11. LANDSCAPE AND VISUAL RESOURCE

11.1 INTRODUCTION

This chapter identifies and assesses the potential impacts of the proposed development at the Belvelly Port Facility on the landscape and visual resource of the study area. It identifies the mitigation measures that will be implemented to prevent, reduce or offset potential adverse landscape and visual effects and describes the residual impacts.

11.1.1 Scope of Assessment

This assessment considers:

- How landscape impacts associated with a development relate to changes to the fabric, character and quality of the landscape resource and how it is experienced; and
- How changes in views will affect people's perception of visual amenity.

11.1.1.1 Guidelines

The following sources and guidelines were used in the assessment:

- Landscape Institute UK/IEMA: Guidelines for Landscape and Visual Impact Assessment (GLVIA), 2013, 3rd Edition;
- Guidelines on the information to be contained in Environmental Impact Assessment Reports, Draft (EPA), August 2017

The draft EPA guidelines from August 2017 provide a general methodology and impact ratings for all types of specialist assessments. Best practice guidance, such as the "*Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, 2013, Landscape Institute (UK) & IEMA*" provide specific guidelines for landscape and visual impact assessments. Therefore, a combination of the draft EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for this assessment.

11.1.2 Assessment Methodology

A baseline study has been undertaken through a combination of desk based research and site appraisal in order to establish the existing conditions of the landscape and visual resources of the study area. Desk based research has involved a review of mapping and aerial photography, relevant planning and policy documents and the Cork County Development Plan 2014-2020.

A site survey of a 5km radius study area was carried out, identifying the potential visibility of the proposed works, key viewpoints within the local and wider landscape and the potential for mitigation measures to minimise landscape and visual impact.

11.1.3 Assessment Criteria

The guidelines cited in **Section 11.1.1.1**. above require the assessment to identify, predict and evaluate the significance of potential effects to landscape characteristics and established views. The assessment is based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. Definitions of the terms used in this report are contained in **Appendix 11.1**. For clarity, and in accordance with best practice, the assessment of potential impacts on landscape character and visual amenity, although closely related, are undertaken separately.

The significance of an effect is determined by two distinct considerations:

1. The nature of the RECEPTOR likely to be affected, namely:
   - The sensitivity to change is related to the value attached to the receptor.
2. The nature or magnitude of the EFFECT likely to occur, namely:
   - The size and scale of the landscape and visual effect (for example, whether there is a complete or minor loss of a particular landscape element);
   - The geographical extent of the areas that will be affected;
   - The duration of the effect and its reversibility; and
   - The quality of the effect – whether it is neutral, positive or adverse.

Landscape and Visual effects can be direct or indirect.

Landscape receptors

The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as *landscape receptors* and comprise the following:

- Individual landscape elements or features;
- Specific aesthetic or perceptual aspects; and
- Landscape character, or the distinct, recognisable and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another.

The assessment will identify the interaction between these components and the proposed development during construction and operation. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

Visual Receptors

For there to be a visual impact there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and regular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e. people, will be affected by changes as a result of the proposed development depends on a number of factors, including:

- Receptor activities, such as taking part in leisure, recreational and sporting activities, travelling or working;

- Whether receptors are likely to be stationary or moving and how long they will be exposed to the change at any one time;
- The importance of the location, as reflected by designations, inclusion in guidebooks or the facilities provided for visitors;
- The extent of the route or area over which the changes will be visible;
- Whether receptors will be exposed to the change daily, frequently, occasionally or rarely;
- The orientation of receptors in relation to the proposed development and whether views are open or intermittent;
- Proportion of the developments that will be visible (full, sections or none);
- Viewing direction, distance (i.e. short-, medium- and long-distance views) and elevation;
- Nature of the viewing experience (for example, static views, views from settlements and views from sequential points along routes);
- Accessibility of viewpoint (public or private, ease of access);
- Nature of changes (for example, changes in the existing skyline profile, creation of a new visual focus in the view, introduction of new man-made objects, changes in visual simplicity or complexity, alteration of visual scale, landform and change to the degree of visual enclosure);

Landscape Sensitivity

Landscape sensitivity to change is determined by employing professional judgment to combine and analyse the identified value and quality.

Visual Sensitivity

A judgement is also made on the value attached to the views experienced.

This takes account of:

- Recognition of the value attached to particular views, for example in relation to heritage assets, or through planning designations;
- Indicators of the value attached to views by visitors, for example through appearance in guidebooks or on tourist maps, provision of facilities for their enjoyment (sign boards, interpretive material) and references to them in literature or art; and
- It is important to note that the absence of view recognition does not preclude local value, as a view may be important as a resource in the local or immediate environment due to its relative rarity or local importance.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones;
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character;

- The geographic area over which the landscape effects will be felt; and
- The duration of the effects (temporary, short term, medium term, long term, permanent). Duration is related to the reversibility of the effect and some effects may be fully or partially reversible.

Magnitude of Visual Change

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the proposed development. The magnitude of the visual effect resulting from the development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved include:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, skylining, back-grounding, visual clues, focal points, colour and texture;
- The nature of the view of the development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

11.1.4 Statement on Limitations and Difficulties Encountered

A comprehensive on site survey was carried out to ascertain potential visibility of the proposals from public roads, public paths and accessible areas of the landscape. No private properties were accessed, and assumptions are made in relation to potential views from such areas based on the views from adjacent public areas.

11.1.5 Competency of Assessor

Deirdre Black is a registered Landscape Architect and a full member of the Irish Landscape Institute. She completed her Masters of Landscape Architecture in 1999 and has 20 years' experience of the landscape and visual impact assessment of transport, water and energy infrastructure and other large scale works. Full details of Deirdre's qualifications and experience are provided in **Chapter 1 Introduction.**

11.2 EXISTING ENVIRONMENT

11.2.1 Description of the Proposed Development

This chapter assesses the landscape and visual effects of a new agricultural fertiliser facility at the Belvelly Port Facility and the additional port operational use of the jetty to facilitate cargo vessels. The

current site layout and content is shown in **Figure 11.1** below. The primary use of the agricultural fertiliser facility will be for blending and bagging of dry bulk materials for storage and distribution.

A number of aspects of the proposed agricultural fertiliser facility works have particular relevance to this chapter, namely:

- importation of raw materials to the existing jetty;
- a storage warehouse;
- a bagging and palletising facility;
- an office building to support customer service and weighbridge operations; and
- external storage bays with associated circulation space, weigh-bridges, access control and security facilities.

The additional port operational use will involve an increase in the use of the jetty by cargo vessels.

Figure 11.1 Proposed new fertiliser facility site and existing jetty outlined in red

The pending submission for the Belvelly Port Facility site infrastructure and utility upgrade works (Planning Ref. 19/06783) includes a Green Infrastructure Plan. This Plan sets out plans for the

retention and protection (to British Standard 5839:2010) of existing boundary vegetation and new boundary planting along the northern, north-western boundaries (see **Figure 11.2**).

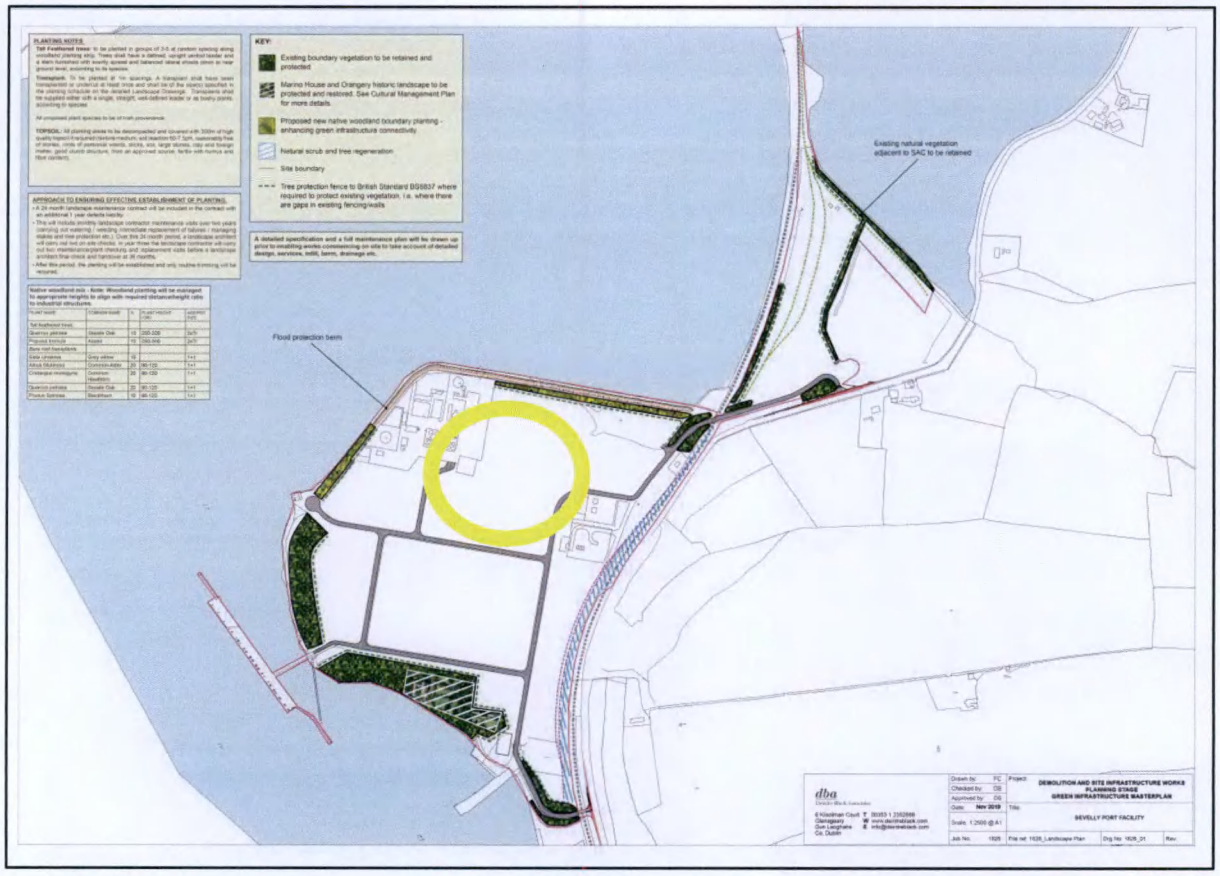

Figure 11.2 Proposed Green Infrastructure Plan for the Belvelly Port demolition, site infrastructure and utility upgrade works Planning Ref. 19/06783 with proposed fertiliser facility location shown in yellow

Potentially visible operational use at the proposed development will include the following:

Proposed Agricultural Fertiliser Facility

- An office building to support customer service and weighbridge operations
- Delivery of raw material by ship to the existing jetty which will be unloaded and transported from the jetty to the proposed blending and bagging facility across a weighbridge and placed in bays. The following handling equipment will be employed:
    - Two material handling cranes utilising a semi-closed clamshell grab with spill plates
    - A mobile hopper
    - Up to four tractors and covered trailers to be used for transport of material from jetty to blending/bagging facility and for transport of finished material from facility.
- Raw material and other various components mixed and then conveyed to the bag store area and storage warehouse. These bags will then be stockpiled on pallets, wrapped and transported by forklift to external storage bays and then collected by trucks and distributed nationwide by road.

Additional Port Operational Uses of the Jetty

- The proposed additional port operational use of the jetty will consist of cargo handling procedures and an increase in the number of cargo vessels using the jetty.
- In addition to the shipping associated with Goulding's operations, it is expected that approximately 40 additional ships will berth at the jetty each year, carrying general cargo material.
- The cargo types proposed will include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, and other miscellaneous dry cargo.
- The size and frequency of cargo vessels will be variable and will be subject to the various customers' needs. On average, ships will be berthed for 1 to 2 days to offload / load cargo but may be longer depending on cargo size and weather conditions.

11.2.2 Site location and visibility

The Belvelly Port Facility site, within which the proposed handling procedures will take place, is located on the north-west of Great Island on a small peninsula, east of Cork City. The site is bound by water to the north, west and south and the closest settlement is Passage West, approximately 1.0km from the centre of the site to the west on the opposite side of Lough Mahon. The R624 and the Cork to Cobh railway bound the east of the site. Cobh Golf Course is located immediately to the east of the R624. Further south, Monkstown and Cobh are located approximately 2km from the Belvelly Port Facility site. Refer to **Figure 11.3** below.

Views into the site currently present an image of a mainly disused industrial site within a vegetated setting. Its location at the water's edge means that is it visible from waterside locations across the water to the west and north, and from higher ground to the east and west of the site. Given the nature of topography and the screening effects of existing vegetation, the large areas of hardstanding are not openly visible from the surrounding area except for some areas immediately adjacent to the site along the R624.

Figure 11.3 Site location

11.2.3 Site Description

The overall site consists of large former industrial structures, roads and marine infrastructure, large areas of hardstanding, mature trees and natural regeneration where industrial uses have ceased.

The northern end of the peninsula was reclaimed post 1938 and currently contains the operational Marinochem facility including the loading and unloading of cargo at the jetty, redundant carparking areas and the lagoon at the northeast corner. The site has been historically used for docking ships and the loading/unloading of cargo since the late 1970s.

There are two access points from the R624 main road into the site, an emergency access to the northern end and the main site access point to the southern end. The southern entrance will continue to be the main access point into the site for all road vehicles.

11.2.4 Landscape and Visual Policy Context and Designations

High Value Landscape

The entire study area is described as a "High Value Landscape" in the Cork County Development plan.

County Landscape Character Assessment

The entire study area lies within Landscape Character Area 1: City Harbour and Estuary described as: *"...a character area with both urban and rural characteristics. The rural areas around much of the greater harbour area are now characterised by a prevalence of infrastructure such as roads, bridges*

and electricity power lines and some urban sprawl. There are also attractive fringes of broadleaf woodland in many areas around the estuary some of which are protected. Attractive towns such as Cobh and Passage West/Monkstown, which contain Architectural Conservation Areas, contribute hugely to the rich built heritage of the area. The orientation of these towns towards the harbour and the existence of rows of terraced houses reflect their maritime heritage. It is also home to a number of prime industrial/enterprise sites including one of the largest concentrations of pharmaceutical industries in the world."

Scenic Routes

There are a number of scenic routes in the study area: the R610 from Passage West to Monkstown and continuing westwards and the N624 from Belvelly bridge, past the eastern boundary of the site and onwards to Cobh. At a further distance, there is also a short scenic route to the west of the site at Rochestown and to the east of the site at Ballymore.

Figure 11.4 Scenic routes indicated in red as shown in the Cork County Development Plan 2014-2020

Architectural Conservation Areas

The distinctive urban characteristics of both Passage West and Monkstown are recognised by their designation as Architectural Conservation Areas.

Cork Harbour Greenway

The Cork Harbour Greenway runs along the estuary shoreline to Passage West and continues on southwards towards Monkstown.

Figure 11.5 The Cork Harbour Greenway

11.2.5 Do-Nothing Scenario

All components of the baseline are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison:

- The existing baseline environment; and
- The future baseline environment without the implementation of the proposed development but considering natural changes only.

In landscape terms, if the development did not go ahead, the proposed development site will remain as a former large scale industrial site. The deterioration of structures and the succession and maturing of existing vegetation on the site would continue depending on maintenance measures taken.

In visual terms, the content in available views of the development site will remain similar, although vegetation is likely to increase and grow in height over time and existing structures are likely to deteriorate.

11.3 LIKELY SIGNIFICANT IMPACTS

This section describes the likely significant impacts of the proposed works including direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects.

11.3.1 Landscape Impact

11.3.1.1 Landscape Impacts at Construction Stage

11.3.1.1.1 Proposed Agricultural Fertiliser Facility

The construction phase of the project will take place over an estimated 12-18 month period, including an estimated 4 month overlap with the proposed demolition, site infrastructure and utility upgrade works (Planning Ref. 19/06783). It is anticipated that during this period, a maximum of 40 people will work on the project.

A temporary construction compound will be established within the red line boundary of the proposed development site. The area of the construction site compound will be defined and enclosed by protective hoarding and will accommodate contractor personnel and visitor parking, porta cabins for site offices, WC and welfare facilities, storage containers and material lay down areas. The compound will be removed upon completion of the works. A perimeter fence will be erected around the construction site and protective hoarding will be adapted and altered as the works progress.

The most likely significant landscape effects arising at construction stage are set out below:

Vegetation Removal

Existing naturally regenerated vegetation across most of the site will be removed as part of the removal of structures, buildings and hardstanding as part of the pending Belvelly Port Facility demolition, site infrastructure and utility upgrade works submission (Planning Ref. 19/06783). Note that the Green Infrastructure Plan submitted as part of that pending submission includes the retention of the existing mature trees on the southern and western parts of the peninsula and new perimeter planting on the northern shoreline, outside the footprint of the proposed development assessed in this EIAR. This would mean that the vegetated shoreline character of the wider landscape would remain unchanged, and would be enhanced by further new shoreline planting on the northern boundary.

Earthworks

Earthworks for services (1-3m below ground level) and piled foundations for buildings would inevitably have a moderate adverse impact on the local landscape during the construction period. The effects would be short-term.

Landscape character

The existing landscape character of the site is one of deteriorating large scale industrial development bound by mature shoreline vegetation and with regenerating natural vegetation throughout. The operational Marinochem facility including the loading and unloading of cargo at the jetty, is located just to the west of the proposed application site.

The broader landscape includes estuarine landscapes of mudflats, open water, vegetated edges, towns, suburbs, rural housing and marine/industrial infrastructure. The introduction of construction machinery and activity into this landscape for drainage works, loading machinery and storage structures will have a moderate neutral effect on the character of the site itself as the site already has an industrial character. In the wider landscape, the effects of heavy plant movement will have a moderate-high adverse effect on the character of the immediate vicinity of the site, along the R624

and at the access point. These effects will be short term and last for the duration of the construction period of 12-18 months with an estimated 4 month overlap with the proposed demolition, site infrastructure and utility upgrade works (Planning Ref. 19/06783).

11.3.1.1.2 Additional Port Operational Uses of the Jetty

There will be no construction works associated with the additional port operational use.

11.3.1.2 Landscape effects at Operational Phase

11.3.1.2.1 Proposed Agricultural Fertiliser Facility

The proposed development will result in changes to a number of elements of the physical fabric and character of the receiving landscape.

- Topography of the site
- Landscape character of the immediate and wider area

Topography of the site

There will also be negligible changes to the internal topography of the site arising from excavations, and these will not have any significant adverse long term effects.

Landscape character of the immediate and wider area

The proposed new agricultural fertiliser facility represents a continuation of the existing character of Marino Point, and bring existing infrastructure into greater use. The retention of all boundary vegetation and the planting of new vegetation along boundaries as part of the pending demolition, site infrastructure and utility upgrade works (Planning Ref. 19/06783) at Marino Point will retain and enhance the character of the site as experienced from the surrounding areas.

The facility will have an average of 17 operational employees on site at any one time, with a maximum of 30 at peak times. Peak production takes place in the early spring.

The Goulding's agricultural fertiliser facility will operate all year-round, with working times varying depending on market demand. Normal hours of operation are 7.00 a.m. to 5.00 p.m. Monday to Friday. During peak demand, which is typically between February and April, fertiliser blending and bagging operations will occur between 7.00 a.m. and 12.00 midnight, and HGV distribution of finished fertiliser product by road will occur between 7.00 a.m. to 7.00 p.m. Monday to Saturday.

Overall, the impact of the proposed development on landscape character will be moderate and neutral as the proposal will represent a continuation of the current nature of use of the site.

11.3.1.2.2 Additional Port Operational Uses of the Jetty

The additional port operations in the jetty will bring more maritime activity to this part of Cork harbour with an increase in ships moving to and mooring at the jetty. This is in line with the general maritime character of Cork Harbour with overall landscape impact that is slight to moderate, intermittent and neutral.

11.3.2 Visual Impact

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e. how construction works are seen within the landscape); for example, whether they appear integrated and balanced within the visual composition of a view or whether they create a focal point.

Key visual receptors at construction stage include: ·

- Residents of houses on the coastal edge and higher ground at Passage West
- Residents of houses at an elevated position at Monkstown
- Residents of houses along the R624 along the coastal edge
- Residents at Carrigmahon Place
- Users of Cobh Golf Club
- People sailing through the estuary, using the Passage West ferry and users of Passage West and Monkstown harbours and jetties
- People travelling along the R610
- People travelling along the R624
- Passengers on the Cork – Cobh railway
- People travelling along the southernmost roads of Little Island
- People travelling along the N25
- Cyclists and walkers along the Cork harbour greenway and the Patrick Murphy Park at Passage West

11.3.2.1 Visual Effects at Construction Phase

11.3.2.1.1 Proposed Agricultural Fertiliser Facility

Machinery & Materials

Machinery, heavy plant and material stockpiles will be visible, temporarily and at a localised scale, during the construction phase particularly in views from the north along the R624 at Belvelly which is a scenic route in the Cork County Development Plan. The higher parts of plant would be partly visible at longer distances from Passage West, parts of Monkstown, higher areas to the west and east, and from the R610 (which is a scenic route), the Cork Harbour Greenway and the Cork-Cobh railway.

The movement and activity of heavy plant, which has a significant visual presence, on a local scale, due to size/scale and hazard lighting would have short term slight and adverse visual effects on views from the north of the site along the R624. The proposed hours for the movement of HGVs on and off the site are 9.00 a.m. to 4.00 p.m., Monday to Friday, and 8.00 a.m. to 5.00 p.m. on Saturdays.

At a longer distance, the visual effects at construction stage on views from Passage West, the R610, the Cork Harbour Greenway and houses at elevated positions with views of the site would not be significant.

Fencing, traffic management, signage, personnel and traffic movement

Temporary fencing, traffic management works and signage would also have an effect upon the local landscape and views towards the construction site. There will be a maximum of approximately 40 construction staff working on the site. Site personnel will travel to site prior to 8.00 a.m. and depart

from site from 6.00 p.m. Visual effects would be temporary, slight and would have no long-term visual effects.

11.3.2.1.2 Additional Port Operational Uses of the Jetty

There would be no impacts at construction stage as there are no proposed changes to the existing jetty.

11.3.2.2 Visual effects at Operation Phase

11.3.2.2.1 Proposed Agricultural Fertiliser Facility

A number of photomontages have been prepared to illustrate the proposals from key locations. Refer to **Figure 11.6** and **Appendix 11.2**. Note that the photomontages show the proposed line of new tree planting along the northern boundary of the overall site which forms part of the Green Infrastructure Plan for the proposed demolition and site infrastructure works due to take place across the site (Planning Ref. 19/06783).

11.3.2.2.2 Additional Port Operational Uses of the Jetty

The additional use of the jetty is shown in relevant photomontages by a cargo ship berthed to represent the type of ship that would use the jetty.

11.3.3 Analysis of photomontages and photographs

Six photomontages have been prepared to assess the nature of visibility of the proposals at various distances, elevations and contexts. A description of each photomontage is provided in the following sections. The corresponding photographs showing the existing view and view with the proposed development are provided in **Appendix 11.2**.

Figure 11.6 Photomontage locations

Photomontage 2 – Passage East Ferry terminal	
This viewpoint from the embarkation point for the ferry crossing looks northwards towards Marino Point. The existing redundant industrial structures on Marino Point are visible along with the large industrial structures on Little Island in the distance. Houses face onto this narrow stretch of water and the sloping ground to the water frames views and focuses the eye in the direction of the site. The upper parts of the fertiliser facility building would be partly visible over the existing and retained trees on Marino Point. A large crane would also be visible at the existing jetty. Neither structure would break the skyline or be out of place within this port landscape and other similar features are already present in the scene. The length of the storage facility building is discernible, but the distance and colour of the structure means that it might not be readily perceived by viewers at this point. The increase in use of the jetty would be in keeping with the overall maritime character of this viewpoint. Refer to **Photomontage Viewpoint No. 2** of **Appendix 11.2**.	
Sensitivity of view:	Medium
Magnitude of change:	Low
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* - Slight, adverse, long term *Additional Port Operational Uses of the Jetty* – Slight, neutral, intermittent

Photomontage 4 – Pedestrian Bridge at Carrigaloe train station	
The elevated pedestrian bridge at Carrigaloe train station has open views of Marino Point. The retention of existing vegetation along the southern boundary of the site as part of the proposed Green Infrastructure Plan for the demolition, site infrastructure and utility upgrade works will help integrate new developments into views from the south such as this one. The view represents the nature of views looking northwards from the railway, the R624 which is a protected Scenic Route in the County Development Plan, and waterside houses along the R624. The heritage buildings on the southern boundary of Marino Point are visible as well as the existing mature vegetation on the site. This view also shows the relationship between Marino House and Orangery on the shoreline and the current industrial site. The planned retention of existing trees in this location provides a vegetated landscape setting for the house, albeit within a broader industrial context. This will not change as result of the proposed fertiliser facility development. The removal of the existing industrial structures on Marino Point (Planning Ref. 19/06783) will result in the more open visibility of the existing buildings in the distance on Little Island. A small part of the upper part of the proposed fertiliser facility will be seen in the context of these buildings in the distance and be read as part of the general industrial developments within the harbour. From this location the proposed new crane at the existing jetty would be visible and be perceived as a continuation of the maritime of the site. Refer to **Photomontage Viewpoint No. 4** of **Appendix 11.2**.	
Sensitivity of view:	Medium
Magnitude of change:	Low
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* - Slight, neutral, long term *Additional Port Operational Uses of the Jetty* – Slight, neutral, intermittent

Photomontage 7 – View from R624 at Belvelly	
This is a protected Scenic Route as recognised by the Cork County Development Plan. A view opens up of Marino Point south of Belvelly and is intermittently available travelling along the route towards the site. The existing Marinochem works are visible in the centre of the image. The photomontage also shows the proposed new planting along the northern boundary of the Marino Point site as part of the proposed demolition, site infrastructure and utility upgrade works. A very small part of the proposed fertiliser facility and upper parts of the proposed crane at the jetty would be visible but unlikely to be discernable by travellers along this road. Cargo ships at the existing jetty would not be visible from this location. Refer to **Photomontage Viewpoint No. 7** of **Appendix 11.2**.	
Sensitivity of view:	Medium-high
Magnitude of change:	Negligible
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* – Slight, neutral, long term *Additional Port Operational Uses of the Jetty* – Slight, neutral, intermittent

Photomontage 9 – View from junction of Church Hill and Mariner's View	
This view represents views from elevated positions within and west of Passage West. Many private houses would have similar or more open views where views are available over the harbour. The proposed removal of existing industrial structures (Planning Ref. 19/06783) would result in the Marinochem site becoming more openly visible, but the proposed fertiliser facility or additional jetty use would not be visible from this location as is indicated in the wireframe image. Refer to **Photomontage Viewpoint No. 9** of **Appendix 11.2**.	
Sensitivity of view:	Medium
Magnitude of change:	None
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* - none *Additional Port Operational Uses of the Jetty* - none

Photomontage 10 – View from the Cork Harbour Greenway	
This view looks across the harbour waters from the Cork Harbour Greenway running along the coastline towards Passage West. The existing industrial structures at Marino Point are openly visible along with the shoreline marine infrastructure and the band of existing mature vegetation along the Marino Point shoreline. The proposed Marino Point demolition, site infrastructure and utility upgrade works (Planning Ref. 19/06783) will involve the removal of the visible infrastructure on land and the retention of the mature trees along the shoreline and the marine infrastructure. This will result in a more natural vista from this location, with the removal of large scale structures along this part of the Logh Mahon, although the extensive view of the jetty will remain. The proposed fertiliser facility will not be visible from this location, even when the existing industrial structures are removed, as can be seen in the wireframe image. The proposed new crane and hopper would be visible and the crane would slightly break the skyline. Cargo ships would also be openly visible from this location. Both the new jetty plant and the additional jetty use would be in line with the overall maritime visual character of this part of Cork harbour. Refer to **Photomontage Viewpoint No. 10** of **Appendix 11.1**.	
Sensitivity of view:	Medium-High
Magnitude of change:	Low
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* – None *Additional Port Operational Uses of the Jetty* – Slight, neutral, intermittent

Photomontage 12 – View from Patrick Murphy Park	
This park runs along the shoreline in the northern part of the Passage West and connects with the Cork Harbour Greenway. The R610, which is a scenic route, runs alongside the park. The existing industrial structures at Marino Point are openly visible along with the shoreline marine infrastructure and the band of existing mature vegetation along the Marino Point shoreline. The propsed Marino Point demolition, site infrastructure and utility upgrade works (Planning Ref. 19/06783) will involve the removal of the visible infrastructure on land and the retention of the mature trees along the shoreline and the marine infrastructure. This will result in a more natural vista from this location, with the removal of large scale structures along this part of the River Lee, although the extensive view of the jetty will remain. A very small part of the proposed fertiliser facility on the northern part of Marino Point will be visible from this location, but very unlikely to be perceived by a viewer. The new jetty crane and hopper and additional cargo ships berthing will be openly visible and break the skyline, but remain in line with the maritime visual character of the scene. Refer to **Photomontage Viewpoint No. 12** of **Appendix 11.2**.	
Sensitivity of view:	Medium-High
Magnitude of change:	Moderate
Significance of visual effect:	*Proposed Agricultural Fertiliser Facility* – Not Significant *Additional Port Operational Uses of the Jetty* – slight to moderate, neutral, intermittent

In summary, the most open potential views of the proposed fertiliser facility will be from the R624 at Belvelly and from elevated views to the west and east of the site on either side of the water channel. However, the photomontages show that existing trees on Marino Point and in the wider landscape screen most of the proposed fertiliser facility in such views. The proposed planting to the north boundary of Marino Point (as included in the Belvelly Port demolition, site infrastructure and utility upgrade works submission) would screen much of the fertiliser facility and traffic movements from the scenic route along the R624. An increase in vehicular movements will be visible at the entrance to the site from the R624.

The proposed new crane at the existing jetty on the south western side of Marino Point will be visible from a number of locations due to its height and will be most visible from across the water at Passage West and along the Cork Harbour Greenway. Cargo ships will also be intermittently visible from a number of locations docking and unloading at the jetty. The crane and hopper at the jetty and the additional jetty activity will be visually associated with the current maritime activity in this part of Cork Harbour, and while noticeable as new elements, will be in line with the existing maritime landscape character.

11.3.4 Cumulative Effects

In addition to landscape and visual effects, it is also important to consider potential cumulative effects. Significant cumulative effects may occur where a number of similar developments combine to increase the prevalence of that type of development within a landscape or view to the extent that they become a defining characteristic. Cumulative effects can also arise from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development.

The cumulative assessment evaluates the additional change resulting from the proposed development in relation to the theoretical baseline scenario and follows a similar methodology to that used for the landscape and visual assessments.

11.3.4.1 Cumulative landscape effects

The key cumulative landscape effect to consider is the combination of the proposed works and future possible development on the site, bearing in mind that the proposed demolition, site infrastructure and utility upgrade works covers the whole of the Belvelly Port Facility site. Overall, it is likely that the cumulative landscape effects of future site re-development works would be low-moderate, adverse and long-term. Future individual site applicants will need to address landscape and visual impacts as part of their individual planning consent requirements.

11.3.4.2 Cumulative visual effects

Similarly, the key cumulative visual effect to consider is the combination of the proposed works and future possible development on the site. The proposal in the site infrastructure and utility upgrade works submission to protect the existing boundary trees and plant new trees along the northern and north-western boundary mean that the cumulative visual effects are reduced. Overall, it is likely that the cumulative visual effects of proposed and future site re-development works would be moderate, adverse and long-term. Future individual site applicants will need to address landscape and visual impacts as part of their individual planning consent requirements.

11.4 MITIGATION

11.4.1 Incorporated Design Mitigation

The siting, layout and design of the proposals seek to minimise landscape and visual impact by utilising an existing industrial site and jetty.

11.5 RESIDUAL IMPACTS

11.5.1 Residual Landscape impacts

Proposed Agricultural Fertiliser Facility

Table 11.1 Summary of Landscape Impacts

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Topography of site	Medium	Negligible	Not significant
Landscape character of immediate and wider context	Medium-high	Low-moderate	Slight to moderate, neutral, long term

Additional Port Operational Uses of the Jetty

Table 11.2 Summary of Landscape Impacts

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Landscape character of immediate and wider landscape	Medium-high	Moderate	Slight to moderate, neutral, intermittent

11.5.2 Residual Visual Impacts

Proposed Agricultural Fertiliser Facility

Table 11.3 Summary of Visual Impacts

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Residents of houses on the coastal edge and higher ground at Passage West	Medium-High	Negligible-Low	Not significant-slight, adverse, long term
Residents of houses at an elevated position at Monkstown	Medium-High	Negligible	Not significant

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Residents of houses along the R624 along the coastal edge	Medium-High	Negligible-Low	Not significant-slight, adverse, long term
Residents at Carrigmahon Place	Medium-High	Negligible	Not significant
Users of Cobh Golf Club	Medium	Low	Slight, neutral, short-term
People sailing through the estuary, using the Passage West ferry and users of Passage West and Monkstown harbours and jetties	Medium	Low	Slight, neutral, long term
People travelling along the R610	Medium-high	Negligible	Slight, neutral, long-term
People travelling along the R624	Medium-high	Low	Slight, neutral, long-term
Passengers on the Cork – Cobh railway	Medium	Low	Slight, neutral, long-term
People travelling along the southernmost roads at Little Island	Low	Negligible	Not significant
People travelling along the N25	Low	Negligible	Not significant
Cyclists and walkers along the Cork harbour greenway and the Patrick Murphy Park at Passage West	Medium-high	Low	Slight, neutral, long-term

Additional Port Operational Use of the Jetty

Table 11.4 Summary of Visual Effects

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Residents of houses on the coastal edge and higher ground at Passage West	Medium-High	Moderate	Slight to moderate, neutral, intermittent
Residents of houses at an elevated position at Monkstown	Medium-High	Low	Slight, neutral, intermittent

Description of resource / receptor and impact	Sensitivity or value of receptor	Magnitude of impact (incorporating environmental design and management)	Residual effect and statement of significance (incorporating mitigation and monitoring)
Residents of houses along the R624 along the coastal edge	Medium-High	Moderate	Slight to moderate, neutral, intermittent
Residents at Carrigmahon Place	Medium-High	Low	Slight, neutral, intermittent
Users of Cobh Golf Club	Medium	Negligible	Not significant
People sailing through the estuary, using the Passage West ferry and users of Passage West and Monkstown harbours and jetties	Medium	Low	Slight, neutral, intermittent
People travelling along the R610	Medium-high	Low	Slight, neutral, intermittent
People travelling along the R624	Medium-high	Low	Slight, neutral, intermittent
Passengers on the Cork – Cobh railway	Medium	Low	Slight, neutral, intermittent
People travelling along the southernmost roads at Little Island	Low	Negligible	Not significant
People travelling along the N25	Low	Negligible	Not significant
Cyclists and walkers along the Cork harbour greenway and the Patrick Murphy Park at Passage West	Medium-high	Moderate	Slight to moderate, neutral, intermittent

12. MATERIAL ASSETS

12.1 Introduction

This chapter of the EIAR provides an assessment of the likely impacts of the proposed agricultural fertiliser facility and additional port operational use of the existing jetty on relevant material assets. The sites utilisation of material assets, or proximity to these material assets, could lead directly and indirectly to potential environmental impacts. The purpose of this assessment is to identify these assets and determine the impact, if any, on these resources, and to propose mitigation where necessary, to ensure they are used in a sustainable manner.

12.2 Scope of Assessment

The proposed development will consist of the following main elements:

- The construction and operation of an agricultural fertiliser blending and bagging facility which facilitates the relocation of Goulding Chemicals Limited from Cork City to the Belvelly Port Facility. The proposed facility will consist of:
  - a storage warehouse;
  - a bagging and palletising facility;
  - an office building to support customer service and weighbridge operations;
  - external storage bays with associated circulation space, weigh-bridges, access control and security facilities; and
  - importation of raw materials at the existing jetty.

  The primary use of the proposed fertiliser facility will be for bagging and blending of dry bulk materials for storage and distribution. All finished fertiliser product will be distributed from the facility by road.

- Additional BMDC port operational use of the jetty to facilitate general dry cargo vessels at the Belvelly Port Facility.
  - In addition to the shipping associated with Goulding's operations, it is expected that approximately 40 additional ships will berth at the jetty each year, carrying general cargo material.
  - The cargo types proposed will include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, and other miscellaneous dry cargo.
  - The size and frequency of cargo vessels will be variable and will be subject to the various customers' needs. On average, ships will be berthed for 1 to 2 days to offload / load cargo but may be longer depending on cargo size and weather conditions.

Refer to **Chapter 2 Description of the Proposed Development** for full details of the proposed development.

12.2.1 Methodology

Material assets are defined in the EPA 'Advice notes on Current practice (in the preparation of Environmental Impact Statements)' (2003) as 'resources that are valued and that are intrinsic to specific places, they may be either of human or natural origin and the value may arise for either economic or cultural reasons'. **Table 12.1** outlines the topic areas which, as these guidelines suggest may be examined as part of the material assets study.

Table 12.1 Types of Material Assets

Asset Type	Topic Area
Economic Asset - **Natural Origin**	- Assimilative capacity (air & water) - Non-renewable resources - Renewable resources
Economic Asset- **Human Origin**	- Settlements - Transport infrastructure - Major utilities - Ownership and access
Cultural Asset – **Physical Type**	- Archaeology - Architecture - Settlements - Monuments, features and landmarks - Historic sites and structures - Geological heritage
Cultural Asset – **Social Type**	- Language and dialects - Folklore and tradition - Religion and belief - Literary and artistic association

The definition of 'Material Assets' in the revised draft EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports published in August 2017, differs slightly in that it means built services and infrastructure and excludes material assets such as cultural heritage, land resource and air quality, which are covered by other topics in an EIAR. **Table 12.2** outlines the topic areas to be examined when considering the impact of a development on Material Assets, as recommended in the 2017 EPA Guidelines.

Table 12.2 Material Assets and Topics to be covered

Material Asset	Topics to be Covered
Roads & Shipping Traffic	Construction Phase Operational Phase Unplanned Events (i.e. Accidents)
Built Services	Electricity Telecommunications Water Supply Infrastructure Sewerage
Waste Management	Waste Infrastructure Waste Handling, Collection & Disposal Arrangements

Based on a review of the proposed development and the suggested topic areas set out in both of the EPA guidelines, the majority of the topic areas identified for assessment under material assets are closely related to other sections of this EIAR and therefore reference should be made to the associated chapter as follows:

- **Chapter 13, Traffic & Transportation** provides an assessment on the local road infrastructure. No further assessment on this topic is included in this chapter.
- **Chapter 9, Air Quality and Climate** provides an assessment on air as a resource. No further assessment on this topic is included in this chapter.
- **Chapter 11, Cultural Heritage** is an assessment on Cultural Assets. No further assessment on this topic is included in this chapter.
- **Chapter 6, Lands and Soils** provides an assessment on the land and geological resource. No further assessment on this topic is included in this chapter.
- **Chapter 7, Hydrology** provides an assessment on the surface water resource. No further assessment on this topic is included in this chapter.
- **Chapter 8, Hydrogeology** provides an assessment on the ground water resource. No further assessment on this topic is included in this chapter.

The consideration of the projects impact on material assets provided within this Chapter is discussed in the context of built services and waste management, e.g.:

- Electricity;
- Gas;
- Water Supply Infrastructure;
- Wastewater Infrastructure; and
- Materials Management and Resource use;
- Other utilities e.g. communications.

12.2.2 Sources of Information

This chapter has been prepared having regard to the following guidelines:

- *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA 2002);
- *Revised Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, Draft 2017);
- *Advice Notes on Current Practices in the Preparation of Environmental Impact Statements* (EPA 2003); and
- *Revised Advice Notes for Preparing Environmental Impact Statements* (EPA, Draft September 2015).

12.3 Existing Environment

The following section discusses the material assets outlined above in the existing environment relevant to the development.

12.3.1 Water Supply Infrastructure

At present, the Richmond Reservoir (TWL 62.7 mOD) which forms part of the Glashaboy Water Supply Scheme provides water to the Marino Point site via a 600mm branch taken off the 900mm trunk main. Water is delivered to the site via gravity. This public water supply network terminates at a valve/meter house, known locally as the IFI meter house. The trunk mains which supply this water to the site are all in good condition and will not require replacement in the near to medium future.

The Cork Strategic Water Study allowed for a Strategic Industrial demand in the Little Island / Fota / Marino Point area of 4,250m^3/day and demonstrated that the existing network could deliver this demand.

The network on the downstream side of this "IFI Meter House" is private and provides a mains water supply and fire mains supply to the 'redundant IFI site' and a mains water supply to the existing Marinochem facility. There is an existing water storage tank on the Marino Point site with a capacity of approximately 16000m^3. This tank was used for fire water storage. However, the water main has been modified in recent years to bypass this tank and the tank is now redundant. The tank is not situated within the planning boundary of the proposed development.

12.3.2 Wastewater Infrastructure

The historic foul and waste water system for the Marino Point site comprised 2 no. septic tank treatment systems discharging to surface waters. These effluent systems serviced the workshop and storage buildings as well as the urea train loading area. The remaining buildings on the site were serviced by a foul sewer network that discharged to a bio-treatment plant on site before moving to a retention pond. The retention pond was then pumped to seawater via an existing outfall. The existing foul sewer collection network is defunct and inadequate.

12.3.3 Electricity

Up until recently the site was served with a 110kV substation. The substation has a looped overhead supply terminating in 2 no. 110kV pylons in the 110kV external substation compound. This substation is a carryover from the site's previous usage requirements (under IFI). The 110kv substation recently suffered catastrophic failure and has reached its end of life. There is currently no permanent electrical power supply to the site. Works are progressing to establish a new temporary power supply to the existing facilities on the site. The current 110kV infrastructure will be retained in the medium to long term.

12.3.4 Gas

Currently, there is an existing Gas Networks Ireland (GNI) compressor station/Above Ground Installation (AGI) on site which covers an area of approximately 70m x 60m. This AGI was constructed to serve the former IFI facility which would have used a large amount of natural gas. At the time, it also provided natural gas to a limited domestic market in Cobh and its environs. The AGI now serves the Marinochem facility to the north west of the Marino Point site, and an increased volume of domestic houses on Great Island. The AGI will be retained.

12.3.5 *Rail Connection and Services*

The Belvelly Port Facility site adjoins the existing rail route from Cobh to Cork. There is a historic rail siding present in the northern annexe part of the site.

12.3.6 *Methanol Pipe*

There is an existing above ground methanol pipe on the site which supplies methanol to the Marinochem facility. This pipe runs from the existing jetty where methanol is received from ships which berth at the jetty, above ground along the north western edge of the site to the Marinochem facility.

12.4 Summary of Proposed Development

The characteristics of the proposed development in relation to material assets are as follows:

- Power and water supply will be required, in addition to a foul and surface water drainage system.
- Raw materials will be required as process inputs.
- Residues from waste will be generated during the operation phase.
- There will be movement of materials on and off site during the construction phase.
- Utilisation of land for the construction and operation of the proposed development.

12.4.1 *Electricity and Telecommunications*

Under planning application Ref. No. 19/06783, the Belvelly Port Facility site will be supplied with a new 10kV supply which is to be taken from the local ESB network via a new substation located in the southern end of the site. The existing 110kV substation will be retained. The new 10kV substation will be connected to a new underground ducting network installed under the roadways to service Marinochem and provide capacity for future development proposals. This new 10kV supply and 10kV substation for the overall Belvelly Port Facility is being installed under planning application Ref. No. 19/06783.

An electrical connection from a new electrical substation on the proposed agricultural fertiliser facility site will be made to underground ducting in the roadway connecting to the new 10kV electrical supply on the Belvelly Port Facility site.

12.4.2 *Water Supply Infrastructure*

As part of planning application Ref. No. 19/06783, it is proposed to construct a new water supply ring with fire hydrants at intervals of maximum 90m along the internal road network. These hydrants are being provided to assist in the event of a fire. The existing Marinochem water connection will be disconnected once the new ring main pipeline is in place.

The proposed agricultural fertiliser facility will connect to this new ring main. There is no requirement for water in the fertiliser blending and bagging process. Water will only be required for canteen and

toilet facilities, using approximately 300 litres per/day. Water required in the event of a fire at the Gouldings facility will be supplied from the mains supply.

The proposed development will include the installation of a fire water retention tank on the Gouldings site. The site will be split into two zones, each of which drain separately to the retention tank. Zone 1 will cover the buildings and the yard area in the proximity of the buildings. Zone 2 will cover the majority of the storage yard areas. Water will be discharged as normal and diverted to the retention tank in the event of a fire.

The tank will be an above ground tank, which will be a glass lined steel tank. Surface water will be pumped into tank and will discharge under gravity.

12.4.3 Surface Water Infrastructure

As per planning application Ref. No. 19/06783, the Belvelly Port Facility site will be serviced with two separate networks, one line that will serve shared areas (mainly runoff from the internal roadways) and a second line that will serve future drainage requirements within the overall Belvelly Port Facility. These networks will be kept separate but will be laid under the internal road network, where practicable. The new surface water collection network for the shared areas will run along the internal road network and will be treated by full retention interceptors before discharging into the harbour.

Surface water runoff from the proposed agricultural fertiliser facility will be collected and conveyed through a dedicated surface water drainage network on the Gouldings site. All runoff will be routed to the north of the site prior to discharging via an interceptor to the harbour via an existing outfall off the northern end of the Belvelly Port Facility site.

The surface water will pass a monitoring point before it leaves the agricultural fertiliser facility site and if any exceedances are detected, the water will be diverted to an attenuation tank where it will be held until safe to discharge.

12.4.4 Wastewater Infrastructure

As per planning application Ref. No. 19/06783, a new foul drainage system will be developed for the Belvelly Port Facility site in addition to the provision of an on-site Wastewater Treatment Plant (WWTP). This will consist of a trunk main to collect foul effluent from each future individual site and convey the effluent to a new pumping station. There will be three foul effluent networks flowing by gravity to pumping stations and one to the proposed WWTP.

The proposed wastewater treatment system will consist of a proprietary secondary treatment unit followed by tertiary treatment prior to discharge to the harbour via an outfall pipe which will be located along the route of an existing outfall to the south-west of the site. The WWTP will be located in the southern part of the Belvelly Port Facility site and will be an underground installation. The proposed WWTP will be equipped to handle influent for between 10 and 50 Population Equivalent (PE) while allowing for expansion to the estimated future loading of 100 PE. This will allow for a range

from an initial 10PE currently on site to an estimated 100PE which could potentially be discharging to the SBR once the masterplan development has been fully implemented.

Belvelly Marino Development Company will apply to Cork County Council for a discharge licence under section 4 of the Local Government (Water Pollution) Acts 1977 – 2007 to discharge the treated wastewater to the harbour. All treated water will be of a minimum standard in line with the Urban Waste Water Directive 91/271/EEC. An Assimilative Capacity Study was completed as part of the EIA process for planning application Ref. No. 19/06783 to illustrate that there will be no adverse impact on water quality as a result of this discharge. Please refer to **Chapter 7 Hydrology** for further details.

Any process effluent which may be generated by future individual developments on the site will be treated and disposed of independently by each facility in accordance with the requirements of their relevant regulatory consents.

Foul drainage from the proposed agricultural fertiliser facility will be routed to the proposed Belvelly Port Facility domestic wastewater treatment plant. There will be no process wastewater generated from the fertiliser facility.

As all wastewater will be treated on site, there will be no requirement to use the public foul network as a result of proposed development.

During the construction phase of the proposed development, a temporary construction compound will be established on-site to facilitate construction staff. This compound will include temporary welfare facilities. Any wastewater arising from this compound will be collected & removed off-site to an appropriately licensed facility.

12.4.5 Materials Management and Resource Use

12.4.5.1 Construction Waste

Waste generated during the construction phase of the proposed agricultural fertiliser facility will be carefully managed in accordance with the Construction Environmental Management Plan (CEMP), refer to **Appendix 2.3**, and in accordance with the accepted waste hierarchy which gives precedence to prevention, minimisation, reuse and recycling over disposal with energy recovery and finally disposal to landfill.

The management of construction waste will reflect the waste management hierarchy as set out in the 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects, 2006', with waste prevention and minimisation being the first priority succeeded by reuse and recycling, preferably on-site to avoid the effects arising from transportation. If this is not feasible, then waste will be sent to an off-site waste recovery facility, and only where there is no alternative, will waste be disposed of to landfill.

In general, construction waste materials may include general construction debris, scrap timber and steel, machinery oils and chemical cleaning solutions. The practice of excessive purchase of materials and equipment to allow for anticipated wastage will be avoided.

There will some Asphalt/Bitumen hardstand surfacing to be stripped as part of the site construction works. There will also be some surplus excavated soil which will require off site removal. It is estimated that 2,800m^3 of surplus excavated material will be generated. This material will be disposed of off-site to an appropriately licensed waste facility in accordance with the relevant waste legislation and waste classification requirements.

Waste generated during the construction works will be minimised and managed by advance planning of onsite operations, liaising with material suppliers, using best management practices of segregation and in accordance with the waste management hierarchy. This will include waste from construction activities, as well as from construction staff canteen and sanitary facilities.

During the construction phase, all possible actions will be taken to avoid and minimise the volume of waste generated by the appointed contractor during construction at the proposed development. All materials from the proposed works will be segregated and sorted on-site and will be processed in regards to the waste hierarchy. Wastes generated on site that cannot be reused will be source-segregated on-site, stored appropriately and removed off-site for recovery/recycling to an approved waste facility in the area. Overall, the management of general waste during construction will not have a significant effect on the waste resources.

There is no construction works associated with the proposed additional operational port use.

12.4.5.2 Imported Materials

To complete the proposed development works, some materials will have to be imported to the site. **Table 12.3** below outlines the estimated volumes of material to be imported for the proposed development works.

Table 12.3 Estimated volumes of materials to be imported to construct proposed Agricultural Fertiliser Facility

Import Material	Volume of Material
Stone / Bedding Material	14,798 m^3
Concrete	12,578 m^3
Steel	496 T
Cladding and Roofing	18,340 m^2
Pipework / Ducting	3,703 m

12.4.5.3 Operational Phase

Plastic packaging will be the main operational waste produced by the proposed fertiliser facility, with approximately 150 tonnes of plastic generated per annum. All plastic packaging waste will be

segregated, baled, and collected for recycling by approved waste management collectors. Approximately 100 tonnes of timber pallet waste will be produced per annum.

Remaining wastes will comprise domestic waste from the staff canteen, etc. This will be managed in accordance with the Waste Framework Directive waste hierarchy. Domestic waste will be stored in a skip and removed off-site to a licensed facility.

There will be no operational waste associated with the additional operational port uses of the jetty. The necessary management and disposal of waste will be the responsibility of the individual jetty user.

12.5 Likely significant impacts

12.5.1 Electricity

Electricity for the site will continue to be provided by the ESB network. As outlined earlier, a new 10kV supply is to be taken from the local ESB network via a new substation located on the Belvelly Port Facility site under planning application Ref. No. 19/06783. This 10kV substation will be connected to a new underground ducting network installed under the roadways to service the proposed agricultural fertiliser facility. This supply will secure the electricity requirements of the site. The capacity of this substation is much smaller in comparison to the existing ESB infrastructure currently on-site. As such, capacity in the network should be more than adequate to meet requirements.

During the construction phase, power will be required for the construction compound. The existing ESB Network supply will be available to power the construction compound. Generators will be used at certain working areas where connections to ESB networks are not available.

No adverse impact on the local power infrastructure is predicted, arising from either the construction or operation of the proposed development.

12.5.2 Gas

It is not envisaged that there will be any impacts on the existing AGI infrastructure as part of the proposed project. There will be no gas supply required for the construction or operation of the proposed agricultural fertiliser facility and additional port operational uses.

No adverse impact on natural gas infrastructure is predicted, arising from either the construction or operation of the proposed development.

12.5.3 Water Supply Infrastructure

There is no requirement for water in the fertiliser blending and bagging process. Water is required only for canteen and toilet facilities, using approximately 300 litres per/day. The water supply for the proposed agricultural fertiliser facility will be met by the public Glashaboy Water Supply Scheme.

Water supply for the construction phase of the proposed development will come from the existing public water supply already servicing the site. The volume of water required during construction on

an average daily basis is broadly estimated at approximately 10-20m^3 per day. There is ample capacity within this supply to accommodate the construction phase water needs of the proposed development works.

No adverse impacts on the public water supply infrastructure are predicted, arising from either the construction or operation of the proposed development.

12.5.4 Wastewater Infrastructure

As discussed in **Section 12.1.12** above, the on-site foul drainage network will be up-graded in its entirety as part planning application Ref. No. 19/06783. This will result in foul wastewater produced by the proposed agricultural fertiliser facility receiving both secondary and tertiary treatment in the Belvelly Port Facility WWTP before being discharged via an outfall to Cork Harbour. The treated wastewater will be of a standard compliant with the Urban Wastewater Directive.

No significant impact is envisaged on this resource.

12.5.5 Materials Management and Resource Use

Where feasible and lawful, excavated material will be used as backfill on the site. Unsuitable and residual wastes will be segregated and removed off-site for recycling and/or disposed in accordance with relevant waste classification, handling and recovery/disposal requirements. Refer to the CEMP contained in **Volume 3 Appendix 2.3** for full details.

Imported materials will be obtained from appropriate sources. Where feasible, notified Article 27[1] By-product soil and stone in accordance Article 27 of the European Communities (Waste Directive) Regulations, 2011 S.I. No. 126 of 2011 will be imported. Alternatively, natural fill materials will be sourced from local quarries.

No adverse impacts are predicted on this resource either during the construction or operational phase of the development.

12.5.6 Cumulative Effects

No significant negative cumulative impacts are anticipated on material assets discussed in this chapter. No significant negative cumulative impacts on public utilities are anticipated.

Regarding the development listed under planning application 19/06783, it is expected that the two construction phases will overlap by approximately 12 months. Both projects will be compliant with best practice construction practices and the CEMP. There is adequate on site supply of power and water to facilitate both construction projects. As such, no potential cumulative impacts on material assets or public utilities are expected due to the proposed works.

[1] https://www.epa.ie/waste/wastereg/byprod/ [Accessed 03/09/2019]

12.6 Mitigation

Mitigation in relation to material assets such as roads, natural resources and cultural assets have been addressed in the relevant chapters of the EIAR.

The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services unless this has been agreed in advance with the relevant service provider. Specific measures have been integrated into the construction proposals to avoid or reduce environmental impacts, which might otherwise occur. These will be incorporated in the Construction Environment Management Plan (CEMP). No further mitigation measures are required.

12.7 Residual Impacts

As detailed above the proposed development will not result in a significant increase in demand for major utilities i.e. clean water, public sewer capacity and power. Therefore, no significant adverse residual risks to material assets are anticipated as a result of the proposed development. Overall it is concluded that there will be short-term minor negative impacts during the construction phase of the development, however the long-term residual impacts will be negligible.

12.8 References

Marino Point Masterplan, *RPS Consulting Engineers*, July 2012.

Environmental Protection Agency (EPA), 2003. *Advice Notes on Current Practice in the Preparation of Environmental impact Statements*

Environmental Protection Agency (EPA), 2017. *Guidelines on the Information to be Contained in Environmental impact Assessment Reports (Draft)*

Environmental Protection Agency (EPA), 2002. *Guidelines on the Information to be contained in Environmental Impact Statements*

Environmental Protection Agency (EPA), 2015. *Revised Advice Notes for Preparing Environmental Impact Statements (Draft)*

European Commission (EC) *Urban Waste Water Directive 91/271/EEC*

European Communities (EC) (Waste Directive) Regulations 2011 S.I. No. 126/2011

Local Government (Water Pollution) Act, 1977 - 2007

13. TRAFFIC AND TRANSPORTATION

13.1 Introduction

This chapter of the EIAR quantifies and assesses the impact of traffic generated by the proposed agricultural fertiliser facility and additional port operational uses on the existing local road network, and recommends mitigation measures, as appropriate. There will be no construction phase associated with the additional port operational uses requiring assessment.

13.1.1 Scope of Assessment

The scope of the traffic and transportation assessment includes consideration of the following:

- Existing and expected future road and transport network;
- Existing and predicted future baseline traffic volumes on the surrounding local road network;
- Predicted construction traffic volumes associated with the proposed development and likely impacts;
- Proposed construction mitigation measures;
- Predicted operational traffic volumes associated with the proposed development and likely impacts; and
- Proposed operational mitigation measures.

This Traffic and Transportation Assessment chapter has been prepared following pre planning consultation with the Traffic and Transport Section of the Planning and Development Directorate of Cork County Council and Transport Infrastructure Ireland (TII).

13.1.2 Methodology

This chapter has been prepared in the context of the following:

- Cork County Council's Cork County Development Plan 2014;
- Cork County Council's Cobh Municipal District Local Area Plan 21st August 2017;
- The National Transport Authority (NTA) Cork Metropolitan Area Transport Strategy 2040 (CMATS);
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE-PDV-02045 May 2014;
- The Belvelly Marino Development Co. DAC (BMDC) proposed demolition and site infrastructure works at the subject site (Cork County Council planning reference: 19/06783);
- TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017 October 2016;
- TII's Geometric Design of Junctions DN-GEO-03060 June 2017; and
- The Environmental Protection Agency (EPA) Guidelines on The Information to be Contained in Environmental Impact Assessment Reports Draft August 2017 (EPA EIAR Guidelines).

13.1.3 Assessment Criteria

Existing baseline traffic volumes on the surrounding local road network have been established on the basis of recorded traffic volumes provided by Cork County Council, and automatic traffic counter data from TII's online database for national roads.

Suburban road link capacities on the R624 Regional Road have been established on the basis of the UK Traffic Capacity of Urban Roads TA79/99.

The significance and duration of predicted impacts have been defined in accordance with the EPA EIAR Guidelines.

13.1.4 Statement of Limitations and Difficulties Encountered

This assessment was undertaken in March and April 2020, during the Government's Coronavirus (Covid-19) restrictions and measures. This restricted on-site traffic surveys to record typical peak hour and daily traffic volumes on the R624 during 2020. Accordingly, on-site classified junction traffic volumes recorded on behalf of Cork County Council on Tuesday 24th April 2018 were used in this assessment to establish typical baseline traffic volumes on the R624. This traffic data was recorded during schools' term and the typical commuter traffic peak periods, when peak hour traffic volumes are higher on the R624, compared to during the summer months, when schools are closed and commuter traffic volumes are lower. The summer traffic generation busiest hours occur during late morning and afternoon, outside the morning and evening peak hours. Existing baseline traffic volumes have been increased to future baseline levels on the basis of TII's high sensitivity growth rate scenario. This includes for high growth during the period since 2018.

13.1.5 Competency of Assessor

This Traffic and Transportation Assessment was prepared by Seamus Quigley BE CEng MIEI MCIHT of Malachy Walsh and Partners.

Seamus Quigley has over 30 years experience in transport planning and traffic engineering projects, including EIS/EIAR traffic and transportation chapters, traffic impact assessments, traffic management studies, mobility management plans, traffic modelling studies, feasibility studies and road safety audits. He is a Chartered Engineer with Engineers Ireland, and also a member of the Chartered Institution of Highways and Transportation. He joined Malachy Walsh and Partners in 2007, having spent over sixteen years with Atkins. Refer to **Chapter 1** for full details.

13.2 Existing Environment

13.2.1 Site in Context

The Belvelly Port Facility site is located at Marino Point on the west side of the R624 Regional Road on Great Island, County Cork, north of Cobh, as shown on **Figure 13.1** below. The R624 extends from Cobh to its grade-separated interchange with the N25 National Primary Road, at Cobh Cross.

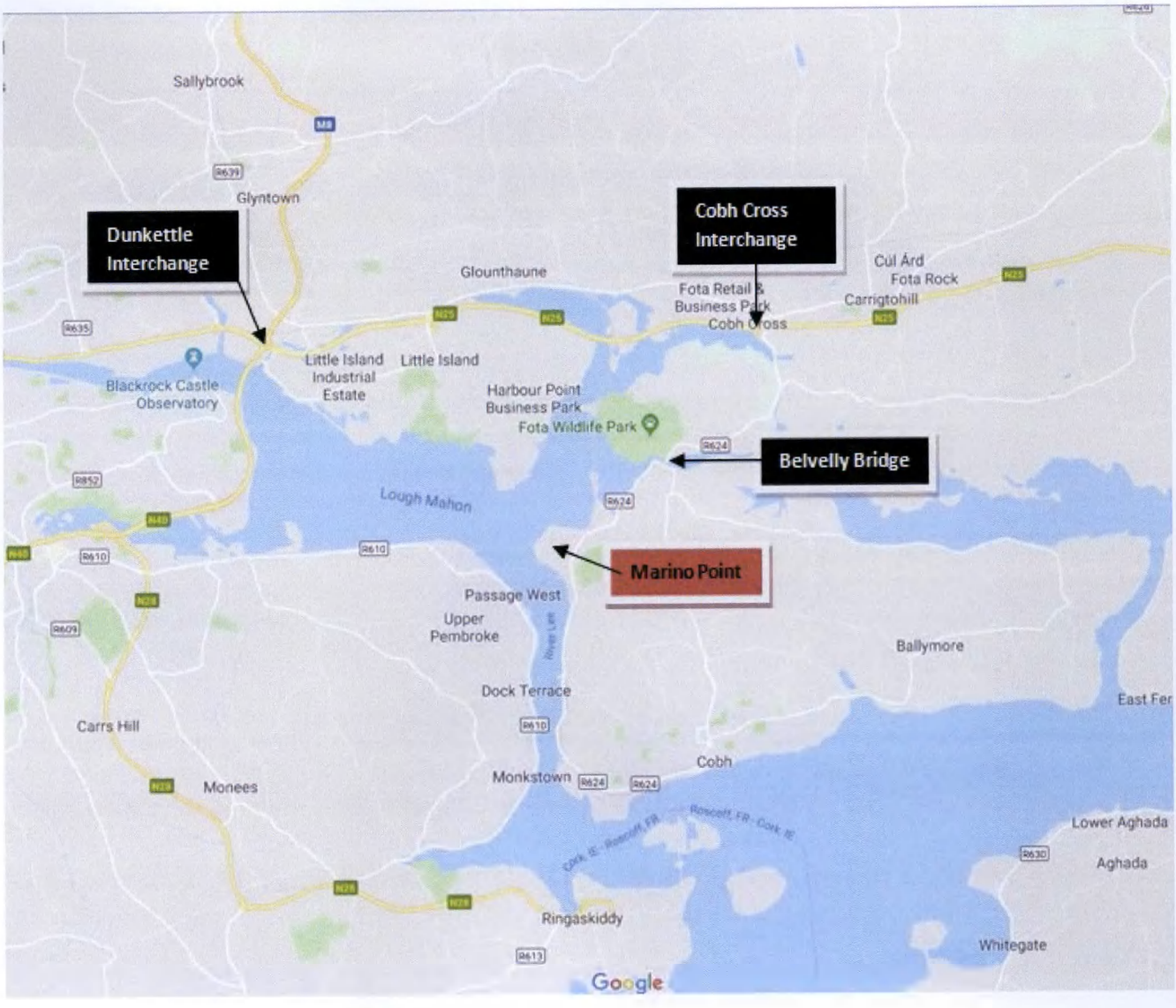

Figure 13.1 Site Location Map

The Belvelly Port Facility site is located within the 60 km/hour suburban speed limit zone on the R624. The main access is a 'Stop' priority T-junction located at the southern end of the site, which includes dedicated left and right turn lanes on the R624. The main site access road extends over the Cork to Cobh railway line at Íarnród Éireann bridge OBC 424A, immediately west of its R624 junction. A second, emergency only, access is located approximately 950 metres north of the main access, at the northern end of the site.

The site access road has a typical road carriageway width of 8.5 metres at its R624 junction. The internal site emergency access road at the northern end of the site overpasses the Cork to Cobh railway line at Íarnród Éireann bridge OBC 422A. The emergency site access road horizontal alignment has an off-square acute angle tie-in at its R624 junction. The site posted speed limit is 15 mph.

Figure 13.2 Local Road and Transport Network Map

13.2.1.1 R624 Regional Road

As stated earlier, the R624 extends from Cobh to its grade-separated interchange with the N25 National Primary Road, at Cobh Cross. Refer to **Figure 13.2**. At the Belvelly Port Facility site main access junction, the R624 has a total road carriageway width of circa 12.4 metres, including the left and right turn lanes on the R624. The right-turn lane length is circa 65 metres. Elsewhere, adjacent to the site, the R624 has a typical road carriageway width of 6.8 metres, with continuous centreline and road edge markings.

South of the Belvelly Port Facility site, the R624 underpasses the Cork to Cobh railway line at Íarnród Éireann bridge OBC 425, within a 50 km/hour speed limit zone.

Approximately 2.4 kilometres north of the Belvelly Port Facility site, the R624 extends from Great Island via Belvelly Bridge. The Fota House and Wildlife Park access junction is located immediately north of Belvelly Bridge and includes a dedicated right-turn lane off the R624. The R624 has a typical road carriageway width of 8.0 metres at this section.

The R624 extends over Slatty Bridge, approximately 450 metres south of Cobh Cross, with a typical road carriageway width of 7.0 metres, with circa 0.5 metres wide hard shoulders on both sides and a west side footway. Refer to **Figure 13.2.**

The R624 links with the L3004 (Glounthaune) and L3678 (Carrigtohill) Local Roads on the north side of Cobh Cross.

The R624 60 km/hour suburban speed limit zone extends north of Belvelly Bridge, for approximately 2.2 kms, to immediately south of the Fota Island Resort Access/L3619 Local Road crossroads junction, which includes dedicated right-turn lanes on the R624. The R624 is within the 80 km/hour rural speed limit zone north of this junction. The L3619 local road extends east to Midleton and the N25 between Belvelly bridge and the Cobh cross interchange.

In the vicinity north of Belvelly Bridge, the R624 has a typical road carriageway width of 6.0 metres.

13.2.1.2 Belvelly Bridge

Belvelly Bridge has a crest curve on the R624 vertical alignment; a typical road carriageway width of 5.8 metres on the basis of the defined hard strip road markings; a circa 1.2 metres wide footway on its west side; and a circa 0.3 metres wide rubbing strip on its east side. The clear width between the footway and rubbing strip is 5.9 metres. The R624 horizontal alignment is on a 90 degrees horizontal curve immediately south of Belvelly Bridge and has an east side priority T-junction with the L2989 Local Road. The L2989 also links with Cobh, as shown in **Figure 13.2.**

During the site inspection undertaken as part of this assessment, the swept paths of bus coaches and heavy goods vehicles were observed crossing the centreline of the R624 road carriageway at the horizontal bend on the south side of Belvelly Bridge and on Belvelly Bridge. Informal vehicle stopping and yielding were observed at these locations, to facilitate large and heavy vehicle movements.

13.2.1.3 N25 Cobh Cross Interchange

The N25 Cobh Cross Interchange is N25 Junction 3, which is located approximately 5.6 kms north of the Marino Point main site access on the R624. The N25 has a 120 km/hour speed limit in the vicinity of Cobh Cross.

13.2.1.4 N25 between Midleton and Dunkettle Interchange

The N25 is a 2+2 lanes dual carriageway road, between its Little Island Interchange, in the west, and its Lake View Roundabout at Midleton, in the east. The N25 forms the Dunkettle Interchange junction with the N8, M8 and N40 Cork Southern Ring Road, on the north side of the Jack Lynch Tunnel. The N25 is a 3+3 lanes road, between Dunkettle Interchange and Little Island Interchange.

The N40 Cork Southern Ring Road links with the N28, N27, N71 and N22 National Roads on the southern side of Cork city.

13.2.1.5 Existing Alternative Modes of Transport

The Íarnród Éireann Cork to Cobh railway line extends along the east side of the site, adjacent to the R624. This rail service extends from Kent Station, in Cork city centre, to Cobh Station, and also serves stations at Little Island, Glounthaune, Fota, Carrigaloe and Rushbrooke. The Cork to Cobh rail service has up to 23 services per day, with 30 minutes frequencies during peak hours and 60 minutes frequencies at other times.

Carrigaloe Station is located approximately 670 metres south of the Marino Point access. There is a footway along the west side of the R624, south of its Íarnród Éireann bridge OBC 425.

Cobh is served by the Cobh/Cork Connect bus service, with up to 24 services per day, six days per week. The stops on the service include a bus stop and shelter on the R624 west side at Carrigaloe Port, approximately 1.4 kilometres south of Marino Point.

The Passage West Ferry on Lough Mahon is operated between Carrigaloe Port and Glenbrook Port, by Cross River Ferries, from 6.30 a.m. to 9.30 p.m. daily, with average crossing times of five minutes. Refer to **Figure 13.2.**

13.2.2 Baseline Traffic Data

On-site classified junction traffic volumes recorded on behalf of Cork County Council on Tuesday 24th April 2018, from 7.00 a.m. to 7.00 p.m. at the R624/L2989 junction, during schools' term, were provided by Cork County Council and used in this assessment to establish typical baseline traffic volumes on the R624. The recorded peak hour traffic volumes for the R624 are detailed in **Table 13.1**. The recorded morning and evening peak traffic hours were 8.00 a.m. to 9.00 a.m. and 5.00 p.m. to 6.00 p.m., respectively.

Table 13.1 R624 Peak Hour Traffic Volumes (April 2018 Cork County Council)

R624 Location	Peak Hour	Total Vehicles (HGVs)		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	AM	174 (9)	542 (9)	716 (18)
	PM	366 (5)	226 (1)	592 (6)
Belvelly Bridge	AM	383 (13)	961 (17)	1,344 (30)
	PM	900 (6)	447 (4)	1,347 (10)

The recorded traffic volumes on the R624 are significantly higher at Belvelly Bridge than south of Belvelly Bridge and the L2989 junction. This confirms that a significant proportion of traffic volumes on the R624 at Belvelly Bridge are generated by the L2989 Local Road, which also links with Cobh. The recorded morning and evening peak hour traffic volumes on the R624 south of its L2989 junction equate to 53% and 44%, respectively, of the equivalent peak hour traffic volumes on the R624 at Belvelly Bridge.

The recorded peak hour traffic volumes for the L2989 and the R624/L2989 are detailed in **Table 13.2**.

Table 13.2 L2989 Peak Hour Traffic Volumes (April 2018 Cork County Council)

Location	Peak Hour	Total Vehicles (HGVs)
L2989 Road Link at R624 (Two-way link volumes)	AM	634 (13)
	PM	569 (4)
R624/L2989 Junction (Total junction volumes)	AM	1,347 (31)
	PM	1,254 (10)

The recorded peak hour traffic volumes indicate that the dominant directions of traffic volumes, on the R624, are northbound during the morning and southbound during the evening.

The 12-hour profiles of the recorded traffic volumes on the R624 at Belvelly Bridge and south of Belvelly Bridge and the L2989 junction are provided in **Figure 13.3** and **Figure 13.4**, respectively from 7.00 a.m. to 7.00 p.m. The hourly volumes are for the hour commencing.

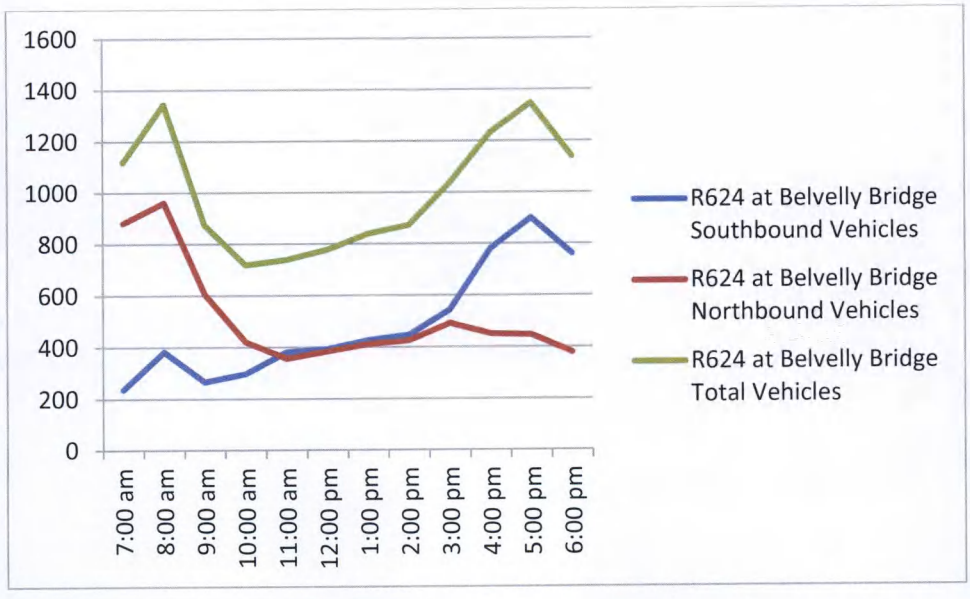

Figure 13.3 R624 at Belvelly Bridge 12-Hour Traffic Volumes (Vehicles)

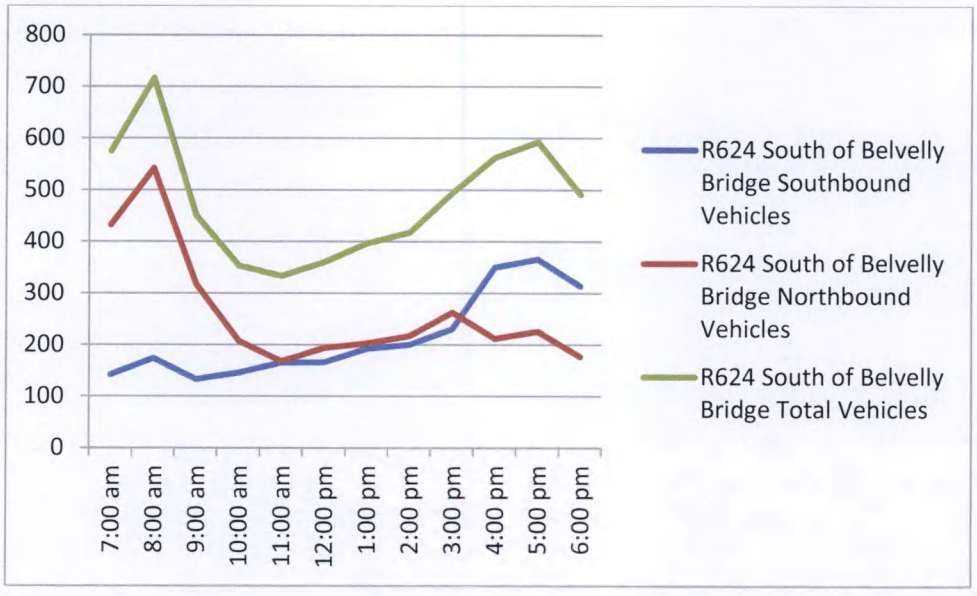

Figure 13.4 R624 South of Belvelly Bridge 12-Hour Traffic Volumes (Vehicles)

The recorded 12-hour traffic volumes' profiles indicate that traffic volumes on the R624 are significantly lower outside the morning and evening peak traffic periods of 07.00 to 09.00 and 16.00 to 18.00, respectively.

On-site, publically available, traffic volumes were recorded by Tracsis on Thursday 10th May 2018, from 8.00 a.m. to 8.00 p.m. during schools' term. The recorded peak hour total traffic volumes for the R624 at Cobh Cross are detailed in **Table 13.3**. The directional split in the two-way flows of the recorded R624 counts (**Table 13.1**) were reviewed and determined to be 75/25 in the morning peak and 60/40 in the evening peak and applied to the total traffic volumes at R624 Cobh Cross. The recorded morning and evening peak traffic hours were 7.45 a.m. to 8.45 a.m. and 4.30 p.m. to 5.30 p.m.

Table 13.3 R624 Cobh Cross Peak Hour Traffic volumes (May 2018)

R624 Location	Peak Hour	Total Vehicles		
		Southbound	Northbound	Total
Cobh Cross	AM	385 (9)	1,155 (27)	1,540 (36)
	PM	1,077 (11)	718 (33)	1,795 (44)

Tracsis also recorded the 2018 morning and evening peak hour vehicle queue lengths at the Cobh Cross Interchange northern and southern roundabout junctions. The morning and evening peak hour vehicle queue lengths at Cobh Cross Interchange occurred from 7.45 a.m. to 8.45 a.m. and from 4.30 p.m. to 5.30 p.m., respectively, and are detailed in **Table 13.4.**

Table 13.4 N25/R624 Cobh Cross Peak Interchange Hour Vehicle Queue Lengths (May 2018)

N25/R624 Cobh Cross Junction	Junction Approach	Queue Length (Vehicles)	
		AM Peak	PM Peak
Cobh Cross Northern Roundabout	N25 Eastbound Off Slip	28	11
	R624 Northbound	6	7
Cobh Cross Southern Roundabout	N25 Westbound Off Slip	10	2
	R624 Southbound	3	3

Automatic traffic counter data from TII's online database for the N25 and other national roads located in the vicinity of the proposed development site is provided in **Table 13.5**. The 2019 morning and evening peak hour traffic volumes are for Tuesday 14th May 2019, during schools' term. The Annual Average Daily Traffic (AADT) volumes' data is for the latest full year, 2019, together with the percentage proportion of heavy goods vehicles.

Table 13.5 TII National Roads Traffic Volumes

National Road	Location	Total Vehicles (HGVs)		
		2019 AM Peak Hour	2019 PM Peak Hour	2019 AADT (% HGVs)
N25	Between Little Island and Carrigtohill	4,974	4,865	49,215 (4.0%)
N25	Carrigtohill Bypass	3,928	3,846	38,785 (4.1%)
N25	Between Dunkettle and Little Island	5,429	5,481	56,068 (4.5%)
N40	Between Tunnel and Mahon	5,957	6,380	67,800 (4.5%)
M8	Between Dunkettle and Glanmire	1,807	2,272	24,050 (8.5%)
N8	Between Dunkettle and Glanmire R/b	3,506	3,614	40,584 (4.5%)
N8	Tivoli	3,258	3,138	35,902 (4.8%)

The suburban road link capacities of the R624 within its 60 km/hour suburban speed limit zone, calculated on the basis of the UK Traffic Capacity of Urban Roads TA79/99, are provided in **Table 13.6**. The TII suburban road link capacities are per each direction per hour, based on a 60/40 directional split.

Table 13.6 Calculated R624 Suburban Road Link Capacities in Each Direction

R624 60 km/hour Suburban Road	TII Urban Road Link			
	Type	Lanes	Carriageway Width (m)	Capacity/Hour/Direction (Vehicles)
R624 South of Belvelly Bridge & L2989 Junction	UAP3	2	6.0	860
R624 at Belvelly Bridge	UAP3	2	5.8	800
R624 at Cobh Cross	UAP2	2	7.3	1,470

The calculated existing suburban road link peak hour volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone are provided in **Table 13.7**.

Table 13.7 Calculated Existing R624 Suburban Road Link Peak Hour Volume/Capacity Ratios

R624 60 km/hour Suburban Road	Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R624 South of Belvelly Bridge & L2989 Junction	AM Southbound	174	860	20%
	AM Northbound	542		63%
	PM Southbound	366		43%
	PM Northbound	226		26%
R624 at Belvelly Bridge	AM Southbound	383	800	48%
	AM Northbound	961		120%
	PM Southbound	900		113%
	PM Northbound	447		56%
R624 at Cobh Cross	AM Southbound	385	1,420	27%
	AM Northbound	1,155		81%
	PM Southbound	1,077		76%
	PM Northbound	718		51%

The R624 south of Belvelly Bridge and its L2989 junction is operating well within its calculated suburban road link capacity, with highest volume/capacity ratios during the morning and evening peak hours of 63% and 43%, respectively.

The R624 at Belvelly Bridge is operating in excess of its calculated suburban road link capacity northbound during the morning peak hour (120%) and southbound during the evening peak hour (113%).

The R624 at Cobh Cross is operating within its calculated suburban road link capacity, with highest volume/capacity ratios during the morning and evening peak hours of 81% and 76%, respectively.

The calculated existing suburban road link off-peak volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone at Belvelly Bridge are provided in **Table 13.8**, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table 13.8 Calculated Existing R624 Suburban Road Link Off-Peak Volume/Capacity Ratios

R624 60 km/hour Suburban Road	Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	267	800	33%
	9/10am Northbound	607		76%
	10am/3pm Southbound [(1)]	447		56%
	10am/3pm Northbound [(1)]	425		53%
	3/4pm Southbound	544		68%
	3/4pm Northbound	492		62%

Note [(1)]: Highest hour.

The R624 at Belvelly Bridge is operating within its calculated suburban road link capacity during the off-peak traffic hours, between 9.00 a.m. and 4.00 p.m.

On the basis of the TII N25 traffic data and the recorded R624 12-hour traffic volumes, the calculated 2018 AADT volumes on the R624 are provided in **Table 13.9**, together with the percentage proportions of heavy goods vehicles (% HGVs).

Table 13.9 R624 Calculated 2018 AADT Volumes

R624 Location	2018 AADT Vehicles (% HGVs)
South of Belvelly Bridge & L2989 Junction	6,485 (3.35%)
Belvelly Bridge	13,598 (2.42%)
Cobh Cross	19,528 (2.50%)

13.3 Likely Significant Impacts

13.3.1 Do Nothing Scenario

The roads and transportation objectives and policies of Cork County Council are set out in their Cork County Development Plan 2014-2020 and Cobh Municipal District Local Area Plan (LAP) dated 21st August 2017.

Cork County Council's national road objectives include the N25 Carrigtwohill-Midleton-Youghal project. Projects identified by Cork County Council as critical to the delivery of planned development include an improved access road between the N25 and Cobh subject to full ecological assessment.

The Council's strategic road infrastructure objectives also include the upgrading of Dunkettle Interchange, in association with TII, at the intersection of the N40/M8/N8/N25 National Roads. Planning permission for the Dunkettle Interchange Upgrade has been granted by An Bord Pleanála, and Cork County Council envisage that the upgrade works will be completed within approximately three years of the commencement of the main construction works.

The Cobh Municipal District LAP, in respect of Marino Point, states that *"the road network serving the site is generally poor requiring significant improvements, including the bridge at Belvelly. Existing road access to Marino Point is via the R624 Regional Road and the capacity of this road would not be sufficient to cater for any traffic intensive use, port or otherwise. Extensive upgrading of the road in both the direction of Carrigtwohill and the N25, including Belvelly and Slatty Bridges, and back to Cobh, would need to be carried out to accommodate any large scale development proposals".*

The County Development Plan freight objectives include protecting the potential for rail-freight facilities to the former IFI plant at Marino Point. The Cobh LAP indicates that the location of Marino Point alongside the Cork-Cobh rail line means the site does have potential for a rail connection or rail freight, although the scope for container freight may be limited.

The Cork Metropolitan Area Transport Strategy (CMATS) has been developed by the National Transport Authority (NTA) in collaboration with TII, Cork City Council and Cork County Council. CMATS

represents a coordinated land use and transport strategy for the Cork Metropolitan Area to cover the period up to 2040. CMATS states that the R624 (Cobh Road to Marino Point) *"will require safeguarding in its function and form"* to *"facilitate existing and future port related uses"* (Reference: CMATS page 90).

The CMATS Primary Cycle Network includes segregated routes along the City Docks waterfront areas including the EuroVelo Route 1 from Cork City Centre to Tivoli and Little Island. The CMATS Greenway Cycle Network includes a Greenway linking City-Tivoli-Glanmire-Little Island-Carrigtwohill and Midleton (part of the EuroVelo 1 route) and potential extension to Youghal via the old railway line. The CMATS Cycle Network Map includes a cycle network between Carrigtwohill/Cobh Cross and Cobh, as part of its integrated cycle network. (References: CMATS pages 48 and 50).

Subject to planning permission, the proposed agricultural fertiliser facility is scheduled to be fully complete by 2023. The TII Traffic and Transport Assessment Guidelines recommend that the opening year of a development proposal and plan years, five and 15 years after the opening year, should be considered for assessing a development proposal. In this case, the operational opening year is 2023 and the plan years are 2028 and 2038. 2022 is the expected peak construction year and highest construction traffic generation year, when the proposed agricultural fertiliser facility works would, subject to planning permission, overlap for four months into January 2022 with the proposed demolition and site infrastructure works at the subject site (Cork County Council planning reference: 19/06783).

TII in their Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections October 2016 envisage that car and light vehicle volumes on Ireland South-West national roads, including Cork City/County, would increase by an annual factor of 1.0112 during the period to 2030, and by a factor of 1.0242 for heavy vehicles, based on their high sensitivity growth scenario. The equivalent factors for the period 2030 to 2050 are 1.0031 and 1.0195, respectively.

13.3.1.1 2022 (Year of Expected Peak Site Construction)

The predicted 2022 morning and evening peak hour traffic volumes on the R624 with the foregoing TII predicted high sensitivity growth scenario are provided in **Table 13.10**. The equivalent predicted R624 2022 AADT volumes and percentage proportion of HGVs are provided in **Table 13.11**.

Table 13.10 Predicted R624 2022 Peak Hour Traffic Volumes with TII High Growth

R624 Location	Peak Hour	2022 Vehicles (HGVs)		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	AM	182 (10)	566 (10)	748 (20)
	PM	383 (5)	237 (1)	620 (6)
Belvelly Bridge	AM	400 (14)	1,005 (18)	1,405 (32)
	PM	941 (6)	467 (4)	1,408 (10)
Cobh Cross	AM	403 (10)	1,209 (30)	1,612 (40)
	PM	1,126 (12)	752 (36)	1,878 (48)

Table 13.11 Predicted R624 2022 AADT Volumes with TII High Growth

R624 Location	2022 AADT Vehicles (% HGVs)
South of Belvelly Bridge & L2989 Junction	6,793 (3.50%)
Belvelly Bridge	14,236 (2.61%)
Cobh Cross	20,444 (2.63%)

The predicted 2022 morning and evening traffic volumes on the R624 during the proposed works staff travel hours of 7.00 a.m. to 8.00 a.m. and 6.00 p.m. to 7.00 p.m., for the proposed on-site works weekday start and finish times, with the TII predicted high sensitivity growth scenario, are provided in **Table 13.12**.

Table 13.12 Predicted R624 2022 Traffic Volumes with TII High Growth During Proposed Site Staff Travel Hours

R624 Location	Hour	Vehicles		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	7/8 am	149 (10)	453 (5)	602 (15)
	6/7 pm	329 (0)	185 (6)	514 (6)
Belvelly Bridge	7/8 am	248 (10)	922 (10)	1,170 (20)
	6/7 pm	796 (4)	396 (11)	1,192 (15)

The predicted 2022 suburban road link off-peak volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone at Belvelly Bridge, are provided in **Table 13.13**, with the TII predicted high sensitivity growth scenario, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99. The equivalent ratios for the proposed site work staff travel hours of 7.00 a.m. to 8.00 a.m. and 6.00 p.m. to 7.00 p.m., for the proposed works weekday start and finish times and staff travel directions, are provided in **Table 13.14**.

Table 13.13 Predicted 2022 R624 Suburban Road Link Off-Peak Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	2022 Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	279	800	35%
	9/10am Northbound	635		79%
	10am/3pm Southbound [1]	468		59%
	10am/3pm Northbound [1]	445		56%
	3/4pm Southbound	569		71%
	3/4pm Northbound	515		64%

Note [1]: Highest hour recorded during off peak times 10.00 – 15.00.

Table 13.2 Predicted 2022 R624 Suburban Road Link Off-Peak Volume/ Capacity Ratios During Proposed Site Staff Travel Hours and Main Directions

R624 60 km/hour Suburban Road	2022 Hour Direction	Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	7/8 am Southbound	248	800	31%
	6/7 pm Northbound	396		50%

The predicted 2022 peak hours and AADT volumes on TII national roads, with the TII predicted high sensitivity growth scenario are provided in **Table 13.15**.

Table 13.15 Predicted National Roads 2022 Traffic Volumes with TII High Growth

National Road	Location	Total Vehicles (HGVs)		
		2022 AM Peak Hour	2022 PM Peak Hour	2022 AADT (% HGVs)
N25	Between Little Island and Carrigtohill	5,153	5,036	50,968 (4.15%)
N25	Carrigtohill Bypass	4,068	3,983	40,168 (4.25%)
N25	Between Dunkettle and Little Island	5,624	5,676	58,077 (4.67%)
N40	Between Tunnel and Mahon	6,170	6,608	70,228 (4.67%)
M8	Between Dunkettle and Glanmire	1,874	2,357	24,950 (8.80%)
N8	Between Dunkettle and Glanmire Roundabout	3,632	3,744	42,038 (4.67%)
N8	Tivoli	3,375	3,251	37,192 (4.98%)

13.3.1.2 2023, 2028 and 2038 (Expected Operational Opening and Plan Years)

The predicted 2023, 2028 and 2038 morning and evening peak hour traffic volumes on the R624 with the foregoing TII predicted high sensitivity growth scenario are provided in **Tables 13.16, 13.17 and 13.18**. The equivalent predicted R624 2023, 2028 and 2038 AADT volumes and percentage proportion of HGVs are provided in **Table 13.19**.

Table 13.16 Predicted R624 2023 Peak Hour Traffic Volumes with TII High Growth

R624 Location	Peak Hour	2023 Vehicles (HGVs)		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	AM	184 (10)	572 (10)	756 (20)
	PM	387 (5)	240 (1)	627 (6)
Belvelly Bridge	AM	404 (14)	1,017 (19)	1,421 (33)
	PM	952 (6)	472 (4)	1,424 (10)

R624 Location	Peak Hour	2023 Vehicles (HGVs)		
		Southbound	Northbound	Total
Cobh Cross	AM	407 (10)	1,223 (31)	1,630 (41)
	PM	1,137 (12)	761 (37)	1,898 (49)

Table 13.17 Predicted R624 2028 Peak Hour Traffic Volumes with TII High Growth

R624 Location	Peak Hour	2028 Vehicles (HGVs)		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	AM	195 (11)	607 (11)	802 (22)
	PM	410 (6)	252 (1)	662 (7)
Belvelly Bridge	AM	430 (16)	1,078 (22)	1,508 (38)
	PM	1,006 (7)	501 (5)	1,507 (12)
Cobh Cross	AM	432 (11)	1,296 (35)	1,728 (46)
	PM	1,204 (14)	808 (42)	2,012 (56)

Table 13.3 Predicted R624 2038 Peak Hour Traffic Volumes with TII High Growth

R624 Location	Peak Hour	2038 Vehicles (HGVs)		
		Southbound	Northbound	Total
South of Belvelly Bridge & L2989 Junction	AM	208 (14)	638 (14)	846 (28)
	PM	431 (8)	266 (2)	697 (10)
Belvelly Bridge	AM	453 (20)	1,133 (27)	1,586 (47)
	PM	1,056 (9)	525 (6)	1,581 (15)
Cobh Cross	AM	454 (14)	1,364 (42)	1,818 (56)
	PM	1,266 (17)	853 (51)	2,119 (68)

Table 13.4 Predicted R624 AADT Volumes with TII High Growth

R624 Location	2023 AADT Vehicles (% HGVs)	2028 AADT Vehicles (% HGVs)	2038 AADT Vehicles (% HGVs)
South of Belvelly Bridge & L2989 Junction	6,872 (3.55%)	7,252 (3.74%)	7,679 (4.32%)
Belvelly Bridge	14,400 (2.65%)	15,240 (2.75%)	16,058 (3.19%)
Cobh Cross	20,677 (2.66%)	21,898 (2.82%)	23,061 (3.28%)

The predicted 2023, 2028 and 2038 morning and evening peak hour junction traffic volumes at the R624/L2989 junction are detailed in **Table 13.20**.

Table 13.20 Predicted R624/L2989 Peak Hour Traffic Volumes with TII High Growth

Location	Year	Peak Hour	Total Vehicles (HGVs)
R624/L2989 Junction (Total junction volumes)	2023	AM	1,426 (35)
		PM	1,326 (11)
	2028	AM	1,502 (39)
		PM	1,404 (13)
	2038	AM	1,590 (48)
		PM	1,474 (16)

The predicted 2023, 2028 and 2038 suburban road link morning and evening peak hour volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone, with the TII predicted high sensitivity growth scenario, are provided in **Table 13.21, Table 13.22** and **Table 13.23**, respectively, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99.

Table 13.21 Predicted 2023 R624 Suburban Road Link Peak Hour Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R624 South of Belvelly Bridge & L2989 Junction	AM Southbound	184	860	21%
	AM Northbound	572		67%
	PM Southbound	387		45%
	PM Northbound	240		28%
R624 at Belvelly Bridge	AM Southbound	404	800	51%
	AM Northbound	1,017		127%
	PM Southbound	952		119%
	PM Northbound	472		59%
R624 at Cobh Cross	AM Southbound	407	1,420	29%
	AM Northbound	1,223		86%
	PM Southbound	1,137		80%
	PM Northbound	761		54%

Table 13.22 Predicted 2028 R624 Suburban Road Link Peak Hour Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R624 South of Belvelly Bridge & L2989 Junction	AM Southbound	195	860	23%
	AM Northbound	607		71%
	PM Southbound	410		48%
	PM Northbound	252		29%
R624 at Belvelly Bridge	AM Southbound	430	800	54%
	AM Northbound	1,078		135%
	PM Southbound	1,006		126%
	PM Northbound	501		63%
R624 at Cobh Cross	AM Southbound	432	1,420	30%
	AM Northbound	1,296		91%
	PM Southbound	1,204		85%
	PM Northbound	800		56%

Table 13.23 Predicted 2038 R624 Suburban Road Link Peak Hour Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	Peak Hour Direction	Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R624 South of Belvelly Bridge & L2989 Junction	AM Southbound	208	860	24%
	AM Northbound	638		74%
	PM Southbound	431		50%
	PM Northbound	266		31%
R624 at Belvelly Bridge	AM Southbound	453	800	57%
	AM Northbound	1,133		141%
	PM Southbound	1,056		132%
	PM Northbound	525		65%
R624 at Cobh Cross	AM Southbound	454	1,420	32%
	AM Northbound	1,364		96%
	PM Southbound	1,266		89%
	PM Northbound	853		60%

The R624 south of Belvelly Bridge and its L2989 junction would continue to operate within its calculated suburban road link capacity with the TII predicted high sensitivity growth scenario, with highest volume/capacity ratios during the morning and evening peak hours of 74% and 50%, respectively, in 2038.

The R624 at Belvelly Bridge would continue to operate in excess of its calculated suburban road link capacity northbound during the morning peak hour and southbound during the evening peak hour, with the TII predicted high sensitivity growth scenario, with highest volume/capacity ratios of 141% and 132%, respectively, in 2038.

The R624 at Cobh Cross would operate within its calculated suburban road link capacity, with highest volume/capacity ratios during the morning and evening peak hours of 96% and 89%, respectively, in 2038, with the TII predicted high sensitivity growth scenario.

The predicted 2023, 2028 and 2038 suburban road link off-peak volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone at Belvelly Bridge, are provided in **Table 13.24**, **Table 13.25** and **Table 13.26**, respectively, with the TII predicted high sensitivity growth scenario, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99. The equivalent ratios for the proposed operational work staff travel hours of 7.00 a.m. to 8.00 a.m. and 6.00 p.m. to 7.00 p.m., for the proposed main on-site operational works weekday start and finish times and staff travel directions, are provided in **Table 13.27**.

Table 13.24 Predicted 2023 R624 Suburban Road Link Off-Peak Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	2023 Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	282	800	35%
	9/10am Northbound	642		79%
	10am/3pm Southbound (1)	473		59%
	10am/3pm Northbound (1)	450		56%
	3/4pm Southbound	576		72%
	3/4pm Northbound	521		65%

Note (1): Highest hour recorded during off peak times 10.00 – 15.00.

Table 13.25 Predicted 2028 R624 Suburban Road Link Off-Peak Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	2028 Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	298	800	37%
	9/10am Northbound	680		85%
	10am/3pm Southbound (1)	501		63%
	10am/3pm Northbound (1)	476		60%
	3/4pm Southbound	609		76%
	3/4pm Northbound	551		69%

Note (1): Highest hour recorded during off peak times 10.00 – 15.00.

Table 13.26 Predicted 2038 R624 Suburban Road Link Off-Peak Volume/ Capacity Ratios with TII High Growth

R624 60 km/hour Suburban Road	2038 Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	314	800	39%
	9/10am Northbound	715		89%
	10am/3pm Southbound (1)	527		66%
	10am/3pm Northbound (1)	501		63%
	3/4pm Southbound	640		80%
	3/4pm Northbound	579		72%

Note (1): Highest hour recorded during off peak times 10.00 – 15.00.

Table 13.27 Predicted R624 Suburban Road Link Off-Peak Volume/Capacity Ratios During Proposed Site Staff Travel Hours and Directions with TII High Growth

R624 60 km/hour Suburban Road	Year: Hour/Direction	Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	2023: 7/8 am Southbound	251	800	31%
	2023: 6/7 pm Northbound	401		50%
	2028: 7/8 am Southbound	265		33%
	2028: 6/7 pm Northbound	424		53%
	2038: 7/8 am Southbound	279		35%
	2038: 6/7 pm Northbound	447		56%

The R624 at Belvelly Bridge would continue to operate within its calculated suburban road link capacity during the off-peak traffic hours, between 9.00 a.m. and 4.00 p.m., with the TII predicted high sensitivity growth scenario.

The R624 at Belvelly Bridge would also continue to operate within its calculated suburban road link capacity during the proposed site travel hours and directions, with the TII predicted high sensitivity growth scenario.

The predicted 2023, 2028 and 2038 peak hours and AADT volumes on TII national roads, with TII predicted high sensitivity growth scenario, are provided in **Table 13.28**, **Table 13.29** and **Table 13.30**, respectively.

Table 13.28 Predicted National Roads 2023 Traffic Volumes with TII High Growth

National Road	Location	Total Vehicles (HGVs)		
		2023 AM Peak Hour	2023 PM Peak Hour	2023 AADT (% HGVs)
N25	Between Little Island and Carrigtohill	5,213	5,095	51,567 (4.20%)
N25	Carrigtohill Bypass	4,115	4,030	40,640 (4.30%)
N25	Between Dunkettle and Little Island	5,690	5,743	58,763 (4.73%)
N40	Between Tunnel and Mahon	6,242	6,686	71,057 (4.72%)
M8	Between Dunkettle and Glanmire	1,897	2,386	25,258 (8.90%)
N8	Between Dunkettle and Glanmire Roundabout	3,675	3,788	42,535 (4.73%)
N8	Tivoli	3,415	3,290	37,633 (5.04%)

Table 13.29 Predicted National Roads 2028 Traffic Volumes with TII High Growth

National Road	Location	Total Vehicles (HGVs)		
		2028 AM Peak Hour	2028 PM Peak Hour	2028 AADT (% HGVs)
N25	Between Little Island and Carrigtohill	5,527	5,401	54,670 (4.47%)
N25	Carrigtohill Bypass	4,363	4,273	43,090 (4.58%)
N25	Between Dunkettle and Little Island	6,034	6,091	62,321 (5.02%)
N40	Between Tunnel and Mahon	6,616	7,086	75,311 (5.02%)
M8	Between Dunkettle and Glanmire	2,018	2,537	26,862 (9.44%)
N8	Between Dunkettle and Glanmire Roundabout	3,897	4,017	45,111 (5.02%)
N8	Tivoli	3,621	3,490	39,922 (5.36%)

Table 13.30 Predicted National Roads 2038 Traffic Volumes with TII High Growth

National Road	Location	Total Vehicles (HGVs)		
		2038 AM Peak Hour	2038 PM Peak Hour	2038 AADT (% HGVs)
N25	Between Little Island and Carrigtohill	5,837	5,704	57,732 (5.18%)
N25	Carrigtohill Bypass	4,609	4,513	45,511 (5.30%)
N25	Between Dunkettle and Little Island	6,379	6,438	65,872 (5.81%)
N40	Between Tunnel and Mahon	6,998	7,495	79,657 (5.82%)
M8	Between Dunkettle and Glanmire	2,148	2,702	28,601 (10.85%)
N8	Between Dunkettle and Glanmire Roundabout	4,120	4,246	47,680 (5.81%)
N8	Tivoli	3,830	3,691	42,218 (6.20%)

13.3.2 Construction Phase Impacts

13.3.3 Construction of the Proposed Agricultural Fertiliser Facility

A detailed description of the proposed agricultural fertiliser facility construction phase is provided in **Chapter 2 Description of the Proposed Development**. There will be no construction works associated with the additional port operational use of the jetty to facilitate dry bulk cargo. Subject to planning permission, the proposed agricultural fertiliser facility and additional port operational uses construction is scheduled to start in October 2021 and will be fully complete by December 2022.

Subject to planning permission, the proposed demolition and infrastructure work on the site (under a separate planning application (Planning Ref 19/6783)) is scheduled to start in April 2021. The total on-site works programme is approximately 18 months with an expected completion date of September 2022. This includes a calculated 10 months demolition phase and 12 months infrastructure works, including four months overlap of demolition and infrastructure works.

The 10 months demolition works would require the exportation off site of materials for appropriate recycling or disposal at licensed waste facilities of a total of 775 vehicle loads, using 20 tonne capacity trucks, or an average of five trucks per day to and from the site. This includes the potential off-site removal of 475 vehicle loads of existing asphalt surfacing.

The 12 months infrastructure works would require the importation to site of 1,870 vehicle loads of materials, using 20 tonne capacity trucks, or an average of eight trucks per day to and from the site. This includes the proposed importation of 300 vehicle loads of suitable material for the lagoon infill and 50 vehicle loads of material for the bridge widening.

It is understood that, subject to grant of full planning permission, construction of the agricultural fertiliser facility within the site will be undertaken, commencing in October 2021, and finishing circa 15 months later in December 2022. This will result in an overlap of four months from October 2021 to January 2022 when the demolition works, the infrastructure works, and the construction of the fertiliser facility will coincide. This four-month period will be the most onerous in terms of traffic generation to and from the site and is used as a worst-case scenario for determining the traffic impacts on the external road network. Subsequent to this overlap there will be a further less onerous eight-month overlap between the infrastructure works and the fertiliser facility construction works from February 2022 to September 2022.

The agricultural fertiliser facility construction will involve the exportation off site of up to 250 vehicle loads over a two to three months period, associated with foundation excavation and installation of utilities.

This equates to an average of six trucks per day to and from the site. Importation of stone, concrete, steel and building materials is expected to require up to 12 truck deliveries per day to and from the site. This equates a total of 18 truck movements per day to and from the site, associated with the construction of the agricultural fertiliser facility. For the purpose of the analysis, these truck movements are conservatively assumed to occur within the four-month overlap period for all elements of the works on site.

It is envisaged that the daily rate of vehicle loads generated would be uniform throughout the works overlap period.

It is envisaged that on-site staff numbers would be approximately 15 personnel for the demolition works, 10 personnel for the infrastructure works, and 40 personnel for the construction of the agricultural fertiliser facility, during the four months overlap of all construction works elements. Accordingly, peak staff numbers would be 65 personnel during the four months overlap of all construction works elements.

The proposed on-site construction working hours are 8.00 a.m. to 6.00 p.m., Monday to Friday, and 8.00 a.m. to 5.00 p.m. on Saturdays.

Site personnel would travel to site prior to 8.00 a.m. and depart from site from 6.00 p.m. on weekdays. The peak staff numbers of 65 personnel during the works overlap period would generate approximately 52 car and van trips, both to and from the site each working day, on the basis of an average vehicle occupancy rate of 1.25 personnel per vehicle. Canteen facilities for personnel would be provided on-site.

The proposed hours for the exportation and importation of vehicle loads are 9.00 a.m. to 4.00 p.m., Monday to Friday, and 8.00 a.m. to 5.00 p.m. on Saturdays. These hours are proposed to avoid coinciding with the existing weekday morning and evening peak traffic periods on the R624 and surrounding road network, of 7.00 a.m. to 9.00 a.m. and 4.00 p.m. to 6.00 p.m.

As calculated above, the 10 months demolition works would generate up to an average of five daily heavy vehicle movements, both to and from site. The 12 months infrastructure works would generate up to an average of eight daily heavy vehicle movements, both to and from site. The construction of the agricultural fertiliser facility would generate up to an average of 18 heavy vehicle movements to and from the site each day. During the four months overlap of all elements of the works on site, there would be up to an average of 31 daily heavy vehicle movements, both to and from site, which equates to a total average of 62 heavy vehicles per day, two-way.

The proposed works weekday daily construction traffic volumes are summarised in **Table 13.31**.

Table 13.31 Proposed Works Weekday Daily Construction Traffic Volumes

Time Period	Direction	Construction Works Phases			
		Demolition Works	Infrastructure Works	Agricultural Fertiliser Facility Works	Overlap of all Works
Before 8.00 am	Inbound	12 cars/vans	8 cars/vans	32 cars/vans	52 cars/vans
9.00 am to 4.00 pm	Inbound	5 trucks	8 trucks	18 trucks	31 trucks
	Outbound	5 trucks	8 trucks	18 trucks	31 trucks
After 6.00 pm	Outbound	12 cars/vans	8 cars/vans	32 cars/vans	52 cars/vans
Daily Total		**24 cars/vans + 10 trucks**	**16 car/vans + 16 trucks**	**64 car/vans + 36 trucks**	**104 car/vans + 62 trucks**

The proposed works during the four-month overlap period would generate a total of up to nine heavy vehicle movements per hour, two-way. This would occur during the proposed hours for the exportation and importation of vehicle loads of 9.00 a.m. to 4.00 p.m., Monday to Friday, and 8.00 a.m. to 5.00 p.m. on Saturdays.

The proposed demolition and site infrastructure works would generate approximately 52 car/van movements to the site prior to the 8.00 a.m. works start time, during the four-month works overlap. The proposed works would not generate any vehicle trips during the R624 morning peak traffic hour, from 8.00 a.m. to 9.00 a.m., or during the R624 evening peak traffic period, from 4.00 p.m. to 6.00 p.m.

Access to the Belvelly Port Facility site during the works will be via the existing site main access junction on the R624. Following consultation with Cork County Council, it is proposed to upgrade the existing access junction layout to include an enhanced Stop location and road markings, as part of separate planning application for the proposed demolition and infrastructure work.

It is proposed that all exportation and importation vehicle loads would travel via the R624 north of the existing site access junction.

The predicted 2022 traffic volumes on the R624, with the simultaneous demolition, site infrastructure, and fertiliser facility construction works, are provided in **Table 13.32**.

Table 13.32 Predicted 2022 R624 Traffic Volumes with Simultaneous Construction of All Elements of the Works Proposals on Site.

R624 Location	Hour	Total Traffic Volumes (HGVs)	Change
R624 South of Belvelly Bridge & L2989 Junction	7/8 am	652 (15)	+52 (0)
	8/9 am	748 (20)	0 (0)
	9/10 am	480 (25)	+9 (9)
	10 am/3pm [1]	446 (24)	+9 (9)
	3/4 pm	526 (27)	+9 (9)
	4/5 pm	588 (18)	0 (0)
	5/6 pm	620 (6)	0 (0)
	6/7 pm	566 (6)	+52 (0)
Belvelly Bridge	7/8 am	1,222 (20)	+52 (0)
	8/9 am	1,405 (32)	0 (0)
	9/10 am	925 (37)	+9 (9)
	10 am/3pm [1]	923 (34)	+9 (9)
	3/4 pm	1,094 (36)	+9 (9)
	4/5 pm	1,290 (29)	0 (0)
	5/6 pm	1,408 (10)	0 (0)
	6/7 pm	1,244 (15)	+52 (0)

Note [1]: Highest hour.

The predicted 2022 daily traffic volumes on the R624 with the proposed works are provided in **Table 13.33**, with the overlap of all works elements. The proposed works would increase weekday daily traffic volumes on the R624 by up to 166 vehicles, including 62 heavy goods vehicles, during the four months full overlap period. This would equate to an increase of 1.2% on Belvelly Bridge and 2.4% south of Belvelly Bridge and the L2989 junction. The increase on the R624 at Cobh Cross would equate to 0.8%.

Table 13.33 Predicted R624 2022 Daily Traffic Volumes with Simultaneous Construction of all Elements of the Works Proposals on Site

R624 Location	2021 Daily Vehicles (HGVs)	Change	% Change
South of Belvelly Bridge & L2989 Junction	6,959 (300)	+166 (62)	2.4%
Belvelly Bridge	14,402 (434)		1.2%
Cobh Cross	20,610 (599)		0.8%

The predicted 2022 suburban road link off-peak volume/capacity ratios for the R624 within its 60 km/hour suburban speed limit zone at Belvelly Bridge are provided in **Table 13.34**, with the proposed overlap of all works elements, on the basis of the UK Traffic Capacity of Urban Roads TA 79/99. The equivalent ratios for the proposed works staff travel hours of 7.00 a.m. to 8.00 a.m. and 6.00 p.m. to 7.00 p.m., for the proposed on-site works weekday start and finish times and staff travel directions, are provided in **Table 13.35**.

The R624 at Belvelly Bridge would continue to operate within its calculated suburban road link capacity during the off-peak traffic hours, between 9.00 a.m. and 4.00 p.m., with the proposed overlap of all construction works elements heavy vehicle trucks movements. It would also continue to operate within calculated capacity with the proposed overlap of all works elements construction staff car/van trips.

Table 13.34 Predicted 2022 R624 Suburban Road Link Off-Peak Volume/Capacity Ratios with Simultaneous Construction of All Elements of the Works Proposals on Site

R624 60 km/hour Suburban Road	2022 Hour Direction	Off-Peak Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	9/10am Southbound	284	800	36%
	9/10am Northbound	640		80%
	10am/3pm Southbound (1)	473		59%
	10am/3pm Northbound (1)	450		56%
	3/4pm Southbound	574		72%
	3/4pm Northbound	520		65%

Note (1): Highest hour.

Table 13.35 Predicted 2022 R624 TII Suburban Road Link Off-Peak Volume/Capacity Ratios with Proposed Site Staff Travel Hours and Directions with Simultaneous Construction of All Elements of the Works Proposals on Site

R624 60 km/hour Suburban Road	2022 Hour Direction	Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
Belvelly Bridge	7/8 am Southbound	300	800	38%
	6/7 pm Northbound	448		56%

The predicted 2022 daily traffic volumes on the national road network with the proposed works development are provided in **Table 13.36.**

These assume full overlap of demolition, infrastructure, and fertiliser facility construction works and conservatively assume 100% of the works traffic volumes at each location, which would not occur in reality. The proposed overlap of all works elements would increase weekday daily traffic volumes by

up to 166 vehicles, including 62 heavy goods vehicles, during the overlapping works period. This would equate to an increase of 0.41% on the N25.

Table 13.36 Predicted National Roads 2022 Daily Traffic Volumes with 100% of Traffic Volumes for Simultaneous Construction of All Elements of the Works Proposals on Site

National Road	Location	2022 Daily Vehicles (HGVs)	Change with 100% All Proposed Works Traffic
N25	Between Little Island and Carrigtohill	51,134 (2,177)	+ 166 (62)
N25	Carrigtohill Bypass	40,334 (1,769)	
N25	Between Dunkettle and Little Island	58,243 (2,774)	
N40	Between Tunnel and Mahon	70,394 (3,342)	
M8	Between Dunkettle and Glanmire	25,116 (2,258)	
N8	Between Dunkettle and Glanmire Roundabout	42,204 (2,025)	
N8	Tivoli	37,358 (1,914)	

The predicted highest increases in peak traffic hour and daily traffic volumes, on the existing local road network, are significantly less than the volumetric threshold (5%) identified by TII in their TTA Assessment Guidelines for consideration of sensitive locations.

13.3.3.1 Proposed Facility Access /Routes

The R624/Marino Point main access junction includes a dedicated right-turn lane on the R624, with a right-turn lane length of circa 65 metres. The Belvelly Port Facility site main access junction is located within the 60 km/hour suburban speed limit zone on the R624.

The proposed construction overlap of all works elements highest weekday daily traffic generation, of up to 166 vehicles, would be significantly less than the traffic volumes' warrant identified by the TII Geometric Design of Junctions for the provision of a dedicated ghost island right-turn lane. The TII Geometric Design of Junctions identifies a minor road AADT volume range of 450 to 3,000 vehicles, for a major road AADT volume range of 5,000 to 10,000 vehicles, to warrant a right-turn lane. Accordingly, the highest traffic volumes generated by the Belvelly Port Facility site main access at its R624 junction, during the proposed construction overlap of all works elements, would be relatively low and would be facilitated by the existing ghost island right-turn lane junction, without any significant traffic queuing and delays.

The additional traffic volumes generated by the proposed works on the R624, at the horizontal bend on the south side of Belvelly Bridge and on Belvelly Bridge, would increase instances of informal vehicle stopping and yielding at these locations, to facilitate large and heavy vehicle movements. Heavy vehicle trucks generated by the proposed construction overlap of all works elements during the off-peak traffic hours would be at the rate of one truck every seven minutes.

On the basis of the EPA Guidelines, the proposed agricultural fertiliser facility construction phase would have slight to moderate short-term negative construction traffic effects.

13.3.4 Operational Phase Impacts

A detailed description of the proposed agricultural fertiliser facility and additional use of the existing jetty operational phase is provided in **Chapter 2 Description of the Proposed Development**. Subject to planning permission, the proposed agricultural fertiliser facility will be operational from 2023.

13.3.4.1 Agricultural Fertiliser Facility

Raw material will be shipped into the existing jetty at the Belvelly Port Facility, at an average of one ship per week. It is expected that operations will require approximately 50 ships per annum. Following an on-site blending process, the product is packaged into bags and stored on site. The bags will be collected by trucks as required and distributed nationwide by road. Due to the nature of the agricultural fertiliser business, the proposed agricultural fertiliser facility operates with seasonal peaks. Normal peak traffic volumes occur during February, March, and April. During the three months peak period, it is envisaged there will be typically 47 heavy goods vehicle (HGV) trips per day, both to and from the proposed agricultural fertiliser facility. During the off-peak nine months period, there will be typically 20 HGV movements per day, both to and from the proposed facility. These traffic volumes have been determined by a review of the existing agricultural fertiliser facility operations in Cork city. This includes hourly, daily and monthly empirical data recorded on a multi annual basis.

The facility will operate all year-round, with working times varying depending on market demand. Normal hours of operation are 7.00 a.m. to 5.00 p.m. Monday to Friday. During peak demand, which is typically between February and April, fertiliser blending and bagging operations will occur between 7.00 a.m. and 12.00 midnight, and HGV distribution of finished fertiliser product from the facility by road will occur between 7.00 a.m. to 7.00 p.m. Monday to Saturday.

The facility will have an average of 17 operational employees on site at any one time, with a maximum of 30 employees during the peak period. The peak period staff numbers would generate approximately 24 car and van trips, both to and from the proposed agricultural fertiliser facility each working date, based on an average vehicle occupancy rate of 1.25 personnel per vehicle. Canteen facilities for personnel will be provided on site.

13.3.4.2 Additional Port Operational Uses of the Jetty

The proposed additional port operational use of the jetty will consist of servicing other cargo vessels, which will include the relocation of vessels displaced from the Cork City Quays. The additional cargo types proposed will include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, and other miscellaneous dry cargo.

Approximately 40 additional port related cargo ships will berth at the jetty each year. The size and frequency of cargo vessels will be variable and subject to the various customers' needs. On average, ships will be berthed for 1 to 2 days to offload / load cargo but may be longer depending on cargo size and weather conditions.