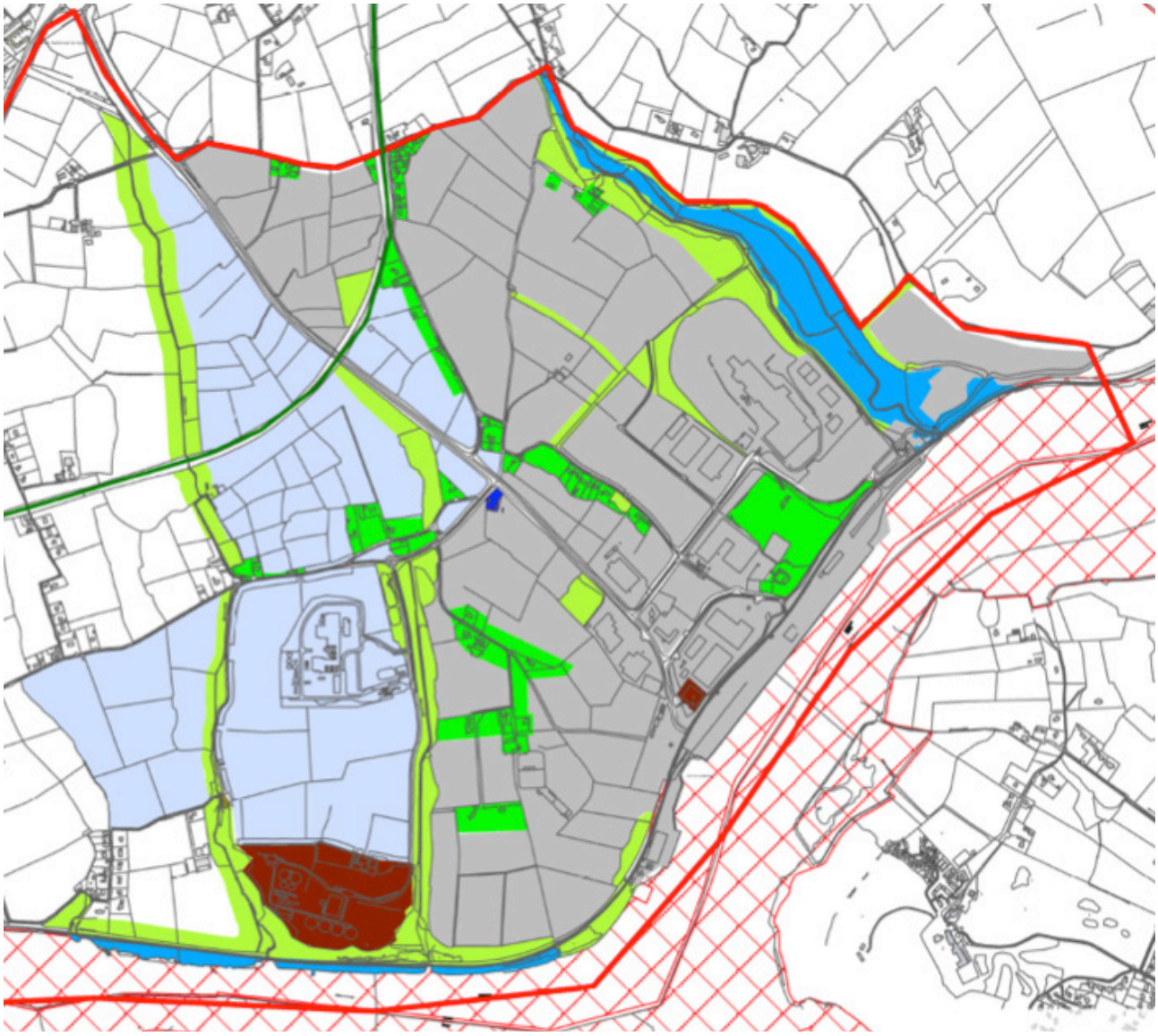


*Figure 8.1 - Belview Industrial Area - Zoning Objectives Map*

support modern day industrial requirements. The local authority has advanced a proposal to deliver high speed broadband to the area.
Following on from the investment by Glanbia, it may be possible to deliver a natural gas supply to the Belview area. The local authority will fully support the provision of natural gas to the port area and will proactively assist the statutory undertaker if and when required.

## 8.6 Ferrybank-Belview Local Area Plan 2017

The purpose of the Ferrybank-Belview Local Area Plan 2017 is to identify a land use strategy for the proper planning and sustainable development of the Belview Area. It zones development land with a view to delivering this strategy and supporting the growth of the Port of Waterford. There are two port related zones designated in the Belview Industrial area; Industrial/Technology Park and Port Facilities and Industry. These zones, shown in Figure 8.1 below, allow for the development and expansion of portal facilities and associated industries.

### 8.6.1 Permitted Uses under each Zoning Objective

**Port Facilities and Industry**
**Objective:** To allow for the further development and expansion of portal facilities not encouraging leakage of uses which would be more appropriately located in the existing urban centres of Waterford City and Ferrybank.

**Permissible Uses:** Car/Truck park, industry (General Industrial use), Industry (Light), Port related office, open space, park and ride facility, silos and storage areas, storage tanks including bulk liquid storage and general warehousing, wholesale/warehousing.

**Open for consideration:** Advertising board, ATM, buildings for the health, safety and welfare of the public, cafe, car repair/sales, childcare facilities, enterprise centre/campus industry, service/petrol station, recycling centre (bottle banks, etc), Shop - Convenience outlet, water based recreational cultural activities.

**ITP- Industrial Technology Park**
**Objective:** To provide for industry, technology and the expansion of port related activity.
Permissible Uses: Car park, industry (General Industrial use) and ancillary office, Industry (Light) and ancillary office, open space, park and ride facility, silos and storage areas, storage tanks including bulk liquid storage and general warehousing, wholesale/warehousing.

**Uses open for consideration:** Advertising board, ATM, buildings for the health, safety and welfare of the public, cafe, car repair/sales, childcare facilities (crèche/nursery), enterprise centre/campus/office based industry, public house, restaurant, service/petrol station, recycling centre (bottle banks, etc), water based recreational/cultural activities.

**Passive Open Space/Green Links/Biodiversity Conservation**
The lands surrounding the Port are largely agricultural and contain many sensitive environmental features, including tree groups, flood plains and stream valleys. It is important that these features remain protected.

**Objective:** To allow for passive open space/green links/ biodiversity conservation.

**Permissible Uses:** Agricultural Building, Open Space, Playground.

**Open for Consideration:** Cafe, Car Park, Caravan Park/Camping Site (not permissible within the flood zones), Club house and associated facilities, Community facility & associated structures, Cultural/ Recreational building, essential infrastructure, Golf Course, Graveyard, Leisure and associated structures, Water-based Recreational / Cultural Activities. Extensions and expansions of existing uses will be considered on their own merits.

**Transport connections**
The disused railway (Waterford to New Ross) line runs through the Belview area. As this line is proposed for development as the Greenway this is ideally located to provide opportunities for commuting between the Port and Ferrybank, and the wider Waterford city area, via walking or cycling. It is an objective of this Plan to provide access points to the Greenway as part of the overall transport strategy for the area, and one of these access points should be at the N29.

It is also important that the route of the greenway is carefully considered in respect of the operational plan for the Port in terms of both amenity and public safety. The Port will actively engage with the sponsoring agencies to facilitate an appropriate route for the Greenway.

**Truck parking**
The LAP states that Port of Waterford has identified a need for a truck park/open storage in the vicinity of the Port to allow for vehicles to park and wait. This would require a land take of approximately 3 ha. Such a use is permissible within the PFI zone.

**Services hub at Marine Point**
The area around the Marine Point office building could serve as a small services centre for the port area, providing facilities for employees such as a cafe and small shop. A development objective has been included on Figure 4 Development Objectives to designate this area for this purpose. This facility would be developed at a scale to serve the local workforce.

*Buffering of new development*
New industries locating in the Belview area will be required to incorporate appropriate landscape screening. Tree planting provides not only visual buffering, but also filters dust and attenuates noise. This is particularly important around all existing residential developments, but also more generally to ensure the mitigation of any impact of industrial development on the landscape.

## 8.6.2 Road Access – N29

In recognition of the importance of the Belview area the Kilkenny County Development Plan included the following objective:

> "To develop and agree an appropriately planned policy response to access from the N29 Port Road to industrial zoned lands in the Belview area in conjunction with the National Roads Authority".

The zoned land in the 2009 LAP was centred around the N29. This is a national primary route, where at present the 100 km/h speed limit applies. Transport Infrastructure Ireland (TII) raised concerns with respect to the means of access from the N29, citing road safety concerns and a reduction in carrying capacity.

In the context of the emerging Draft LAP Kilkenny County Council engaged directly with the TII and separately with Port of Waterford to develop a policy response. Various strategies were discussed. The emerging proposal is now to provide an urban speed limit at the cul-de-sac end of the N29 accompanied by appropriate measures to ensure a level of speed reduction appropriate to the speed limit. Proposed development can take access, in a suitably planned manner, from the section of the N29 located within the proposed urban speed limit. In the longer term, access to the lands north of the L-3412 (Rathculliheen/Abbey Road) junction from the N29 would be provided following the construction of a roundabout at that junction.

It is an objective of the Council to:

- Introduce a speed limit of 60km/h on the N29 Port Road from the entry point to Belview Port to a point 440m south-east of its junction with the Rathculliheen Road (LS-3412) (as proposed under the National Road Speed Review 2015-2017);

- Provide a roundabout on the N29 Port Road at the L3412 (Rathculliheen) junction. This will provide for the distribution requirements of traffic accessing the development lands to the east and west of the N29, and would, in addition, serve to reduce the speed of traffic travelling into the port itself;
- the layout of the N29 between the roundabout and the port gate will be reconfigured to ensure that the speed reduction effected by the roundabout is maintained to the port;
- the construction of the roundabout will facilitate the extension of the 60km/hr speed limit zone to a point just south-east of the junction of the N29 with the Rathculliheen Road (LS-3412);
- access would be provided to development lands directly from this section of the N29 in a planned manner.

**Land reservation**

To facilitate improvement works to the N29 Port Road to cater for increased development activity, a 7.5m land reservation shall be applied, either side of the existing carriageway along the entire length of the N29, for the future widening of the existing road to dual carriageway along with the introduction of vulnerable road user infrastructure (allocated road space for pedestrians and cyclists). This land reservation shall be utilised to facilitate the following:-

- 1.2m widening of paved road;
- 2m verge (per TII DMRB TD300);
- 3m Bi-directional shared footpath / cycle path (per TII DMRB TD300);
- 1m verge.

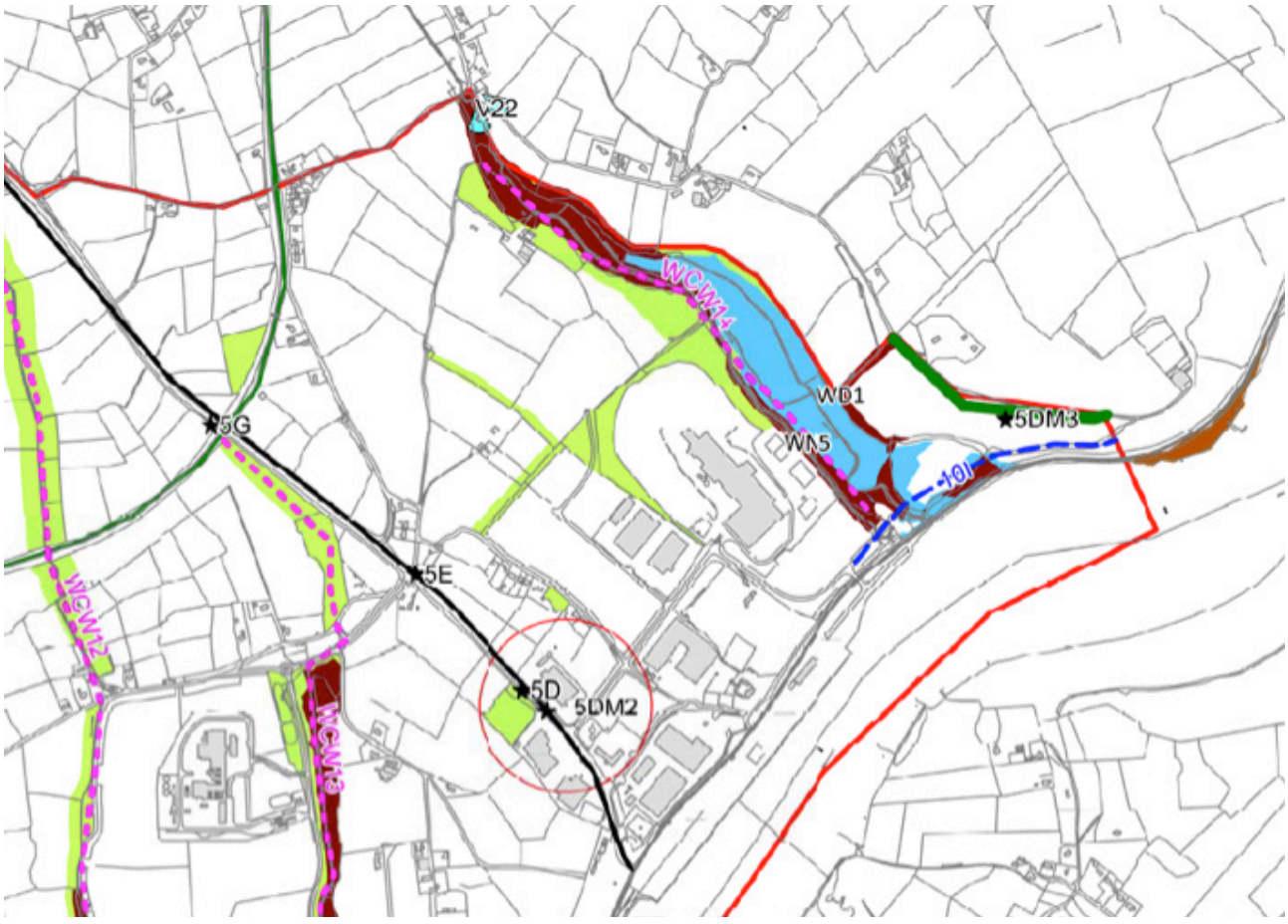



*Figure8.2– Belview Industrial Area - Development Objectives Map*

# 9 Assessment and mitigation of environmental impacts

## 9.1 Background

Malone O'Regan Environmental (MOR) were commissioned by PoW to undertake a a Strategic Environmental Assessment (SEA) for the Masterplan. The main objective of the SEA process was to evaluate development options proposed in the Master Plan to ensure they could provide a high level of protection for the environment and to provide sustainable development.

MOR were also commissioned to undertake Appropriate Assessment to assess the potential adverse effects, if any, of the proposed PoW Masterplan and associated works on nearby sites with European conservation designations (i.e. Natura 2000 sites). The findings of the Appropriate Assessment process are presented in the Natura Impact Report (NIR).

The location and boundary of the Masterplan, encompassing all proposed Masterplan projects are shown in Figure 1.3 above.

The future implementation of any projects detailed within the Masterplan will be subject to further detailed environmental assessment at a project level and will require the necessary statutory planning consent together with project specific Appropriate Assessment, and where required Environmental Impact Assessment.

## 9.2 Regulatory Context

### 9.2.1 Strategic Environmental Assessment

SEA is required under the European Union (EU) Council Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (herein referred to as the 'SEA Directive'). The SEA Directive was transposed into Irish Law through the EC (Environmental Assessment of Certain Plans or Programmes) Regulations (S.I. 435 of 2004) as amended and S.I. No. 436 of 2004 (Planning and Development (Strategic Environmental Assessment) as amended.

The aim of these Regulations is to enable plan making authorities to incorporate environmental considerations into early decision-making and in an integrated way throughout the plan making process.

### 9.2.2 Appropriate Assessment (AA)

This NIR was prepared in compliance with the following legislation:

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and on Wild Flora and Fauna better known as "The Habitats Directive" which provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC) (better known as "The Birds Directive").

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any adverse effects on European sites by identifying possible adverse effects early in the planning stage, and designing the project in order to avoid such adverse effects. Second, mitigation measures should be applied, if necessary, during the AA process to the

point where no adverse effects on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effects.

## 9.3 Objectives of Environmental Assessments

A Strategic Environmental Assessment (SEA) of the PoW Masterplan was carried out in parallel with the AA process. The AA and SEA have together informed and shaped the development of the PoW Masterplan.

**Objectives of SEA**
The SEA process is an essential part of achieving sustainable development in public planning and policy making. SEA ensures that negative environmental effects arising from a plan / programme or other strategic action are properly:

1. Identified and assessed;
2. Taken into account by the responsible authority / decision makers;
3. Transparent to the public through public consultation; and,
4. Regularly monitored.

**Objectives of AA**
The objectives of the AA process is to document the implications of the PoW Masterplan in the context of the conservation objectives of Natura 2000 sites, and assess residual potential impacts on theses conservation objectives after implementation of mitigation measures.

## 9.4 SEA Process

The SEA process is undertaken in four stages, see Table 9.1 below.

| Stage | Description |
|---|---|
| **1. Screening** | Determines whether SEA is required for a plan / programme in consultation with the designated statutory consultees. |
| **2. Scoping** | Determines the spatial and temporal scope of the SEA in consultation with the designated statutory consultees. |
| **3. Environmental Report** | Formal and transparent assessment of the likely significant impacts on the environment due to implementation of a plan / programme including all reasonable alternatives. The output from this stage is an Environmental Report which is required to go on public display along with the draft plan / programme. |
| **5. SEA Statement** | Summarises the process undertaken and identifies how environmental considerations and consultations have been integrated into the final Plan / Programme. |

*Table 9.1: The Stages in SEA*

Stage 3 of the SEA process (the assessment stage) was undertaken in a number of phases, as set out in Table 9.2 below

| Assessment Stage | Description |
|---|---|
| **Consultation & Baseline** | Information gathered during the SEA scoping exercise was collated and expanded upon. This included a review of the findings of the consultation submissions received during the scoping stage. |
| **Plan & Policy Review** | A review of relevant national and regional plans and policy documents was undertaken both to identify the key environmental issues, to ensure that the objectives set out in the Master Plan meet the requirements of all relevant plans and policies. |
| **Key Environmental Issues** | The key environmental issues were identified based on the baseline data, and the plans and policy review. |
| **Environmental Objectives** | The environmental objectives, targets and indicators outlined in the SEA Scoping Report were finalised |
| **Assessment of the Alternatives** | A total of five alternatives for the Master Plan were identified and considered in order to identify and explore different ways to deliver a plan's or programme's objectives while addressing environmental issues. Each alternative was scored against the objectives of the Master Plan. |
| **Assessment** | Using the environmental objectives, the assessment of the potential significant effects associated with the Master Plan (objectives, projects and alternatives to the Plan) was undertaken. |
| **Mitigation & Recommendations** | Based on this assessment, and the potential environmental impacts, mitigation and recommendations have been proposed. |
| **Monitoring** | The final step is the development of the SEA monitoring framework. |

*Table 9.2: SEA Assessment Stages*

## 9.5 Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (European Commission, 2002) a list of European sites that can be potentially affected by the proposed development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government (DoEHLG, 2009) states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are: the physical distance from the project to the site; the sensitivities of the ecological receptors; and, the potential for in-combination effects.  Adopting the precautionary principle, all SAC and SPA sites within a 15km radius of the Masterplan Boundary Site have been considered.

Nine Natura 2000 designated sites were identified within 15km of the Site as detailed below:

| Site Name | Site Code | Distance (km)* | Direction from MasterPlan Boundary |
|---|---|---|---|
| **Special Area of Conservation** | | | |
| Lower River Suir SAC | 002137 | 002137 | - |
| River Barrow and River Nore SAC | 002162 | 002162 | - |
| Hook Head SAC | 000764 | 000764 | SE |
| Bannow Bay SAC | 000697 | 000697 | E |
| Tramore Dunes and Backstrand SAC | 000671 | 000671 | W |
| Ballyteigue Burrow SAC | 000696 | 000696 | E |
| **Special Protection Area** | | | |
| Tramore Backstrand SPA | 004027 | 004027 | W |
| Bannow Bay SPA | 004033 | 004033 | E |
| Keeragh Islands SPA | 004118 | 004118 | E |

*Table 9.3 - Natura 2000 Designated Sites within 15km of the Site*
**The distance to the Natura 2000 Sites is measured from the nearest point on the red line boundary to the nearest point on the Natura Site Boundary.*

The proposed PoW Masterplan is not located within or directly adjacent to Hook Head SAC, Bannow Bay SAC, Bannow Bay SPA, Tramore Dunes and Backstrand SAC, and Tramore Back Strand SPA, Ballyteigue Burrow SAC and / or Keeragh Islands SPA, however, the boundaries of these 7 Natura Sites are located within 15km of the Site (Refer to Figure 9.2).

Given the significant distance of ca. 14.5km and ca. 13km separating Ballyteigue Burrow SAC and Keeragh Islands SPA from the proposed Masterplan Boundary, comprised of extensive agricultural land, local and regional road infrastructure and Hook Head Peninsula, it is considered highly unlikely that the proposed development would have any direct or indirect effects on Ballyteigue Burrow SAC or Keeragh Islands SPA or their designated features of interest. As a result, these Natura Sites has been screened out and will not be considered further as part of this assessment.

However, the proposed project area is situated within the boundaries of Lower River Suir SAC and River Barrow and River Nore SAC and within <6.7km of Hook Head SAC, Bannow Bay SAC, Bannow Bay SPA, Tramore Dunes and Backstrand SAC, and Tramore Back Strand SPA (Refer to Figure 9.2). Given the proximity of the proposed development area to these Natura 2000 sites, further consideration will be given to assess potential impacts resulting from the proposed development.

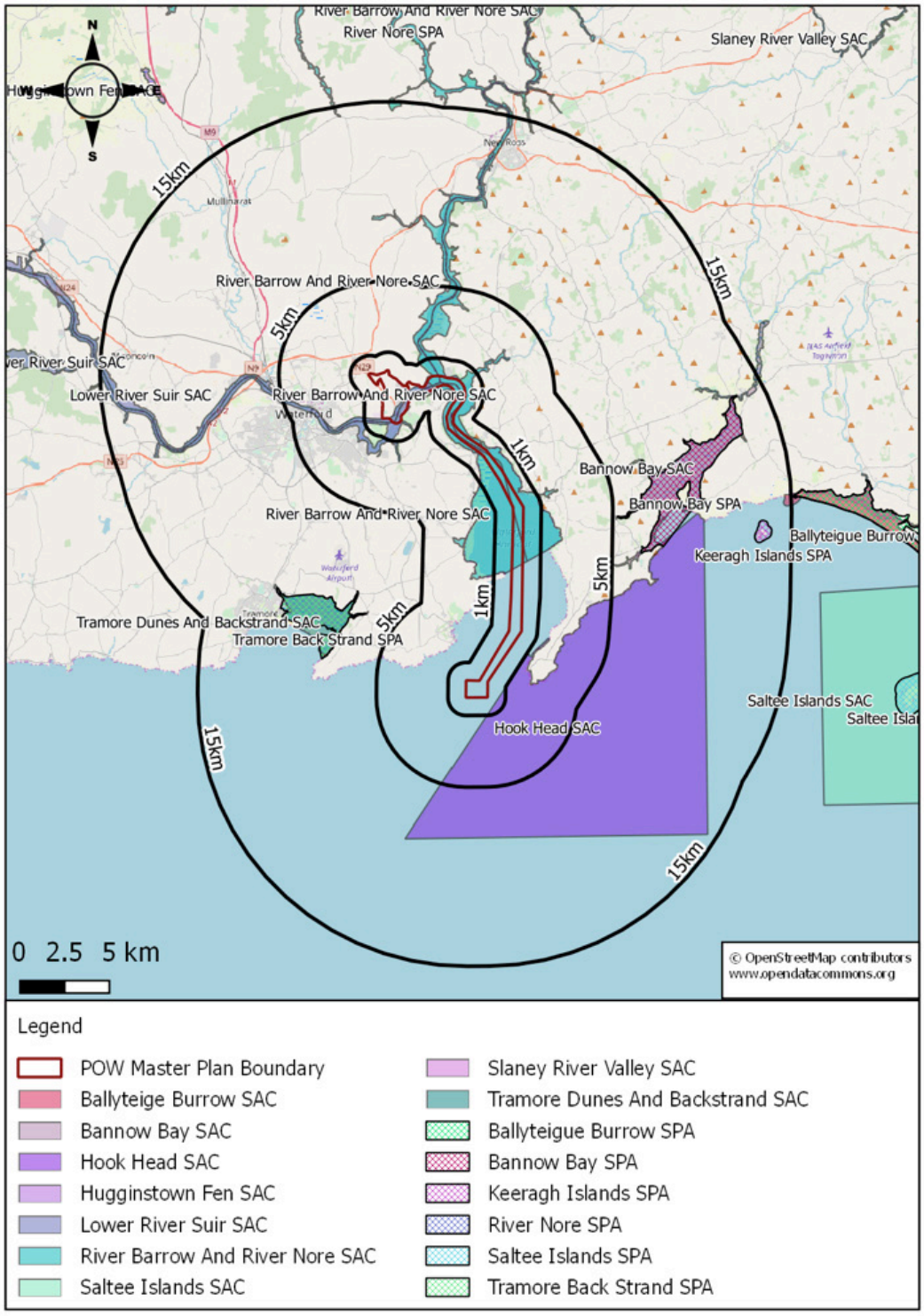



*Figure 9.1 - Natura 2000 Sites*

## 9.6 Conclusions of the AA process

The screening part of the AA process identified that the Lower River Suir SAC, River Barrow and River Nore SAC, and Hook Head SAC require further consideration as part of the AA process due to the potential for impacts to occur.

A further high-level assessment exercise was undertaken, taking high level mitigation measures into consideration. Taking these mitigation measures into account, a number of species and habitats were also identified as unlikely to be impacted by the projects detailed within the POW Master Plan and screened out. Hook head SAC was also screened out at this stage and all potential impacts arising from Option No. 3 in the Masterplan - Shore Side Developments were screened out at this stage.

A number of species and habitats for which both the Lower River Suir SAC and the River Barrow and River Nore SAC are designated will require further detailed assessment at the project level to ensure that impacts can be avoided / minimised. These species and habitats include:

- Lower River Suir SAC: Atlantic salt meadows / Mediterranean salt meadows, Atlantic salmon, Sea lamprey, Brook lamprey, River lamprey, Twaite shad; and
- River Barrow and River Nore SAC: Estuaries, Mudflats and sandflats not covered by seawater at low tide, Atlantic salmon, Sea lamprey, Brook lamprey, River lamprey, Twaite shad.

It should however be noted that the iterative approach taken in the preparation of the POW Masterplan, the SEA and the NIR has allowed consideration of potential adverse impacts on both these Natura Sites during the design process. This has allowed for the selection and development of options that are both in keeping with the ongoing port core activities while being sympathetic to the local environment and the designated features of the Natura 2000 sites.

Mitigation measures proposed in the Natura Impact Report are included in Table 9.4 below.

## 9.7 Key outputs of the SEA Process

The key outputs of the SEA Process are identifying key environmental issues, setting the Environmental Objectives, Targets and Indicators and monitoring of these objectives and targets, identifying the preferred alternative, and identifying measures to mitigate for the potential environmental impacts.

The Environmental Objectives, Targets and Indicators and monitoring of these objectives and targets is presented in Table 9.4 below.

The preferred alternative is full implementation of the Masterplan development options presented in Section 6.2 above, in a phased manner.

Identified mitigation measures are presented in the following section. These mitigation measures aim to prevent and where this is not possible minimise negative environmental impacts envisaged as a result of implementing the Masterplan.

| Environmental Topic | Objectives | Targets | Indicators | Responsible Authority and Possible Data |
|---|---|---|---|---|
| **Biodiversity, Flora & Fauna (B)** | **B1:** Preserve, protect and where possible enhance, the biodiversity, flora and fauna at and in the vicinity of the Port of Waterford in particular designated sites and their qualifying features of interest. | To maintain and or enhance European sites and species in accordance with conservation objectives. | Status, condition, area and number of European sites and their habitats and species, within Master Plan area. | NPWS – Conservation Action Plans<br>NPWS – Status of EU Protected Habitats and Species in Ireland Report (Every 6 years)<br>IFI – Fisheries research and monitoring |
| | **B2:** Prevent and control as far as possible the entry of invasive species to the Master Plan area due to the Port operations and understand associated risks. | Prevent and control as far as possible the entry and spread of invasive species within Master Plan area due to Port operations. | Presence, absence, location, quantity of invasive species, within Master Plan area. | NBDC – National Invasive Special Database |
| **Population & Human Health (P)** | **P1:** To maximise positive impacts and minimise the negative impacts of the proposed Master Plan projects to the local communities and mitigate any potential negative effect of development on the local communities. | Noise and air quality impacts arising from the proposed projects (on-shore and offshore) shall not exceed statutory and/or recommended guideline values.<br>Increasing direct and indirect employment created by the delivery of the projects set-out in the Master Plan.<br><br>Implementing corporate social responsibility programmes at local communities. | Noise levels and air quality indicators (primarily dust, NOx, CO, SOx).<br><br>A long-term employment figures associated with the Port.<br><br>Implementation of specific community projects or sponsorships. | CSO statistics and Census data<br>POW monitoring, records and reporting<br>Local Authorities |
| **Geology, Sediments, Soils & Land-use (G)** | **G1:** To minimise coastal erosion and soil / sediment contamination. | Protect the coastline from further erosion.<br><br>Prevent contamination of soils / sediments at | Erosion rates, and / or presence of new areas of erosion within the Master Plan area. | EPA – CORINE landcover mapping<br>Local Authorities – County Development Plans, Local Area Plans |

| | | | | |
|---|---|---|---|---|
| | | lands within or in the vicinity of the Master Plan area. | The number and significance of soil / sediment contamination incidents. | |
| | **G2:** Beneficial use of dredged materials to support circular economy. | Seek to introduce the reuse of dredged materials. | Proportion of dredge material reused. | POW monitoring and reporting |
| **Water (W)** | **W1:** Prevent the deterioration of the status of water bodies (surface / ground / coastal) in line with the objectives of the WFD and River Basin Management Plan.<br><br>Protect the local designated bathing areas and shellfish waters. | Maintain the status of any water bodies (surface / ground / coastal) and support the ability of any water body to maintain or achieve its WFD status.<br><br>Maintain status and prevent the deterioration of water quality the local designated bathing areas and in shell fish waters. | WFD water body status as indicated by the EPA.<br><br>Status of local designated bathing areas and shellfish waters. | EPA – WFD / RBMP status reporting and updates<br>POW monitoring and reporting |
| | **W2:** Minimise the impacts on water resources and flood risk and to ensure implementation of the Flood Directive within the Master Plan. | No increase in flood risk at the Port or in the estuary. | Flood risk within the Master Plan area. | OPW – Flood Risk Management Plans (Reviewed every 6 years) |
| | **W3:** Limit the impacts of the dredging regime in the long-term. | Maintain suspended sediment concentrations at baseline levels. | Suspended sediment concentrations in the estuary during and after dredging operations. | NPWS – Conservation Action Plans<br>NPWS – Status of EU Protected Habitats and Species in Ireland Report (Every 6 years)<br>IFI – Fisheries research and monitoring |
| **Acoustics (A)** | **A1:** To minimise acoustic impacts to local communities | Daytime noise emissions, of Lar,T of 55dB and night-time | Noise levels. | POW monitoring and reporting |

| | | | | |
|---|---|---|---|---|
| | and aquatic environments during construction stage<br><br>**A2:** To minimise acoustic impacts to local communities and aquatic environments during operational stage. | emissions of LAeq,T of 45dB at sensitive receptors.<br><br>To achieve a 'Good Environmental Status' (GES) for the acoustic aquatic environment from direct and indirect activities as part of the Master Plan. | Underwater acoustics shall comply with the Marine Strategy Framework Directive (2008/56/EC) to 'not adversely affect the marine environment'. | |
| **Air Quality (AQ)** | **AQ1:** To minimise the impacts on air quality. | Maintain a 'Good' Status on the EPA Air Quality Index for Health.<br>Compliance with Air Quality Standards as set out in the CAFE Directive. | The EPA's Air Quality Index for Health.<br><br>Ambient concentrations of relevant pollutants. | EPA – Air Quality in Ireland Report (Annual)<br>Local Authorities |
| **Climatic Factors (CF)** | **CF1:** To minimise greenhouse gas (GHG) emissions and the carbon footprint of the Port. | To ensure no increase in GHG emissions and the carbon footprint, expressed per unit of cargo at the Port. | Carbon emissions from Port activities. | POW monitoring and reporting |
| | **CF2:** Adaptation to the potential climate change effects. | No increased risk from climate change induced flooding events and more frequent/intense storms | Flood risk associated with climate change within the Master Plan Area.<br>Frequency and severity of dry periods and extreme temperatures. | OPW - Flood Risk Management Plans (Reviewed every 6 years)<br><br>POW - monitoring and records |
| **Material Assets - Infrastructure, Fisheries & Aquaculture (MA)** | **MA1:** To support the development of sustainable commercial fisheries and aquaculture within the Port Waterford Estuary / Harbour. | To support the development of sustainable commercial fisheries and aquaculture within the Port. | Annual turnover of fisheries and aquaculture in the area of the Master Plan. | BIM monitoring and reporting<br>Marine Institute monitoring and reporting |
| | **MA2:** To protect existing and develop new material assets and infrastructure. | To develop new infrastructure which supports sustainable development within the Port. | Number of new pieces of infrastructure at the Port. | ESB, Irish Water, EPA, Local Authorities and POW reporting |

| | | | | |
|---|---|---|---|---|
| | **MA3:** To reduce waste generation from Port related activities. | To limit any potential increase in the quantity of waste being directed to landfill from the Port and increase, wherever possible, the quantity of material for reuse and recycling at the Port, supporting a circular economy. | Percentage of waste being directed to landfill, recycled or reused. | POW monitoring and reporting |
| **Cultural Heritage Architectural & Archaeological (CH)** | **CH1:** To prevent damage to / loss to heritage features with particular regard to the local maritime heritage.<br><br>**CH2:** To support the research of underwater archaeology in the Master Plan area. To improve by record and publication the diverse range of underwater archaeology of the locality. | To ensure no significant impacts on known Sites and Monuments Record or Record of Protected Structures sites.<br><br>To prevent potential impact on unknown archaeological sites (on-shore and underwater). | The record of known cultural, archaeological, underwater artefact or shipwreck finds, and the quality of these objects. | Department of Culture, Heritage and the Gaeltacht – National Monuments Service (NMS) and NIAH<br>Local Authorities<br>POW monitoring and reporting |
| **Landscape & Visual Amenity (L)** | **L1:** To avoid adverse impacts to the landscape as far as possible and where possible enhance the landscape character and visual amenity at and in the vicinity of the Port. | No avoidable significant impacts on the landscape character and visual amenity as a result of the Master Plan. | The number of residential properties affected by significant visual impacts from the development of the Master Plan. This includes post development impacts of the Master Plan. | Local Authorities – Landscape Character Assessments, County Development Plans, Local Area Plans |

*Table 9.4: SEA Objectives, Targets, Indicators and Monitoring*

## 9.8 Proposed Environmental Mitigation Measures

Mitigation measures identified during the SEA and AA processes are presented in Table 9.5 below. These mitigation measures aim to prevent and where this is not possible minimise negative environmental impacts envisaged as a result of implementing the Masterplan.

| No. | Topic | Potential Impact | Mitigation |
|---|---|---|---|
| 1 | General | Negative impacts the environment. | An overall Environmental Management Plan, Dredge Management Plan and Habitat Management Plan will be prepared for the Port in accordance with best practice guidelines. These plans will be agreed with the relevant statutory bodies.<br>A Construction Environmental Management Plan (CEMP) and comprehensive Working Method Statements (WMS) will be created for the individual projects as required. All relevant key findings, recommendations and mitigation measures arising from the Masterplan SEA and AA processes will be integrated into the project-level CEMPs, WMSs and environmental assessments in a tiered manner. |
| 2 | Biodiversity | Impact on European sites, habitats and species from construction and operational phase.<br>Disturbance / displacement to species. | Pre-construction surveys will be undertaken by a suitably qualified and experienced ecologist for each of the relevant projects. These will confirm the extent and quality of the habitat to be impacted by the various elements of the works.<br>Contact with IFI and the National Parks & Wildlife Service will also be established at the design stage.<br>This information will be used at the project level to inform design / approach to the project to ensure the impacts can be either minimised or avoided.<br>Full details of the proposed construction methodologies will be developed at the design stage and subject to detailed assessment to ensure that impacts can be both avoided and minimised.<br>In cases where impacts cannot be avoided, the appropriate statutory bodies will be consulted and should detailed surveys at the project level to identify the presence of protected / notable species within the area, then it will be necessary to acquire the suitable derogation licence from the relevant statutory body.<br>On-going consultation with the NPWS will be required for the full life cycle of the Master Plan to ensure that the NPWS are fully informed and that the mitigation measures employed remain current / relevant in the context of the impacted Natura 2000 sites and their conservation objectives.<br>Ongoing monitoring, including water quality monitoring during projects that take place either in or adjacent to the estuary. This will help monitor impacts on the environment and aquaculture. Thresholds for action (trigger levels) for water quality monitoring will be set.<br>If mitigation cannot adequately avoid impacts at the project level and no alternatives can be identified that are suitable, it will be necessary to identify the Imperative Reasons of Overriding Public Interest (IROPI). Any reliance on IROPI will need to be appropriately documented and the required statutory consents sorted.<br>Any future infrastructure developments that require IROPI will need to meet the requirements of European Commission guidance, i.e. that any compensation measures must be available, achievable and judged likely to be effective; and must be in place before the adverse effect occurs. |

| No. | Topic | Potential Impact | Mitigation |
|---|---|---|---|
| 3 | Biodiversity | Accidental introduction / spread of invasive species. | As part of initial habitat surveys completed for planning applications for specific projects, invasive species survey will be carried out. If required, a pre-construction survey to identify any potential invasive species will also be carried out.<br>In order to ensure biosecurity in terms of aquatic invasive species, all works requiring access to the marine environment will be required to prepared method statements detailing their biosecurity protocol in relation to use of equipment between different Sites.<br>The method statements will be based on the relevant guidance for the works being undertaken.<br>In order to mitigate against the unintentional introduction of invasive species to the Site as part of the works, all shore side developments works will be undertaken in line with best practice. |
| 4 | Biodiversity | Impacts to movement / migration. | Good planning and timing of works, with sensitive construction methods and adherence to best practice construction guidelines including NRA guidelines 'On Crossing Watercourses, On treatment of Otters' etc., and Eastern Fisheries Board 'Requirements for the Protection of fisheries habitats during Construction and development works at river sites.' |
| 5 | Biodiversity | Potential impacts on habitats as a result of dredging and disposal of dredged material. | Dredging regime will employ best-practice measures to minimise the release of suspended particulate matter within the water column by:<br>• Preparation of an Environmental Management System (EMS) which meets the recommendations as outlined in the EC Guidance on the implementation of the EU nature legislation in estuaries and coastal zone (EC, 2011a);<br>• Maintaining a low speed during dredging;<br>• Only utilising water jets when necessary to ensure adequate production and efficient loading;<br>• Minimise the use of overflowing whenever possible to achieve an economic load; and,<br>• Dredging will be undertaken as efficiently as possible so that the number of dredger movements is minimised.<br>The disposal regime will employ the following best practice measures:<br>• Maintain an acceptable speed to ensure against losses during transit during inclement weather;<br>• Division of the disposal site into sectors with each used in turn; and,<br>• Maintain a low speed during disposal to disperse material over disposal area.<br>The above measures are standard best practice and serve to minimise impacts on the environment.<br>The POW will be bound by the conditions as set out by the EPA in their Dumping at Sea permit. This will ensure a sustainable maintenance / or capital dredging strategy is adopted.<br>The POW will ensure that all dredging works are optimized in line with the ESPO guidance (ESPO, 2007). |
| 6 | Population & Human Health<br>Air Quality<br>Acoustics | Disturbance to the local communities during the construction of development options. | Disturbances can be kept to a minimum through effective planning and timing of works in addition to adherence of construction best practice guidelines.<br>Noise-producing activities in sensitive locations should be undertaken in line with the EPA's Guidance Note for Noise in Relation to Scheduled Activities (NG4) and monitoring of these activities should be ongoing. Mitigation |

| No. | Topic | Potential Impact | Mitigation |
|---|---|---|---|
| | | | measures, such as limited operational hours, will be implemented where necessary.<br>Development of Dust and Noise Minimisation Plans as applicable.<br>Continued liaison with local communities is recommended with regard to complaints related to air, noise and vibration emissions resulting from POW construction works. |
| 7 | Population & Human Health | Disturbance to the local communities from Port operations / Port traffic. | Disturbances can be kept to a minimum through effective planning and good site management practices.<br>Continued liaison with local communities should be undertaken to ensure that concerns raised are addressed. |
| 8 | Sediments, Geology, Soils & Land-use<br>Water (Groundwater) | Contamination of soils and groundwater during construction works from concrete, oil and other hazards.<br><br>Contamination of groundwater body from construction works and pollutants being discharged to soils and groundwater. | Good construction management and planning will ensure soil and groundwater contamination is prevented.<br>Preparation of Erosion and Sediment Control Plans, Emergency Response Plans and Accident Prevention Procedures.<br>Adherence to best practice measures outlined the above plans and the CEMP. These will include, inter alia, pollution prevention and control, sediment management, suitable storage of hazardous materials, minimising surface water runoff and flow from sites, bunded refuelling areas, exposed soil management and dust control. |
| 9 | Sediments, Geology, Soils & Land-use | Disposal of dredged material. | Appropriate surveys will be undertaken to assess the dredged material and to ensure compliance with the current Dumping at Sea Permit.<br>POW will continue to search for a viable beneficial use of dredged material and minimise the amount of dredging being undertaken wherever possible. |
| 10 | Water | Deterioration of water quality, including accidental spillage / runoff entering the watercourse. | Good construction management and planning will ensure water quality disturbance to be kept to a minimum. Any potential water quality issues from construction activities should be contained and treated to ensure no impact to the receiving water body.<br>Works should adhere to best practice guidelines, such as CIRIA C532 - Control of Water Pollution from Construction Sites.<br>An Erosion and Sediment Control Plan and CEMP will be prepared prior to works commencing. Effluent will continue to be monitored at the Port. Drainage from bunded and waste storage areas will be treated in onsite WWTP.<br>Project designs should aim to ensure WFD objectives are not compromised. |
| 11 | Water | Impact on the watercourse from dredging (increasing suspended solids). | Dredging and construction will have to be planned appropriately, using Best Available Techniques (BAT) at all times, to ensure water quality issues are kept to a minimum, with no significant adverse effects. Adherence to Dredge Management Plan which will include a dredge mitigation strategy.<br>The Plan will address the potential effects of an increase in ship movements, sediment resuspension, contaminated sediments, and potential for changes to the hydrodynamic regime.<br>Conditions outlined in the Dumping at Sea Permit for dredging activities to be maintained. |
| 12 | Water | Potential for flood risk. | All Master Plan developments will be subject to a detailed FRA at planning stage. Future port development will be designed for flood risk and reducing the risk to Port assets. All facilities will include Sustainable Urban Drainage (SuDS) design. |

| No. | Topic | Potential Impact | Mitigation |
|---|---|---|---|
| | | | Ensure that all sewer and foul water drains are adequately equipped to cope with flood events in order to prevent water contamination. |
| 13 | Air Quality | Dust and Particulate Matter resulting from construction related activities at the Port. | Good site management.<br>Dust Management Measures will be included in CEMP on project basis.<br>Adherence to best practice dust management measures. |
| 14 | Air Quality<br>Climatic Factors<br>Material Assets | Emissions to air resulting from increased vessel size and number of vessels operating at the Port. | Good management of vessel movements within the Harbour to avoid the adverse effects of emissions build-up during periods of high Port activity.<br>Ensure any new Port equipment purchased in the coming years is energy efficient to reduce operational emissions. |
| 15 | Air Quality<br>Climatic Factors<br>Material Assets | Negative effects on air quality from increased road traffic emissions at the Port. | Good planning and traffic management to minimise emissions, especially during peak hours.<br>Improved fuel efficiency and increased electric and low emission cars on Irish roads over the next two decades. Port will provide charging facilities for electric vehicles. |
| 16 | Climatic Factors | Increase in the frequency of extreme weather events, higher rainfall and sea level raise will affect coastal areas and rivers. | Ensure all Master Plan developments are designed with predicted climatic change factors in mind i.e. greater potential for significant storms, flooding, increase in water level rises and increase and intensity in rainfall events.<br>All Master Plan developments will be subject to a detailed FRA at planning stage.<br>POW will develop a climate mitigation plan, with short, medium and long term objectives and targets. |
| 17 | Material Assets | Increased transport volumes as a result of construction activities and increase in cargo volumes to the Port. | A Traffic Impact Assessment (TTA) will be prepared for specific Master Plan projects that will result in increased traffic. Each planning application for future projects at the port will have to consider traffic growth at the time of the application. |
| 18 | Material Assets | Increased waste generated at the Port as a result of construction and operational activities.<br>Increased wastewater generation at the Port as a result of construction and operational activities. | For construction phase of each project, a Construction Environmental Management Plan will be prepared, which will include waste management requirements, including requirement for implementing prevent-reuse-recycle hierarchy.<br>Review the current Waste Management Plan to assess how best to accommodate additional predicted waste outputs from the new developments.<br>Continue engagement with the commercial shipping companies on the benefits of waste prevention / reuse/ recycling.<br>Maintain good-standard of recycling and waste disposal at the Port and ensure adequate waste-reception facilities are available.<br>Liaise with the Southern Regional Waste Management Office on all aspects of waste.<br>Upgrade of the current WWTP facilities at the Port will be assessed further at project level.<br>Wastewater discharges will be compliant with requirements of the European Communities Environmental Objectives (Surface Water) Regulations 2009. |
| 19 | Material Assets | Increased energy demand at the POW. | Continue with the energy efficiency programme at the Port. Purchase of electric vehicles for the Port, and provision of charging stations. |
| 20 | Material Assets<br>Population & | Impact to the commercial fisheries and shellfish | A sediment transport and coastal process modelling should be undertaken for all marine development to ensure there are no significant impacts on species and habitats during the lifetime of the Master Plan. |

| No. | Topic | Potential Impact | Mitigation |
|---|---|---|---|
| | Human Health | production sites in the area. | |
| 21 | Material Assets | Increased water usage at the POW.<br>Increased wastewater generation at the POW. | Monitoring of water usage and wastewater generated will ensure changes are recorded and suitably managed. |
| 22 | Cultural Heritage | Potential for underwater heritage sites to be negatively impacted during construction and / or dredging operations. | Consultation with a qualified archaeologist and further sonar and bathymetry research of the estuary prior to construction, channel widening or changes in dredging.<br>Consultation with the DCHG in advance of works taking place in respect of protected heritage features.<br>Maintenance of appropriate exclusions zones, the extents of which will be agreed with the DCHG.<br>Where agreed necessary from consultation with the DCHG, dredging operations will be supervised by a qualified archaeologist. |
| 23 | Cultural Heritage | Disturbance to registered monuments (SMRs) located within the Master Plan Area. | Maintenance of a strict buffer around the registered monuments (SMRs). No works will be undertaken within this buffer.<br>Sensitive construction measures will be employed during all works. |
| 24 | Cultural Heritage | Disturbance to the RPS sites located within the Master Plan Area. | Maintenance of a strict buffer around the Glass House, Mill and Bellevue House. No works will be undertaken within this buffer.<br>Sensitive construction measures will be employed during all works. |
| 25 | Landscape and Visual | Construction phase impacts on landscape and visual amenity. | Good site management and planning. Adherence to best practices measures outlined in the CEMP. |
| 26 | Landscape and Visual | Increased Port activity affecting the visual amenity of Waterford Harbour | Good planning and management of vessel movements within the Harbour. |
| 27 | Landscape and Visual | Physical infrastructure may be visually intrusion / spoil landscape and views. | Where possible, sensitive designed aiming assimilation into the surrounding landscape will be ensured. |

*Table 9.5: Masterplan Environmental Mitigation Measures*

## 9.9 Monitoring, Review and Reporting

The environmental monitoring programme outlined in table in section 9.7 has been developed based on the SEA Objectives, Targets and Indicators. PoW is committed to implementing this monitoring programme and associated reporting. Results from each round of monitoring will be reviewed by the POW staff with environmental responsibilities to facilitate an early response to any environmental issues that may arise, including remedial action as appropriate.

The Masterplan and associated environmental documentation will be reviewed every 5 years and updated as required.

PoW will continue to collaborate with the relevant public authorities, including but not limited to the statutory SEA consultees, as well as with the local community and all other stakeholders in Waterford Harbour. PoW would support any Estuary stewardship organisation that may be formed by those stakeholders.

# 10 Strategic Development Plan

## 10.1 General

This section provides guidance and direction for the scope and timing of future development at the Port of Waterford. The forecasts of future traffic levels has identified that the port has no immediate necessity for expansion of capacity in the short or medium term, but that traffic forecasts should be constantly monitored to identify trigger points to allow any development to be implemented in good time to provide capacity as and when required.

There is an immediate benefit in carrying out improvements to the marine access through the navigation channels to enhance marine safety and to carry out some river training works to reduce levels of siltation at key points along the channel.

## 10.2 Phased action plan

The expected demand for port throughputs has been projected using low, medium and high growth scenarios. The low growth scenario sees the current container and bulk berth infrastructure sufficing until 2037 when an additional 200m of bulk quay is needed. There is no requirement for expansion of the container terminal under this scenario.

In the medium growth scenario, additional bulk quays will be required in 2029 (200m) and 2041 (200m) with again no container terminal investment required.

In the high growth scenario, the bulk investments are similar to those under the medium picture but there is need for a container terminal investment in 2035.To ensure that this additional infrastructure is completed and commissioned in time to meet the forecast traffic levels then a trigger point must be identified to allow a suitable time for the design, permitting, construction and commissioning of the works to be carried out. This is discussed further in Section 10.3 below.

## 10.3 Implementation programme

This section discusses the durations required for the design, permitting, tendering and contractors mobilisation and execution of the works required.

### 10.3.1 River training wall construction

Figure 10.1 shows the activities and indicative timing for the design and construction of the river training walls. Preliminary work has already been completed on this project, including extensive modelling work to establish the project viability and identify any major environmental issues and mitigation measures. The initial activity of concept design preparation is now in progress. Following this concept design phase a period of around 6 – 9 months is required for preparation of the planning application and completion of the Environmental Impact Assessment and Appropriate Assessment, followed by 18 – 24 months for planning approval and obtaining the Foreshore Lease and Licence.

In parallel with this, the detailed design and tendering process would be carried out to allow appointment of the contractor as soon as permitting approval is given. The construction period required for the training walls would be around 16 months from award of contract which means that the training walls would be complete in around 60 months from start.

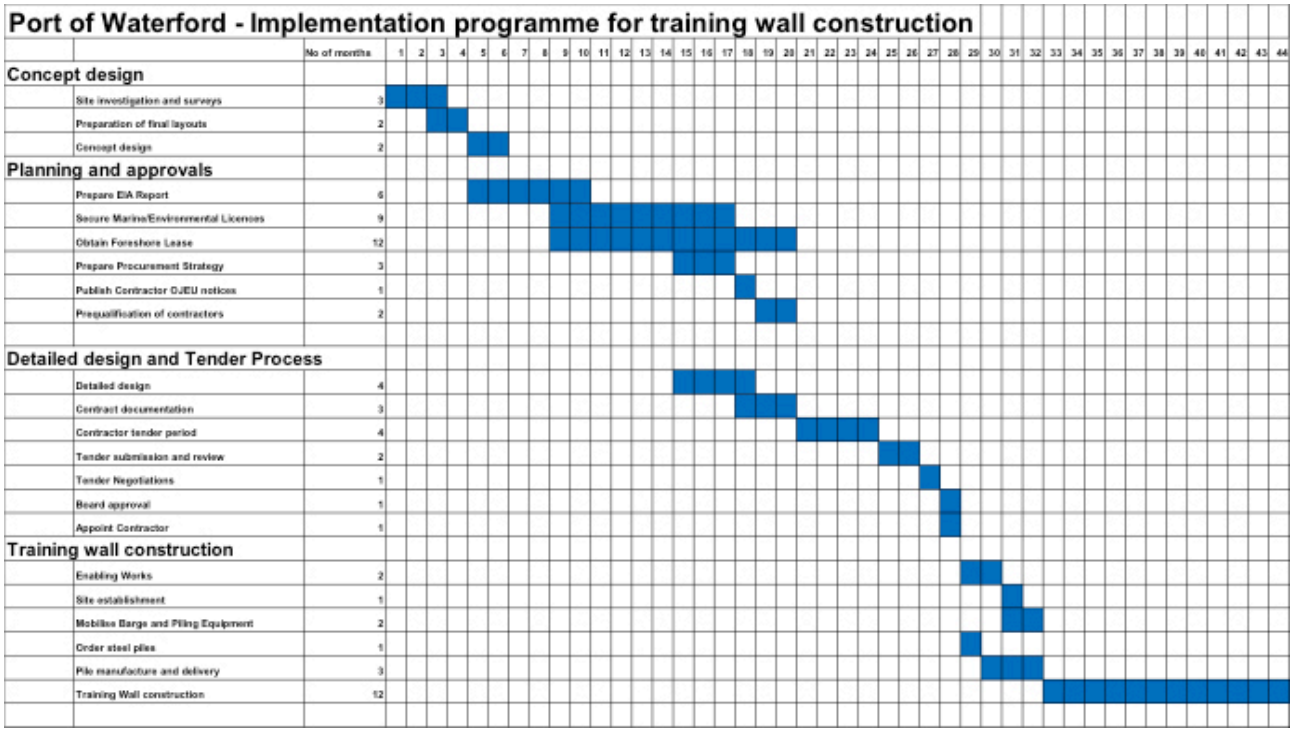



*Figure 10.1 - Implementation programme for training wall construction*

## 10.3.2 Improvements to marine access

The programme for the proposed dredging works to improve marine access is already underway. Major surveys and site investigations have been undertaken to determine river bed and rock levels to establish any design issues and overall viability. Figure 10.2 below indicates the estimated time for completion of design, environmental studies and approvals as around 22 - 24 months, covering completion of concept design, including verification of design parameters using a real-time ship simulator and environmental approvals. Following this preliminary work a further three periods of dredging campaigns are envisaged over the following 36 months covering three periods of contract award, contractors' mobilisation and execution of the dredging works.

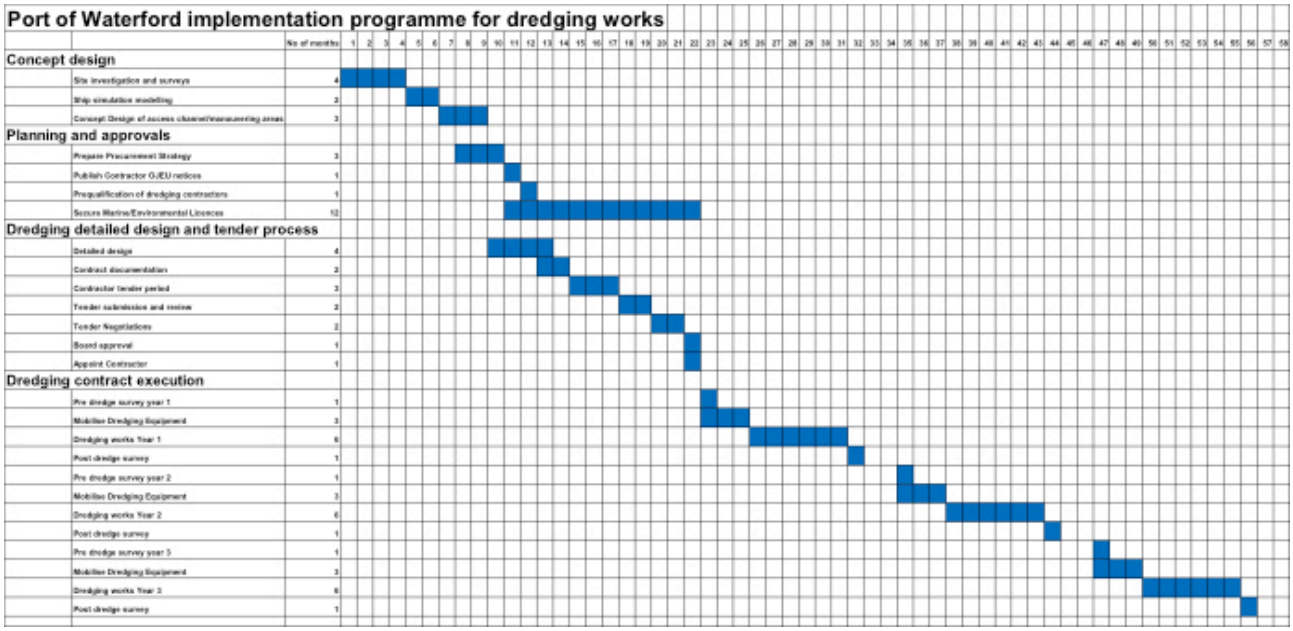



*Figure 10.2 - Implementation programme for dredging works*

### 10.3.3 Quay wall construction

An indicative programme for the construction of a nominal 200m long quay wall is shown in Figure 10.3 below. A total period of around five years is required for the design, environmental assessments, permitting approvals, tender and contractor mobilisation and site construction works to be completed and commissioned.

If additional bulk handling facilities are required (under the medium growth scenario) in 2029 (200m) and 2041 (200m) then investment decisions must be made five years in advance, in 2024 and 2035.

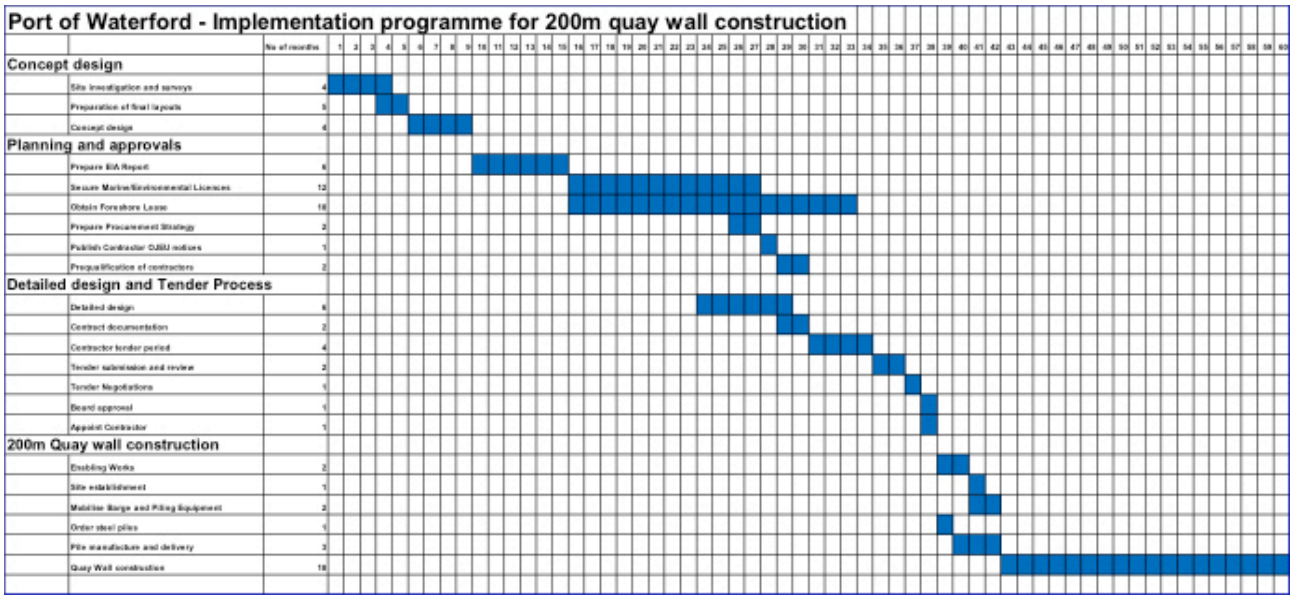



*Figure 10.3 - Implementation programme for 200m quay wall construction*

## 10.4 Financing plan

The Port of Waterford has prepared financial projections for the Masterplan period covering the three scenarios recommended in the economic assessment. These projections incorporate the forecast business activity levels and resultant income streams, the phasing of capital expenditure (delivery of identified Masterplan projects) as needed to provide the required navigational and operational capacity. The purpose of the financial projections is to determine the financial practicality of the plan, based on projected income streams and to confirm the ability of the Port Company to deliver the programme and to meet the funding challenges of the future development of the port. Grant aid will be an important part of the financing of projects wherever possible.

Table 10.1 summarises the anticipated budget capital costs of the identified projects and the time frame in which they will be implemented.

| Masterplan Projects | | | |
|---|---|---|---|
| | | Cost | Phases |
| 1 | **Options to minimise dredging and improve marine access** | €'m | |
| | 1.1 Cheekpoint Lower Bar River Training Wall | 6.5 | 1 |
| | 1.2 Carter Patch Channel Widening | | |
| | 1.3 Approach Channel Deepening | | |
| | 1.4 Turning Basin Development | | |
| | 1.2, 1.3 & 1.4 in combination - to 7mCD (from 6.5m) | 4.5 | 1 |
| | 1.2, 1.3 & 1.4 in combination - to 7.5mCD (from 7m) | 2 | 1 |
| | 1.2, 1.3 & 1.4 in combination - to 8mCD (from 7.5m) | 2.5 | 1 |
| 2 | **Options for development/improvements to berths** | | |
| | 2.1 Belview Quay Extension | 27 | 2 |
| | 2.2 O'Brien Quay Extension | n/a | n/a |
| | 2.3 Quay Wall Continuity | 14 | 1 |
| | 2.4 Berth Deepening | n/a | n/a |
| 3 | **Shore Side Developments** | | |
| | 3.1 Improvements to road access to port | | |
| | 3.2 Improvements/development of services infrastructure | | |
| | 3.3 Serviced sites | | |
| | 3.4 Office Buildings | | |
| | 3.5 Development of additional warehousing | | |
| | TOTAL | 56.5 | |

*Table 10.1 – Budget capital costs of identified Masterplan projects*

Table 10.2 below summarises the projected cargo flows (in Tonnes for bulk and general cargo and in TEUs for container traffic) for the period 2019 – 2044. These projections are based on the low, medium and high growth rates discussed in Section 4 – "Future Port Traffic Projections"

| Masterplan | Growth Rates | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Budget | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 | Year 16 | Year 17 | Year 18 | Year 19 | Year 20 | Year 21 | Year 22 | Year 23 | Year 24 | Year 25 |
| ***Bulk & General Cargo*** | | | | *Cargo Throughputs (000 Tonnes)* | | | | | | | | | | | | | | | | | | | | | | | |
| Low | 2% | 1,522 | 1,552 | 1,583 | 1,615 | 1,647 | 1,680 | 1,714 | 1,748 | 1,783 | 1,819 | 1,855 | 1,892 | 1,930 | 1,969 | 2,008 | 2,048 | 2,089 | 2,131 | 2,174 | 2,217 | 2,262 | 2,307 | 2,353 | 2,400 | 2,448 | 2,497 |
| Medium | 4% | 1,522 | 1,583 | 1,646 | 1,712 | 1,781 | 1,852 | 1,926 | 2,003 | 2,083 | 2,166 | 2,253 | 2,343 | 2,437 | 2,534 | 2,636 | 2,741 | 2,851 | 2,965 | 3,083 | 3,207 | 3,335 | 3,468 | 3,607 | 3,751 | 3,901 | 4,057 |
| High | 6% | 1,522 | 1,613 | 1,710 | 1,813 | 1,921 | 2,037 | 2,159 | 2,289 | 2,426 | 2,571 | 2,726 | 2,889 | 3,063 | 3,246 | 3,441 | 3,648 | 3,866 | 4,098 | 4,344 | 4,605 | 4,881 | 5,174 | 5,485 | 5,814 | 6,162 | 6,532 |
| ***Container (Lo-Lo)*** | | | | *TEU '000 (Laden & Empty)* | | | | | | | | | | | | | | | | | | | | | | | |
| Low | 2% | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 60 | 61 | 62 | 63 | 65 | 66 | 67 | 69 | 70 | 71 | 73 | 74 | 76 | 77 | 79 | 80 | 82 | 84 | 85 |
| Medium | 4% | 52 | 54 | 56 | 58 | 61 | 63 | 66 | 68 | 71 | 74 | 77 | 80 | 83 | 86 | 90 | 94 | 97 | 101 | 105 | 109 | 114 | 118 | 123 | 128 | 133 | 138 |
| High | 8% | 52 | 56 | 61 | 65 | 71 | 76 | 82 | 89 | 96 | 104 | 112 | 121 | 131 | 141 | 152 | 165 | 178 | 192 | 207 | 224 | 242 | 261 | 282 | 305 | 329 | 356 |

*Table 10.2 Projected cargo flows for the period 2019 – 2044.*

Tables 10.3, 10.4 and 10.5 below shows the Profit & Loss (Turnover and Profit after tax), Cashflow (Opening, Net cash generated, Capex, Closing), Balance Sheet (Fixed/Investment Assets (net of grants), Working Capital, Bank), Capital & Reserves and Return on capital for the low, medium and high growth scenarios. The average return on capital for the low growth scenario is 6.5%, increasing to 6.6% for medium growth and 8.0% for the high growth scenario

| Scenario 1 | Low Growth | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m |
| ***Profit & Loss*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turnover | | 8.2 | 8.3 | 8.4 | 8.5 | 8.7 | 8.8 | 8.9 | 9.0 | 9.2 | 9.3 | 9.4 | 9.6 | 9.7 | 9.9 | 10.0 | 10.2 | 10.3 | 10.5 | 10.6 | 10.8 | 10.9 | 11.1 | 11.3 | 11.5 | 11.6 | 11.8 |
| Profit after tax | | 1.5 | 1.3 | 1.7 | 1.8 | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 | 1.8 | 1.9 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 2.0 | 1.9 | 1.9 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 |
| ***Cashflow*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opening | | 4.6 | 4.9 | 4.7 | (0.8) | 0.3 | (3.2) | (2.1) | (1.0) | 0.2 | 1.5 | 2.8 | 4.1 | 3.4 | 4.8 | 6.2 | 7.7 | 9.3 | 10.9 | 12.6 | 1.0 | 2.9 | 4.9 | 7.0 | 9.1 | 8.7 | 10.9 |
| Net cash generated | | 1.2 | 1.0 | 2.2 | 2.3 | 2.2 | 2.3 | 2.3 | 2.4 | 2.4 | 2.5 | 2.6 | 2.5 | 2.6 | 2.6 | 2.7 | 2.8 | 2.8 | 2.9 | 3.1 | 3.1 | 3.2 | 3.3 | 3.3 | 3.3 | 3.4 | 3.5 |
| Capex | | (0.9) | (1.2) | (7.7) | (1.2) | (5.7) | (1.2) | (1.2) | (1.2) | (1.2) | (1.2) | (1.2) | (3.2) | (1.2) | (1.2) | (1.2) | (1.2) | (1.2) | (1.2) | (14.7) | (1.2) | (1.2) | (1.2) | (1.2) | (3.7) | (1.2) | (1.2) |
| Closing | | 4.9 | 4.7 | (0.8) | 0.3 | (3.2) | (2.1) | (1.0) | 0.2 | 1.5 | 2.8 | 4.1 | 3.4 | 4.8 | 6.2 | 7.7 | 9.3 | 10.9 | 12.6 | 1.0 | 2.9 | 4.9 | 7.0 | 9.1 | 8.7 | 10.9 | 13.2 |
| ***Balance Sheet*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fixed/Investment Assets (net of grants) | | 25.9 | 26.3 | 33.0 | 33.2 | 37.8 | 37.8 | 37.9 | 37.9 | 37.9 | 37.8 | 37.8 | 39.7 | 39.5 | 39.3 | 39.1 | 38.9 | 38.7 | 38.4 | 51.3 | 50.8 | 50.2 | 49.5 | 48.9 | 50.6 | 49.9 | 49.1 |
| Working Capital | | 2.7 | 3.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Bank | | 4.9 | 4.7 | (0.8) | 0.3 | (3.2) | (2.1) | (1.0) | 0.2 | 1.5 | 2.8 | 4.1 | 3.4 | 4.8 | 6.2 | 7.7 | 9.3 | 10.9 | 12.6 | 1.0 | 2.9 | 4.9 | 7.0 | 9.1 | 8.7 | 10.9 | 13.2 |
| | | 33.5 | 34.8 | 32.9 | 34.2 | 35.3 | 36.4 | 37.6 | 38.8 | 40.0 | 41.3 | 42.6 | 43.8 | 45.0 | 46.3 | 47.6 | 48.9 | 50.3 | 51.7 | 53.0 | 54.4 | 55.7 | 57.2 | 58.7 | 60.0 | 61.5 | 63.0 |
| Capital & Reserves | | 33.5 | 34.8 | 32.9 | 34.2 | 35.3 | 36.4 | 37.6 | 38.8 | 40.0 | 41.3 | 42.6 | 43.8 | 45.0 | 46.3 | 47.6 | 48.9 | 50.3 | 51.7 | 53.0 | 54.4 | 55.7 | 57.2 | 58.7 | 60.0 | 61.5 | 63.0 |
| **Return on capital** | | 4.5% | 4.4% | 6.3% | 6.2% | 5.3% | 5.2% | 5.2% | 5.2% | 5.2% | 5.1% | 5.1% | 4.6% | 4.6% | 4.6% | 4.6% | 4.6% | 4.6% | 4.6% | 4.1% | 4.2% | 4.2% | 4.2% | 4.2% | 3.9% | 3.9% | 4.0% |

*Table 10.3 – Scenario 1 – Low Growth Financial Summary*

**Scenario 1 is the low growth projection. This sees bulk throughput increasing to 2.5 million tonnes and containers handled growing to 85k teu over the plan period. Capital spend of €80m is envisaged being €30m on Masterplan projects and a further €50m on new plant and other re-investment required to maintain and develop the business. The spend on Masterplan projects does not represent all projects as the forecast demand does not indicate a need for full implementation. Turnover is projected to grow to €11.8m and Profit after Tax to €3.8m with an average return on capital of 6.5%.**

| Scenario 2 | Medium Growth | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m |
| ***Profit & Loss*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turnover | | 8.2 | 8.4 | 8.7 | 8.9 | 9.2 | 9.4 | 9.7 | 10.0 | 10.3 | 10.6 | 10.9 | 11.2 | 11.6 | 12.0 | 12.3 | 12.7 | 13.1 | 13.5 | 14.0 | 14.4 | 14.9 | 15.4 | 15.9 | 16.5 | 17.0 | 17.6 |
| Profit after tax | | 1.5 | 1.4 | 1.9 | 2.0 | 1.8 | 2.0 | 2.1 | 2.2 | 2.4 | 2.5 | 2.4 | 2.4 | 2.6 | 2.7 | 2.9 | 3.1 | 3.3 | 3.5 | 3.8 | 4.0 | 4.2 | 4.5 | 4.5 | 4.6 | 4.9 | 5.2 |
| ***Cashflow*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opening | | 4.6 | 4.9 | 3.8 | (2.6) | (2.3) | (6.5) | (6.1) | (5.5) | (4.9) | (4.0) | (3.1) | (15.3) | (16.0) | (14.6) | (13.0) | (11.2) | (9.2) | (7.0) | (4.7) | (2.1) | 0.6 | 3.6 | 6.8 | (3.1) | (1.9) | 2.0 |
| Net cash generated | | 1.2 | 1.1 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.9 | 3.0 | 3.2 | 3.4 | 3.5 | 3.7 | 3.8 | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | 5.4 | 5.7 | 5.9 | 6.1 | 6.4 |
| Capex | | (0.9) | (2.2) | (8.7) | (2.2) | (6.7) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (15.7) | (4.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (2.2) | (15.7) | (4.7) | (2.2) | (2.2) |
| Closing | | 4.9 | 3.8 | (2.6) | (2.3) | (6.5) | (6.1) | (5.5) | (4.9) | (4.0) | (3.1) | (15.3) | (16.0) | (14.6) | (13.0) | (11.2) | (9.2) | (7.0) | (4.7) | (2.1) | 0.6 | 3.6 | 6.8 | (3.1) | (1.9) | 2.0 | 6.2 |
| ***Balance Sheet*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fixed/Investment Assets (net of grants) | | 25.9 | 27.3 | 34.9 | 36.1 | 41.6 | 42.5 | 43.5 | 44.3 | 45.2 | 45.9 | 59.9 | 62.3 | 62.6 | 62.9 | 63.2 | 63.4 | 63.6 | 63.7 | 63.8 | 63.8 | 63.8 | 63.7 | 76.9 | 78.9 | 78.4 | 77.9 |
| Working Capital | | 2.7 | 3.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Bank | | 4.9 | 3.8 | (2.6) | (2.3) | (6.5) | (6.1) | (5.5) | (4.9) | (4.0) | (3.1) | (15.3) | (16.0) | (14.6) | (13.0) | (11.2) | (9.2) | (7.0) | (4.7) | (2.1) | 0.6 | 3.6 | 6.8 | (3.1) | (1.9) | 2.0 | 6.2 |
| | | 33.5 | 34.9 | 33.1 | 34.5 | 35.8 | 37.1 | 38.6 | 40.2 | 41.8 | 43.6 | 45.3 | 47.0 | 48.8 | 50.7 | 52.7 | 54.9 | 57.2 | 59.7 | 62.3 | 65.1 | 68.1 | 71.3 | 74.4 | 77.7 | 81.1 | 84.7 |
| Capital & Reserves | | 33.5 | 34.9 | 33.1 | 34.5 | 35.8 | 37.1 | 38.6 | 40.2 | 41.8 | 43.6 | 45.3 | 47.0 | 48.8 | 50.7 | 52.7 | 54.9 | 57.2 | 59.7 | 62.3 | 65.1 | 68.1 | 71.3 | 74.4 | 77.7 | 81.1 | 84.7 |
| **Return on capital** | | 4.5% | 4.6% | 6.7% | 6.8% | 6.1% | 6.2% | 6.4% | 6.5% | 6.7% | 6.8% | 6.3% | 6.0% | 6.2% | 6.4% | 6.5% | 6.7% | 6.8% | 7.0% | 7.1% | 7.2% | 7.3% | 7.4% | 7.2% | 7.0% | 7.1% | 7.2% |

*Table 10.4 – Scenario 2 –Medium Growth Financial Summary*

**Scenario 2 is the medium growth projection. This sees bulk throughput increasing to 4 million tonnes and containers handled growing to 138k teu over the plan period. Capital spend of €98m is envisaged being €43m on Masterplan projects and a further €55m on new plant and other re-investment required to maintain and develop the business. Again the spend on Masterplan projects does not represent all projects as the forecast demand does not indicate a need for full implementation. Turnover is projected to grow to €17.6m and Profit after Tax to €5.2m with an average return on capital of 6.6%.**

| Scenario 3 | High Growth | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m | €m |
| ***Profit & Loss*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turnover | | 8.2 | 8.6 | 9.0 | 9.5 | 9.9 | 10.4 | 11.0 | 11.6 | 12.2 | 12.9 | 13.6 | 14.4 | 15.2 | 16.1 | 17.1 | 18.1 | 19.2 | 20.4 | 21.6 | 23.0 | 24.4 | 26.0 | 27.6 | 29.4 | 31.3 | 33.4 |
| Profit after tax | | 1.5 | 1.4 | 1.9 | 2.1 | 2.0 | 2.2 | 2.3 | 2.5 | 2.8 | 2.8 | 2.8 | 3.1 | 3.4 | 3.5 | 3.9 | 4.3 | 4.5 | 4.9 | 5.4 | 5.7 | 6.3 | 6.9 | 7.6 | 8.3 | 9.0 | 9.9 |
| ***Cashflow*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opening | | 4.6 | 4.9 | 3.3 | (3.5) | (3.6) | (8.2) | (8.1) | (7.8) | (7.3) | (6.6) | (7.8) | (20.2) | (18.8) | (17.1) | (17.7) | (15.6) | (13.1) | (24.1) | (20.8) | (17.0) | (26.3) | (21.6) | (16.4) | (10.7) | (4.4) | 2.5 |
| Net cash generated | | 1.2 | 1.1 | 2.4 | 2.5 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.5 | 3.9 | 4.1 | 4.4 | 4.6 | 4.9 | 5.2 | 5.7 | 6.0 | 6.4 | 7.0 | 7.4 | 7.9 | 8.4 | 9.0 | 9.6 | 10.2 |
| Capex | | (0.9) | (2.7) | (9.2) | (2.7) | (7.2) | (2.7) | (2.7) | (2.7) | (2.7) | (4.7) | (16.2) | (2.7) | (2.7) | (5.2) | (2.7) | (2.7) | (16.7) | (2.7) | (2.7) | (16.2) | (2.7) | (2.7) | (2.7) | (2.7) | (2.7) | (2.7) |
| Closing | | 4.9 | 3.3 | (3.5) | (3.6) | (8.2) | (8.1) | (7.8) | (7.3) | (6.6) | (7.8) | (20.2) | (18.8) | (17.1) | (17.7) | (15.6) | (13.1) | (24.1) | (20.8) | (17.0) | (26.3) | (21.6) | (16.4) | (10.7) | (4.4) | 2.5 | 10.0 |
| ***Balance Sheet*** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fixed/Investment Assets (net of grants) | | 25.9 | 27.7 | 35.9 | 37.5 | 43.5 | 44.9 | 46.2 | 47.5 | 48.8 | 52.0 | 66.3 | 67.1 | 67.8 | 70.9 | 71.5 | 72.0 | 86.1 | 86.3 | 86.3 | 99.6 | 99.3 | 98.9 | 98.5 | 98.0 | 97.5 | 96.9 |
| Working Capital | | 2.7 | 3.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Bank | | 4.9 | 3.3 | (3.5) | (3.6) | (8.2) | (8.1) | (7.8) | (7.3) | (6.6) | (7.8) | (20.2) | (18.8) | (17.1) | (17.7) | (15.6) | (13.1) | (24.1) | (20.8) | (17.0) | (26.3) | (21.6) | (16.4) | (10.7) | (4.4) | 2.5 | 10.0 |
| | | 33.5 | 34.9 | 33.1 | 34.6 | 36.0 | 37.5 | 39.1 | 40.9 | 42.8 | 44.8 | 46.8 | 49.0 | 51.4 | 53.9 | 56.6 | 59.6 | 62.7 | 66.2 | 70.0 | 74.0 | 78.4 | 83.2 | 88.5 | 94.3 | 100.7 | 107.6 |
| Capital & Reserves | | 33.5 | 34.9 | 33.1 | 34.6 | 36.0 | 37.5 | 39.1 | 40.9 | 42.8 | 44.8 | 46.8 | 49.0 | 51.4 | 53.9 | 56.6 | 59.6 | 62.7 | 66.2 | 70.0 | 74.0 | 78.4 | 83.2 | 88.5 | 94.3 | 100.7 | 107.6 |
| **Return on capital** | | 4.5% | 4.7% | 6.8% | 7.0% | 6.5% | 6.8% | 7.0% | 7.3% | 7.6% | 7.4% | 7.1% | 7.5% | 7.8% | 7.7% | 8.1% | 8.5% | 8.4% | 8.8% | 9.1% | 9.1% | 9.4% | 9.8% | 10.1% | 10.3% | 10.6% | 10.8% |

*Table 10.5 – Scenario 3 –High Growth Financial Summary*

Scenario 3 is the high growth projection. This sees bulk throughput increasing to 6.5 million tonnes and containers handled growing to 356k teu over the plan period. Capital spend of €125m is envisaged being €57m on Masterplan projects and a further €68m on new plant and other re-investment required to maintain and develop the business. Here the spend on Masterplan projects does represent all projects as the forecast demand indicates a need for full implementation. Turnover is projected to grow to €33.4m and Profit after Tax to €9.9m with an average return on capital of 8%.

The forecasts indicate that the plans are both practical and achievable and that Port of Waterford will have the financial ability to deliver on all three scenarios over the long term. The returns generated are relatively modest insofar as the first two scenarios forecast c 6.5% and while the third scenario forecasts 8% this is heavily influenced by stronger returns at the latter (and more uncertain) end of the projection. Inflation has been ignored in the projections so all numbers are effectively 'current day'.

Furthermore the forecasts assume steady rates of change, clear sight of the future trading picture and capital investment when it is needed and can be supported by enhanced activity. The real world doesn't always work like that and there is potential for tough financial challenges and a real need for grant aid and other funding supports from Europe under Ten-T and/or Motorways of the Sea to reduce the risk profile of the investments and to help ensure that they are delivered when needed.

Grant aid has not been yet been taken into the projections and it is assumed that the National Exchequer will not be in a position to provide financial supports due to State Aid and other restrictions. Just as each individual Masterplan option/project will need to achieve individual appropriate consents, each project will need to be supported by detailed financial models and appropriate funding solutions.

# Appendix A - Glossary of terms and abbreviations

Several terms, expressions and abbreviations have been used in this document which may not be familiar to all users. A glossary of such terms is given below:

| | |
|---|---|
| *aid to navigation (AtoN)* | a device external to a vessel designed to assist in the determination of its position and its safe course or to warn of changes or obstructions. In the case of channels such devices include buoys, piled beacons, leading lights, sector lights, radar reflectors etc. |
| *benchmarking* | key performance indicators (KPIs) can be applied to monitor port activities and a tool to use in assessing port and terminal capacities in port Masterplanning. Benchmarking is a method to use these KPIs to compare performance with a target (or operations at other ports) and to observe trends in performance levels. |
| *break bulk* | cargo that must be loaded individually, and not in intermodal containers or in bulk as with oil or grain. Break bulk cargo is typically transported in bags, boxes, crates, drums, or barrels or as unit loads secured to a pallet or skid. |
| *capacity* | capacity, in terms of cargo handling, is a measure of the volumes which can be handled at a defined quality of service. Capacity can be considered in terms of:<br>• Maximum instantaneous capacity – only achievable with maximum productivity of equipment and full utilisation over short time frame<br>• Maximum annual capacity – assuming maximum productivity of equipment and high utilisation<br>• Optimum annual capacity - assuming high productivity of equipment and normal utilisation, based on optimum queuing of vessels |
| *channel width* | defined in this document as the width at the bed of the channel |
| *Chart Datum* | Reference level to which water depths are measured on a chart and is approximately the level of Lowest Astronomical Tide |
| *dead weight tonnage (DWT)* | the weight (usually in metric tonnes) of a ship's cargo, fuel, water, crew, passengers and stores |
| *displacement* | the actual total weight of the vessel (usually in metric tonnes) |
| *draft* | "draft" or "draught" refers to the distance from the waterline to the lowest point of the keel of a vessel. This varies with the amount of cargo carried and distribution of the cargo in the vessel |
| *dredged depth* | dredged depth is the distance from Chart Datum(CD) to the sea bed |

| | |
|---|---|
| *general cargo* | all cargo that is not carried as a bulk cargo or containerised. Sometimes referred to as "break-bulk" cargo. |
| *Gross Tonnage (GT)* | a measure of the overall size of a ship determined in accordance with the provisions of the International Convention on Tonnage Measurement of Vessels, 1969 |
| *Key Performance Indicators (KPIs)* | KPIs are measurements of a port's or terminal's operational activity or revenue based on cargoes handled/vessels served etc. over a period of time (per shift/ month/year). These KPIs can be financial, based on revenues, or operational based on cargo handling throughputs |
| *Lift-on/lift-off cargo (Lo-Lo)* | Cargo lifted on and off ships by crane. In the context of Waterford this typically refers to containers loaded on and off ships using dedicated container cranes |
| *productivity* | Productivity is a measure of actual operational efficiency in a port or terminal and can be used to compare with other operational KPIs and to determine future port requirements. |
| *Ramsar sites* | Areas listed under the International Convention on Wetlands of International Importance, especially as waterfowl habitat, signed at Ramsar, Iran in 1971 |
| *Roll-on/roll-off cargo (Ro-ro)* | Cargo capable of being wheeled on and off ships, typically motor vehicles that can be loaded and unloaded under their own power |
| *Special Area of Conservation (SAR)* | Area protected under European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive) |
| *Special Protection Area (SPA)* | Area protected under European Council Directive 79/409/EEC for the conservation of wild birds (The Birds Directive) |
| *tidal window* | The time period for which a channel is available for use (typically due to tide height) |

# Abbreviations

| | |
|---|---|
| *AA* | Appropriate Assessment |
| *AGI* | Above ground installation |
| *BHD* | Back Hoe Dredger |
| *BIM* | Bord Iascaigh Mhara |
| *CAGR* | Compound Annual Growth Rate |
| *CAPEX* | Capital expenditure |
| *CD* | Chart Datum |
| *CEO* | Chief Executive Officer |
| *CSR* | Corporate Social Responsibility |
| *DAFM* | Department of Agriculture, Food and the Marine |
| *DCCAE* | Department of Communications, Climate Action and the Environment |
| *DCHG* | Department of Culture, Heritage and Gaeltacht |
| *DHPLG* | Department of Housing, Planning and Local Government |
| *DWT* | Dead Weight Tonnage (metric tonnes) |
| *EIA* | Environmental Impact Assessment |
| *EIS* | Environmental Impact Statement |
| *EPA* | Environmental Protection Agency |
| *FDI* | Foreign direct investment |
| *FRA* | Flood Risk Assessment |
| *FTTC* | Fibre to the cabinet |
| *GDP* | Gross Domestic Product |
| *ha* | hectare |

| | |
|---|---|
| *HAT* | Highest Astronomical Tide |
| *HGV* | Heavy goods vehicle |
| *HR* | Human Resources |
| *IMDO* | Irish Maritime Development Office |
| *IDA* | Industrial Development Authority |
| *IRR* | Internal rate of return |
| *ISPS* | International Ship and Port Facility Security Code |
| *km* | kilometre |
| *KPI* | Key performance indicator |
| *LAT* | Lowest Astronomical Tide |
| *LOA* | Length overall |
| *Lo-Lo* | Load on - load off |
| *m* | metre |
| *MHC* | Mobile harbour crane |
| *MOR* | Malone O'Regan Environmental |
| *MT* | Empty (container) |
| *Mtpa* | Million tonnes per annum |
| *NPV* | Net Present Value |
| *ODC* | Ordnance Datum Cork |
| *ODD* | Ordnance Datum Dublin |
| *OPW* | Office of Public Works |
| *p.a.* | per annum |
| *PEC* | Pilot exemption certificate |
| *PIANC* | Permanent International Association of Navigational Congresses (now the World Association for Waterborne Transport Infrastructure) |

| | |
|---|---|
| *PoW* | Port of Waterford |
| *RoRo* | Roll-on roll-off |
| *RTG* | Rubber tyred gantry crane |
| *s* | second |
| *SDZ* | Special Development Zone |
| *SEA* | Strategic Environmental Assessment |
| *SWOT* | Strengths, weaknesses, opportunities and threats |
| *t* | tonne |
| *teu* | Twenty-foot Equivalent Unit |
| *tpd* | tonne per day |
| *tph* | tonne per hour |
| *TSHD* | Trailing suction hopper dredger |
| *UKC* | Underkeel Clearance |

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