

## 5.3 LIKELY SIGNIFICANT IMPACTS

### 5.3.1 Overview



206955-22/12/2020-EIAR Volume 2 - Main Report Part  
3 (Chapters 5.3.1 to)

The proposed development will include site clearance and construction of a new agricultural fertiliser facility. These works will result in considerable changes to the existing environment within the proposed development site. Increased activities at the Belvelly Port Facility site during the construction and operational phases of the Goulding facility, along with the additional operations at the jetty, will result in an increase in ambient noise levels in the local environment. Noise during the construction phase may disturb foraging birds during the winter period. Indirect impacts on estuarine habitats via contamination in surface water during construction could impact on foraging resources for species within the SPA via the potential alteration of the ecology of estuarine habitats. Disturbance or displacement impacts to marine mammals could potentially arise during the operational phase of the project via increased levels of vessel activity within the port.

The design and construction of the works will be to the standards applied in the Irish construction industry. The work will be fit for the purpose intended, and comply with any requirements of a competent authority, Irish standards, or Irish standard codes of practices and will also reflect best engineering practice.

The construction phase of the project will take place over an estimated 12-18 month period. It is envisaged that the work will commence in October 2021 and that the construction works will be fully complete by the December 2022.

There is no construction works associated with the additional port operations at the jetty.

The proposed development is described in detail in **Chapter 2 Description of the Proposed Development**.

As part of the Belvelly Marino Development Company DAC (BMDC) application for the site demolition and site infrastructure works (Planning Ref. 19/06783), a number of ecological enhancement measures were proposed for the Belvelly Port Facility, which take consideration of the biodiversity of the area. These measures will provide adequate enhancement for the overall Belvelly Port Facility site. These measures noted below are only applicable to the BMDC application (Planning Ref. 19/06783) and are not listed mitigation/enhancement measures of this EIAR.

#### **5.3.1.1 Enhancement of the Site for Birds**

##### **5.3.1.1.1 Common Tern**

It was proposed that a second pontoon be put in place in Floaty Channel to encourage more Terns to breed. This pontoon was installed in June 2020 and incorporates otter proofing.

##### **5.3.1.1.2 Biodiversity Enhancement**

The following biodiversity enhancement measures have been proposed in the BMDC application (Planning Ref. 19/06783);



- Retention and enhancement of approximately 0.6 acres of the eastern section of the Lagoon
- Establishment of a grassland / meadow habitat along the flood protection berm
- Enhancement of the existing and retained woodland and treelines on site
- Native woodland boundary planting
- A Bee Orchid method statement 'Belvelly Port Facility Bee Orchid (*Ophrys apifera*) Translocation – Method Statement' which will provide for the protection and continued existence of the species within the Belvelly Port Facility site
- Erection of appropriate bird boxes and pollinator nesting sites.

The following sections assess the potential impacts that the proposed development may have on the existing flora and fauna at the Belvelly Port Facility site, on protected international and national sites and habitats and species of conservation interest. Potential impacts may arise from the construction and operational phase of the project, both of which are included in the assessment below.

### 5.3.2 Designated Sites

#### 5.3.2.1 Natura 2000 Sites

The proposed development does not traverse the boundaries of any European or Nationally designated sites important for nature conservation. There will be no direct effects on any designated site as a result of the construction and operation of the proposed development.

An Appropriate Assessment has been undertaken to identify any potential impacts of the proposed development on Natura 2000 Sites (SACs and SPAs). This assessment is required under Article 6 of the Habitats Directive (92/43/EEC). The Stage 1 (Screening) concluded that the only Natura 2000 sites requiring more detailed assessment were the *Great Island Channel SAC* and the *Cork Harbour SPA*. As such a Natura Impact Statement (NIS) has been prepared to identify any potential impacts to these two Natura 2000 sites as a result of the proposed development.

The NIS has objectively concluded, beyond reasonable scientific doubt, and with the implementation of the prescribed mitigation measures that the proposed development (construction and operational phases of the development), will not result in any adverse impacts on the Conservation Objectives of the relevant Natura 2000 sites and the integrity of these sites will not be adversely affected.

#### 5.3.2.2 IBA & Ramsar Sites

Circa 5,950 ha of the Cork Harbour waters are designated as an IBA (Site Code: IE088), as are 1,436 ha as a Ramsar site (site no. 837). Cork Harbour SPA (004030) overlaps with the IBA and the Ramsar site<sup>22</sup> and, with the exception of whimbrel, the species for which the IBA and Ramsar sites are selected are included as SCI species for which the SPA site is selected.

<sup>22</sup> <http://datazone.birdlife.org/site/factsheet/cork-harbour-iba-ireland/text>



It is considered that the conclusion of the NIS that pertains to the Cork Harbour SPA (004030) site applies by inference, to the IBA and Ramsar sites with which it overlaps. Therefore, it is considered that the construction and operational phases of the proposed development described in this report, with mitigations in place, will not result in significant impacts within nearby IBA sites and Ramsar sites.

### 5.3.2.3 Sites of National Importance

Of the 15 pNHAs listed in **Table 5.3**, 8 are encompassed within the Natura 2000 sites listed in **Table 5.2** above i.e Great Island Channel SAC and the Cork Harbour SPA. These include;

- Great Island Channel pNHA (001058)
- Douglas River Estuary pNHA (001046)
- Monkstown Creek pNHA (001979)
- Dunkettle Shore pNHA (001082)
- Lough Beg Cork pNHA (001066)
- Whitegate Bay pNHA (001084)
- Owenboy River pNHA (001990)
- Rostellan Lough, Aghada Shore & Poul nabibe Inlet pNHA (001076)

The NIS has concluded that the proposed development (construction phase and operational phase), with mitigations in place, will not result in any adverse impacts on the Conservation Objectives of the relevant Natura 2000 sites, and the integrity of these sites will not be adversely affected. Therefore, as these pNHAs support a similar range of habitats and species that could be potentially impacted due to hydrological links, it is considered that the conclusions of the NIS that pertain to the Natura 2000 sites listed in **Table 5.2** above, apply by inference, to the pNHA listed above.

The impacts on the pNHA sites within the wider landscape of the proposed development site will be assessed in this section. These sites are listed in **Table 5.43** below, with their features of conservation interest and their proximity to the proposed development described in this report.

**Table 5.43 Impact on NHAs**

Site name and code	Distance from pNHA site to development site	Features of Interest	Rationale for exclusion from assessment
Great Island Channel (001058)	pNHA is approx. 30m north of the subject site	pNHA site code, site area and features of interest correspond to those of the Great Island Channel SAC i.e. Mudflats and sand flats not covered by seawater at low tide [1140] & Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	Conclusions of the NIS that pertain to Great Island Channel SAC, apply by inference, to this pNHA
Douglas River Estuary (001046)	pNHA is 1.3 km west of subject site	The site is of ornithological importance and forms an essential part of the Cork Harbour SPA complex.(004030)	Conclusions of the NIS that pertain to Great Island Channel SAC & Cork Harbour SPA, apply by inference, to this pNHA



Site name and code	Distance from pNHA site to development site	Features of Interest	Rationale for exclusion from assessment
Rock Farm Quarry, Little Island (001074)	pNHA is 1.4 km northwest of subject site	The site is site is of considerable interest botanically because of its species diversity and presence of 'rarities' for the region. Numerous habitat types exist within e.g. lowland dry grassland, rich calcareous grassland and scrub woodland.	Designated for terrestrial habitats. No spatial overlap. Therefore, significant impacts not reasonably foreseeable
Monkstown Creek (001979)	pNHA is 3.2 km south west of subject site	The main interest of the site is ornithological, with the mudflats acting as winter refuge to at least locally important numbers of waterfowl, including shelduck, teal, redshank and dunlin. Site encompassed within Cork Harbour SPA (004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Cuskinny Marsh (001987)	pNHA is 3.6 km south east of subject site	The main interest of the site is ornithological, with the lake supporting locally important numbers of dabbling ducks and Mute Swans.	Designated for a variety of waterbird species. Due to the nature, scale and location of the proposed works along with the intervening distance, any potential for significant impacts is considered negligible.
Dunkettle Shore (001082)	pNHA is 4.7 km north west of subject site	The site is of ornithological importance and forms an essential part of the Cork Harbour SPA complex.(004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Lough Beg Cork (001066)	pNHA is 5.8 km south of subject site	The site is of ornithological importance due to the presence of feeding waders and wildfowl. However, the site is mainly used as a high tide roost. Site encompassed within Cork Harbour SPA (004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Templebreedy National School (000107)	pNHA is 5.8 km south of subject site	This is a nursery roost for Leisler's Bats which roost in the attic of a Church of Ireland primary school building.	Due to the distance involved and the lack of critical resources within the proposed development site which Leisler's bat may rely on i.e. foraging habitat, no potential impacts have been identified.
Glanmire Wood (001054)	pNHA is 6.3 km north west of subject site	This site is of interest because this type of woodland is rare in east Cork; mixed broad-leaved woodlands dominated by oak ( <i>Quercus</i> spp.), Beech ( <i>Fagus sylvatica</i> ) and Sycamore ( <i>Acer pseudoplatanus</i> ) with a few conifers, especially European Silver-fir ( <i>Abies alba</i> ).Terrestrial	Designated for terrestrial habitats. Any impacts due to overlap with Cork Harbour SPA will follow the conclusions of the NIS that pertain to Cork Harbour SPA.



Site name and code	Distance from pNHA site to development site	Features of Interest	Rationale for exclusion from assessment
		site with riparian element that partially overlaps with Cork Harbour SPA (004030)	
Whitegate Bay (001084)	pNHA is 6.8 km south east of subject site	The site is of ornithological importance and forms an essential part of the Cork Harbour SPA complex.(004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Owenboy River (001990)	pNHA is 6.6 km south west of subject site	The site is of ornithological importance and forms an essential part of the Cork Harbour SPA complex. (004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Rostellan Lough, Aghada Shore & Poul nabibe Inlet (001076)	pNHA is 8.2 km south east of subject site	The site is of ornithological importance and forms an essential part of the Cork Harbour SPA complex. (004030)	Conclusions of the NIS that pertain to Cork Harbour SPA, apply by inference, to this pNHA
Fountainstown Swamp (000371)	pNHA is 10.4 km south west of subject site	Once a former lake or inlet of the sea, this site has been grown over by a mixture of marsh plants and woodland, giving rise to a quaking swamp of unusual character. The undisturbed nature of the site means that bird numbers are quite high.	Designated for terrestrial habitats. No spatial overlap. Therefore, significant impacts not reasonably foreseeable
Carrigshane Hill (001042)	pNHA is 12.8 km north east of subject site	This area is important as a representative of the herb-rich community found near the exposed limestone, a habitat under threat from quarrying. The presence of Thick leaved Stonecrop adds further interest to the site as this is one of the few locations for this plant in the county where it appears native.	Designated for terrestrial habitats. No spatial overlap. Therefore, significant impacts not reasonably foreseeable
Minane Bridge Marsh (001966)	pNHA is 13.0 km south west of subject site	Mineral character grassland and marshes/unusual vegetation plants	Designated for terrestrial habitats. No spatial overlap. Therefore, significant impacts not reasonably foreseeable

### 5.3.3 Habitats Loss/Alteration

#### 5.3.3.1 Construction Phase

Impacts on terrestrial habitats are generally restricted to direct removal of habitats and possible impacts from the spread of invasive species. Indirect impacts may occur via damage and disturbance arising from vehicular activities and storage of overburden and materials. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be imperceptible. Overall, the



habitats to be directly affected are common and no Annex 1 habitats or rare or uncommon habitats will be directly affected.

The proposed development will include site clearance, earth works, construction and installation of new infrastructure and structures. There is no construction works associated with additional port operational use of the jetty.

**Table 5.44: Impacts on Terrestrial Habitats**

Habitat	Spatial description within site	Ecological Comments	Evaluation <sup>23</sup>	Potential Impact <sup>24</sup>
Buildings and artificial surfaces BL3	Main area of site	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower Value)	Imperceptible, Permanent Impact
Recolonising bare ground ED3	Various paved areas within main area of site	This is a highly modified habitat with low species diversity and limited value for wildlife.	Local importance (Lower Value)	Not significant, Permanent Impact
Scrub WS1	Various including area adjacent to the existing man-made lagoon	Native scrub can be ecologically important, providing foraging for small mammals including bats. Scrub also provides feeding and nesting sites for small birds and for invertebrates. However, the scrub habitat which will be impacted by the proposed development is of poor quality, is dominated by a non-native species and is of very limited ecological value.	Local importance (Lower Value)	Not significant Permanent Impact
Treeline WL2	Southern boundary of the proposed Goulding Facility site	Treelines can provide important sites for foraging, roosting and breeding birds whilst also providing ecological corridors facilitating bird and other animal movement. However, the treeline to be impacted by the proposed development is fragmented from similar habitats in the surrounding landscape and provides little in the way of potential roosting features for bat species.	Local importance (Lower Value)	Not significant, Permanent Impact
Dry meadows and grassy verges GS2	Adjacent to existing man-made lagoon.	Dry meadow and grassy verge GS2 corresponds to the Habitats Directive Annex I habitat: 'lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) (6510)'.	Local importance (Lower Value)	Not significant, Permanent impact

<sup>23</sup> As per criteria outlined in Section 5.1.4.

<sup>24</sup> As per criteria outlined in Section 5.1.5.



Habitat	Spatial description within site	Ecological Comments	Evaluation <sup>23</sup>	Potential Impact <sup>24</sup>
		<p>However, the dry meadow and grassy verge habitat within the site is limited in extent and has a patchy distribution. It does not represent a valuable example of this Annex 1 habitat type.</p> <p>Overall, this is a highly modified habitat with low value for local wildlife</p>		
Sea walls, piers and jetties CC1	Jetty situated along the south-western boundary of the Belvelly Port Facility site.	This is a highly modified habitat with low species diversity and little value for wildlife.	Local importance (Lower Value)	Imperceptible, Permanent Impact

The overall direct habitat loss from the proposed development is considered a **permanent not significant impact**.

There is the potential for chemicals and sediment used/produced during the construction phase to enter the waters of Cork Harbour (MW4) due to surface water run-off resulting in water quality impacts. This in turn could have indirect ecological effects on intertidal and marine habitats and species. Given the volume and area of the marine waters of Cork Harbour, these potential hydrological effects are unlikely as the volumes of pollutants generated would need to be very large for any adverse impact within the marine waters.

A Construction Environmental Management Plan (CEMP) has been developed to ensure that the construction works will not deteriorate the water quality and will safeguard the existing water quality status of the adjacent Lough Mahon. The preliminary CEMP is provided in **Appendix 2.3** of this EIAR. The mitigation methods outlined within the CEMP will effectively prevent impacts from silt and hydrocarbons. Following the implementation of these measures, no significant impact on water quality and aquatic ecology during construction is predicted to occur.

There is no construction works associated with the additional port operational uses of the existing jetty.

#### 5.3.3.2 Operation phase

No further direct habitat loss impacts other than those described in the previous section are expected during operation of the development.

With regard to the project having any potential indirect habitat alteration impacts within the estuaries (MW4) as a result of emissions to Cork Harbour, all treated foul wastewater discharged



during the operation phase will be of a in line with the Urban Waste Water Treatment Directive. See **Chapter 2 Description of the Proposed Development** of this EIAR for further details in relation to foul drainage management. An Assimilative Capacity Study, undertaken as part of planning further application (Planning Ref. 19/06783) for the site demolition and infrastructure works, determined that there will be no adverse impact on water quality as a result of any proposed treated foul effluent discharges at the site.

Surface water runoff and surface water potentially contaminated by accidental fuel and coating oil spills will be the only discharges to surface water from the Goulding facility. Surface water will pass via full retention interceptors through a monitoring point before it leaves the Gouldings site. Should any exceedances be detected, the water will be diverted to a fire water attenuation tank where it will be held until safe to discharge. Goulding Chemical Limited will operate under a discharge license from the EPA. Discharge rates from the site will be limited to Greenfield runoff.

The jetty will be serviced with its own storm water system (BMDC application (Planning Ref. 19/06783)). In the 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. An isolator switch situated at the pumping station will be used to manually divert any runoff to this tank either as an operational procedure at the time of loading/unloading cargo or as a procedure to be carried out in the event of a spill or possible contamination. Once the surface water in the tank has been tested for contaminants it will either be transferred through the oil interceptor to the outfall or will require collection and appropriate disposal off site. The necessary management and disposal of the contaminated surface water is the responsibility of the individual jetty user.

Written agreements will be put in place with Belvelly Port Facility site users on discharge volumes, rates, concentrations, on-site attenuation arrangements and contributions for connection and maintenance. Discharge rates from the site will be limited to Greenfield runoff. Written procedures will be implemented regarding the use of chemicals and controls to ensure spills will not occur on access roads. Emergency clean up procedures will be implemented in the event of this occurrence.

With regard to adverse water quality impacts it is concluded, in light of the content in the preceding paragraph and bearing in mind the volume and area of the marine waters of Cork Harbour, that these effects are unlikely as the volumes generated would need to be very large for any adverse impact to ensue. Those that are reasonably foreseeable are not likely to impact on physicochemical parameters within the marine waters or any key ecological attribute of any habitat therein. Overall the impact on water quality is predicted to be **long-term imperceptible**.

Risk of major accidents and disasters are addressed in **Chapter 15** of this EIAR. This chapter concluded that taking into account best practice operational measures, including strict safety and environmental measures, that any potential risk associated with the operational phase of the development was considered low in relation to the risk matrix i.e. no operational procedures require priority treatment but there is need for continuing awareness and monitoring on a regular basis.



### 5.3.4 Mammals

#### 5.3.4.1 Otter (Construction Phase)

Otter was the species of which evidence was recorded most often during the 2019 surveys, albeit the primary evidence comprised spraint. While a single entrance holt was found near the jetty, no evidence of any other holt, occupied or otherwise, was found on-site, or within 300m of the site in 2019 or the early part of 2020. Activity was concentrated where the wetland areas are adjacent to the edge of the site, and there appears to be significantly more sprainting activity in the winter/early spring than during the summer. The site is clearly used regularly by foraging otters, probably more than one (on 23<sup>rd</sup> May 2019 single otters were recorded within 30 minutes of each other near the jetty and the man-made lagoon) and as of October 2020 has been confirmed as part of a breeding site for otter.

Otter breeding sites can be defined as an area of land, or open water and land, large enough to provide a breeding otter with:

- Security from disturbance.
- One or more potential natal den sites.
- Play areas for cubs.
- No risk of flooding.
- Access to a good food supply.

Where several discrete areas of suitable cover exist within a few kilometres of a river, it is possible that two or more breeding sites may be available within the home range of a single breeding female (Liles, 2003).

The use of the site and immediate surrounding waters/habitats by otter will undoubtedly be affected to some extent during construction works. Disturbance could reduce otter access to some portions of their range, which may have implications for food availability for otters during this period, which may be more critical for female otters with young.

Otters can be relatively tolerant of disturbance, but will undoubtedly be affected by the construction phase of the project in the short term, mainly through disturbance. Otters can become tolerant of human activity as evidenced by the presence of otters in the centre of Cork and Limerick City. Thus, otters are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower. It is noted that a natal holt was not recorded during any site survey of the area, however, during the period in which the adult female and young were recorded a concentrated otter survey had not taken place.

Given that otters are solitary and competitively territorial it is reasonable to conclude that social groups of otters do not normally occur and that only a mother and cubs constitute a social group in the normal course of events. As a consequence, the number of otters active in any area within or



adjacent to the site will usually be low and only a small number of individuals, possibly no more than a pair, will be exposed to any impacts from the proposed development.

It is noted that the proposed development site is located adjacent to the existing and operating MarinoChem Ltd. (formerly Dynea Ireland Ltd.) facility and is subject to noise disturbance and light pollution from the MarinoChem site. During the construction stage, there may be short-term increases in disturbance but it will not be significant in the context of existing noise levels. Likewise given that otters are able to adapt to increased noise and activity levels, it is considered that otters will habituate to the change of landuse within a short period of time.

With regard to the former and notwithstanding the current unoccupied status of the holt, noise emissions during the construction phase may result in disturbance to breeding otters potentially utilising the holt at the time of construction. Similarly, foraging/commuting otters may temporarily avoid the development area during the construction phase. However, owing to the temporary and relatively limited nature of the construction works and the distance to the holt (approx. 300m) and to those parts of the site where evidence indicate otter activity is most prevalent, disturbance impacts to any potential breeding/commuting/foraging otter during the construction phase are expected to be a **temporary, not significant impact**. However, any construction within 150m of a natal holt will be considered as having a potential significant impact. As a precaution, a preconstruction survey for otter will be undertaken.

#### **5.3.4.2 Otter (Operational Phase)**

Once construction works are complete, circumstances will revert largely to those that currently pertain and it is reasonable to predict that the current level of activity will resume with only a slight increase. It is considered that otters that may have been temporarily displaced owing to construction activity will utilise the habitats within and adjacent to the development site, within a short period of time.

During the operational phase of the proposed development, there is likely to be an increase in the level of cargo ships using the jetty. However this disturbance is considered to be slight, as there is a certain amount of activity, currently at the site.

The Goulding operation will require the delivery of approximately 50 ships per year delivering raw material (bulk granular fertiliser) to the facility. A maximum of 40 cargo ships operated by BMDC carrying dry bulk and break bulk material will berth at the jetty each year. In general, 15 – 20 cargo ships are anticipated each year. The frequency of cargo vessels will be variable and subject to the various customers' needs. On average, ships will be berthed for 1 to 2 days to offload/load cargo and may be longer depending on weather conditions.

The facility will operate all year-round, with working times varying depending on market demand. Normal hours of operation are 7.00 a.m. to 5.00 p.m. Monday to Friday. During peak demand, which is typically between February and April, fertiliser mixing and bagging operations will occur between



7.00 a.m. and 12.00 midnight, and HGV distribution of finished fertiliser product from the facility by road will occur between 7.00 a.m. to 7.00 p.m. Monday to Saturday.

For the port operations, 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 operate 8.00 a.m. to 6.00 p.m., Monday to Saturday. There will be no operations on Sundays, or Bank Holidays.

Otter are largely, but not exclusively, nocturnal and can habituate to human disturbance (Chanin, 2003). As works will be largely undertaken during daylight hours, the impact of operational phase of the development, including increased cargo ship traffic, is thus considered imperceptible.

Overall, the impact of the operational facility on otters is expected to be a **long-term imperceptible impact**.

#### **5.3.4.3 Badger (Construction Phase)**

The survey evidence indicates that there are no breeding Badgers, or occupied Badger setts on the site or within 300m of it. Evidence of badger activity within the Belvelly Port Facility site indicates that the activity is restricted to its periphery /extending away from the site, where natural and semi natural habitats are available, but not to the main area of the Belvelly Port Facility site where the proposed development works will occur. In summary, the use of the overall site by badgers is irregular to occasional.

Badgers are expected to forage throughout the greater area, and will likely avoid areas of development. Any avoidance of the development area by badgers during the construction phase of the development is expected to be a **temporary not significant impact**.

#### **5.3.4.4 Badger (Operation Phase)**

It is considered that once the construction phase of the proposed development has been completed, badgers that may have been temporarily displaced owing to construction activity will utilise the habitats within and adjacent to the development area within a short period of time. As works will typically be undertaken during normal daylight working hours and badgers are nocturnal in habit, displacement of badgers from foraging areas is extremely unlikely to affect the local badger population and will not result in a likely significant negative effect, at any geographic scale. Any avoidance of the development area by badgers during the operational phase of the development is expected to be a **permanent imperceptible impact**.

#### **5.3.4.5 Bat Species (Construction Phase)**

The Preliminary Roost Habitat Assessment (PRHA) & Structural Survey determined that suitable roosting habitat is not available within the development site and none of the buildings within the overall Belvelly Port Facility site have the potential to support any type of established roost site.



The desk top study established that the geographical area encompassing the site and approximately 20 km extending away from it has a low Bat Habitat Suitability Index (BHSI) rating, indicating that the geographical area, including the Belvelly Port Facility site, is not likely to be a significant resource to any population of any bat species. In other words bats are likely to preferentially select alternative areas for foraging.

The activity survey indicates that none of the bat species recorded during the survey period roosts in the vicinity of the development area.

With regard to disturbance that could ensue from fugitive noise, generated by the construction phase, on bats that use the site for foraging and that roost at a remove from the site, but in proximity to it, the survey evidence indicates that bats recorded travelled some distance to the site. The timing of the first recording (22:12) relative to sunset, which on the night of the survey was 9:57pm, indicates that the bat commuted for a minimum of 15 minutes to the site, a time lag which would not have occurred if the bat had emerged from a location within the development site. The timing of the last call is also a significant indicator as to the likely origin of the bats recorded. The fact that the last call was recorded at 04:42, some 33 minutes before dawn would also indicate that this last bat commuted some distance away from the development site to return to its roost.

It is concluded that any potential impacts on bats that occur during the construction phase is a **short-term imperceptible impact**.

#### **5.3.4.6 Bats Species (Operational Phase)**

The results of the of the onsite Preliminary Roost Habitat Assessment (PRHA), structural survey and Passive Automated Bat Survey indicate that that the Belvelly Port Facility site does not contain any roost sites nor is it used extensively by foraging bats. With regard to bats it is considered that the introduction of lighting into the environment is a characteristic of the operational phase that may have an adverse impact on foraging bats.

All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost; only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift 1980). When bats emerge from roosts early in the evening, they tend not to echolocate but rely on eyesight to fly from the roost to adjoining treelines or hedgerows. Where there is too much luminance near exist points, a bats vision can be reduced resulting in disorientation. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Any delays of emergence can reduce feeding periods and affect the overall survival rate of bats. Bright light may reduce social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost. In addition to causing disturbance to bats in the roost, artificial lighting can also affect the feeding behaviour of bats. Mitigation measures to address this aspect of the proposed development are included below.



Overall, the proposed development will not result in a net loss of linear foraging habitat for bats. It is concluded that impacts on foraging/commuting/roosting of any bat species as a result of the operation phase will be **permanent imperceptible impact**.

#### **5.3.4.7 Harbour seal (Construction Phase)**

Individual harbour seals were recorded in the vicinity of the existing jetty in most months between February and August 2019. Although animals present this far up the River Lee are likely to be wandering and foraging animals, the regularity of sightings in this area means that this species may be exposed to risks of disturbance or displacement during the construction phase. However, as the number of sightings is low and the individuals observed were in transit, it is considered that any impacts on harbour seal during the construction phase of the development will be **temporary and not significant**.

#### **5.3.4.8 Harbour seal (Operational Phase)**

Sightings of this species were infrequent and only individual seals were observed. The risk of injury or mortality due to collisions from increased use of the jetty is considered low as seals in the immediate vicinity of the site are exposed to human activity on a daily basis and would be habituated. The cargo vessels operating within the channel will be slow moving and thus any animals in the area would have sufficient time to avoid any collisions and thus injury or mortality. In light of this, it is concluded that this species is unlikely to be significantly exposed to any impacts from the operation phase. Given that the haul out locations are at least 4km from the development area and that seals are mobile and can readily move away from short-term disturbance, any impact on seals will be imperceptible.

It is concluded, therefore, that impacts as a result of the operation phase will, if they occur at all, be a **permanent imperceptible impact**.

#### **5.3.4.9 Aquatic Fauna- Fish and Invertebrate Species (Construction Phase)**

Given the proximity of the proposed works to Cork Harbour, significant impacts on aquatic fauna have the potential to occur as a result of the unmitigated construction phase of the proposed development. High levels of silt in surface water run-off from the construction site, can impact in particular on fish species. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species.

It is noted that there is no risk of alteration to the hydrological regime within the surrounding waters of Cork Harbour. Deposition of sediments within the harbour is a natural process which occurs over a number of tidal cycles and as such will not result in any change to the existing infaunal



communities in surrounding intertidal habitats as the organisms within have adapted to the natural deposition of sediments in estuarine/marine environments.

Habitats which are estuarine and marine in nature (Estuaries, Mudflats and sandflats etc.) are very unlikely to be affected. It is noted that due to the dilution provided in the marine environment and naturally fluctuating levels of silt, impacts are only likely to arise from extremely severe levels of siltation. The risk of significant silt levels being generated is very low given the limited scope of the proposed development and due to the mitigation measures (see **Section 5.4 below**) to be implemented.

Overall, impacts as a result of the construction phase will, if they occur at all, be a **short-term imperceptible impact**.

#### **5.3.4.10 Aquatic Fauna- Fish and Invertebrate Species (Operational Phase)**

It is considered that the operational phase of the proposed development will not result in poor water quality impacts within Cork Harbour (see **Section 5.3.3.2**). Therefore, it is considered that impacts on aquatic fauna during the operation phase will be **long-term imperceptible**.

### **5.3.5 Birds**

#### **5.3.5.1 Habitat Loss (Construction Phase and Operation Phase)**

##### **5.3.5.1.1 Shore and water birds (including all SCI)**

The habitats that occur within the 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. This is particularly the case for the species of waterfowl and waders that rely on the nearby estuarine and intertidal habitats, and the waters of the wider Cork Harbour area, where more favourable habitats for these wetland bird species occur. It is considered that the habitat loss required for the project will result in slight long term impacts on shore and water birds using the site/greater area.

The proposed development will not result in the permanent loss of potential foraging and roosting areas. It is considered that any species that use the site are not expected to rely on the resources available within the proposed site itself. Whilst the habitat to be removed may form part of the feeding range of a number of species, the area to be removed is not likely to be a critical feeding resource for these species based on similar available and higher valued habitat in the surrounding landscape.

It is considered that the habitat loss within the site will not significantly impact the shore and water birds that use the greater area. More favourable habitats occur in the wider Cork Harbour area. It is considered that the habitat loss within the site as a result of the proposed development will result in **permanent imperceptible impacts**.



#### 5.3.5.1.2 Birds of Prey

Avian monitoring at the Belvelly Port Facility site suggests that there is ample foraging habitat for birds of prey using the area, including peregrine, buzzard, kestrel and sparrow hawk. Therefore the habitat loss within the proposed development site will not result in significant impacts on foraging birds of prey using the area.

A pair of Peregrine were seen regularly on the tallest building at the centre of the overall Bellvelly Port Facility site throughout the winter, spring and summer 2018/2019, on almost all survey occasions. A male Peregrine was further recorded onsite in January 2020 with breeding confirmed in June 2020. The wider surroundings of the proposed development site consist primarily 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 habitats could support several pairs of peregrine falcon. However, the topography is flat and does not provide many natural nesting opportunities. Therefore, a lack of nest sites could be a limiting factor undermining local population growth. This building will be unaffected by this proposed development.

Overall, the predicted impact on birds of prey as a result of the proposed development is considered a **permanent, imperceptible impact**.

#### 5.3.5.1.3 Passerines/Pigeons and Game Birds

The habitats that occur within the 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, including passerines, pigeons, and game birds. Scrub habitat for example, is often an ephemeral habitat within the wider agricultural landscape and the scrub on site has developed because sections of the site are no longer utilised. Small areas of this type of scrub are commonly lost or recreated within the wider landscape. It is noted that the woodland and treeline habitats along the Belvelly Port Facility site boundary, will be preserved as part of the proposed development.

The wider surroundings of the proposed development consist primarily 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 such as grey wagtail, linnet, kingfisher, and redstart. Once the construction phase is complete, it is considered that the bird species present will continue to use the habitats within and adjacent to the site. It is considered that the habitat loss required as part of this proposed development will result in **permanent not significant impact** on passerines, pigeons, and gamebirds using the area.

### 5.3.5.2 Displacement and Disturbance (Construction Phase and Operation Phase)

This section of the assessment focuses on the disturbance and displacement effects on all birds observed during the winter and summer surveys and also includes any SCI species.

#### 5.3.5.2.1 Shore and water birds (including all SCI)

There is the potential for visual and noise disturbance to impact shore and water birds arising from workers, plant and machinery during construction and the operational stages of the development.



Certain species are more sensitive to disturbance than others. Wintering birds in Cork harbour have habituated to moderate levels of disturbance associated with the daily activity of a busy harbour.

There is potential for disturbance to roosting birds arising from disturbance from workers, plant and machinery and from noise emissions from machinery on site particularly along the northern shores of the main site and the northern annexe where large numbers of birds forage on the intertidal mudflats.

The proposed development footprint of the Goulding's facility is located in close proximity to the northern boundary of the overall Belvelly Port Facility site. This could potentially disturb foraging birds on the mudflats to the north with the presence of plant and workers above the shoreline.

The response of birds to noise disturbance is seen as birds moving away from the works to areas which are less disturbed. Moderate noise disturbance is typified as high level noise which has occurred over long periods so that birds become habituated to it. It is considered that the construction work will present a moderate to low level of noise disturbance. This encompasses regular noise between 60-70dB, and noise between 55-72dB in some highly disturbed areas such as adjacent to roads (IECS, 2013). Noise emissions from the construction work are predicted to be approximately 65dB at the site boundary and it is considered that this will result in moderate disturbance and is within acceptable noise levels for water birds. During construction the impact on birds is predicted to be **short-term** and **not significant**.

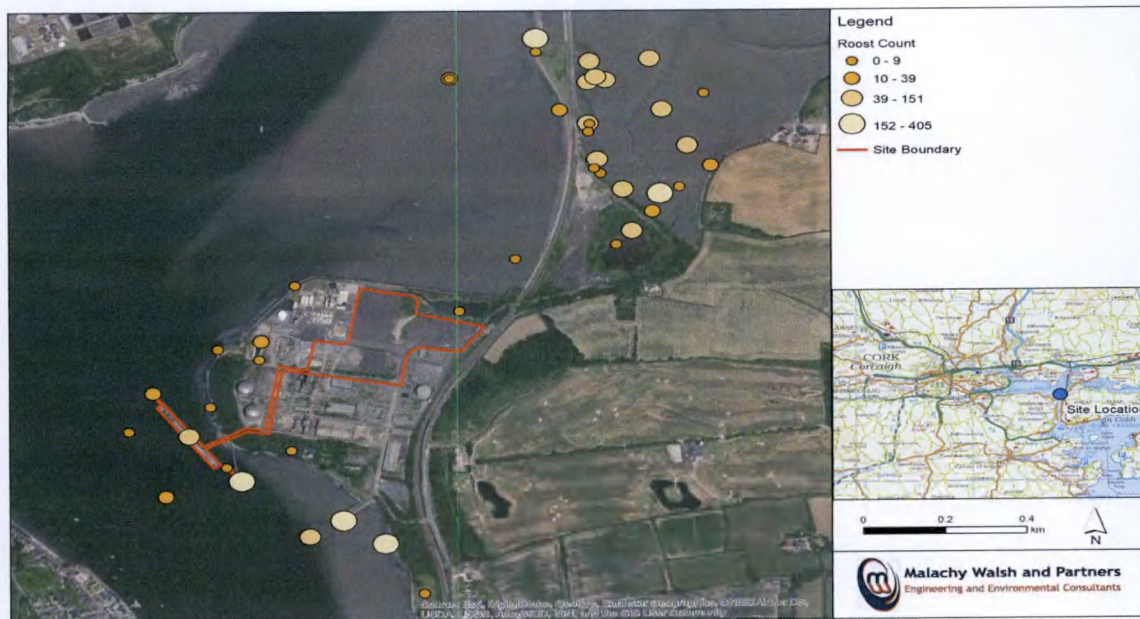
Mitigation measures are included in **Section 5.4** below.

During the operational phase of the proposed development, it is considered unlikely that the proposed development will result in significant disturbance/displacement impacts on shore and water birds. The proposed Goulding site is set back from the shoreline and as part of the BMDC application (Planning Ref. 19/06783) currently under review; it is proposed to construct a flood protection revetment along the northern boundary of the Belvelly Port Facility site. This flood revetment will be planted with native tree species creating a narrow woodland band. The new planting will ultimately reach heights of 10-15m after a number of years, screening the proposed Goulding site from the adjacent mudflat habitat. This woodland band will provide a buffer along to the shoreline and it is therefore unlikely that any increases in noise and lighting would have a significant impact on birds making use of the nearby marine environment.

Artificial lighting can affect birds in numerous ways, it can affect the quality of breeding habitat along with breeding timing, prey availability, foraging patterns and by increasing exposure to predators. The main risk to the Species of Conservation Interest (SCI) for which Cork Harbour SPA is designated, is from lighting during dusk, dawn and night hours, which could increase the risk of predation from mammalian predators, particularly during high tide periods when birds are roosting.

Low numbers of birds roost within the main Belvelly Port Facility site or along its northern boundary. The main roosting sites are located within the Cork Harbour SPA, to the north of the Northern Annexe (see **Figure 5.11** below).





**Figure 5.11. High tide roost locations including total bird counts over the 6 monthly survey period for winter 2018-19**

As shown in on the Proposed Site Lighting planning drawing, the proposed fertiliser facility has a combination of light fittings. These range between building wall mounted units, 6m high column lights for the carpark and 3 No. High 25m high mast lights located within the storage yard areas. The light lux levels along the northern boundary of the proposed fertiliser facility have been kept as low as possible with lighting lux levels of between 10-28 while still maintaining the minimum lighting levels for operations. The proposed lighting fixtures have been designed to deflect the light into the site and minimise the light spill outside the site boundary and this is evident in the low lux levels along the boundary which range between 9 – 16 lux. The proposed northern boundary vegetation planting as part of planning application ref. Planning Ref. 196783 will provide additional screening between the site and the shore.

The proposed lights will be turned off outside operational times. 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 mixing and bagging operations will occur between 7.00 a.m. and 12.00 midnight, and HGV distribution of finished fertiliser product from the facility by road will occur between 7.00 a.m. to 7.00 p.m. Monday to Saturday.

Light spillage is limited to within the proposed yard area and will not overlap with any of the roosting locations or adjoining mudflat habitats within both the Cork Harbour SPA and Great Island Channel SAC.

With regard to the introduction of lighting into the environment, mitigation measures to address this aspect of the proposed development are included below. Overall, the impact from lighting is predicted to be **permanent, not significant**.



Many species are seen to mitigate the effects of continued but harmless disturbance by habituation; as they become used to disturbance they react less strongly. Wintering and breeding birds in Cork Harbour have habituated to moderate levels of disturbance associated with the daily activity of a busy harbour. Sources of existing anthropogenic disturbance within the harbour include port activities including shipping, road traffic including trucks and commercial vehicles, aircraft, energy generation, recreational vessels, and activities associated with residential, urban areas and industrial areas on the shorelines.

Chapter 14 Noise and Vibration of the EIAR notes the following in relation to the operational phase of the project in relation to shorebirds and the adjoining Cork Harbour SPA;

*'With respect to SAC/SPA areas north of Marino Point, proposed operations will not result in increases in noise levels, as the soundscape here is currently dominated by R624 traffic. Traffic levels remain elevated during the evening and night-time..... Given that a doubling of road traffic is required to alter  $L_{Aeq,T}$  levels by 3 dB, road traffic noise impacts are not expected at receptors or at the SPA/SAC. No indirect impacts are expected.'*

Therefore, any disturbance/displacement impacts during the operational phase of the proposed development will result in **permanent not significant impacts** on shore and water birds using the area.

#### 5.3.5.2.2 Birds of Prey

Potential disturbance to foraging birds of prey owing to the construction and operational phase of the proposed development is considered a permanent imperceptible negative impact. In general there is an abundance of suitable foraging habitat in the surrounding area for species such as peregrine, buzzard, kestrel and sparrow hawk.

Peregrine was the only species confirmed to be breeding on-site. Mitigations are included in **Section 5.4** below to prevent significant disturbance/displacement impacts on breeding peregrine in the area.

Impacts on birds of prey as a result of the proposed development is considered **permanent imperceptible**.

#### 5.3.5.2.3 Passerines/Pigeons and Game Birds

Some disturbance to breeding passerines, pigeons, and game birds could be expected if construction work takes place in the breeding season.

Disturbance impacts during the construction stage of the project will be localised and confined to areas within the site/existing facility. There may be slight temporary disturbance/displacement impacts to bird species at construction areas by these species.

As the habitats within the development area are not of intrinsic value to the species using the site, and as there is an abundance of similar habitat in the locale, this is not considered to be a significant



impact. Birds are expected to continue utilising habitats within the development area once construction is completed. It is expected that any bird species that are displaced as a result of the construction phase will use the alternative habitats readily available to these species in the area surrounding the site.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance levels. The impact on terrestrial birds in habitats adjoining the proposed development site is therefore predicted to be **permanent** and **imperceptible** during operation.

### 5.3.6 Non-native Invasive Species

Following best practice guidance any amber listed species found on site i.e. Butterfly bush, will be removed through standard eradication/control methods. On the basis of its invasive qualities, the ecological value and types of habitats recorded during the walkover survey and its Amber Listing by Invasive Species Ireland, this species is unlikely to have a significant ecological impact. However, if not eradicated, Butterfly bush 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**.

Vessel biosecurity is governed by the IMO Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) (resolution MEPC.207(62)). These guidelines provide a globally consistent approach to the management of biofouling, which is the accumulation of various aquatic organisms on ships' hulls. Biofouling Guidelines represent a decisive step towards reducing the transfer of invasive aquatic species by ships. Additionally, ballast water will be disposed of in line with IMO and Flag state requirements. This will be no different to the disposal from all other existing marine traffic within the harbour. IMO ballast water management convention (BWMC) is not yet ratified in Ireland, however, flag state requirements for each vessel and European Maritime Safety Agency (EMSA) regulation 1143/2014 do apply. Many vessels are being retrofitted with Ballast Water Treatment systems and all vessels must have a ballast water management plan, detailing the procedures for handling, intake, exchange, treatment and discharge of Ballast Water. These controls form part of the vessels classification and flag state certification and are audited under their survey regime: initial, renewal, intermediate & annual surveys. The potential introduction of alien species due to the increase in vessels utilising the jetty will be **long term** and **imperceptible**.

### 5.3.7 Water Quality

There is potential for pollutants to enter the marine environment during the construction phase and negatively impact on water quality. This could result in habitat modification by affecting the distribution or abundance of prey and consequently have a negative effect on the distribution species, such as foraging birds. A CEMP has been developed to ensure that the proposed works will not deteriorate the water quality and will safeguard the existing water quality status of the adjacent



Lough Mahon. Refer to **Appendix 2.3**. Further mitigation has been included with regard to water quality monitoring, control of concrete washout, fuel management on site.

It is not anticipated that prey abundances or distribution will be significantly affected by the operation of the WWTP or surface water system. The water quality of the foul effluent discharge will meet the required standards as demonstrated in the assimilative capacity and mass balance assessment. Surface water discharges from the site will be intercepted through a Class 1 oil retention interceptor prior to discharge.

The jetty will be serviced with its own storm water system (BMDC application (Planning Ref. 19/06783)). In the 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. An isolator switch situated at the pumping station will be used to manually divert any runoff to this tank either as an operational procedure at the time of loading/unloading cargo or as a procedure to be carried out in the event of a spill or possible contamination. Once the surface water in the tank has been tested for contaminants it will either be transferred through the oil interceptor to the outfall or will require collection and appropriate disposal off site. The necessary management and disposal of the contaminated surface water is the responsibility of the individual jetty user.

Vessels operating at the jetty are governed by the International Maritime Organizations (IMO) International Convention for the Prevention of Pollution from Ships (MARPOL) treaty which has been ratified nationally<sup>25</sup>. MARPOL is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes, which are as follows;

- Annex I Regulations for the Prevention of Pollution by Oil (entered into force 2 October 1983)
- Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force 2 October 1983)
- Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force 1 July 1992)
- Annex IV Prevention of Pollution by Sewage from Ships (entered into force 27 September 2003)
- Annex V Prevention of Pollution by Garbage from Ships (entered into force 31 December 1988)
- Annex VI Prevention of Air Pollution from Ships (entered into force 19 May 2005)

Given the water quality controls proposed for the works and the outcome of the assimilative capacity calculations, it is not considered that the project will have a significant effect on water

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<sup>25</sup> [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx)



quality or consequently prey biomass effects. However, on the basis of the precautionary principle, further mitigation measures have been outlined to ensure the robustness of the construction water quality controls.

### 5.3.8 Cumulative Impacts

An assessment of relevant projects and plans was undertaken to determine the potential for significant in combination effects on biodiversity. A cumulative impact arises from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development. There are a number of plans associated with the Cork Harbour area, some of which have been subject to Appropriate Assessment and most of which include safeguards to protect the marine environment.

In relation to the future development of the proposed fertiliser bagging and mixing plant on the Belvelly Port Facility site, it is expected that the construction phase will overlap with the proposed demolition and site infrastructure works. Both projects will be compliant with best practice construction practices and the CEMP (**Appendix 2.3**). While there is the potential for a slight increase in disturbance/displacement impacts on fauna during the overlap period, this will be minor as the majority of the main disturbance factors i.e. demolition works will have been completed. Therefore, no significant potential cumulative impacts on biodiversity are expected due to the proposed works.

According to EPA (2018) diffuse urban, agriculture and hydromorphology are the most significant pressures affecting the Lee-Cork Harbour catchment. Excess phosphorus leading to eutrophication is a concern in several water bodies within the catchment, as well as ammonia for a limited number of water bodies. Elevated phosphorous is associated in the catchment with pressure types diffuse urban, agriculture, urban waste water, forestry, industry, agriculture and domestic waste water and anthropogenic pressures (Unknown). The ammonia is associated with a waste facility. There is potential for significant cumulative effects from these pressures on water quality during the construction phase of the project.

Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been highlighted as the main significant pressure to the waters of Lough Mahon, with the Carrigrennan (Cork City) WWTP being the main pressure. As a result, Lough Mahon is considered at risk of not meeting its surface water environmental objectives.

A cumulative impact arises from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development. Climate change and agriculture are other considerations. The surrounding environment is dominated by urban development, agricultural land, and Cork Harbour. The activities, pressures and projects considered in relation to the potential for cumulative effects are outlined below.

#### 5.3.8.1 Climate Change

Climate is an important environmental influence on ecosystems. Changing climate affects ecosystems in a variety of ways. For instance, warming may force species to migrate to higher latitudes or higher elevations where temperatures are more conducive to their survival. Similarly, as



sea level rises, saltwater intrusion into a freshwater system may force some key species to relocate or die, thus removing predators or prey that are critical in the existing food chain. Climate change not only affects ecosystems and species directly, it also interacts with other human stressors such as development. Although some stressors cause only minor impacts when acting alone, their cumulative impact may lead to dramatic ecological changes (Settele *et al*, 2014). Because species differ in their ability to adjust, asynchronies<sup>26</sup> can develop, increasing species and ecosystem vulnerability. These asynchronies can include mismatches in the timing of migration, breeding, pest avoidance, and food availability. Growth and survival are reduced when migrants arrive at a location before or after food sources are present (Horton *et al*. 2014). Ecosystems can serve as natural buffers from extreme events such as wildfires, flooding, and drought. Climate change and human modification may restrict ecosystems' ability to temper the impacts of extreme conditions, and thus may increase vulnerability to damage. An example of a biotope is the riparian zone that acts as a buffer zone protecting riverine ecosystems from runoff of silt/nutrient laden waters via overland/pluvial flow, by absorbing/attenuating surface floodwaters. Land along Lough Mahon, within the catchment, may become vulnerable to erosion and flooding if climate change leads to increases in heavy rain-storms. This could lead to uncontrolled erosion of land, loss of soil from fields, resulting in unnatural sediment loads and associated siltation of watercourses. Climate change and shifts in ecological conditions could also support the spread of pathogens, parasites, diseases and non-native biota, with potentially serious effects on agriculture and aquatic ecosystems. Together with the proposed development, the aforementioned affects of climate change could exacerbate potential impacts associated with the proposed development.

Taking into account the nature of the wider study area (existing water quality impacts, past and present agricultural operations and urban expansion), the potential for cumulative impacts are considered unlikely to be significant as a result of the proposed development, and **long term imperceptible negative** at most. See **Chapter 9** of this EIAR for further information on climate.

### 5.3.8.2 Plans

Plans that are relevant to the Cork Harbour area include:

- Marino Point Masterplan, 2018
- Cork Metropolitan Strategic Plan (MASP), 2018
- Cork County Development Plan 2014-2020
- Cobh Municipal District Local Area Plan 2017
- Draft Cork Harbour Study 2011
- Port of Cork Strategic Development Plan Review (2010)

### 5.3.8.3 Wastewater Treatment Plants

Cork Harbour receives treated effluent from a number of scattered settlements which include Cork city itself and surrounding suburbs. Carrigtwohill WWTP discharges at Slatty Bridge to the Lough Mahon waterbody. The Cork Main Drainage scheme covers the city and suburbs including Glanmire,

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<sup>26</sup> absence or lack of concurrence in time



Watergrasshill, Douglas, Rochestown and Little Island with a WWTP at Carrigrennan, Little Island which discharges treated effluent to Lough Mahon, near Marino Point. Treated effluent from Ringaskiddy, Carrigaline, Crosshaven, Passage West and Monkstown are treated in the Shanbally WWTP prior to discharge to Cork Harbour. Works are currently ongoing as part of the Cork Lower Harbour Main Drainage Project to pump raw sewerage through a pipeline crossing between Cobh and Monkstown and on to the Shanbally treatment plant. The Cork Lower Harbour Main Drainage Project is improving the water quality in Cork Harbour.

#### 5.3.8.4 Industrial Licensed Sites

The following is a list of IED/UWWT licensed facilities<sup>27</sup> discharging treated effluent directly to the North Channel Great Island waterbody (Cork Harbour):

- Midleton WWTP - This WWTP was upgraded in 2012, but requires further upgrade works
- Irish Distillers Ltd. (P0440-02)

IEL, IPPC and IPC licensed facilities in the surrounding area include:

- Marinochem Limited, located in the northwest of the site (P0034-03)
- Cork Fabrication Services Limited which is located southwest of Cobh

IEL, IPPC and IPC licensed facilities on Little Island which is situated northwest of the site:

- Wexport Ltd. manufactures heparin and related products<sup>28</sup> (P0091-02)<sup>27</sup>
- Janssen Pharmaceutical Sciences UC (P0016-02)<sup>27</sup>
- Thornbush Holdings Limited (P0389-01)
- Cara Partners (P0017-02)
- Upjohn Manufacturing Ireland Unlimited Company (P0136-04)
- BASF Ireland Limited (P0052-02)
- Little Island BioEnergy Limited (P1018-01)

IEL, IPPC and IPC licensed facilities northeast of the site:

- Georgia Holdings Limited, T/A Youghal Carpet Yarns, Killacloyne (P0246-01)
- Fournier Laboratories Ireland Limited T/A AbbVie, Carrigtwohill (P1046-01)
- Merck Millipore Limited, (P0571-04)
- Mr James O'Brien, Carrigtwohill (P0316-01)
- John A. Wood (Burnt Lime) Limited (P0399-01)

IEL, IPPC and IPC licensed facilities south of site (Ringaskiddy):

<sup>27</sup> <https://gis.epa.ie/EPAMaps/>

<sup>28</sup> [http://www.epa.ie/licences/lic\\_eDMS/090151b280603fa3.pdf](http://www.epa.ie/licences/lic_eDMS/090151b280603fa3.pdf)



- The Hammond lane metal company limited (P0997-01)
- Indaver Ireland Limited (P1114-01)
- Pfizer Ireland Pharmaceuticals (P0013-04)
- BioMarin International Ltd (P0864-01)
- Janssen Sciences Ireland UC (P0778-02)
- Novartis Ringaskiddy Limited (P0006-03)
- Recordati Ireland Limited (P0476-02)
- Smithkline Beecham (Cork) Limited (P0004-05)
- Hovione Limited (P0010-04)
- Corrin MDA Limited (Fermoy, west of Ringaskiddy) (P0053-01)

IEL, IPPC and IPC licensed facilities southeast of site (Whitegate):

- Electricity Supply Board (Aghada) (P0561-05)
- Irving Oil Whitegate Refinery Limited (P0266-03)
- Bord Gais Energy Ltd (P0830-02)

UWWT Plants:

- Cork City, northwest of site. Compliance = pass (D0033-01)
- Carrigtwohill and Environs, northeast of site. Compliance = pass (D0044-01)
- Midleton, northeast of site. Compliance = pass (D0056-01)
- North Cobh, southeast of site. Compliance = pass (D0140-01)
- Cobh, southeast of site. Compliance = fail (D0054-01)
- Ringaskiddy Village, southeast of site Compliance = fail (D0436-01)
- Ringaskiddy, southwest of site. Compliance = pass (D0057-01)
- Passage-Monkstown, southwest of site. Compliance = fail (D0129-01)

#### 5.3.8.5 Diffuse Sources of Pollution

Diffuse sources of pollution within Cork Harbour have been identified as:

- Nutrient inputs from agricultural (and other) sources within the river catchments that discharge to the harbour
- Leaks in the existing sewer network giving rise to further nutrient inputs to the system

#### 5.3.9 Ongoing Activities

A number of landuse activities including agriculture, recreation and industry, and urban dwelling occur in the vicinity of Cork Harbour. Ongoing activity around the Marino Point site relate to industry at the Marinochem site.



## 5.4 MITIGATION

### 5.4.1 Project Ecologist

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. The project ecologist will also have a role in reviewing and approving all work method statements. The project ecologist will have the authority to stop works should an unforeseen issue arise.

### 5.4.2 Habitats

To prevent incidental damage by machinery or by the deposition of spoil during the site clearance stage, any habitats earmarked for retention will be securely fenced early in the construction phase. The fencing will be clearly visible to machine operators.

Any habitats earmarked for retention that are damaged and disturbed will be left to regenerate naturally or will be rehabilitated and landscaped, as appropriate, once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.

### 5.4.3 Birds

#### 5.4.3.1 Vegetation Removal

All vegetation removal required to accommodate the works will be done outside of the bird breeding period, March to August, inclusive.

#### 5.4.3.2 Wintering Birds and Bird Protection during breeding season

Standard construction site screening will be erected local to construction works in the most northern part of the site, which will minimise visual stimuli and subsequent visual disturbance to birds of SCI roosting on the adjacent rock armour, wetland, nearby mudflats and shorelines and foraging on nearby mudflats and subtidal areas.

Vegetation which includes suitable nesting habitat around the site will be removed during winter months and before 1st of March. This will ensure no impact on nesting birds during construction.

Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Lights will be focused away from the intertidal areas which support feeding birds. Lights will be as low as possible and light spillage will be minimised. Designs to luminaires to help reduce light spillage and to direct light to the intended area only, particularly along the northern boundary, are by using accessories such as hoods, cowls, louvres and shields.



It is important to maintain Dark Zones for roosting intertidal bird species in areas where lighting is not necessary. However, where lighting is required, this lighting should be placed at a minimum height using the lowest lux value permitted for health and safety.

#### **5.4.3.3 Common Tern Measures**

In order to avoid disturbing breeding Common Tern at the jetty, it is necessary that construction works at the proposed Gouldings site do not start within the breeding period April to July, so as not to introduce a new disturbance during the breeding cycle. Works should already be underway by April so birds are acclimatised before egg laying, or start in August. Works should start between September and March. This is also necessary to minimise disturbance of the colony at the Martello tower and breeding site at the pontoon.

#### **5.4.3.4 Peregrine Falcon Measures**

In order to avoid disturbing breeding peregrine in the vicinity of the construction area, it is necessary that construction works at the Gouldings site do not start within the breeding period April to July, so as not to introduce a new disturbance during the breeding cycle. Works should already be underway by April so birds are acclimatised before egg laying, or start in August. Works should start between September and February/March.

#### **5.4.4 Bats**

While no bats were recorded within the development site, external lighting should be kept to a minimum during construction and operation, at locations where it is likely to disturb bats, and where possible will follow the Bat Conservation Ireland Lighting Guidelines and the Bat Conservation Trust 'Bats and artificial lighting in the UK' 2018 Guidelines, if applicable.

#### **5.4.5 Otter**

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. Should any holts be identified within the proposed zone of influence of the project, additional surveys will be undertaken under the appropriate NPWS licence. Any holts found to be present will be subject to monitoring and mitigation as set out in the NRA Guidelines for the Treatment of Otter prior to the Construction of National Road Schemes (2006).

#### **5.4.6 Water Quality Controls**

A CEMP has been developed to ensure that site works will not deteriorate the water quality and will safeguard the existing water quality status of the adjacent Lough Mahon. The key to avoid impacts to water during the construction works is good site management practices, tight controls, regular inspections and ongoing vigilance with staff and employees on site. These measures are outlined in the CEMP in **Appendix 2.3**, Volume 3 of the EIAR. No additional mitigation is proposed here.



### 5.4.6.1 Invasive Species Control

#### Control of in-situ Invasive Plant Species

The large open bare paved areas and road side edges that dominate the overall Belvelly Port Facility site have become colonised by opportunistic plant species and are now significantly overgrown due to disuse. The dominant species is butterfly bush (*B. davidii*), a Medium Impact invasive species<sup>15</sup> which is dominant and extensive in its distribution to the point of ubiquity.

Significant sections of the treelines in the eastern boundary of the site are infected with old man's beard (*C. vitalba*), a Medium Impact invasive species<sup>15</sup> which is also present in the shrubby growth adjacent to the south of the marsh in the northern annexe.

The scrub to the south of the man-made lagoon and along the northeastern boundary of the Gouldings site is also dominated by butterfly bush (*B. davidii*) and an area of ca. 35m<sup>2</sup>, adjacent to the southern bank of the lagoon, has been colonised by winter heliotrope (*P. fragrans*), a Medium Risk invasive species<sup>15</sup>.

In order to appropriately manage these invasive species as part of the BMDC application (Planning Ref. 19/06783), Invasive Plant Management Plans and species specific Control Programmes will be consulted and adhered to. Invasive species management methodologies and plans outlining Best Available Techniques (BAT) will be sourced from current best practice/TII (The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads).

#### Bio -security

To prevent the transfer of in situ invasives off site and the introduction of ex-situ invasive plant species to the site, the following measures are proposed:

- To reduce the likelihood of invasive species being introduced to the site from quarries, the aggregate will be crushed stone which will be biologically inert and would not be expected to have a seed bank.
- To reduce the likelihood of invasive species spreading throughout the site, the construction personnel involved in works will be trained in basic relevant invasive species prevention and management.
- Invasive species management methodologies and plans outlining Best Available Techniques (BAT) will be sourced from current best practice/TII (The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads).

### 5.4.7.3 Bird Monitoring

Bird monitoring will be undertaken prior to construction works commencing, during construction work and following completion of the construction works. The survey design should be developed by a suitably qualified ecologist.



## 5.5 RESIDUAL IMPACTS

The potential effects of the proposed development were considered and assessed to ensure that all effects on Key Ecological Receptors are adequately addressed and no significant residual effects are likely to remain following the implementation of mitigation measures/best practice. With best practice incorporated into the design, the potential for significant effects in relation to disturbance/displacement of fauna is not anticipated. It is considered that the significance of the residual impacts will be **permanent slight to imperceptible negative**, provided the appropriate mitigation measures and best practice methodologies recommended and provided in the CEMP and implemented.

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## 6. LAND AND SOILS

### 6.1 Introduction

This chapter of the EIAR assesses the impacts to the land and soil and considers any direct or indirect effects on these resources arising from the proposal for the development of a new agricultural fertiliser facility and additional port operational use of the jetty to facilitate general dry cargo vessels at the Belvelly Port Facility, Marino Point, Co. Cork.

### 6.2 Scope of Assessment

Land and soil is considered both in geological terms and in current, historical and planned land use. The subject matter of hydrogeology is addressed in **Chapter 8 Hydrogeology** of this EIAR. This chapter includes data and descriptions of the soil and geology at the site, as well as any prominent features present. Data includes information from baseline surveys as well as desk top research. The geology is briefly described at the local and regional level. All activities associated with the project are considered for construction and operational phase impacts.

#### 6.2.1 Methodology

The assessment was completed by both desk study and field visits and in line with the requirements of the current EPA advice notes and guidelines on Environmental Impact Assessment. The assessment has been completed having regard to the EPA's draft Guidelines on Information to be contained in Environmental Impact Assessment Reports (2017).

#### 6.2.2 Sources of Information

A desk study was undertaken to collate and review available information, datasets and documentation sources pertaining to the site's natural environment and involved the following:

- Examination of maps and aerial photography (including the Geohive online resource of maps and historic maps);
- Examination of the Geological Survey of Ireland (GSI) datasets pertaining to geological (bedrock, heritage) and extractive industry data;
- Examination of the Geological Survey of Ireland (GSI) Sheet 25 geological map and accompanying description, "Geology of South Cork".
- Examination of EPA soil and subsoil maps;
- Review of the IGI Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (2013);
- Review of the 2003 Report on Site Investigation, Irish Fertilizer Industries Site, Marino Point, Cobh; and
- Review of the 2012 RPS Hydrogeological IFI Site Investigation Report, Marino Point, Cobh.

A walkover survey of the site was undertaken in May 2019 to confirm the following:

- the industrial and brownfield setting of the proposed site;



- the site characterisation as constituting made ground; and
- the conditions of the coastline around the site.

### **6.2.3 Assessment Criteria**

The assessment is based on the EPA Glossary of Impacts, included in the 2002 Guidelines on Information to be contained in Environmental Impact Statements and the Description of Effects included in the draft 2017 Guidelines. The assessment of the Likely Significant Impacts in the IGI Guide to Geology in Environmental Impact Statements (2013) was also consulted.

### **6.2.4 Competency of Assessor**

This chapter was completed by Fergus Doyle and Olivia Holmes of Malachy Walsh and Partners. Refer to **Chapter 1 Introduction** for full details of their qualifications and relevant experience.

## **6.3 Existing Environment**

### **6.3.1 Site and Project Context**

The works involved for this proposed development include the relocation of the Goulding's agricultural fertiliser facility from Cork city and the additional port operational use by cargo vessels at Marino Point, Co. Cork. This will require the construction of a new agricultural fertiliser facility and the increased use of the jetty by cargo vessels. The proposed Goulding's redevelopment will be bound on all sides by the proposed Belvelly Port Facility. The jetty extends from the western edge of Belvelly Port the site.

Marino Point is located on a small peninsula on the northwest of Great Island, within Cork harbour to the east of Cork City (**Figure 6.1**). It is approximately 5km north of Cobh, 5.5km south-west of Blackrock, Cork and 10km east of Cork City centre. The proposed development will be located on a brownfield site, constituting made ground.



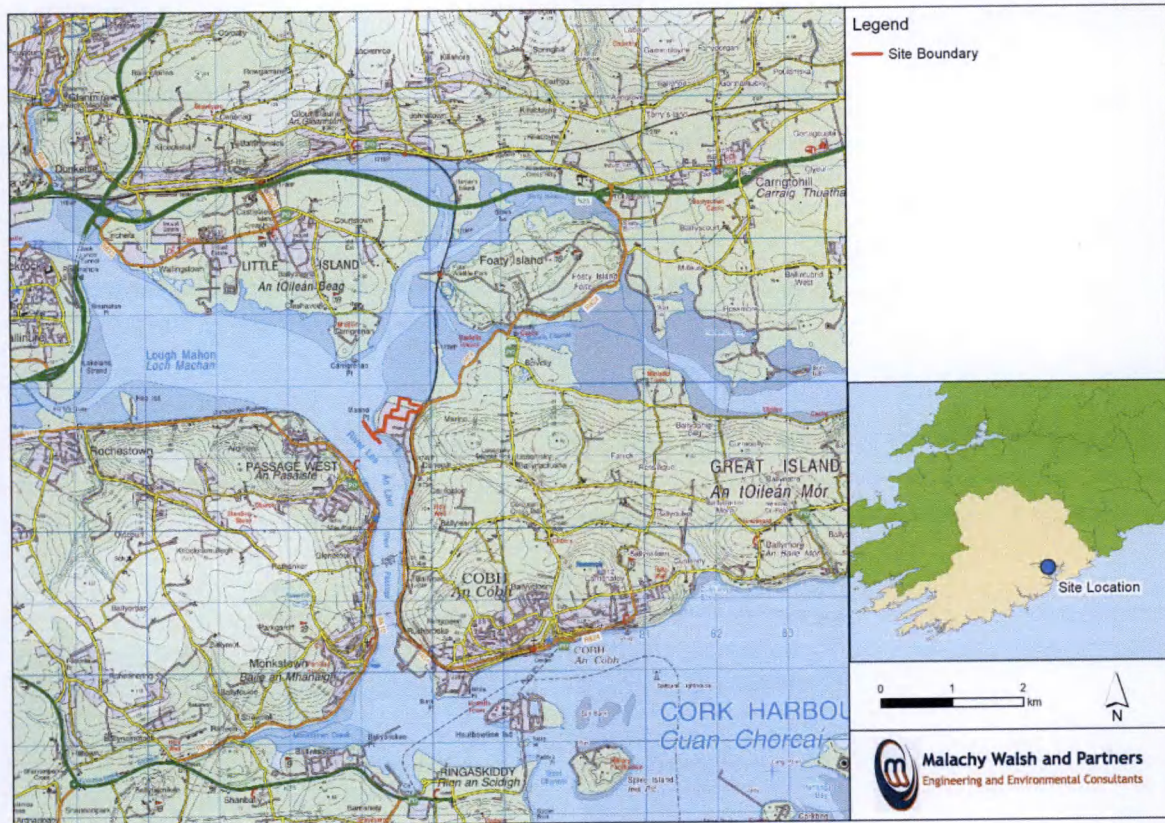


Figure 6.1 Proposed site location

### 6.3.2 Existing Land Use

The eastern boundary of the Belvelly Port Facility 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 6.1**). Passage West is approximately 1.0 km from the centre of Marino Point on the opposite side of the harbour (west). Cobh Golf Club is located to the east, on the eastern side of the R624.

The Marino Point site was formerly occupied by IFI. The site operated under an Integrated Pollution Control (IPC) Licence (P0028-01) issued by the EPA in 1996 (reference number P0028-01). In October 2019, the EPA confirmed in writing that this licence has now ceased to exist. The EPA letter regarding the cessation of the licence is attached as **Appendix 2.4** of Volume 3.

### 6.3.3 Site 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 distinctive town of Cobh has a varying topography from its position as a seaside town, extending up the hills of Great Island. A review of the historic maps of Great Island (using Geohive) indicates the Marino Point area includes reclaimed land, particularly to the north of today's point. The original coastline is visible in **Figure 6.2** below. It shows that the area where the proposed agricultural fertiliser facility will be located is reclaimed land.





**Figure 6.2 Overlay of historic map (1837-1842)**  
*Source: Geohive online maps.*

#### **6.3.4 Regional Geology**

The rocks in the south Cork region are mostly sedimentary in nature, dominated by sandstone and limestone. There is an igneous intrusion west of Cork City, close to the town of Bandon. The Cork City area is underlain by a combination of the Devonian Old Red Sandstones and the Dinantian (Carboniferous) Pure Unbedded Limestone and Dinantian Mudstones and Sandstones Group (GSI). In the greater area, the oldest rocks are the Devonian Old Red Sandstones (DORS). These sediments were deposited from rivers into the Munster Basin, an ancient large trough, forming the sandstones, siltstones and mudstones of the facies. The uppermost Devonian Old Head Sandstone Formation (the Cork Group) succeeded the DORS and is in turn succeeded by the Carboniferous sediments, such as the limestones and lower limestone shales. All sedimentary rocks in the region were deposited during the late Devonian and Carboniferous geological periods, approximately 370 to 310 million years ago.

#### **6.3.5 Local Geology**

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 underlying bedrock geology of the site is relatively complex, with three different bedrock units and a series of faults running through the site. The identified bedrock present is as follows:



- Cuskinny Member – flaser bedded sandstone and mudstone (north and western area of the site)
- Old Head Sandstone - flaser bedded sandstone and minor mudstone (east and central area of the site)
- Gyleen Formation – Sandstone with mudstone and siltstone (south western area of site)

Three fault lines occur on the Marino Point peninsula. 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 above information can be observed in **Figures 6.3** and **6.4**, below.

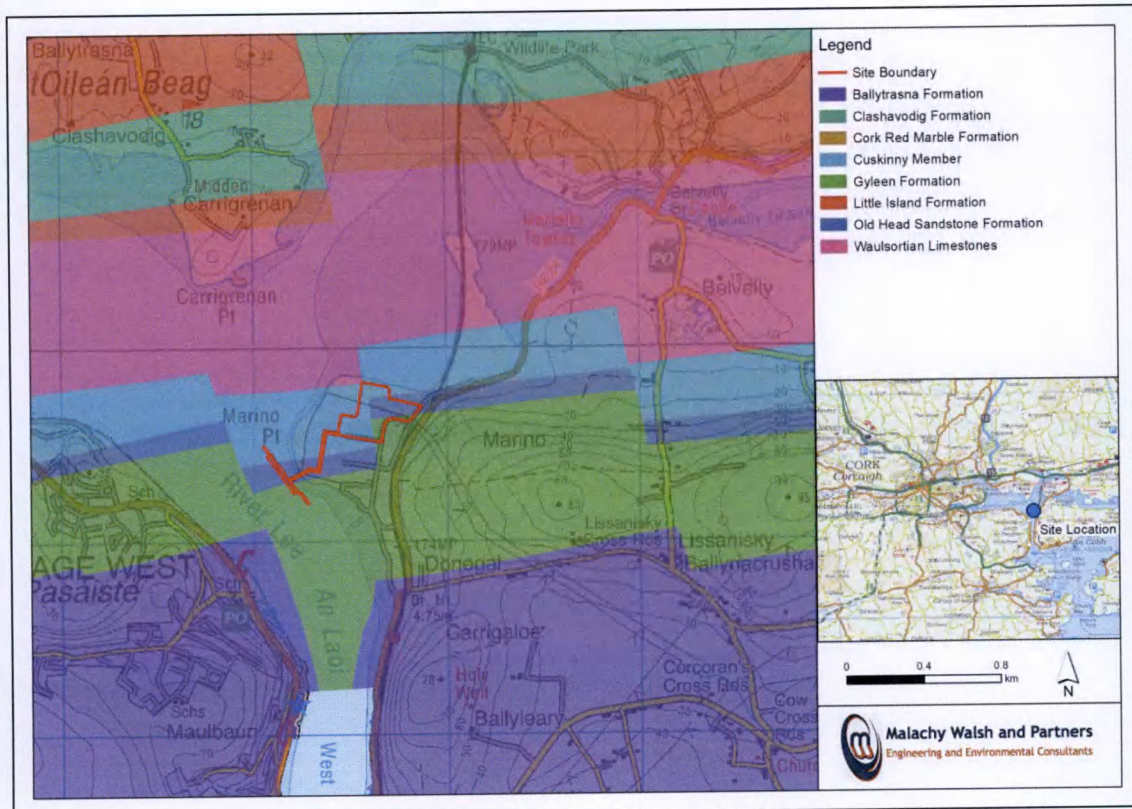


Figure 6.3 Local bedrock unit names at the proposed development site



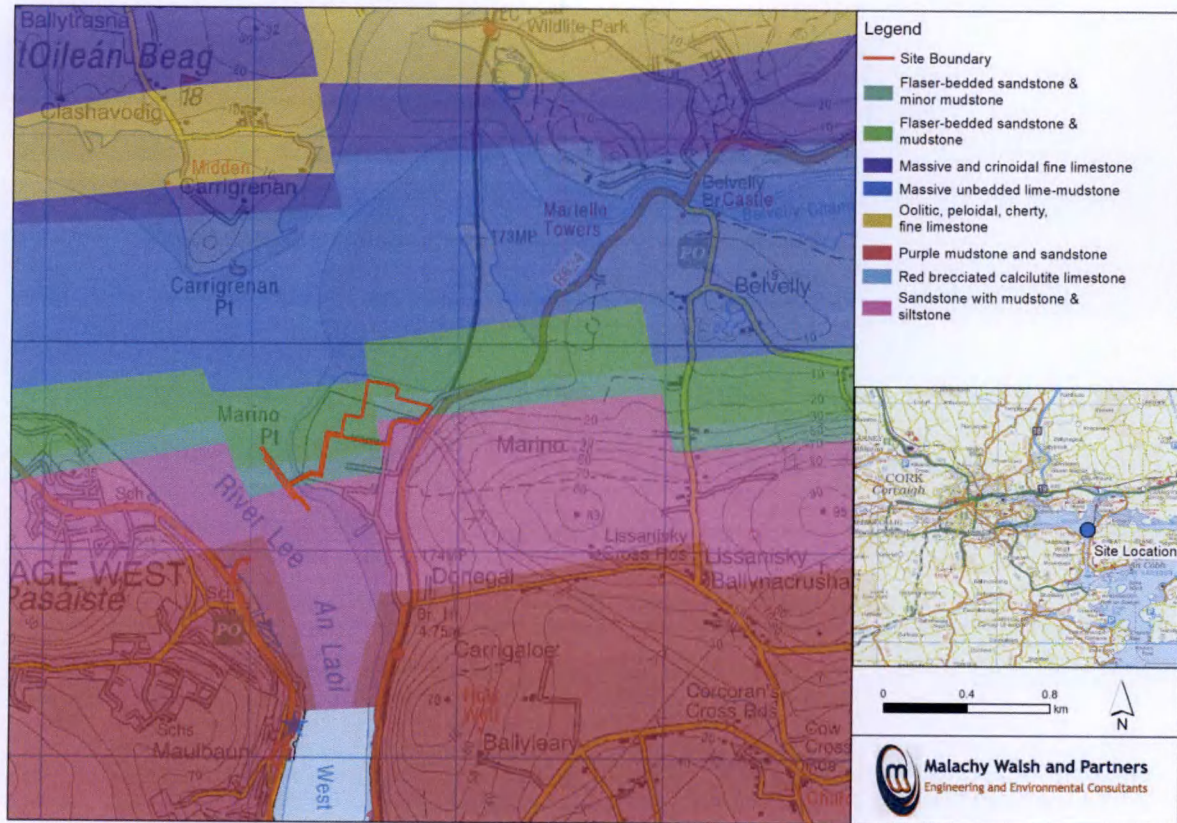


Figure 6.4 Local bedrock descriptions at the proposed development site

### 6.3.6 Soil and Subsoil

Soil is an essential natural resource and inherently valuable to all life. Soil includes the topsoil and subsoil, which together provide for the following important functions;

- Facilitate the hydrological cycle in the filtration/recharge, storage and discharge of rainwater.
- Support all terrestrial ecology, including all flora and fauna (and all food crops).
- Holding or preserving archaeological remains.
- Provision of raw materials and a base on which to build.

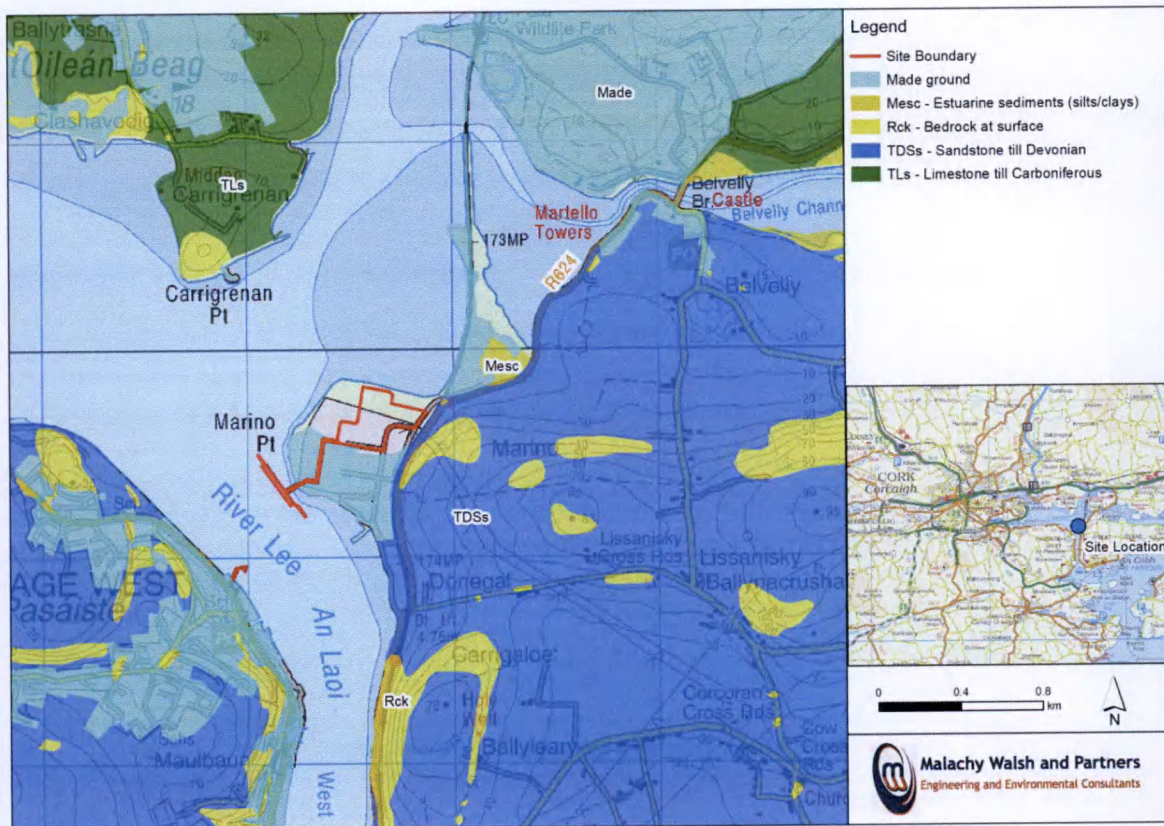
Soil (topsoil) and subsoil may derive from parent geological material and organic matter under the influence of processes including weathering and erosion. The presence of soil on a site may be naturally derived or may have been imported to the site in the case of brown field sites.

There is no available Teagasc data (GSI) on soil and subsoil for the proposed agricultural fertiliser facility development site. This area situated at the north of the Marino Point peninsula was reclaimed from Lough Mahon in the 1970s and now consists of hardstanding overlying made ground. The underlying subsoil consists of the estuarine silts of Lough Mahon.

According to the Teagasc data (GSI online mapping) on subsoil, the remainder of the Belvelly Port Facility site is listed as being on 'Made Ground'. The region to the east of the Belvelly Port Facility, and



the greater Great Island region consists predominantly of “Sandstone till Devonian”, with sparse pockets of “Bedrock at surface” occurring throughout. Refer to **Figure 6.5**.



**Figure 6.5** Subsoil underlying the proposed development site

### 6.3.7 Economic Geology

There are numerous quarries serving the Cork City and county area. The materials available include aggregates of sandstone and limestone, sands and gravels, quarry run and concrete sands and products.

Any quarries employed during the construction phase will be appropriately permitted as required. However, details are included below, not as an exhaustive list, but to demonstrate a sample of known geological resources as follows;

- O' Mahony Sand and Gravel, Rossmore Quarry, (Carrigtwohill, Co. Cork)
- Carrigtwohill Quarry, Readymix (Carrigtwohill, Co. Cork)
- Roadstone (Carrigtwohill, Co. Cork)
- Healy Brothers, Milebush Quarry (Midleton, Co. Cork)
- Coppingerstown Quarry (Middleton, Co. Cork)
- Loftus Rockfill Quarry (Monkstown, Co. Cork)
- John A Wood, Coolmore (Carrigaline, Co. Cork)
- Ballygarvan Sandstone Quarry (Killanully, Co. Cork)



- Midleton Quarry, Roadstone Ltd, General fill, aggregates (Carrigshane, Midleton, Co. Cork) (GSI Data 2014))

### 6.3.8 Previous Site Investigations

#### 6.3.8.1 Historic boreholes from GSI Mapping

According to the GSI, there are historical boreholes on the site at the location of the existing Marino Point site. Historical Boreholes located within boundary of the Belvelly Port Facility are presented in **Table 6.1** and indicated on **Figure 6.6** below.

**Table 6.1 Historical Borehole Data by Geological Survey of Ireland.**

Borehole ID	Grid Reference (ITM)	Depth from ground surface to top of bedrock	Bedrock met	Total depth of borehole
66157	177433E,69763N	2.5 m	✓	5.25 m
66158	177551E,69729N	2.25 m	✓	4.5 m
66159	177770E,69660N	16.5 m	✓	18 m
66160	177770E,69660N	6 m	✓	8.75 m
66161	177429E,69679N	1.25 m	✓	15.75 m
66162	177698E,69581N	Null	X	19.25 m
66163	177778E,69555N	5.5 m	✓	6.75 m
70366	177843E,69617N	Null	X	5 m



**Figure 6.6 Historical Borehole Data by Geological Survey of Ireland**



### 6.3.8.2 Geotech Specialist Limited Site Investigation

A site investigation was undertaken by Geotech Specialists Limited in 2003. Geotech were commissioned by IFI to undertake the investigations, involving the excavation of 30 no. trial pits, concrete coring and hand augering. The aim of the investigation was to obtain geo-environmental information at several locations throughout the facility.

### 6.3.8.3 Groundwater Sampling Wells

5 no. more recent groundwater sampling wells were drilled on the site. These were installed at the IFI site to assess contamination in the bedrock aquifer. **Table 6.2** provides details on the wells. Locations are shown in **Figure 6.7**. No boreholes have been drilled within the footprint of the proposed agricultural fertiliser facility.

**Table 6.2 Groundwater sampling wells data.**

GSM Name	Easting (ITM)	Northing (ITM)	Ground Elevation
12-1	577602.502	569537.538	4.04
12-2	577593.03	569488.25	4.09
12-3	577589.72	569469.091	4.03
12-4	577609.626	569403.435	4.07
12-5	577630.619	569419.582	4.1





Figure 6.7 Locations of groundwater sampling wells 12-1 to 12-5

### 6.3.9 Historical Ground Contamination

Given the historical uses of the Marino Point site and reclamation using fill material, there were legacy ground contamination issues associated with the site. Previous soil sampling was undertaken by IFI during site closure. Shallow spot sampling found that there were localised pockets of petroleum hydrocarbons present throughout the site. It was subsequently recommended by the EPA that contaminated pockets be excavated.

An Independent Closure Audit undertaken for the EPA refers to the removal of hydrocarbon contaminated soils from a total of 11 no. locations on the Marino Point site. In a subsequent 2018 EPA report, the EPA considered that no significant waste, including hydrocarbons and VOCs remained on



the site as confirmed by a review of relevant documentation, IFI and other waste transfer records and on-site inspections. The EPA letter received in October 2019 stated that: *“the EPA is satisfied that the remediation of the site has been completed to the required standard. The EPA is further satisfied, based on an industrial zoning land use, that the site of the activity is in a satisfactory state, and no further action is required in relation to IPPC Licence Reg. No. P0028-01”*.

#### **6.3.10 Conceptual Site Model**

In accordance with the IGI Guidelines, a Conceptual Site Model (CSM) has been developed from ground investigation information for the area to the south east of the proposed development site and summarises the important geological features near the site. It is stated that the CSM should “consist of a series of maps centred on the development site together with interpretative cross sections passing through the development site.” The data taken from the boreholes drilled at Marino Point form the basis for the CSM. A plan of borehole locations is shown in **Figure 6.8** and a cross section analysis showing the bedrock strata across the site is presented in **Figure 6.9** below.

Up to circa 1970, pre land reclamation, the proposed agricultural fertiliser facility site was located in the Lough Mahon estuary, after which it was reclaimed and built up to form the northern part of the Marino Point peninsula. This area is now underlain by approximately 2.5m of made ground.

Groundwater well locations are organised from north to south in a relatively linear pattern and are situated towards the eastern edge of the Belvelly Port Facility. The cross section is shown across all five wells.



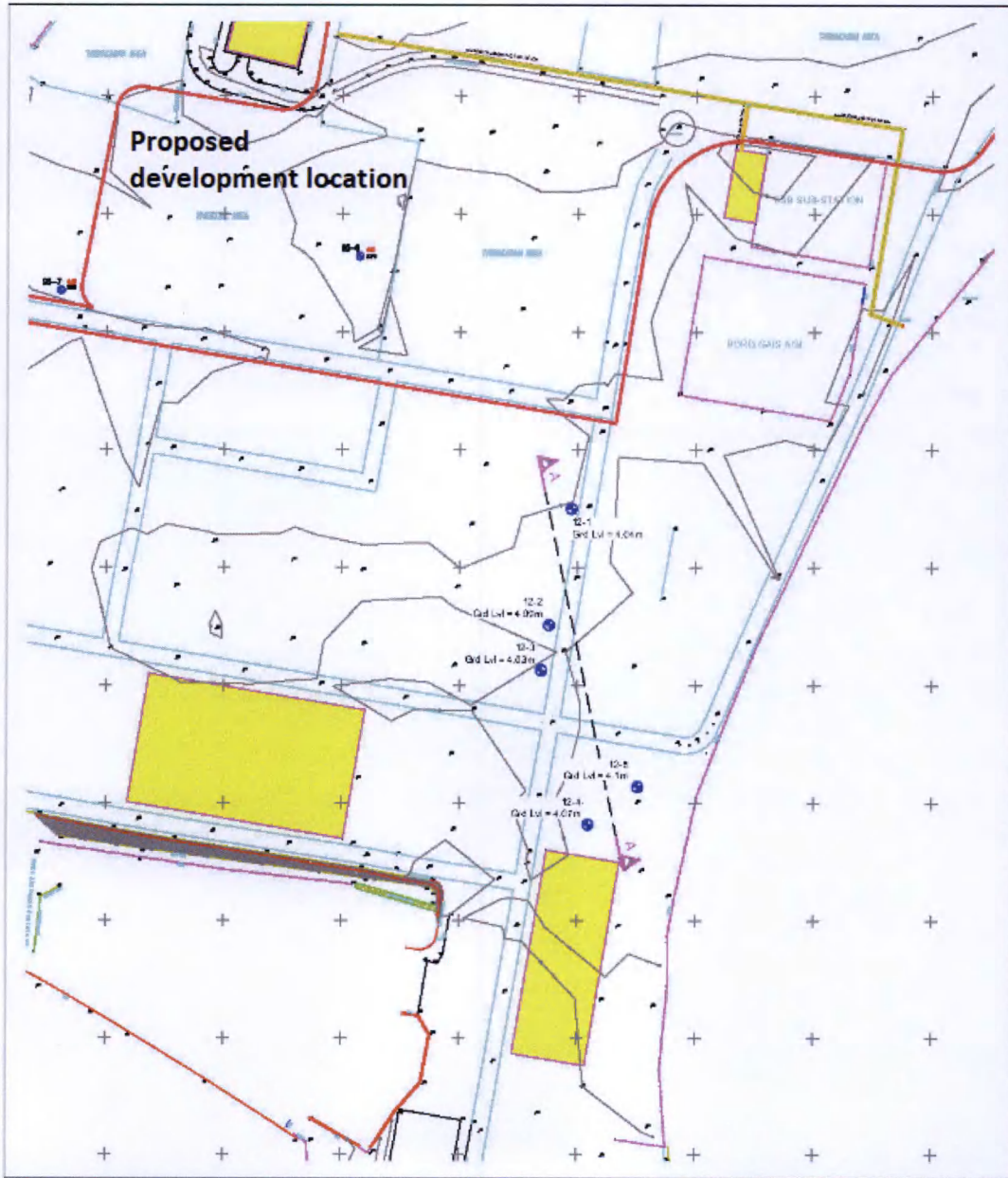


Figure 6.8 Locations of groundwater monitoring wells at the Belvelly Port Facility



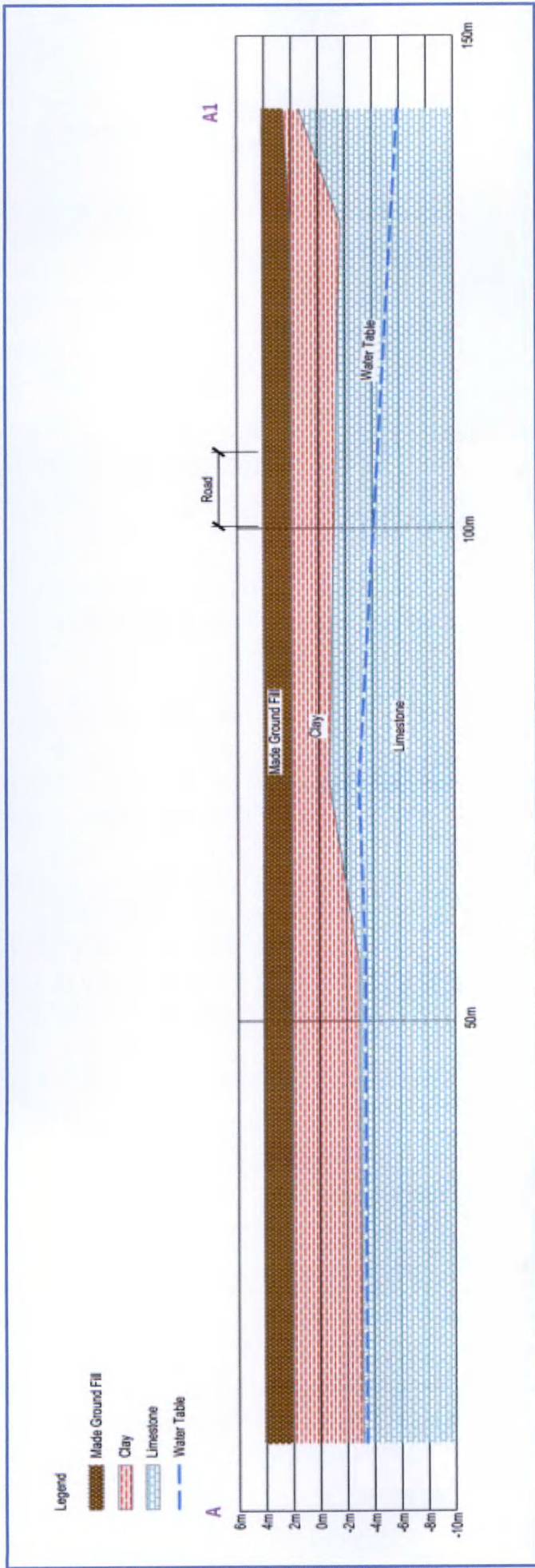


Figure 6.9 CSM cross section showing bedrock strata at the Belvelly Port Facility.

The cross section, taken using borehole data from the area to the south east of the proposed development area, shows a mostly uniform depth of made ground fill. Elevation is also seen to be relatively flat across the site. Clay is shown to occur within a range of c. 2m to -3m, with total clay depth diminishing steadily from north to south. The depth at which Limestone was encountered varies considerably from north to south. Limestone was met at a depth of c. -3m in the northern section, and a depth of c. 2m at the southern end. Water table depths range from -c. 3m to c. -6m, with deepest levels occurring towards the southern end. Given that the proposed Gouldings development is situated entirely on made ground over reclaimed land, the CSM cross section is not representative of the proposed development site, but rather provides an overview of the conditions present in the greater Belvelly Port Facility site.



## 6.4 Likely Significant Impacts

### 6.4.1 Summary of the Proposed Project

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, weighbridges, 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.

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

### 6.4.2 Potential Impacts

#### 6.4.2.1 Construction of Proposed Agricultural Fertiliser Facility

##### Excavations and piling during works

The current ground levels and hardstand at the proposed development site will be retained, except in locations of proposed buildings and underground utilities. 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.



Construction works associated with the excavation of trenches for the laying of underground utilities 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 tarmacadam, concrete slab and fill material.

It is envisaged that approximately 12,000m<sup>3</sup> of excess subsoils and/or hardcore will be removed from site.

Given the ground conditions, piled foundations will be required for the proposed buildings. 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. The stockpiling of such material and the creation of excessive mounds on the site can lead to sedimentation from runoff. Excavated material and pile arisings will be managed, segregated, stored and tested in accordance with the procedures set out in the CEMP and will be collected and disposed of by a licensed waste operator in accordance with the relevant waste legislation and waste classification requirements.

Mitigation measures and recommendations are outlined below to ensure best practice in relation to the management of site-generated 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.

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

The main materials that will be required throughout construction and approximate quantities are provided in **Chapter 12 Material Assets**. 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.

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



#### 6.4.2.2 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.

#### 6.4.2.3 Additional port operational use by Cargo Vessels

It is proposed to use the jetty for the berthing additional cargo vessels. All operations will take place on the jetty where no soil is present. 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 for the jetty which will be installed as part of the proposed demolition and site infrastructure works (Planning Ref. 19/06783) which 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.

### 6.5 Mitigation

No significant impacts on the soil and geological environment are expected to arise as a result of the proposed works. During construction, soil erosion and pollution will be minimised by the implementation of good construction practices. The contractor will develop and implement a detailed construction environmental management plan (CEMP). Refer to **Appendix 2.3** for the site-specific CEMP prepared 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 material 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, kerosene 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. These will include appropriate design codes for the tanks, flexible hoses and solid pipework, bunding to an appropriate code, level monitoring and independent automatic overfill protection on the tanks and



an appropriate mechanical integrity programme for the tank, hoses and fixed pipelines. The diesel and kerosene tanks will be double-contained tanks and the coating oil tank will be a pressure rated ISO steel tank. In addition, fire water retention will be provided on site which will also act as tertiary containment for these materials.

## 6.6 Residual Impacts

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 by cargo vessels at Marino Point.

## 6.7 References

Institute of Geologists of Ireland (2013) *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*.

Environmental Protection Agency (EPA) (2019) *EPA Maps*, Accessed 04/09/2019, <https://gis.epa.ie/EPAMaps/default>.

Geological Survey of Ireland (GSI) (2019), Accessed 04/09/2019, <https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0>.

Irish Fertilizer Industries Site, Marino Point, Cobh (2003) *Report on site investigation, Factual Report No. KC3241*.

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Geological Survey Ireland, Accessed 04/09/2019, <http://spatial.dcenr.gov.ie/GeologicalSurvey/GeoTechnicalViewer/index.html>



## 7. HYDROLOGY

### 7.1 Introduction

This chapter of the EIAR describes and assesses the potential impacts of the proposed development on hydrology (surface water). It identifies the potential for effects on surface water associated with the proposed development. The existing environment is described, mitigation measures are proposed and the predicted residual impacts are described in the following sections. Hydrogeology (groundwater) is assessed in **Chapter 8 Hydrogeology**.

#### 7.1.1 Scope of Assessment

The scope of the impact assessment and methodology pertaining to hydrology is as follows:

1. Establish the baseline hydrological conditions relevant to the development site;
2. Identify the potential impacts of the proposed development on the receiving hydrological environment;
3. Determine the significance of any identified effect;
4. Develop mitigation measures to reduce or eliminate the impacts; and
5. Identify any residual impacts after mitigation measures are implemented.

#### 7.1.2 Methodology

The assessment methodology included desk based studies, site visits and a qualitative assessment of the potential impacts.

Relevant guidelines have been used to inform the preparation and assessment of impacts from the proposed development on surface water, including:

- National Roads Authority (NRA) (2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydro-geology for National Road Schemes and EPA Guidelines – Advice Notes on Current Practice (in the preparation of Environment Impact Statement);
- Department of Housing, Planning and Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; and
- EPA (2017) Guidelines on the Information to be contained in Environmental Impact Assessment Reports – Draft.

Relevant water quality standards have been consulted and used to inform the assessment where relevant, including:

- European Communities (Drinking Water) Regulations 2014 (S.I. No. 350 of 2014);
- European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009) as amended by S.I. No. 327 of 2012, SI No. 386 of 2015 and S.I. No. 77 of 2019.



As discussed further in **Section 7.2**, the surface water in Lough Mahon is saline and is not a suitable potable water resource. As such, drinking water quality standards are considered less relevant screening criteria.

### 7.1.3 Sources of Information

#### 7.1.3.1 Desk Study

A desk-based study was undertaken to establish baseline surface water features on the site and surrounding area. Information on geology and soils is provided in **Chapter 6 Land and Soils**. The desk study involved a review of all available information, datasets and documentation sources pertaining to the hydrology of the area surrounding the application site. Publicly available information sources have been used to inform and supplement the site specific information gathered to complete this assessment as summarised in **Table 7.1** below.

**Table 7.1 Outline of Public Data Sources Consulted to Inform the EIAR**

Data Source	Information Relevant to the EIAR
Ordnance Survey of Ireland (OSI) mapping	Historic mapping to assess infilled areas.
EPA Envision Mapviewer website	Water quality data Water Framework Directive classifications Protected Areas under the Water Framework Directive
EPA Website	Public records of relevant EPA licensed facilities in the area (i.e. Marinochem , Licence P0034-03)
EPA Hydrotool	Information on catchment descriptors
Catchments.ie Website	Water Framework Directive data Protected Areas under the Water Framework Directive
Office of Public Works (OPW) Website	Flood Risk Mapping

### 7.1.4 Assessment Criteria

#### 7.1.4.1 Evaluation and impact assessment categorisation

The method of impact assessment and prediction follows the EPA (2017) Draft *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

### 7.1.5 Legislation context

The following section sets out the legislative context of the assessment in relation to surface water quality.

#### **Water Framework Directive (WFD) (2000/60/EC)**

The Water Framework Directive (WFD) (2000/60/EC) establishes an integrated and coordinated framework for the sustainable management of water. The WFD, transposed into national legislation in 2003, aims to:



- Prevent deterioration of status for surface and groundwaters and the protection, enhancement and restoration of all water bodies;
- Achieve good ecological status and good chemical status for surface waters and good chemical and good quantitative status for groundwaters;
- Progressively reduce pollution of priority substances and phase-out of priority hazardous substances in surface waters and prevention and limitation of input of pollutants in groundwaters;
- Reverse any significant, upward trend of pollutants in groundwaters; and
- Achieve standards and objectives set for protected areas in Community legislation.

The objective for each surface water and groundwater body is to prevent deterioration, maintain high and good status waters, restore waters to at least good status where necessary, and ensure that the requirements of associated protected areas are met.

The assessment will therefore determine the impact in accordance with the following regulations which give effect to the WFD:

- S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Water Regulations) 2009;
- S.I. No. 296 of 2009 European Communities Environmental Objectives (Pearl Mussel Regulations) 2009;
- European Communities (Quality of Salmonid Waters) Regulations, (S.I. 293 of 1988); and the
- Urban Waste Water Treatment Regulations (SI No. 254 of 2001 as amended) (UWW Regulations).

#### 7.1.5.1 Water Framework Protected Areas

The Water Framework Directive requires a register of protected areas. These are protected for their use (such as fisheries or drinking water) or because they have important habitat and/or species that directly depend on water. The register includes areas identified by the WFD itself or other European Directives. These may include the following:

- Areas used for water abstraction - European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018)
- Areas designated for the protection of economically significant aquatic species (Freshwater Fish Directive 78/659/EEC; Shellfish Directive 79/923/EEC)
- Recreational waters (Bathing Waters Directive 76/160/EEC)
- Nutrient Sensitive Areas (Nitrates Directive 91/676/EEC; Wastewater Treatment Directive 91/271/EEC)
- Areas of protected species or habitats where water quality is an important factor in their protection (Natura 2000 sites under Birds Directive 79/409/EEC and Habitats Directive 72/43/EEC)
- Surface waters (The European Communities Environmental Objectives (Surface Waters) Regulations [S.I. No 272 of 2009], and amendment Regulations 2012 [S.I. 327 of 2012])

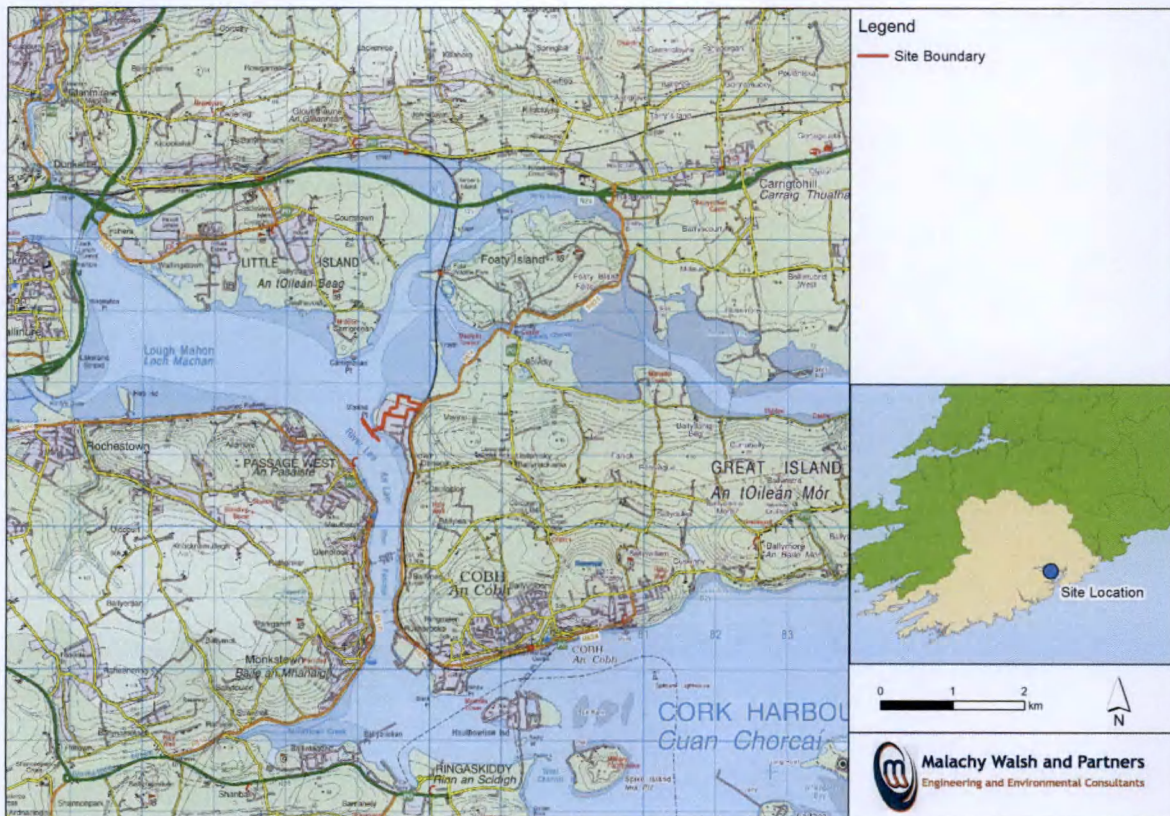


## 7.2 Existing Environment

### 7.2.1 Site and Project Context

The proposed site is located on the northwest of Great Island, within Cork harbour to the east of Cork City. The site is bound by Cork Harbour to the north, west and south. Passage West is situated approximately 1km from the centre of the site, across the harbour to the west.

**Figure 7.1** below shows the proposed site relative to the greater Cork Harbour area. The northern end of the peninsula was reclaimed post 1938 and currently contains the operational Marinochem facility, redundant carparking areas and the lagoon at the northeast corner.



**Figure 7.1 Site location relative to Cork Harbour. OSI (2019)**

As addressed in **Chapter 2 Description of the Proposed Development**, the former IFI site operated under an Integrated Pollution Control (IPC) Licence issued by the EPA in 1996 (reference number P0028-01). The EPA has confirmed in writing that no further action is required with regard to this IPC Licence and that the licence has ceased to take effect. The EPA letter regarding the cessation of the licence is attached as **Appendix 2.4** in Volume 3.

### 7.2.2 Hydrology

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. This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry



and Templebreedy Battery, Co. Cork, draining a total area of 2,153km<sup>2</sup>. The largest urban centre in the catchment is Cork City. The other main urban centres in this catchment are Ballincollig, Macroom, Carrigaline, Crosshaven, Blarney, Glanmire, Midleton, Carrigtohill, Cobh, Passage West and Belvelly. The total population of the catchment is approximately 328,854 with a population density of 153 people per km<sup>2</sup>.

The Lough Mahon estuary forms part of the upper Cork Harbour, stretching from Blackrock to Passage West, and incorporating the estuary of the Douglas River (see **Figure 7.1** above). Marino point is surrounded by the Lough Mahon estuary to the north, west and south. Several of Cork City's southern suburbs, including Blackrock, Mahon, Douglas and Rochestown also lie along its shores. The estuary covers an area of 12.23km<sup>2</sup> and is influenced by the marine environment. The estuary receives the water of the Lee, Glashaboy and Douglas rivers.

#### 7.2.2.1 Existing hydrological features

There are no hydrogeological features within the footprint of the proposed development site. A man-made lagoon exists 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 (location shown on **Figure 7.2**). This man-made lagoon is outside the boundary of the proposed development. It is proposed to infill a portion of the lagoon up to existing ground level and retain the remaining area of the lagoon as wetland habitat as part of the previous planning application for the demolition, site infrastructure and utility upgrade works (Ref. 19/6783). There are no surface water features adjacent to the development footprint on its eastern side.



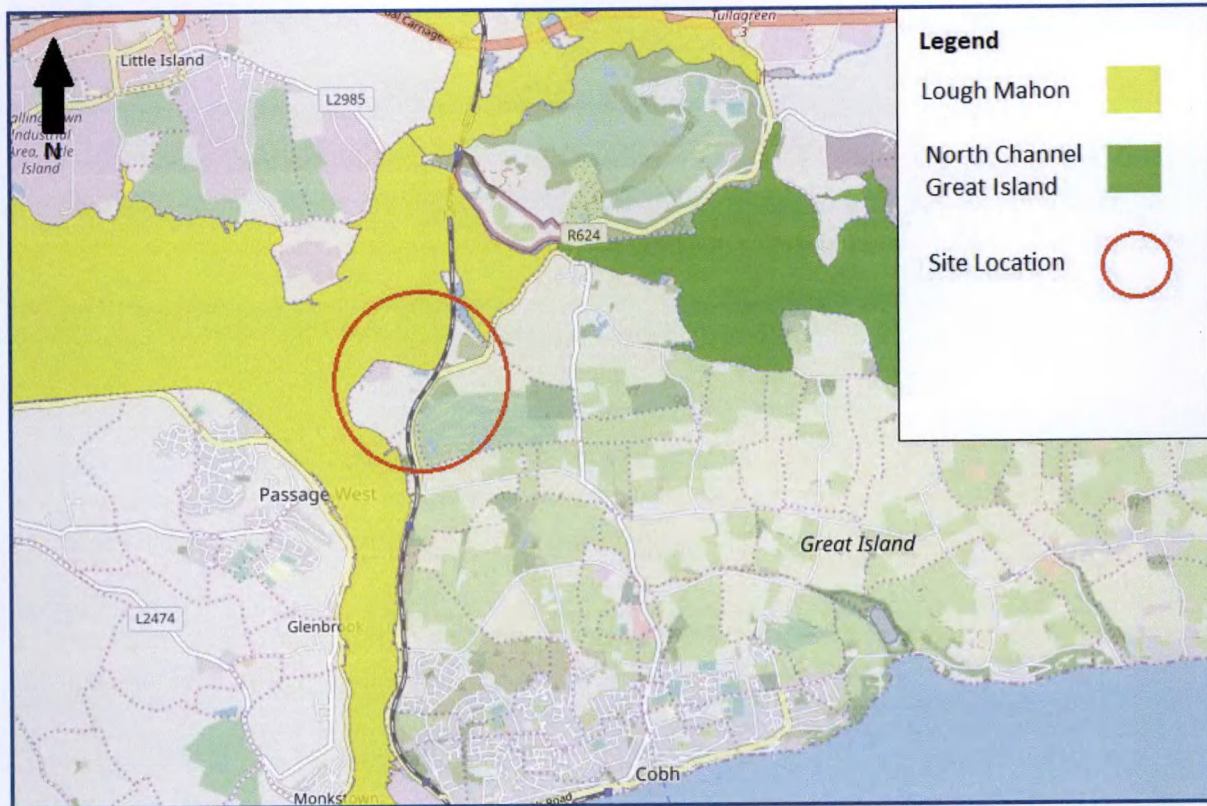


**Figure 7.2 Lagoon piped outfall location**

There are two designated Natura 2000 sites within the Lough Mahon estuary (Waterbody Code IE\_SW\_060\_0750), into which the development site drains. Cork Harbour Special Protection Area (SPA) Site code 004030, and the Great Island Channel Special Area of Conservation (SAC) Site code 001058, are both located north of the site. 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.

Potential impacts on designated Natura 2000 sites are specifically addressed in the Natura Impact Statement (NIS) which has been submitted as part of this application. This report concluded that following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the qualifying interests and conservation objectives for Natura 2000 sites, the proposed development will not have an adverse effect on the integrity of Natura 2000 sites. Refer to **Chapter 5 Biodiversity** and the NIS for further details.





**Figure 7.3 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<sup>2</sup> and is an integral part of Cork Harbour coastal waterbody (IE\_SW\_060\_0000). The main land use within the waterbody is aquaculture and fishing. Refer to **Figure 7.3** above.

#### 7.2.2.2 Existing Site Drainage

The historic foul and waste water system for the Belvelly Port Facility site comprised 2 No. septic tank treatment systems discharging to surface waters. These effluent systems serviced the Workshop/Stores building and the Urea train loading area. The remaining buildings on the site were serviced by a foul sewer network that discharged to a bio-treatment plant on site before draining to a retention pond. The retention pond was then pumped to seawater via an existing outfall. The existing foul sewer collection network is defunct and inadequate and it is proposed under the current Planning Application Reference No. 19/6783 to bring the 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.



Marinochem, which is an active industrial facility located in the north-west corner of the site, discharges treated wastewater from their on-site wastewater treatment plant to the harbour in accordance with the conditions of their EPA licence.

Surface water drainage from the jetty is currently discharged directly to the harbour by means of opes and channel drains in the jetty deck. The channel drain is open at all times and although covers are available to cover these opes, they are not water tight.

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.

### **7.2.3 Flood Risk**

The OPW has developed an indicative flood zone mapping assessment for management of flood risks on a countywide basis for planned future development. The indicative mapping creates flood zones that are fit for use in applying the Guidelines for The Planning System and Flood Risk Management at a strategic level for County Development Plan and Local Area Plans, and to help inform screening for site specific flood risk assessment for individual planning applications.

The indicative flood zone mapping used in the 2011 Local Area Plans takes account of the information that has become available from the National CFRAM programme (Catchment Flood Risk Assessment and Management), and other Flood Schemes undertaken by the OPW.

The Cork County Development Plan sets out the preferred approach to dealing with flood management. Cork County Development Plan 2014 Objective WS 6-1 notes that the aim is to avoid development in areas at risk of flooding; and where development in floodplains cannot be avoided, to take a sequential approach to flood risk management based on avoidance, reduction and mitigation of 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.

The design water level for the Belvelly Port Facility site is based on the 1 in 200 year (0.5% AEP) coastal flooding event which is 3.25 mOD. An appropriate freeboard above this level should be provided depending on the particular design element.

The lagoon area at the northern end of the site and part of the adjacent hard surface to the east of the lagoon are areas that are currently vulnerable to tidal flooding for tide levels with a return period of less than 200 years (greater than 0.5% AEP).



As part of the BMDC application for the Belvelly Port Facility site currently under review (Planning Ref. 19/06783), it is proposed to fill a portion of the man-made lagoon up to existing ground level with suitable material generated from the proposed demolition works within the site. The remainder of the lagoon will be retained as wetland habitat.

In addition, it is proposed to increase the height of the existing revetment along the north and part of the northwest boundaries of the site to a level of 4.25 mOD. This will protect the northern part of the site and the proposed agricultural fertiliser facility, 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.

The proposed development will not increase flood risk outside the confines of the site.

#### **7.2.4 Surface Water Monitoring**

A walkover survey of the site was undertaken in May 2019 by Mr. Shane Herlihy, project hydrogeologist, to fully assess current baseline groundwater and surface water conditions. The following scope of work was completed in relation to surface water:

- Installation of data loggers in the lagoon in the northern part of the site over three months to capture seasonal variations in response to rainfall and tidal changes;
- Collection of surface water samples from the lagoon and drainage inflow to the lagoon;
- Field measurement of temperature, pH, electrical conductivity, and dissolved oxygen in surface water samples; and
- Laboratory analysis of surface water samples for a range of parameters and potential contaminants including Dissolved Inorganic Nitrogen (DIN) species (nitrate, nitrite, ammonium, ammonia), major ions, alkalinity, metals, volatile organic compounds (VOC), total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH's).

Further information in relation to baseline groundwater conditions can be found in **Chapter 8 Hydrogeology**.

#### **7.2.5 Surface Water Quality**

The proposed development is located within the South Western River Basin District (SWRBD), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy, (commonly known as the Water Framework Directive [WFD]). Under the Water Framework Directive (Directive 2000/60/EC) all surface water catchments have been characterised and assigned an overall status based principally on chemical and ecological status. The status of river water bodies can range from Bad-Poor-Moderate-Good-High. The objective of the Water Framework Directive is to restore poor quality water bodies to at least 'Good' status, and prevent deterioration of 'Good' status water bodies, by 2021. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015.



The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) for Ireland 2018 – 2021 (2nd Cycle) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are At Risk of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas.

In line with the Water Framework Directive (WFD), the EPA provides information on the water quality status of transitional waterbodies. The WFD water quality status of Lough Mahon is Moderate and the date to meet its environmental objective is 2027. The WFD water quality status for the North Channel Great Island waterbody is Moderate and the date to meet its environmental objective is 2027.

A summary of waterbodies associated with the project are summarised in **Table 7.2**.

**Table 7.2 Waterbody status for Receiving Waters<sup>1</sup>**

Waterbody Code	Waterbody Type	Name	Status	Risk	Date to Meet Environmental Objective
IE_SW_060_0750	Transitional	Lough Mahon	Moderate	At Risk	2027
IE_SW_060_0300	Transitional	North Channel Great Island	Moderate	At risk of not achieving good status	2027

<sup>1</sup><https://www.catchments.ie/maps/>



Surface water quality results from samples collected from the drain and lagoon at low water level (**Table 7.3**) indicate that the drain water quality is relatively fresh (non-saline) with dissolved inorganic nitrogen (DIN) dominated by ammonium and to a lesser extent ammonia, which is similar to groundwater in the area.

Water quality in the lagoon indicated a significant difference with salinity typical of sea water, reflecting the tidal ingress which dominates the overall water quality in the lagoon. Concentrations of ammonium and ammonia were orders of magnitude lower, reflecting the dilution by the tidal ingress into the lagoon.

There are no appropriate surface water standards for DIN relevant to transitional waters and it is not considered appropriate to apply coastal water body standards, although these are included within **Table 7.3** for indicative purposes only. As the surface water and groundwater at the site are connected, the assessment of groundwater quality described in **Chapter 8** is considered relevant.

**Table 7.3 Surface Water Quality Results from the lagoon and associated drain**

Location		Transitional Water Body <sup>2</sup>	Coastal Water Body <sup>2</sup>	Drain	Lagoon
Date				28-May-2019	28-May-2019
Temperature (°C)				13.9	18.7
pH				7.36	7.72
Electrical conductivity (µS/cm)				802.0	37695.0
Dissolved Oxygen (%)		>70%	>70-80%	52.5	100.0
Notes				Clear, no odour, no sheen	Clear, no odour, no sheen
Bromide	mg/l			< 0.10	< 0.10
Salinity	ppt			< 2.0	26
Total Dissolved Solids	mg/l			620	24000
Alkalinity (Total)	mg/l			350	89
Chloride	mg/l			170	16000
Fluoride	mg/l			0.20	0.78
Ammonia (Free)	mg/l			2.6	0.071
Ammonium	mg/l			20	1.3
Nitrite	mg/l			0.020	< 0.020
Nitrate	mg/l			< 0.50	< 0.50
Dissolved Inorganic Nitrogen (DIN)	mg/l - N		≤0.25	17.64	1.07
Phosphate	mg/l			< 0.20	< 0.20

<sup>2</sup> S.I. No. 77 of 2019 European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019, S.I. No. 386 of 2015 European Union Environmental Objectives (Surface Waters) (Amendment) Regulations & S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Water) Regulations 2009. Based upon Good Status conditions and high salinity level. Cadmium reference values refer to hardness of the water. Blanks = no applicable concentration or value.



Location		Transitional Water Body <sup>2</sup>	Coastal Water Body <sup>2</sup>	Drain	Lagoon
Sulphate	mg/l			1.9	1900
Calcium	mg/l			63	370
Potassium	mg/l			6.1	340
Magnesium	mg/l			6.6	1100
Sodium	mg/l			100	8000
Arsenic (Dissolved)	µg/l			2.2	31
Cadmium (Dissolved)	µg/l	0.6 µg/kg (Class 3)	0.6 µg/kg (Class 3)	0.088	0.50
Chromium (Dissolved)	µg/l			7.2	160
Copper (Dissolved)	µg/l			1.9	290
Mercury (Dissolved)	µg/l	0.07 (µg/kg)	0.07 (µg/kg)	< 0.50	< 0.50
Nickel (Dissolved)	µg/l	34 (µg/kg)	34 (µg/kg)	5.2	< 1.0
Lead (Dissolved)	µg/l	14 (µg/kg)	14 (µg/kg)	< 1.0	< 1.0
Selenium (Dissolved)	µg/l			2.8	200
Strontium (Dissolved)	µg/l			150	700
Zinc (Dissolved)	µg/l			10	9.7
TPH >C6-C10	µg/l			< 0.10	< 0.10
TPH >C10-C21	µg/l			< 0.10	< 0.10
TPH >C21-C40	µg/l			< 0.10	< 0.10
Total TPH >C6-C40	µg/l			< 10	< 10
Total Of 16 PAH's	µg/l			< 2.0	< 2.0
Volatile Organic Compounds (VOC's)	µg/l			n.d.	n.d.

### 7.2.6 Do-Nothing Scenario

This section describes the current state of the hydrological environment at the site and how it would be expected to evolve without the development of the proposed agricultural fertiliser facility and the additional port operational use. Under a do-nothing scenario, surface water run-off within the footprint of the proposed fertiliser facility will continue to enter the existing inadequate storm network and in some areas infiltrate the ground and discharge through natural conduits before entering Lough Mahon. The existing storm network is in poor condition and does not include oil interceptors.

### 7.3 Likely Significant Impacts

This section addresses the potential impacts on the hydrological environment from activities arising during construction and operation of the proposed development and makes a determination on the likelihood of occurrence.



### 7.3.1 Summary 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 facility which facilitates the relocation of Goulding Fertiliser Limited from Cork City to the Belvelly Port Facility. The proposed facility will consist of:
  - Importation by ship of bulk granular fertiliser at the existing jetty.
  - A storage warehouse;
  - A bagging and palletising facility;
  - An office building to support customer service and weighbridge operations; and
  - Outside paved storage area, weigh-bridges, access control and security facilities.

The primary use of the proposed fertiliser facility will be for bagging and blending of dry bulk materials for storage and distribution.

The proposed additional port operational use of the existing jetty to facilitate cargo vessels will be for the following operations:

- Importation and exportation of general cargo.
- The cargo types proposed include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, berths for laid –up vessels and other miscellaneous dry cargo.

The proposed demolition, site infrastructure and utility upgrade works applied for under planning application ref. no. 19/06783 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. 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 increased use of the jetty and these aspects are considered and cumulatively assessed in this EIAR. The phasing of the two projects will ensure that the surface water and foul drainage networks proposed as part of planning application ref. no. 19/06783 will be fully installed prior to the operation of the proposed fertiliser facility. This will allow the proposed facility to connect into the new foul network and ensures that an adequate controlled stormwater collection system exists on the jetty prior to the additional operational use of the jetty.

It is proposed to install a dedicated surface water drainage system on the proposed Gouldings site which will connect into the existing surface water outfall into Lough Mahon which is located off the northern end of the main site. Refer to **Figure 7.2**. The surface water will be collected and conveyed through a dedicated surface water drainage network before it leaves the Gouldings site. The northern area of the yard which is proposed as a storage area is to be drained towards the north following the existing ground levels and then collected via an open channel along the northern boundary. All runoff is to be routed to the north of the site prior to discharging to the harbour via the existing outfall which is made up of 3 drains which are 600mm in diameter. If any exceedances are detected, the water will



be diverted to the surface water attenuation/ fire water retention tank where it will be held until safe to discharge.

Surface water attenuation, and fire water retention in the event of a fire on site, will be provided given the nature of the development as a Seveso site. The fire water retention requirements have been calculated based on EPA Guidance on Retention Requirements for Firewater Run-off. It is proposed to split the site into two separate potential fire zones, the Building zone and the yard area. The building zone will be drained via gravity in a drainage network of road gulleys, channel drains and pipework while the northern yard area will be drained through an open channel since the yard falls in this direction thus reducing the required pipework, manholes and gulleys required.

It is proposed to construct an above-ground tank with 3,010m<sup>3</sup> capacity. This could be utilised for each of the following scenarios:

- For the attenuation of water during normal scenarios of rainfall and tidal events.
- To retain firewater from the building network in the event of a fire in the buildings area. Water collected from the northern yard will drain directly to the existing outfall during this fire event
- To retain firewater from the northern yard area in the event of a fire. Water collected from the buildings area will drain directly to the existing outfall during such an event.

In order to allow the tank to be utilised effectively for each scenario, several automatic valves will be required within manholes to allow the above scenarios operate effectively. These valves are also required to retain surface water within the tank in the event of a spill of contaminated material on site.

### **7.3.2 Construction Phase**

#### **7.3.2.1 Impacts on Hydrology**

In considering the receiving environment and the proposed activities, the principal issues relating to the hydrological environment during the construction phase are the potential impairment of surface water quality associated with surface water run-off and de-watering during excavations, mobilisation of sediment and potentially existing contamination and accidental spillages / leaks of substances used at construction sites such as lubricants, fuels and oils.

It is noted that 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.

For details of the surface water management drainage during the construction phase, refer to the information provided in the CEMP, **Appendix 2.3** of Volume 3.



### 7.3.3 Operational Phase

#### 7.3.3.1 Impacts on Hydrology

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 operation at the jetty.

##### Surface Water Drainage System

Due to the development of roads, hardstanding areas and buildings, infiltration of surface water will be reduced. As stated in **Section 7.3.1**, 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 leaves the site. Should any exceedances be detected, the water will be diverted to the surface water attenuation / fire water attenuation tank where it will be held until safe to discharge.

Surface water discharge from the fertiliser facility will operate under a discharge licence from Cork County Council. Discharge rates from the site will be limited to brownfield runoff rates.

The jetty will be serviced with its own storm water system as detailed in the previous 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 a 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. The pumping station will be positioned underground on the main Belvelly Port Facility site at a depth of 4.5m.

An isolator switch situated at the pumping station will be used to manually divert any runoff to this tank either as an operational procedure at the time of loading/unloading cargo or as a procedure to be carried out in the event of a spill or possible contamination.

Once the surface water in the tank has been tested for contaminants it will either be transferred through the oil interceptor to the outfall or will require collection and appropriate disposal off site. The necessary management and disposal of the contaminated 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 prior to discharge to the harbour. The plant will be located underground and will service waste water from the proposed agricultural fertiliser facility. Wastewater will receive Primary and Secondary treatment in the SBR unit which will be capable of treating variable loads, including shock loads which will be buffered to prevent discharge of partially treated or untreated effluent.



The WWTP will be equipped to handle influent for between 10 and 50 PE. This will allow for a range from an initial 10PE currently on site to an estimated 100PE which may be discharging to the SBR once the Belvelly Port Facility masterplan development is at capacity.

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.

In the future, it will be the responsibility of individual site operators within the Belvelly Port Facility to treat runoff from their own sites before discharging into the collection network if any further treatment is necessary.

Given above, no significant impacts 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.

### **7.3.4 Cumulative Impacts**

#### **7.3.4.1 Hydrology**

Any future developments within the Belvelly Port Facility site will be undertaken in accordance with the relevant planning and regulatory requirements. As mentioned earlier, stormwater generated on individual sites will be pre-treated prior to discharge to the main stormwater collection system.

In the event that future site users generate process waste water, it will be treated and managed on each individual site in accordance with legislative requirements.

As referenced throughout this chapter, there is one known development proposal currently under consideration by Cork County Council for the Belvelly Port Facility site, Planning Ref. 19/06783 regarding proposed demolition, site infrastructure and utility upgrade works. The construction period for this application is expected to overlap with the construction of the agricultural fertiliser facility by approximately 12 months. Both projects will be compliant with best practice construction practices and the requirements of the respective CEMPs (**Appendix 2.3** contains the CEMP for this project). No potential cumulative impacts on hydrology are expected due to the proposed concurrent works.

## **7.4 Mitigation**

### **7.4.1 Construction Phase**

During construction, surface water pollution will be minimised by the implementation of good construction practices. The contractor will develop and implement a detailed construction environmental management plan (CEMP). Refer to **Appendix 2.3** for the site-specific CEMP prepared



as part of this planning application. At a minimum, the manual will be formulated in consideration of standard best practice including but not limited to the following:

- CIRIA, (2001) 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors', Construction Industry Research and Information Association, CIRIA reference C532, January 2001
- CIRIA, (2005). 'Environmental Good Practice on Site' (C650). London: Construction Industry Research and Information Association (CIRIA) (Connolly S. and Charles P.)
- CIRIA, (2007). 'The SUDS Manual'. London: Construction Industry Research and Information Association, CIRIA reference C697
- CIRIA, (2011). 'Environmental good practice on site'; Construction Industry Research and Information Association publication C692 (3rd Edition - an update of C650 (2005); (I. Audus, P. Charles and S. Evans)
- Murnane, Heap and Swain. (2006) Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.
- EA, (2004) 'UK Pollution Prevention Guidelines' (PPG), Environment Agency
- Inland Fisheries Ireland (2016) Guidelines on the Protection of Fisheries during Construction Works and Adjacent to Waters.

#### **Excavation works**

Temporary excavations during the construction stage will be backfilled as soon as reasonably practicable.

Surface water management will be required during excavation works and during piling. It is possible that there will be some surface water or ground water ingress into excavations. Any pumping from these works area will discharge to a silt collection pond to allow for settlement of suspended solids prior to discharge. In the event that contaminated soils or subsoils containing other potentially contaminated material are discovered during excavation activities (identified through staining, discoloration, or odour), this soil will be segregated, stockpiled, sampled for waste classification purposes sufficient to meet the requirements of the applicable waste disposal facility, transported off-site by a licensed waste contractor, and disposed of in an approved waste treatment or disposal facility.

#### **Drainage and Sediment Control**

The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites in their publication Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters – Williams et al, 2001).

The surface water management will involve minimising the volume of water requiring treatment, intercepting and treating construction surface water runoff prior to discharge to Lough Mahon.

A silt fence will be installed down gradient of terrestrial site works i.e. between the works and sensitive aquatic receptors during construction. A single cut off drain will be installed around the proposed



footprint of the fertiliser facility. This drain will divert surface water to a silt collection pond for treatment. The full details are contained in the CEMP contained in **Appendix 2.3**.

### **Waste**

Standard good waste management practices will be employed on the site during the construction and operational stages to ensure that waste management activities do not pose a risk to water quality.

### **Temporary Construction Compound**

- Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillage occurs.
- Temporary toilet facilities will be managed by the Contractor during the construction phase.
- A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc.
- The compound will be in place for the duration of the construction phase and will be removed once commissioning is complete.

### **Storage and Stockpiles**

- Temporary stockpiles of excavated earth will be constructed within the lands made available.
- Stockpiles will be located away from drainage systems and silt retaining measures (silt fence/silt curtain or other suitable materials) to reduce risk of silt run-off shall be installed along the downgradient edges of stockpiled earth materials.
- All excavated materials from the site or introduced materials for construction will be either used or removed from the site.
- No permanent spoil or stockpiles will be left on site, other than those materials required for landscaping, berm construction and construction generally.
- 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.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.
- On-site washing of concrete truck barrels should not be allowed. The washing of the chutes at the rear of the trucks may be permitted. A designated wash area will be required.

### **Refuelling of Construction Plant On-Site**

- Refuelling will be carried out using 110% capacity double bunded mobile bowzers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using.
- Plant nappies or absorbent mats to be placed under refuelling point during all refuelling to absorb drips.



- Mobile bowzers, tanks and drums should be stored in a secure, impermeable storage area, away from drains and open water.
- To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor.
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- The site Environmental representative will be immediately informed of the oil leak/spill and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil and initiate the clean-up if necessary.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery.
- Correct action in the event of a leak or spill will be facilitated by training all vehicle / machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction.
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

### **Construction Wheel Wash**

- A Construction Wheel Wash will be used to wash truck tyres leaving the construction site. Water residue from the wheel wash will be fed through a settlement pond, interceptor and then discharge to the stormwater drainage network. The wheel wash area will be cleaned regularly so as to avoid the build-up of residue.

## **7.4.2 Operation Phase**

### **7.4.2.1 Proposed Agricultural Fertiliser Facility**

During operation of the proposed agricultural fertiliser facility, an environmental management plan (EMP) will be in place to ensure compliance with environmental legislative requirements and planning consent. This will include full containment of potential pollutant sources, site-specific emergency response measures and management of surface water run-off and wastewater discharge.

The unloading and handling of bulk granular fertiliser at the existing jetty will be undertaken following agreed operational procedures that minimises the potential for the generation of contaminated run-off. Mobile cranes with clamshell grabs will be used to prevent loss of material, the grab will be lowered into a hopper and the fertiliser will be transferred in covered trailers to the facility. In addition to the controlled handling of the bulk granular fertiliser, road sweepers and manual sweeping will be employed on the jetty as required. The jetty drainage network will be operated to ensure no release



of contaminated water into the harbour takes place. Full details of the jetty drainage are provided below in **Section 7.4.2.2**.

Surface water from the fertiliser facility will be discharged to Lough Mahon via the existing outfall and in accordance with a discharge licence which will be obtained from Cork County Council.

Foul wastewater from the facility will be conveyed to the Belvelly Port Facility WWTP which is to be constructed under planning application 19/06783. The treated foul effluent will be discharged to Lough Mahon via an existing outfall and in accordance with a discharge licence which will be obtained from Cork County Council. Ongoing maintenance of the WWTP will be undertaken to ensure that the plant is operated and maintained correctly. A maintenance contract will be implemented which will manage such operations such as de-sludging, trouble shooting and addressing malfunctions.

#### *7.4.2.2 Operational Use of the Jetty*

Operational procedures will be employed during the handling of bulk cargo at the jetty that minimises the potential generation of contaminated run off. In addition to controlled handling of cargo, road sweepers and manual sweeping will be employed on the jetty as required. During operation, the jetty drainage network system which is to be constructed under planning application 19/06783 will be operated to ensure no risk of pollution of the receiving waters exists. The following operating procedures are proposed:

- The valves in the pumping station are closed during offloading;
- If the offloading is in dry weather, the jetty is swept clean and then washed down;
- The resulting wash water will be manually tested and, if clear, discharged through the oil interceptor. If contaminated it is diverted for treatment or disposal;
- If the offloading takes place in wet weather, then the collected storm water will be manually tested before release or diversion;
- At all times, other than offloading, the valve to the oil interceptor will be left open so that storm water can discharge normally;
- Where there is a risk of a contamination incident due to the type of cargo being handled at the jetty, surface water will be pumped to a retention tank. The pumping station will be positioned underground on the main Belvelly Port Facility site at a depth of 4.5m. An isolator switch situated at the pumping station will be used to manually divert any runoff to this tank either as an operational procedure at the time of loading/unloading cargo or as a procedure to be carried out in the event of a spill or possible contamination. Once the surface water in the tank has been tested for contaminants it will either be transferred through the oil interceptor to the outfall or will require collection and appropriate disposal off site.
- The individual users of the jetty will be responsible for the proper implementation of these operating procedures;
- If storm water is found to be contaminated and is diverted, the jetty user will be responsible for the appropriate management of the contamination. Contaminated water should be dealt with within two days so that the retention tank is available for the next user of the jetty.



- A 150mm high kerb around the perimeter of the jetty and access bridge provides an extra safeguard.

## 7.5 Residual Impacts

In the long term, the residual impact of the proposed development of a new agricultural fertiliser facility and additional port operational use to facilitate cargo vessels works will have a long term moderate positive impact on the surface water environment due to the installation of a storm drainage control system which includes full retention oil interceptors and a monitored diversion system for the jetty drainage.

## 7.6 References

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