GOULDING

BELVELLY PORT FACILITY
Belvelly Marine Development Company DAC

206955-22/12/2020-EIAR Volume 1 - Non-Technical Summary

Volume I: Non-Technical Summary

Proposed Agricultural Fertiliser Facility and Additional Port Operational Use Environmental Impact Assessment Report (EIAR)

Project No. 21082
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1. INTRODUCTION

Goulding Chemicals Limited and Belvelly Marino Development Company DAC (BMDC) wish to jointly submit a planning application to Cork County Council for the development of a new agricultural fertiliser blending and bagging facility and additional port operational use of the jetty to facilitate cargo vessels at the Belvelly Port Facility at Marino Point on Great Island, Co. Cork.

Belvelly Marino Development Company DAC (BMDC) acquired the former Irish Fertilisers Industries (IFI) site at Marino Point on Great Island, Co. Cork in 2017. Goulding Chemicals Limited has an agreement with BMDC to purchase 7.6 hectares of land within the Belvelly Port Facility site to be used for the relocation of their agricultural fertiliser facility from Centre Park Road in Cork City. The jetty at the Belvelly Port Facility site is currently used to export dry cargo (wooden logs), the importation of methanol for use by MarinoChem on the Marino Point site, as a stand-by berth for Port work vessels, and to moor occasional vessels for lay-by or minor maintenance work . The proposed additional 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 cargo types proposed will include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, and other miscellaneous dry cargo.

BMDC applied for planning permission for demolition, site infrastructure and utility upgrade works at Belvelly Port Facility on the 22nd November 2019 (Planning Ref. 196783). Cork County Council gave notice of their intention to grant permission on 22nd July 2020. An appeal was made to An Bord Pleanála and a decision is currently pending. The proposed demolition, site infrastructure and utility upgrade works will be temporary in nature and will not overlap with the proposed operation of the fertiliser facility. Therefore, no significant operational cumulative impacts are anticipated between this project and the proposed demolition, site infrastructure and utility upgrade works. There will be some overlap between the demolition, site infrastructure and utility upgrade works and the construction phase of the agricultural fertiliser facility and the additional use of the jetty and these aspects are considered and cumulatively assessed in this EIAR.

BMDC have developed an overall masterplan for the future development of a range of potential industrial and port related activities at the site. Any future development proposals will be informed by the masterplan and will be subject to separate planning application processes and associated environmental assessment screenings or full assessments.

Malachy Walsh and Partners (MWP) have been engaged by Goulding Chemicals Limited and BMDC to produce an Environmental Impact Assessment Report (EIAR) for the proposed construction and operation of the fertiliser facility and the additional port operational use of the jetty to facilitate cargo vessels, in support of the planning application to Cork County Council.

This Non-Technical Summary is the first volume of the Environmental Impact Assessment Report (EIAR) for the proposed construction and operation of the fertiliser facility and the additional port operational use of the jetty to facilitate cargo vessels. The other two volumes which comprise the EIAR are:

- Volume 2: Main EIAR
- Volume 3: Appendices

The purpose of this Non-Technical Summary is to provide a concise overview, in non-technical terms, of the project, environmental impacts and mitigation measures highlighted by the Environmental Impact Assessment and presented in detail in the main EIAR, Volume 2.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 Site Location

Marino Point is a small peninsula located on Great Island, County Cork. It is approximately 5 km north of Cobh, 5.5km south-west of Blackrock, Cork and 10km south-west of Cork City Centre. The eastern boundary is formed by the Cork-Cobh railway and the regional road from Cork to Cobh (R624). The site is bound by Cork Harbour to the north, south, and west (refer to **Figure 1**). Passage west is approximately 1km from the centre of the site on the opposite side of the harbour (west). Cobh Golf Club is located to the east, on the eastern side of the R624.

Figure 1 Site Location

2.2 The Application Area

The Belvelly Port Facility is located in Marino Point. The site is bound by Lough Mahon, which forms part of the greater Cork Harbour, to the north, west and south. Passage West which lies to the west of the site on the opposite side of the harbour is approximately 1km from the centre of the site. The ownership area of the Belvelly Port Facility site covers approximately 48 hectares. The planning area for this project includes a total area of 16 ha consisting of the proposed Goulding's facility and the jetty.

The most northern part of the overall ownership area lies approximately 30 meters away from the two intertidal mudflats and sandflats which form part of the Natura 2000 network: the Great Island

Channel SAC (001058) and the Cork Harbour SPA (004030). The Cork Harbour SPA is designated for the protection of wintering waterbirds and extends to the east and west from the north of the site. The Great Island Channel SAC extends partially into the site, at the north-eastern periphery. This SAC is designated for mudflats and sandflats not covered by seawater at low tide, in addition to Atlantic salt meadows (Glauco-Puccinellietalia maritimae).

The eastern boundary of the overall site is formed by the Cork to Cobh railway and the R624 Cork-Cobh regional road. The nearest significant town on the same side of the harbour is Cobh which lies approximately 5 km south-east of the site. **Figure 2**, below shows the site within the context of the Belvelly Port Facility, along with the Natura 2000 sites which border the site.

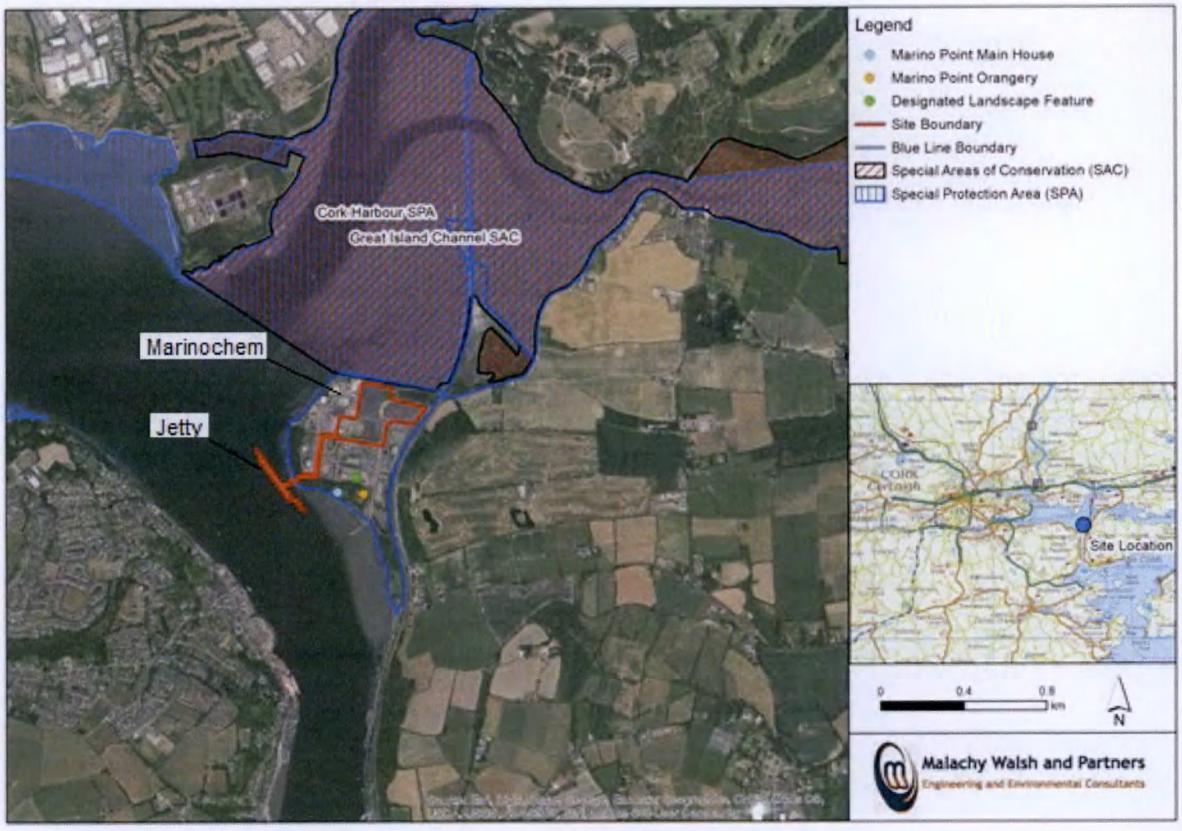

Figure 2 Belvelly Port Facility

2.3 Description of the Existing Belvelly Port Facility Site

The overall Belvelly Port Facility site is a brownfield site. A brownfield site is any previously developed land that is not currently being used. There are three Recorded Monuments located in the southern end of the overall Belvelly Port Facility site, approximately 400m away from the proposed works. These monuments include Marino House (RMP CO075-13); an Orangery (RMP CO075-076) and a Landscape Feature (RMP CO075-027). Marino House and the Orangery are not included on the Record of Protected structures but are listed as NIAH buildings of regional importance. See **Figure 2**, above for location of these structures.

The northern end of the main Belvelly Port Facility site was reclaimed post 1938 and contains the operational MarinoChem Plant, car parking areas and a manmade lagoon at the northeast corner. The original shoreline of the peninsula is now a brownfield area. It is a predominantly flat site situated adjacent to the sea within Cork Harbour. The immediate surrounding area is lightly populated, while Passage West currently has a population of approximately 6,000 people.

The proposed development site area includes a total area of 7.6 hectares consisting of the proposed Goulding's facility and the jetty. The Goulding's site area, currently consisting of an area of unused hardstanding at the north of Marino Point, is 7.6 hectares and the existing jetty which serves the site measures approximately 240m x 20m with a shore access viaduct. The jetty is currently used to export dry cargo (wooden logs), the importation of Methanol for MarinoChem, as a stand-by berth for Port work vessels, and to moor occasional vessels for lay-by or minor maintenance work.

Similar to a number of other industries in County Cork, the Belvelly Port Facility site is subject to provisions of the Seveso Directive 2012/18/EU. This Directive is the main EU legislation dealing specifically with the control of on-shore major accident hazards involving dangerous substances. It is aimed at improving the safety of sites containing large quantities of dangerous substances. The proposed Goulding development will be a lower-tier Seveso site, and will be required to comply with any regulations associated with this designation.

The MarinoChem site is classified as an Upper Tier Seveso Site due to the presence of quantities of listed dangerous substances, including methanol and formaldehyde. It has a 1 km consultation distance and, as such, covers the whole of the Belvelly Port Facility site. As a result, any proposed development on the site will be subject to consultation with the Health and Safety Authority (HSA).

2.4 Overview of the Proposed Development

The proposed development at the Belvelly Port Facility 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.

The construction phase of the project will take place over an estimated 12-18 month period. This includes an estimated four months overlap with the proposed demolition and site infrastructure works due to take place across the site (Planning Ref. 19/06783). It is envisaged that the work will commence in the October of 2021 and will be fully complete by December 2022, subject to the necessary statutory approvals. It is expected that a maximum of 40 people will work on the project during construction.

The final details on how construction will be undertaken will be a decision for the appointed contractor(s). It is envisaged that there will be some flexibility in the methods of construction to be used, subject at all times to be compliant with the provisions of this EIAR and related statutory approvals. All construction contractors employed will be obliged to implement high standards of site management to maintain a safe working environment and to minimise potential environmental impacts.

2.5 Site Selection

2.5.1 Proposed Agricultural Fertiliser Facility

The Belvelly Port Facility is considered a viable site for the relocation of Goulding's city operations for the following reasons:

1. The Belvelly Port Facility site facilitates the relocation of the Goulding's operation from Cork city. This relocation will in turn facilitate the redevelopment of the Cork city docklands.
2. The Belvelly Port Facility provides a level serviced site with adequate open space for storage.
3. The existence of natural deep waters and an operational jetty provides the opportunity for raw fertiliser materials to be imported in close proximity to the blending and bagging facility.
4. Marino Point is zoned for industrial use activity.
5. The proximity of the site to an existing rail network provides a possible opportunity for the future use of freight rail transport.

2.5.2 Additional Port Operational Uses to Facilitate Cargo Vessels

The proposed Belvelly Port Facility is considered a viable site for the additional use of the jetty to facilitate cargo vessels for the following reasons:

1. The existence of an operational jetty with a 10m draft provides the opportunity for the docking of cargo vessels.
2. Ringaskiddy Deep Water Berth is an industrial port busy with large amounts of cargo ship activity on the quayside. As such it is not always free for the docking of additional cargo vessels.
3. Marino Point provides an alternate berth to the city quays which is in line with the Port of Corks overall masterplan for relocating from the city quays to the lower harbour.
4. It can accommodate larger vessels that the city quays. The average size of cargo vessels is increasing and as such the river channel and the shallow waters of the city quays are not suitable for future vessels sizes.
5. The relocation will provide for improved efficiency of Port operations. Vessel movements will no longer be restricted by tides, saving approximately 45-60 mins each way.
6. This is in line with current global shipping trends which aims to reduce emissions and promote more environmentally friendly practices.
7. The required move away from the city quays which is in line with various national and local planning policies, will require the provision of alternative berthing facilities for various vessels/cargos in the lower harbour. Marino Point has the capacity to accommodate various cargos such as woodchip, machinery parts, deep sea maintenance & exploratory vessel engineering cargo, project cargo / breakbulk, berths for laid –up vessels and/or other miscellaneous dry cargo that would normally be catered for in the city quays.

2.6 Consideration of Alternatives

The relocation of industrial facilities from the Cork City Docklands to the Belvelly Port Facility site is supported by objectives of both the Cork County Development Plan 2014-2020 and the Regional and Spatial and Economic Strategy (RSES) 2020. Taking account of these supporting policy objectives and the suitability of site conditions, no other sites were considered for the development of the proposed new agricultural fertiliser facility.

The Port of Cork currently utilise the Ringaskiddy Deep Water Berth for bulk cargo, but this is currently operating near to full capacity. As such it is not suitable for additional cargo. There is also a development underway at Ringaskiddy for a new Cork Container Terminal (CCT). This development will allow for the relocation of the existing Tivoli CCT to Ringaskiddy but will not have capacity to cater for break bulk and bulk cargo. Ringaskiddy is therefore not a suitable site for the proposed additional port use of the jetty and the relocation of vessels form the city quays.

The additional use of the jetty at the Belvelly Port Facility will supplement the existing facilities available to the Port of Cork for the importation and exportation of materials.

3. ENVIRONMENTAL ASSESSMENT

The main objective of the EIA process is to ensure that all direct, indirect and cumulative environmental effects of the project are anticipated. Where effects are identified as unacceptable, these will be avoided or reduced during the design process through the implementation of practical mitigation measures. The main chronological stages of the EIA process include:

- Carrying out baseline studies and collecting data on the existing receiving environment;
- Assessing potential for significant environmental effects (impact assessment); and
- Recommending or designing mitigation measures to avoid or minimize environmental effects.

The EIAR has been carried out in accordance with the relevant legislative requirements and guidelines, including the Environmental Protection Agency (EPA) - 'Guidelines on Information to be Contained in an Environmental Impact Statement, 2002 and draft 2017'. Specialist guidance as required for each of the environmental topics has also been used where appropriate.

3.1 Screening and Scoping

As part of the scoping process, informal consultation was carried out with a number of relevant parties. Consultation through meetings, letters, email and telephone calls with various statutory and non-statutory consultees was undertaken during the EIA process. Pre-planning meetings were undertaken with the relevant Cork County Council departments. The aim of these initial meetings was to present the project and to receive initial feedback on any potential issues of relevance that should be addressed through the EIA process.

Written notifications were circulated to a number of identified stakeholders (both statutory and non-statutory consultees), which set out an overview of the project proposal. The notifications invited feedback from the consultees on any key issues and concerns which they consider should be addressed. The issues raised were subsequently taken into account in the EIA process.

3.2 Public Consultation

It had been intended to hold public information meetings to discuss the project information with interested members of the public. However, because of Government led restrictions on public gatherings in response to the Covid-19 outbreak this was not possible.

In place of a public meeting, a project presentation was made available on-line to inform people of the proposed development and the planning application. A press notice informing the public of the on-line information was published in the local newspaper and email notifications sent to local Councillors and community groups. The public had the opportunity to submit comments on the proposed application to the Project representatives. All public consultation feedback has been taken account of and any relevant feedback has been incorporated into the various chapters of the EIAR.

3.3 Population and Human Health

An assessment of the impacts of the proposed development on population and human health was conducted. One of the principle concerns in the development process is that people, as individuals or communities, should not experience any reduction in their quality of life from direct or indirect effects arising from the construction and operation of a development. The key issues examined in this section of the EIAR include population and settlement patterns, economic activities, land-uses, human health, tourism and amenity resources.

The immediate surrounding area is lightly populated. The areas of highest population density in closest proximity to Marino Point are the urban areas of Passage West/Monkstown, circa 1km from the centre of the site directly across the harbour, and Cobh, approximately 5km directly to the south of Marino Point. Both Cobh and Passage West are identified as Metropolitan Towns, which are critical population growth, employment and service centres.

The Belvelly Port Facility site is an established industrial site. MarinoChem Limited (formerly Dynea Ireland Limited) remains operating on the site and continues to use the jetty for shipping operations.

Land use surrounding the site is varied, however the primary land use is agriculture. Cobh Golf Club is located on a c. 50 hectare site to the east of the Belvelly Port Facility site. Fota Wildlife Park, which forms part of Fota Island Resort, is located approximately 500 m to the north of the site boundary. There are also a number of detached houses located at the east side of the R624, approximately 0.25 km to the south of the main entrance to Marino Point. **Figure 3** provides an overview of the locations of some of the identified land uses in proximity to the Belvelly Port Facility site.

Figure 3 Land uses in proximity to the Belvelly Port Facility

The Belvelly Port Facility site is an industrial site and has no intrinsic tourism or amenity value; however there are a number of important tourism and amenity resources in proximity to the site, most notably Fota Resort and Spa (including Fota Island Golf Club) and Fota Wildlife Park to the North, and Cobh Heritage Centre to the south. Cobh Cruise Port is of significant economic importance. In addition, Cork Harbour provides a very significant resource both in terms of tourism and leisure activities. The world's oldest yacht club is located in Crosshaven, and Cork Harbour hosts a bi-annual Cork Sailing Week regatta.

As with any development, the need to protect the local environment and general local amenity must be addressed, particularly any potential impacts associated with health and safety, including noise, air quality and traffic effects.

The construction phase is estimated to last approximately 12 to 18 months in total. General construction activities such as excavation and piling may give rise to emissions to air or surface water, and may generate noise and vibration. There will also be slight to moderate negative impacts to local traffic on the R624, although this will be short term.

There will be some slight short-term impacts to air quality as a result of the construction works. This is mostly due to dust which becomes airborne due to vehicular movements. However, these impacts will be temporary and further reduced by mitigation measures. Therefore, there will be no significant effect on human health from the proposed development.

The potential impacts to groundwater and surface water during construction have been fully considered. No significant impacts to groundwater quality or surface water flow are predicted, but standard best practice mitigation measures have been proposed to ensure best practice is maintained on-site at all times.

Construction sites pose potential risk to the health and safety of the public. However, only authorised personnel will be allowed on-site and assuming observance of private property rules, no health and safety impacts to the public as a result of construction are anticipated. A detailed plan to reduce the health and safety risks on the site will be implemented before and during the construction activities. This will be prepared by the developer to ensure a minimum amount of risk.

The assessment of potential operational impacts of noise and vibration found that noise emissions during the operational phase relating to the handling operation at the jetty will not be significant.

The potential for air quality impacts during the operational phase will arise mostly from dust associated with vehicular movements, handling of fertiliser materials and combustion of fuels in on-site machinery, ships docking at the jetty and additional vehicle movement associated with the development. The proposed development is characterised by the relocation of existing facilities from one location to another with activities remaining unchanged before and after the relocation. As a result, the net result is that the GHG emissions associated with the proposed development will effectively be neutral and will not have a measurable impact on GHG emissions at either a regional or national scale. Following the implementation of standard mitigation measures, there will be no operational impacts to air quality from the proposed development.

No significant impacts to the sites hydrological or hydrogeological regime and the water quality of Lough Mahon are expected as a result of the operational phase of the proposed development.

The proposed works may result in temporary neutral to adverse impacts, varying from imperceptible to slight in terms of significance, on nearby receptors and some houses along the R624 and at Passage

West, mainly due to noise from construction plant and traffic, and perception of visual changes associated with emerging plant and machinery.

Tourism was also identified as a possible receptor, particularly the nearby Cobh Gold Club and Fota Wildlife Park. However, no significant impacts on tourism and the tourist related industries identified in proximity to the Belvelly Port Facility are anticipated.

3.4 Biodiversity

This section describes the ecology of the proposed development site and the surrounding environment in terms of designated sites, habitats, flora, fauna and biological water quality. This chapter specifies mitigation measures to ensure that significant impacts on these features do not occur. Completed studies and reporting were in line with best practice and recently produced guidance. The information on the existing environment was obtained using publicly available information sources and by field surveys.

Habitats

Field surveys identified seven terrestrial habitat types across the entire Belvelly Port facility site. In addition to the terrestrial habitats, there are two primary wetland areas; a tidal lagoon in the north and a swamp area in the north-east, and two artificial bodies of standing water - settlement pond in the west of the site and a disused water treatment pond in the north-east. All of these wetlands are outside the footprint of the proposed development.

The Belvelly Port Facility is also surrounded by the coastal waters of Cork harbour to the north, west and south, and is also bounded by Great Island SAC and Cork Harbour SPA to the north.

There were six terrestrial habitats identified across the proposed Gouldings development site. The site is dominated by a large expanse of artificial surfacing and holds no intrinsic ecological value.

The construction works required for the proposed development works will result in significant changes within the development site. However, the overall direct habitat loss from the proposed development is not considered significant.

Without mitigation, there is the potential for chemicals and sediment used/produced during the construction phase to enter the waters of Cork Harbour due to surface water run-off. This could result in water quality impacts which could in turn have indirect ecological effects on intertidal and marine habitats and species. However, given the volume and area of the marine waters of Cork Harbour, these potential effects are unlikely as the volumes of pollutants generated would need to be very large for any adverse impact within the marine waters.

Mitigation measures are outlined in the Construction Environmental Management Plan to ensure that construction works will not impact water quality.

Mammals

Disturbance to breeding, sheltering or foraging fauna, through increased human and construction activities is a potential impact during the construction phase. Work taking place during the summer months could cause disturbance to breeding species and could lead to temporary displacement of some species from immediate areas during construction. A number of mammal species were observed throughout the overall Belvelly Port Facility site. These comprise Otter, Badger, Red Fox, Rabbit and American Mink, with an adult female Otter with two young utilising the man-made lagoon. No mammal species were recorded on the proposed development site itself. The studies concluded that potential impacts on these species during the construction phase would be temporary and slight provided all proposed mitigation measures are adequately implemented. Potential impacts on these species during the operational phase on these species will be permanent – and imperceptible.

Surveys determined that suitable bat roosting habitat is not available within the proposed development site. As a result, potential impacts on roosting activity within the site is considered imperceptible for both the construction and operational phases.

It is considered that there is potential for disturbance to bats that could ensue from the introduction of lighting generated by the proposed development. Mitigation measures to address this aspect have been proposed to ensure that disturbance does not occur.

Birds

The habitats that occur within the overall Belvelly Port Facility site do not have a natural value more significant than any of the habitats readily available for bird species in the general location surrounding the site. It is considered that any species that use the site are not expected to rely on the resources available within the proposed site itself. The wider surroundings consists of nearby estuarine and intertidal habitats, the waters of the wider Cork Harbour area, improved agricultural grassland and urban areas with artificial surfaces and buildings. These offer ample foraging and nesting habitat for species. The impact of habitat loss from the proposed development on shore, waterbirds and birds of prey is expected to be imperceptible. There will be a slight impact on passerines, pigeons and game birds.

There is the potential for visual and noise disturbance to impact on birds arising from workers, plant and machinery during construction and the operational stages of the development. However, with the implementation of recommended mitigation measures as noted below these impacts are not expected to be significant.

Given the proximity of the proposed works to Cork Harbour SPA, impacts on bird species have the potential to occur. A number of mitigation measures are being proposed below to ensure significant adverse effects on key ecological bird species will not occur.

Non-native Invasive Species

Non-native plants are plants which have been introduced outside of their native range by humans and their activities. Invasive non-native species are so-called as they typically display prolific reproduction, rapid growth patterns and/or resistance to standard weed control methods.

Where a non-native species displays invasive qualities, and is not managed it can potentially out compete native vegetation, affecting plant community structure and habitat for wildlife, cause damage to infrastructure including road carriageways, footpaths, walls and foundations and have an adverse effect on landscape quality.

Any amber listed invasive species found on site will be removed through standard eradication/control methods. Butterfly bush, a medium impact invasive species has been found to exist on the proposed development site. This species is likely to further invade adjacent semi-natural habitats and disturbed ground associated with construction activities and cause long-term landscape maintenance issues with associated costs. The impact from non-native species is predicted to be short term and imperceptible. With regard to the potential introduction of alien species due to the increase in vessels utilising the jetty, it is considered that associated impacts will be long term and imperceptible.

Mitigation

Proposed mitigation measures associated with the proposed development include the following

- A suitable qualified project ecologist will be employed for the duration of the construction works to ensure that mitigation measures and relevant ecological planning conditions are implemented in full; and
- the removal of vegetation outside the bird breeding period only;
- the commencement of construction works outside the breeding period April to July only;
- the erection of standard construction site screening around the development site; and
- the appropriate management of onsite lighting; and
- prior to any works being carried out, a pre-construction otter survey will be undertaken to ensure that no otters have taken up residence within 150m of the proposed development.

3.5 Lands and Soils

The proposed development is on a brownfield industrialised site, constituting made ground, and is relatively low-lying with a flat topography. The site is considered a flat and low-lying site at less than 10m above sea level. The ground level is approximately 3.5 mOD across the site. The greater area of Great Island has a number of rises within it, with the highest point on the island measuring 95m, approximately 2 km due east of Marino Point.

The geology of the Belvelly Port Facility site comprises a complex combination of subsurface strata varying from soft mudstones and shales to marine silts and construction material. The bedrock in the area of the proposed development is comprised of the Cuskinny Member, Old Head Sandstone Formation and the Gyleen Formation. Three fault lines occur on the site. One occurs in a north-south direction running through the centre of the site. The others occur in an east-west direction at right

angles to the north-south fault. There are bedrock outcrops present along the western edge of the site. The predominant underlying subsoil is that of till.

Construction of the Proposed Agricultural Fertiliser Facility

Excavations and piling during works

As part of the construction phase, excavation works will be required to facilitate the laying of foundations and the construction of drainage and utilities infrastructure. This will require the removal of hardcore, and some underlying soil and subsoil within the planning area. Limited rock breaking may be required in isolated areas of the site. The current ground levels and hardstand at the proposed development site will be retained, except in locations of buildings and underground utilities.

Construction works associated with the excavation of trenches for the laying of pipe drainage and fibre cabling will involve excavations to approximately 1 – 3m bgl. As the ground conditions largely constitutes made ground and fill, the bulk of the excavated material will be broken tarmacadum, concrete slab and fill material. It is envisaged that approximately 12,000m^3 of subsoils and/or hardcore will be removed from site.

Continuous Flight Auger (CFA) piles will be driven through approximately 2.5m of made ground material and through the original underlying silt materials of Lough Mahon. The CFA piling will result in soil and subsoil arisings. The potential impacts of the proposed excavations and piling are from the handling, storage and off-site removal of excavated materials and pile arisings.

Mitigation measures and recommendations are outlined below to ensure best practice in relation to the management of site-generated construction wastes. Provided mitigation measures are implemented, there will be no significant impact on the soil and geological environment as a result of wastes generated from excavation and piling during the works.

Importation of soil and stone required for construction

The materials used for the construction of the facility will include standard materials typical of such developments, including imported stone and concrete. The minimum amount of materials required will be stored on-site and will be managed to minimise waste generation. All materials will be stored within the on-site construction compound.

The use of geological resources during construction such as stone and concrete, as outlined above are typical construction products and will not constitute a significant geological impact. There will be no significant impact on the soil and geological environment as a result of materials imported during the works.

Operation of the Proposed Agricultural Fertiliser Facility

Following construction, all operations will take place on impermeable hardstanding. Adequate containment and bunding will be installed prior to operation. A stormwater collection system treated by a full retention interceptor prior to discharge to Cork harbour will be in place.

Potential impacts associated with the operations of the proposed development are the release of materials/chemicals that could leach into the underlying soil. The installation of containment features/bunding and a controlled stormwater drainage system will ensure that any potential spillages do not impact on the soil and geological environment.

No significant impacts on the soil and geological environment are expected to arise as a result of the proposed works. The contractor will develop and implement a detailed construction environmental management plan (CEMP) as part of this planning application.

Standard mitigation measures are included below to ensure any potential slight impacts are minimised or avoided. The following mitigation measures are recommended:

- Sustainable use of materials on site. Workers on-site should be briefed prior to commencing work with regard to appropriate use and disposal of waste;
- Tight control on materials required to avoid waste. Incoming materials should be of a suitable quantity so as to ensure a minimum amount of waste is generated;
- Temporary storage areas for fuels and other hazardous materials required by the contractor during construction will be stored in appropriately bunded facilities to prevent the accidental spillage of hazardous liquids that could cause soil and groundwater contamination.

During operation, diesel and coating oil will be stored in bunded containment areas. Best practice controls will be used for the both the diesel tank and coating oil tank operations. The diesel tank will be a double contained plastic tank and the coating oil tank will be a pressure rated ISO tanker. In addition, fire water retention will be provided on site which will also act as tertiary containment for these materials.

Additional port operational uses to facilitate Cargo Vessels

It is proposed to use the jetty for the berthing of additional cargo vessels. All operations will take place on the jetty where no soil is present and only dry cargo is proposed. Any accidental spillages of fuels/oils from machinery or HGVs travelling through the site will be managed in line with standard mitigation measures. Any spillages which do occur will be collected and dealt with in the stormwater collection system, as appropriate. The stormwater collection system which will be installed as part of the proposed demolition and site infrastructure works (Planning Ref. 19/06783) allows runoff to be diverted to a holding tank, in the event of an accidental spill. There are no operational phase impacts on the soil and geological environment associated with the proposed additional port operational use by cargo vessels.

Provided all mitigation measures are in place and the project is constructed under strict controls, there will be no residual impacts on the soil and geological environment associated with the proposed construction of a new agricultural fertiliser facility and additional port operational use to facilitate cargo vessels at Marino Point.

3.6 Hydrology – Surface Water

The assessment methodology included desk-based studies, site visits and a qualitative assessment of the potential impacts. Relevant guidelines were used to inform the preparation and assessment of impacts from the proposed development on surface water, and relevant water quality standards have been consulted and used to inform the assessment where relevant.

The study area is located within the South-Western River Basin District (SWRBD). It is within the Lee, Cork Harbour and Youghal Bay catchment area. Marino point is surrounded by the Lough Mahon estuary to the north, west and south. The hydrological features at the Belvelly Port Facility site consist of a man-made lagoon at the north eastern end of the main site which is subject to tidal ingress from the waters of Lough Mahon estuary, through one outfall that is visible at low tide.

Cork Harbour SPA is designated for 23 species of water birds and the Great Island SAC is designated for the protection of Annex I habitats, mudflats, sandflats, and Atlantic salt meadows.

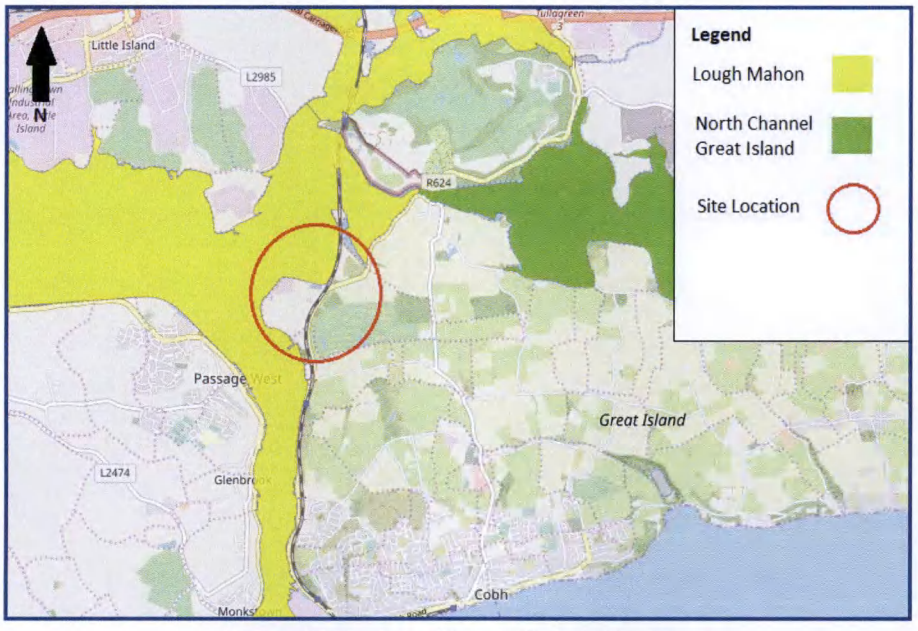

Figure 4 Location of Lough Mahon Estuary

Adjacent to Lough Mahon is the North Channel Great Island (waterbody code IE_SW_060_0300), a transitional waterbody located approximately 2km north east of the site. The North Channel Great Island waterbody covers an area of approximately 7.96km^2 and is an integral part of Cork Harbour coastal waterbody (IE_SW_060_0000). The Water Framework Directive water quality status for the North Channel Great Island waterbody is Moderate with an objective to restore to good status by 2021.The main land use within the waterbody is aquaculture and fishing. Refer to **Figure 4** above.

Existing Site Drainage

The historic foul and wastewater system for the Belvelly Port Facility site comprised 2 No. septic tank treatment systems discharging to surface waters. The existing foul sewer collection network is defunct

and inadequate and it is proposed under the current Planning Application Reference No. 19/6783 to bring the foul network up to current engineering and environmental best practice standards.

There is an existing surface water collection network across the site in various states of operation. To the northern end of the site, surface water is collected and discharged into the existing lagoon area untreated and then into Cork harbour. In other areas of the site, the surface water is collected and feeds into the historic wastewater collection network that discharges into the retention pond. Surface water drainage from the jetty is currently discharged directly to the harbour by means of opes and channel drains in the jetty deck. It is also proposed as part of Planning Application Reference No. 19/6783 to install a surface water system on the site and on the jetty that meets current engineering and environmental best practice standards.

Flood Risk

A Flood Risk Assessment (refer to **Appendix 7.1**) was undertaken to establish the flood risk associated with the proposed development and, if appropriate, to recommend mitigation measures to prevent any increase in flood risk within or outside the site. Because of its location and the absence of any rivers in or near the site, the only source of potential flooding is the high tide levels in Cork Harbour. There are three flood zones identified within the proposed site boundary as distinguished by potential flood risk. The northern end of the proposed Gouldings development site is currently vulnerable to tidal flooding for tide levels with a return period of less than 200 years (Flood Zone A) and less than 1,000 years (Flood Zone B). The remainder of the site, including the jetty is in Flood Zone C. See **Figure 5**, below for flood zone locations.

Figure 5 Flood Zones

As part of planning application 19/6783 for Belvelly Port Facility site demolition and infrastructure works, it is proposed to increase the height of the existing revetment near the northern boundary of the site to a level of 4.25 mOD which is 1.00 metres above the predicted flood level for the mid-range future climate scenario. This will protect the northern part of the site so that the existing paved surface can be retained at its existing level. Notwithstanding the protection afforded by the revetment, this area will still be in Flood Zones A and B. This proposed development has taken account of the associated residual risk.

Impacts on Surface Water

Construction Phase

A walkover survey of the site was undertaken in May 2019 to fully assess current baseline surface water conditions. The main potential impacts to surface water during the construction phase is the potential impairment of surface water quality associated with surface water run-off and de-watering during excavations, movement of sediment and potentially existing contamination and accidental spillages / leaks of substances used at construction sites such as lubricants, fuels and oils.

The proposed works are minor in scope and will be moderate in duration (12-18 months). The potential for significant generation of silt is low and the risk of significant spills of hydrocarbons is likewise low. There is considerable dilution available within the surrounding waters of Lough Mahon and the long-term impact from construction impacts is predicted to be minor in the short-term in the absence of mitigation.

Operational Phase

The main potential impacts on hydrology during the operational phase of the proposed development will be to water quality in Lough Mahon through storm water and wastewater discharge from the proposed fertiliser facility and the additional operations at the jetty. No significant impact to the sites hydrological regime and the water quality of Lough Mahon are expected as a result of the operational phase of the proposed development as detailed below.

Stormwater

As part of planning application Ref. No. 19/06783, the proposed storm water system for the main Belvelly Port Facility site will consist of two separate networks; one line that will serve public areas and roadways and a second line that will serve future individual facilities on the site. These networks will be kept separate but will be laid under the internal road network where practicable. The new public areas surface water collection network will run along the internal road network and will be treated by full retention oil interceptors before discharging into the harbour.

Proposed agricultural fertiliser facility

Surface water run-off from both the proposed agricultural fertiliser facility and the existing jetty will be treated prior to discharge to the surrounding water of Lough Mahon. Surface water run-off from the fertiliser facility will pass through a Class 1 full retention interceptor and monitoring point before it discharges via an existing outfall into Lough Mahon to the north of the site. Should any exceedances

be detected, the water will be diverted to an on site above ground fire water attenuation tank where it will be held until determined safe to discharge.

Jetty

The jetty will be serviced with its own storm water system (BMDC application (Planning Ref. 19/06783). Under normal circumstances, where there is no risk of a contamination event, surface water will pass through a pumping station and into an oil interceptor via gravity flow before discharge to the harbour waters. However, where there is risk of a contamination incident due to the type of cargo being handled at the jetty, surface water will be diverted to a retention tank for testing prior to discharge or disposal as deemed appropriate. All disposal of the contaminated surface water and the necessary management of surface water is the responsibility of the individual jetty user.

Foul Drainage System

As part of the BMDC application (Planning Ref. 19/06783), an onsite wastewater treatment plant (WWTP) will be constructed and will consist of proprietary secondary treatment unit followed by tertiary treatment and discharge to the harbour. The plant will service wastewater from the proposed agricultural fertiliser facility. The treated effluent will be discharged into the harbour via an existing outfall pipe located to the south-west of the site. BMDC will apply to Cork County Council for a discharge licence to discharge the treated wastewater from the Belvelly Port Facility to the harbour. All treated water will be of a minimum standard in line with the Urban Waste Water Directive. An assimilative capacity study of the discharge from the proposed WWTP has been completed as part of the BMDC application (Planning Ref. 19/06783). The results of the study show that the discharge of the WWTP will not have a significant impact on the receiving waters of Lough Mahon.

3.7 Hydrogeology - Groundwater

Groundwater beneath the site is of variable quality due to residual contamination associated with the historic industrial fertiliser manufacturing activities and saline conditions due to its coastal location on reclaimed land. As a result, the local groundwater is not a potable water resource and drinking water standards are not considered relevant in this case.

Existing Site Environment

There are several groundwater monitoring wells that were installed during the site's historic use which remain intact on the overall site. These wells are available for current monitoring and historic water quality data is available to inform this assessment.

The GSI have classified the bedrock underlying the Marino Point area as being a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones. Subsoil permeability has been mapped as being moderate and groundwater vulnerability has been mapped as being High due to the presence of thin subsoil across the site. Average groundwater recharge in the area has been estimated by the GSI to be 130mm/yr. There are no mapped Group Scheme or Public Supply Source Protection Areas on the site or in the surrounding areas within 2km of the site.

Groundwater follows the general topographic gradients across the Marino Point area with groundwater flowing to the north and northwest under the northern two-thirds of the area (including the proposed Gouldings site) and groundwater flowing to the south and southwest in the southern third of the site. Additional groundwater flow mapping at mid tide and low tide conditions were undertaken.

Periodic groundwater and soil contamination monitoring and assessments were conducted on the site to fulfil EPA licence obligations while the IPC licence was operational.

Groundwater Quality

Dissolved Inorganic Nitrogen species (DIN) are a compound of concern within the site groundwater. The presence of DIN relates to the site's historic use as a nitrogen fertiliser manufacturing facility. The highest concentrations of DIN are present off site in the central area of the Marino Point site, reflecting the historic storage and manufacturing activities and the direction of groundwater flow. Although elevated, dissolved nitrogen concentrations in the groundwater have decreased significantly over time since the cessation of the IFI manufacturing activity in 2002. Dilution of DIN within Lough Mahon is massive due to the dilution effects of tidal flow through the channel passing by the site.

Concentrations of DIN in groundwater are expected to remain high for the medium to long term in groundwater. This was acknowledged by the EPA in their assessment of the closure of the former IFI IPC licence. The EPA is of the view that *"the remaining residual nitrogen constitutes a very small and diminishing risk to the status of the Lough Mahon Waterbody"* and they are satisfied that the contamination will be effectively eliminated by the process of natural attenuation over time. The EPA have requested that groundwater monitoring be continued at approximately three yearly intervals.

Impacts on Groundwater

Construction Phase

The principal issues during the construction phase is the potential impairment of groundwater quality associated with dewatering during excavations, mobilisation of sediment and potentially existing contamination during excavations and accidental spillages / leaks of hazardous substance used at construction sites such as lubricants, fuels and oils. Groundwater is unlikely to be encountered in the areas where building foundations are planned, as groundwater depth in these areas is expected to be greater than 1.5m depth based on the available groundwater levels. The presence of DIN is not considered to be of significant concern and it is believed that the contamination will be effectively eliminated by the process of natural attenuation over time. Any changes to groundwater flow in the areas of the excavations will be localised and temporary. The overall cumulative effect of all localised groundwater dewatering impacts on groundwater flow and the movement of DIN beneath the site are considered to be imperceptible as groundwater levels rebound to pre-construction levels.

Operational Phase

Once new foundations and structures below the groundwater table have been installed, groundwater levels will rebound to baseline levels without significant changes in groundwater flow or movement

of dissolved constituents (e.g. DIN). There is a potential negative impact to groundwater occurring from the storage and handling of potentially hazardous substances if losses to ground were to occur.

Cumulative Impacts

The development will facilitate the redevelopment of the site and will increase the footprint of impermeable surfaces across the overall Marino Point site. This will lead to a decrease in infiltration through the soil, leaching of soluble nitrogen in the soil and an overall reduction in groundwater recharge.

- The reduction in leaching of residual nitrogen in the unsaturated zone is considered to be a positive impact in that groundwater concentrations of DIN should progressively decrease over the long term.
- The reduction in groundwater recharge is considered to have an imperceptible impact upon groundwater levels, however the overall groundwater flow directions are expected to remain largely unchanged due to the overall topographic gradients present, which drive groundwater flow.

3.8 Air and Climate

A comprehensive desktop review was completed which aimed to assess baseline air quality and determine the likely significant impacts that the proposed development could have on air quality. Environmental Protection Agency (EPA) air quality data, satellite imagery and relevant assessment criteria and guidelines were considered.

The main sources of atmospheric emissions in the region are local traffic (CO2, NOx), shipping traffic (CO2, NOx) agriculture (CH4), emissions from the Marinochem facility (NOx) and other nearby industrial facilities, as well as existing wastewater treatment plants, and the urban centres of Cobh and Passage West.

Sensitive receptors in this case are people or wildlife that could potentially be impacted by the development. These receptors include nearby residential houses and ecologically sensitive areas e.g. Cork Harbour Special Protection Area (SPA) and the Great Island Channel Special Area of Conservation (SAC). These ecologically sensitive areas are designated for the protection of wildlife or habitats.

The Belvelly Port Facility is located in the air quality management area Zone D as defined by the EPA under the CAFE Directive. Air quality management area Zone B is located across Lough Mahon from Marino Point, which includes the urban areas of Passage West and Upper Pembroke and, further afield, Cork city. The location of the Marino Point in Zone D and its proximity to Zone B is shown in **Figure 6**.

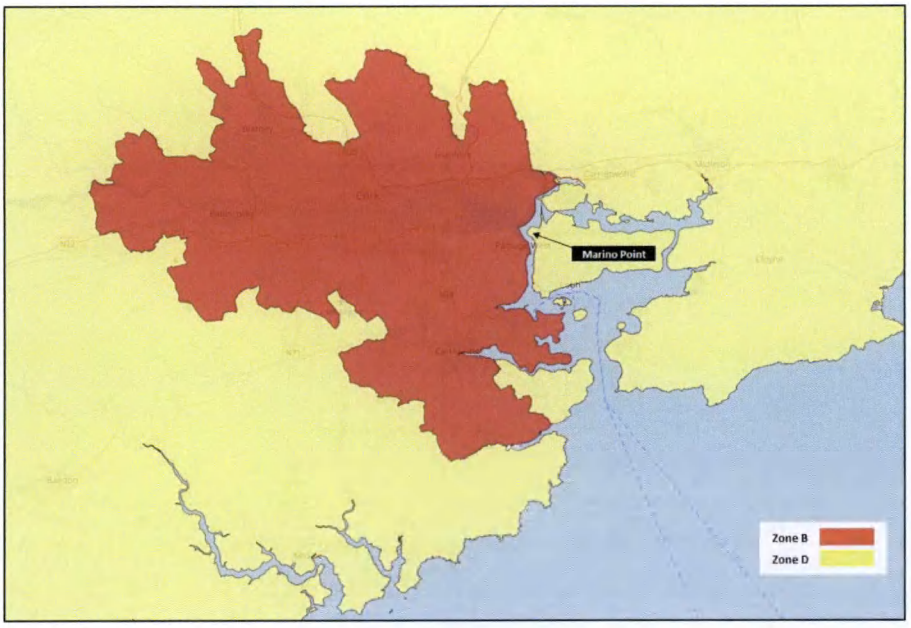

Figure 6 Location of the proposed development at Marino Point in relation to EPA air quality management area (Zone B and Zone D) (Source: EPA, 2020)

Levels of air pollutants in Zone B and Zone D are well below the air quality criteria defined in the CAFE Directive and *Air Quality Standards Regulations 2011*. The maximum concentration of PM_{10} measured at the South Link Road in Cork (Zone B) is close to the CAFE Guideline value, however the CAFE allows for 35 exceedances of this value in each annual reporting period. The concentrations of $PM_{2.5}$ and PM_{10} were measured in Cobh, approximately 3.6 km southwest of the Belvelly Port Facility. This monitoring indicates that the level of ambient particulate matter on Great Island is well below acceptable limit values.

The movement of machinery and the use of fuel powered generators during the construction phase will generate exhaust fumes containing predominantly carbon dioxide (CO2), sulphur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO), and particulate matter (PM_{10}). Dust emissions during construction will be managed through the implementation of a Construction and Environmental Management Plan (CEMP).

Best practice guidelines will be followed during operation to minimise fugitive dust emissions. The following mitigation measures will be employed:

- Crane operation at the jetty:
    - Ensure that grab is operating properly and does not leak fertiliser or dust when full.
    - When grabbing fertiliser, grab shall not be lifted clear of hold until excess fertiliser has fallen or been shaken off.
    - Avoid overfilling grab.
    - Fully lower grabs into hopper.
    - Keep grab as low as possible over hopper to minimise drop height before opening.
    - Take care not to spill fertiliser over the edges of the hopper.

- Do not over fill hopper/trailer

- Hopper operation:
  - Ensure that hopper is positioned as close to ship as possible to minimise crane movement.
  - Fully lower grabs into hopper.
  - Ensure that any screens on hopper are positioned correctly.
  - Check condition of curtains on hopper for integrity.
  - Position trucks centrally under hopper.
  - Communicate with driver to move truck forward as required.
  - Avoid fully emptying hopper.
  - Trucks shall not be overfilled. Avoid spillages.
- Truck operation:
  - Tailgate to be securely closed after tipping at the store and BEFORE leaving the store and returning to the weighbridge/hopper. No trailer with defective or leaking tailboard is to be employed.
  - Trucks to be driven at moderate speeds.
  - Any truck which is departing the facility is to be covered immediately.
  - Trucks which have been drawing to store will be washed down prior to leaving the facility.
- Housekeeping to minimise emissions:
  - All spills to be cleaned up immediately and removed.
  - Road sweeper to be used if fertiliser spillage and dust are noted on roads and open areas.
  - Clean hoppers after use.

Abatement also includes standard operating procedures for dust abatement including:

- The use of water sprays to control dust emissions downwind of operations while grabbing/discharge is underway:
- Operate road sweeper at more regular intervals.

Raw materials will be transported indoors where they will be blended and bagged. Enclosing these activities within a building will significantly reduce emissions of from these activities.

The requirements of the proposed development compared to the existing city centre location are deemed to be roughly equivalent. At a regional level diesel use and associated GHG emissions for the proposed development will be offset by the closure of the existing facility. The net result is that the GHG emissions associated with requirements of the proposed development will not have a material effect on GHG emissions at either a regional or national scale.

There are no negative impacts associated with the proposed development on local, regional or national air quality.

3.9 Material Assets

The EPA defines Material Assets as "resources that are valued and that are intrinsic to specific places, they may be either of human or natural origin." (EPA, 2003). The consideration of the projects impact on material assets provided within this EIAR is discussed in the context of built services and waste management. Examples of these are as follows:

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

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. A study was undertaken to assess the capability of the existing water supply network to cope with further demand in the Little Island/Fota/Marino Point area. This study, called the Cork Strategic Water Study demonstrated that the existing network was capable of delivering the estimated future demand of 4,250m^3 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.

A new water main supply ring with fire hydrants will be installed along the internal road network which is 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 connected to. There is no requirement for water use in the fertiliser blending and bagging process. Water will only be required for canteen and toilet facilities, using approximately 300 litres per/day.

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

Wastewater infrastructure

There is no process wastewater proposed during the operational phase of the development.

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) as part of planning application Ref. No. 19/06783. 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. The treated wastewater will be of a standard compliant with the Urban Wastewater Directive and no significant impact is envisaged on this resource.

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. The Gouldings facility will connect into the overall site foul drainage system and the WWTP.

Electricity

The site is currently served by a dedicated 110kV substation. This substation is a carryover from the site's previous usage requirements (under IFI). Given the age and condition of the existing substation, the current electrical supply on site is unreliable. 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 a new underground ducting network installed under the roadways to service the proposed agricultural fertiliser facility, Marinochem and provide for future development proposals. This supply will secure the electricity requirements of the site.

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.

Gas

Currently there is an existing Gas Networks Ireland (GNI) compressor station/Above Ground Installation (AGI) on site, which was constructed to serve the former IFI facility. The AGI station now serves the Marinochem facility to the north west of the Marino Point site, along with an increased volume of domestic houses on Great Island. The AGI will be retained.

No impacts on the existing AGI infrastructure as part of the proposed project are predicted. 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.

Materials Management and Resource Use

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). In accordance with the waste hierarchy and general best practice which gives precedence to prevention, minimisation, reuse and recycling over disposal with energy recovery and finally disposal to landfill. As such, any suitable site won material will be re-used on site for the partial lagoon infilling and re-grading as appropriate.

Waste generated during the construction works will be minimised and managed by advance planning. It is estimate that 2,800m^3 of surplus excavated material will be generated. This material will be appropriately disposed of off-site in accordance with the relevant waste legislation and waste classification.

No adverse impacts are predicted on this resource either during the construction or operational phase of the proposed agricultural fertiliser facility and additional port operational uses.

During the construction phase of the proposed project, 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 accordance with the waste hierarchy. Overall, the management of general waste during construction will not have a significant effect on waste resources. There is no construction works associated with the proposed additional operational port uses.

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. The diverted methanol, natural gas and water pipelines will be fully constructed prior to making the connection to the new pipelines as appropriate. Once the diversions are operational the old lines will be sealed off and removed. No further mitigation measures are required.

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 risk to material assets are anticipated as a result of the proposed development. Overall, there will be short-term minor impacts during the construction phase of the development. The long-term residual impacts will be negligible.

3.10 Archaeology, Cultural Heritage and Architectural Heritage

The northern end of the Marino Point peninsula is a brownfield site that was reclaimed during construction of the former Irish Fertiliser Industries (IFI) in the 1970's. It is possible that unknown archaeological finds or features may be present in this area in the original mud flats that lie beneath the reclaimed overburden which has been established by Geotechnical Investigations as being up to 2.5m deep.

Construction methods on the site will include piling using CFA piles and excavation for pipework and other underground utilities. Some of these excavations will exceed 2.5m in depth and will therefore impact on the underlying muds within the development area.

The closest Record of Monuments and Places (RMP) sites to the proposed development site are Marino House (CO075-013) and Orangery (CO075-076), c. 250m and designed landscape feature (CO075-027), c. 180m to the south (**Figure 7**). There are no recorded archaeological sites listed in the RMP for Co. Cork or on the SMR database of the ASI within the proposed development site. The closest RMP sites to the proposed development site are Marino House (CO075-013) and Orangery (CO075-076), c. 250m and designed landscape feature (CO075-027), c. 180m to the south. The designed landscape feature, a possible tennis court/garden feature dating from the mid-20th century, was removed in the 1970's during the construction of the IFI complex.

Figure 7 Proposed development site outlined in red within the BPF outlined in blue

There are twenty eight recorded archaeological sites within a 2km radius of the proposed development site. These monuments provide evidence for human settlement and activity within the study area dating back to the Bronze Age. Six cultural heritage sites were identified within the Archaeological, Architectural and Cultural Heritage section of the EIAR for the demolition, site infrastructure and utility upgrade works (Planning Ref. No. 19/6783). The closest of these to the proposed development site is the Cork to Cobh Railway line, located 40m outside to the east. The other five cultural heritage sites are surviving demesne features associated with Marino House (CO075-013; NIAH 20907585), located c.250m outside the proposed development site to the south.

There are no protected structures listed in the Cork County Development Plan within the proposed development site. The closest to the development site is Monning Martello Tower (RPS 01366) located c. 800m to the north. There are a total of seventeen structures listed in the NIAH within the vicinity of the proposed development site, only one of which, the Martello Tower is a protected structure.

It is possible that hitherto unknown archaeological finds or features may be present in this area in the original mud flats that lie beneath the reclaimed overburden.

The proposed development site will not visually impact on Marino House (CO075-013) and Orangery (CO075-076), located at the southern end of Marino peninsula. The buildings associated with the proposed development will be screened from Marino House and Orangery and will have no impact on views both to and from the house. The mature vegetation to the north of Marino house significantly mitigated the visual impact of the industrial complex of the former IFI plant on the house, orangery and the extant demesne features and their setting. As a consequence, the buildings associated with the proposed development will be screened from Marino House and Orangery and will have no impact on views both to and from the house.

No residual impacts on the archaeological, architectural and cultural heritage environment are foreseen. Intermittent archaeological monitoring will be carried out on the site during construction. Archaeological monitoring will be focussed on those areas where excavation will go beneath the reclamation fill. The areas to be archaeologically monitored will be established in advance by the appointed archaeologist when the full construction details are in place.

3.11 Landscape and Visual

The entire study area is described as a "High Value Landscape" in the Cork County Development Plan 2014-2020. There are a number of scenic routes in the study area: the R610 from Passage West to Monkstown and the R624 from Belvelly bridge, past the eastern boundary of the site and onwards to Cobh. There is also a short scenic route to the west of the site at Rochestown and to the east of the site at Ballymore. Several photomontages have been prepared to illustrate how the proposed development will look from key locations. These are provided in **Volume 3 Appendix 11.1**.

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. Views into the site currently present an image of a disused industrial site within a vegetated setting. Its location at the water's edge means that it is visible from waterside locations across Lough Mahon to the west and north, and from higher ground to the east and west of the site. The parcel of land to the extreme north east of the site is visually open to views from a wide area including Fota Island and a protected scenic route. There is a need for planting along this boundary.

Existing naturally regenerated vegetation across most of the site will be removed as part of the pending Belvelly Port Facility demolition, site infrastructure and utility upgrade works submission (Planning Ref. 19/06783). A Green Infrastructure Plan, submitted as part of the application 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. 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.

During the construction of the agricultural fertiliser facility, earthworks for services and piled foundations for buildings would have a short term moderate adverse impact on the local landscape. The introduction of construction machinery and activity into the site for construction 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.

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. 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. Temporary fencing, traffic management works and signage would also have an effect upon the local landscape and views towards the construction site.

During the operational phase there will be negligible changes to the internal topography of the site arising from excavations, and these will not have any significant adverse long-term effects. The proposed new agricultural fertiliser facility represents a continuation of the existing character of Marino Point, and brings existing infrastructure into greater use. The retention of all boundary vegetation and the planting of new vegetation along boundaries will retain and enhance the character of the site as experienced from the surrounding areas. Overall, the impact of the proposed development on landscape character will be moderate and neutral.

The additional port operations at 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 moderate, intermittent, and neutral.

3.12 Noise and Vibration

Existing noise sources close to the proposed development site include the existing Marinochem facility, an electrical substation and temporary compound, the R624 regional road, the Cork to Cobh railway line, low flying aircraft serving Cork Airport, the existing jetty and a commercial ship docking facility at Passage West. Outside of the above, the only other noise sources are bird calls or occasional wildlife calls heard from Fota Wildlife Park. At night-time, distant traffic on the N25 to the north, and sporadic traffic noise at Courtstown Industrial Estate to the northwest can become audible. Commercial plant at the latter, such as air handling units may also become audible during the night.

There are no residences directly bordering the proposed site, which is surrounded on three sides by water, and bound by the R624 and the Cobh railway line on the eastern side. Nearest residences are

located along the R624 and in Passage West across Lough Mahon. All residential dwellings were considered noise and vibration receptors in this assessment. In the context of noise and vibration, the receptors which could potentially be impacted by the development are humans or wildlife.

During the construction phase, noise sources will include plant and machinery associated with the construction works, particularly the movement of HGV's coming to and from the site. Construction noise will be temporary and the assessment showed construction noise thresholds will not be exceeded. While there will be some ground-borne vibration during the works as a result of vibro-rollers, concrete and asphalt breakers and piling, there will be no significant impact on sensitive receptors. There will be no night-time work associated with the construction phase with hours between 0800-1800 h Monday-Friday and 0800-1700 Saturday.

During the operational phase, noise sources at the jetty will include cargo vessels, handling and transport machinery associated with the importation of bulk fertiliser and importation and exportation other dry and break bulk material. Operational noise sources at the agricultural fertiliser facility are plant and machinery associated with the day to day operations of the facility. Loading and unloading will be carried out during between 7.00 to 19.00, Monday to Saturday, although there may be the rare occasions where such operations may need to take place outside these times for operational and safety reasons. Port related HGV traffic will operate 8.00 a.m. to 6.00 p.m., Monday to Saturday. There will be no operations on Sundays, or Bank Holidays.

No mitigation measures are required to achieve compliance with criteria for noise and vibration. However, the applicant proposes to apply the best practice measures to further reduce offsite impacts. These measures include maintaining all plant and machinery in good condition throughout the works and appointing a site liaison officer for communications between the developer, the local authority and the residents. A complaints procedure will also be established for the duration of the construction phase, whereby any complaints received regarding alleged noise and/or groundborne vibration will be investigated.

3.13 Traffic and Transportation

The proposed development lies on the western side of Great Island. The R264 borders the site to the east. **Figure 8** below provides a local road and transport map.

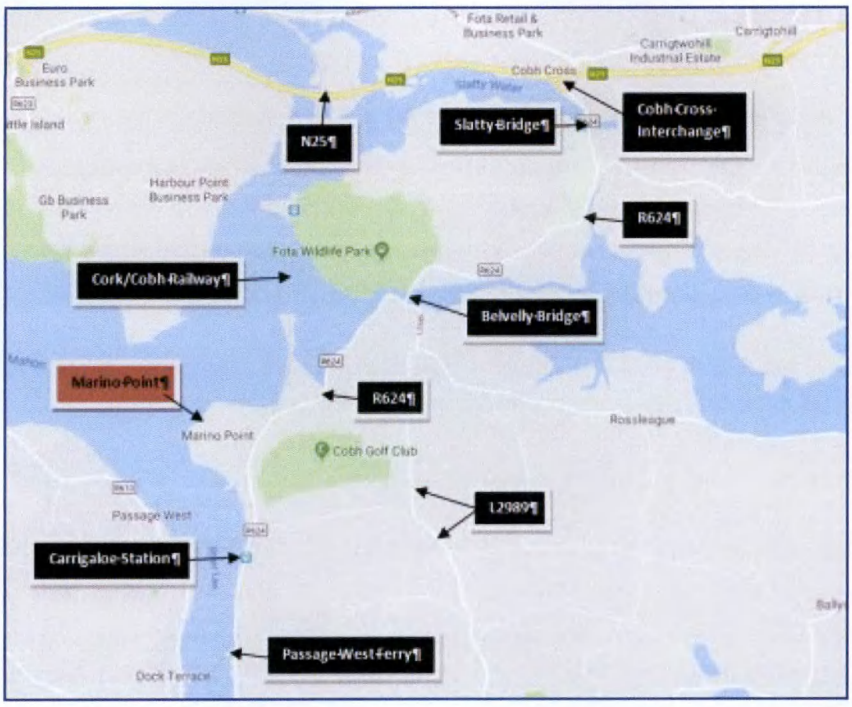

Figure 8 Local Road and Transport Network Map

The R624 traffic survey showed that peak traffic hours occurred between 8:00 a.m. to 9:00 a.m. and 5.00 p.m. to 6.00 p.m. During the proposed construction works, there will be an increase in traffic movements as a result of trucks entering and exiting the site during the construction phase and also staff parking. The traffic impact assessment also considered the four month overlap period with the proposed demolition, site infrastructure and utility upgrade works.

During the construction phase, the proposed 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 will travel to site before 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. Exportation and importation of vehicle loads will occur between 9.00 a.m. and 4.00 p.m., Monday to Friday, and 8.00 a.m. to 5.00 p.m. on Saturdays. These hours have been proposed to avoid overlapping with the existing peak traffic hours on the R624 and the surrounding road network in order to mitigate delays.

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.

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.

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.

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.

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.

The proposed additional 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 cargo types proposed will include logs, woodchip, machinery parts, deep sea maintenance & exploratory vessel engineering cargo, and/or other miscellaneous dry cargo. There would be up to eight operational employees on site associated with the additional port use of the jetty. This staff would generate approximately six car and van trips, both to and from the site each working day.

During February, March and April, it is expected there will be 10 HGVs per day, both to and from the site in order to facilitate the distribution of goods nationwide by road as part of the additional Port operational use. It is expected that there will be up to 30 HGVs per day, both to and from the site to facilitate the distribution of goods, during the nine months period from May to January. Accordingly, peak daily HGV trips generated by the additional Port operational uses of the jetty will be managed so as not coincide with peak daily HGV trips generated by the proposed agricultural fertiliser facility.

On the basis of the EPA Guidelines, the proposed agricultural fertiliser facility and additional port operational phase would have slight to moderate negative effects.

For the jetty, bulk cargo loading and unloading operations will generally be carried out during the period 7.00 to 19.00, Monday to Saturday, although there may be the rare occasions where loading/unloading may need to take place outside these times for operational and safety reasons. Port related HGV traffic will generally operate 8.00 a.m. to 6.00 p.m., Monday to Saturday. There will be no operations on Sundays, or Bank Holidays.

In response to Cork County Council's request on planning reference: 19/06783, the layout of Belvelly Bridge and the horizontal geometry of the R624/L2989 junction was reviewed in consultation with Cork County Council's Traffic and Transport Section. The proposals for improvement for road users submitted for consideration by Cork County Council have been conditioned by the Council as part of their planning permission notification for the proposed demolition and site infrastructure works.

A detailed Construction Traffic Management Plan will be prepared by the main contractor prior to works commencing. This Plan will comprise the construction traffic mitigation measures which are set out in this EIAR and any additional measures which are required by the conditions attached to the Planning Authority's decision.

A proposed reservation for the provision of a four metre wide route for pedestrians and cyclists connecting to the R624 to the north and south of the proposed development, was submitted to Cork County Council, as part of the separate planning application by the Belvelly Marino Development Co. DAC (BMDC) (Cork County Council planning reference: 19/06783), and has been conditioned by the Council as part of their planning permission notification.

On the basis of the EPA Guidelines, the proposed agricultural fertiliser facility and additional port operational phase would have slight to moderate negative effects.

Residual operational traffic impacts are expected to be slight to moderate and would relate to heavy vehicle traffic movements.

3.14 Cumulative Effects

Potential cumulative impacts mainly relate to a temporary increase in traffic on the R624 and surrounding national road network during the construction phase of the agricultural fertiliser facility and increased traffic during the operational phase of both the agricultural facility and the additional port use of the jetty. However, the traffic and transportation assessment has noted the following in assessing potential cumulative effects;

"The Government's Economic and Social Research Institute (ESRI) envisage that the current Coronavirus (Covid-19) restrictions and measures will result in an economic recession. During the last economic recession, traffic volumes reduced year-on-year on National and Regional Roads. Accordingly, it is envisaged that the TII predicted high sensitivity growth scenario used in this assessment may not occur, and future baseline traffic volumes will be lower than predicted".

The Cork Metropolitan Area Transport Strategy (CMATS) proposes to protect the alignment of a future Cork North Ring Road and the strategic function of roads such as the Midleton to Whitegate and the R624 to support potential increase in freight traffic to Marino Point.

The assessment of cumulative effects is based on all projects proceeding as planned, and does not take into account delays or postponements occurring as a result of Covid-19 restrictions.

3.15 Major Accidents and Disasters

An assessment of the likely significant adverse effects arising from the vulnerability of the proposed development and the potential of the proposed development to cause a major accident and/or disaster was undertaken. A risk assessment was prepared which identifies and quantifies risks due to the proposed development, focusing on unplanned, but possible and plausible events occurring during the construction and operation of the proposed development.

The principal risks identified for the construction phase of the proposed agricultural fertiliser facility relate to flooding, fire and explosion, traffic and release of contaminants. A risk assessment has been undertaken for each risk, mitigation measures are proposed and residual risks identified.

The proposed Gouldings agricultural fertiliser facility will operate as a lower-tier Seveso site. In light of this, a quantitative risk assessment (QRA) relating to Seveso Land-use planning was undertaken and submitted to the Health and Safety Authority (HSA). The QRA details the planned environmental controls that are in place in order to mitigate the potential risks of operating as a lower-tier Seveso site.

The principal risks identified during the operational phase of the proposed agricultural fertiliser facility relate to flooding, fire and explosion, traffic and release of contaminants. The principal risks associated with the proposed additional operational port use relate to flooding, fire and explosion, traffic, cargo vessels and release of contaminants.

Potential risks during the construction phase will be managed through the Construction and Environmental Management Plan (CEMP). Prior to the commencement of works the contractor will prepare and implement a detailed CEMP. This plan, which will be specific to the site and its activities, will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary.

Gouldings follow standard precautions across all of their SEVESO sites. These precautions will be implemented in the proposed agricultural fertiliser facility. Precautions include the following:

- Regular maintenance of loading shovels
- Precautions for conveyor belt fires / elevator belt fires in bulk store intake systems, blending and bagging areas. These include rotation sensors and trips to protect against frictional heating and auto-extinguish conveyor and elevator belts to ISO 340
- Hot work permit systems.
- No smoking regulations with appropriate signage at main gate, entrance to buildings, etc.
- Minimising truck presence on site,
- Security precautions such as robust site fencing, locked buildings, building alarms, perimeter intruder detection systems.
- While COMAH qualifying material will not be handled in the bagging plant or stored in the yard, standard precautions used in the other Gouldings sites will be implemented.

- Take precautions against oil spills from conveyors and elevators motor/gearboxes. Depending on the particular situation this would be by ensuring leaks will not spill on product, having the gearboxes over bays used for non-hazardous material or containment of leaks.
- Lightning Protection is required for the bulk store building.

The Port of Cork Company (POCC) implements controls and measures in line with the existing POCC Major Emergency Plan. This plan is consistent across all Port facilities throughout the harbour and will be implemented for the additional operational port use at the jetty.

3.16 Interaction of Effects

There is potential for interactions between one aspect of the environment and another which can result in direct or indirect impacts, and which may be positive or negative. While all environmental aspects can be inter-related to some extent, the following outlines the key interactions identified between each of the various environmental subject areas considered in the EIAR for both the construction and operational phases of the proposed development. Where relevant, interactions between specific environmental aspects and effects are already addressed within each of the individual assessment topic areas of this EIAR. The purpose of this chapter is to draw attention to significant interaction and interdependencies between one topic and another.

Interaction	Description
Biodiversity and; **Land and Soils** and; **Hydrology.**	There are direct links between all three key environmental aspects. The project has the potential to negatively impact and directly alter the hydrology of the surrounding area through means of pollution or sedimentation which in turn could impact on biodiversity. There is also the potential to negatively impact on biodiversity during the construction phase of the project if there is any disturbance to mammal habitats. Excavations introduce the risk of increased sedimentation which would impact on both the hydrological environment and biodiversity.
Noise and Vibration and; **Biodiversity.**	Noise and vibration impacts during the construction works will have the potential to cause negative impacts to local wildlife in the surrounding environment. The interactions and suitable mitigation measures have been considered and discussed in this EIAR.
Population and Human Health and; **Air Quality and Climate** and; **Traffic and Transportation.**	Increased emissions will arise from construction machinery and from traffic caused by the proposed works. There will be increased levels of traffic in the local vicinity and dust is expected to arise from the works. Interactions and mitigation measures have been addressed in this EIAR, however it is not possible to completely eradicate these nuisances and they will inevitably have slight to moderate temporary impact on population and human health and on the local air quality.
Landscape and Visual and; **Population & Human Health.**	The changes in landscape due to the construction and operation of the proposed agricultural fertiliser facility have the potential to impact on population and human health through local

Interaction	Description
	residents and the general public. The potential impacts associated with landscape and visual due to the construction and operational phases of the proposed development are addressed individually within the EIAR.
Noise and Vibration and; **Population and Human Health** and; **Traffic and Transportation.**	Noise impacts will occur during the construction phases of the project as a result of increased levels of site related traffic, use of construction machinery during the works. Noise will also be associated with the operation of the Gouldings facility and the proposed additional port operational uses. Noise and vibration has the potential to impact on population and human health and biodiversity, which are addressed individually and in detail within the relevant chapters.
Biodiversity and; **Traffic and Transportation.**	Increased traffic during the construction phase of the project could impact on the biodiversity of the surrounding environment. The interactions between these aspects, and the design of mitigation measures were addressed in this EIAR.
Traffic and Transportation and; **Hydrology.**	During the construction phase, increased traffic could lead to increased sedimentation or potential pollution of watercourses. The design of suitable mitigation measures and the interactions between these aspects have been considered in this EIAR.
Hydrology and; **Population and Human Health**	There is potential for increased sedimentation and pollution of local watercourses during the construction phase which would in turn impact on population and human health. The interactions between these aspects and related mitigation measures have been considered in this EIAR.